

**GOA UNIVERSITY**  
**Taleigao Plateau, Goa 403 206**

**UPDATED FINAL AGENDA**

**For the 6<sup>th</sup> Adjourned Meeting of the**

**IX ACADEMIC COUNCIL**

**Day & Date**

**13th September 2017**

**Time**

**2.30 p.m.**

**Venue**

**COUNCIL HALL**  
**Administration Block**

**Sixth Adjourned Meeting of the IX Academic Council****INDEX**

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**Sixth Adjourned Meeting of the IX Academic Council**

Date: 13-9-2017

Time: 2.30 p.m.

Venue: Council Hall, Goa University,  
Taleigao Plateau, Goa.

<b>D</b>	<b>DISCUSSIONS</b>	
<b>D 1.1</b>	To confirm the minutes of the <a href="#">5<sup>th</sup> meeting of the IXth Academic Council</a> held on 22 <sup>nd</sup> May, 2017. (refer page no 1)	
<b>D 1.2</b>	To confirm the minutes of the <a href="#">4<sup>th</sup> meeting of the Standing Committee of the IXth Academic Council</a> held on 21 <sup>st</sup> June, 2017. (refer page no 12)	
<b>D 2</b>	<b>FOLLOW UP ACTION</b>	
<b>D 2.1</b>	Follow up action on the minutes of the 4th meeting (Special) of the IXth Academic Council held on 14 <sup>th</sup> March, 2017.	
	<b>D DISCUSSIONS</b>	
	<b>D 7 OTHER ITEMS</b>	
	D 7.1 Consideration of name of personality for award of Honorary Degree at the ensuing Convocation to be held on 25 <sup>th</sup> April, 2017.	The Degree of Doctor of Letters has been awarded to the Hon'ble President of India, Shri Pranab Mukherjee, at the 29 <sup>th</sup> Annual Convocation held on 25 <sup>th</sup> April, 2017.  <a href="#">(Back to Index)</a>
<b>D 2.2</b>	Follow up action on the minutes of the 3 <sup>rd</sup> meeting of the Standing Committee of the IXth Academic Council held on 2 <sup>nd</sup> May, 2017.	
	<b>D DISCUSSION</b>	
	<b>D 3 BOARD OF STUDIES</b>	
	D 3.1 Minutes of the meeting of Board of Studies in History held on 15/03/2017 and 9/03/2017	Approved syllabus forwarded to the Chairperson and the concerned principals of affiliated colleges through mail dated 18/05/2017
	D 3.2 Minutes of the meeting of Board of Studies in Dentistry held on 30/09/2016	Letter forwarded to the Chairperson conveying the decision by vide No. GU/Acad-PG/56/BoS-Dentistry/2017/798 dated 16/06/2017
	D 3.3 Minutes of the meeting of Board of Studies in Geography held on 02/03/2017	Approved syllabus forwarded to the Chairperson and the concerned principals of affiliated colleges through mail dated 19/05/2017

	D 3.4 Minutes of the meeting of Board of Studies in Computer Science & Technology (UG) held on 23/02/2017	Approved syllabus forwarded to the Chairperson and the concerned principals of affiliated colleges through mail dated 08/06/2017 and approved BCA Ordinances forwarded to legal section to place it before Drafting & Vetting Committee on 20/06/2017
	D 3.5 Minutes of the meeting of Board of Studies in French through Circulation	Approved syllabus forwarded to the Chairperson and the concerned principals of affiliated colleges through mail dated 18/05/2017
	D 3.6 Minutes of the meeting of Board of Studies in Para – Clinical Medicine (Ayurvedic) held on 07/04/2017	Letter forwarded to the Chairperson conveying the decision by vide No. GU/Acad-PG/76/BoS-Para-Clinic(Ayur)/2017/723 dated 13/06/2017
	D 3.7 Minutes of the meeting of Board of Studies in Clinical Medicine (Ayurvedic) held on 07/04/2017	Letter forwarded to the Chairperson conveying the decision by vide No. GU/Acad-PG/75/BoS-Clinic(Ayur)/2017/724 dated 13/06/2017
	D 3.8 Minutes of the meeting of Board of Studies in Pre-Clinical Medicine (Ayurvedic) held on 07/04/2017	Letter forwarded to the Chairperson conveying the decision by vide No. GU/Acad-PG/74/BoS-Pre-Clinical(Ayur)/2017/725 dated 13/06/2017
	D 3.9 Minutes of the meeting of Board of Studies in Portuguese through Circulation	Approved syllabus forwarded to the Chairperson and the concerned principals of affiliated colleges through mail dated 19/05/2017
	D3.10 Minutes of the meeting of Board of Studies in Marathi held on 13-04-2017	Approved syllabus forwarded to the Chairperson and the concerned principals of affiliated colleges through mail dated 18/05/2017
	D 3.11 Minutes of the meeting of Board of Studies in Sociology held on 27-04-2017	Approved syllabus forwarded to the Chairperson and the concerned principals of affiliated colleges through mail dated 18/05/2017
	D 3.12 Minutes of the meeting of Board of Studies in Sanskrit held on 28-03-2017	Chairperson was informed telephonically about the decision and requested to re-submit the minutes and syllabus to placed it before A.C. meeting scheduled on 22/05/2017
	<b>D 4 REPORTS OF AFFILAITION INQUIRY COMMITTEE</b>	
	D 4.1 DM'S College & Research Centre, Assagao	Conveyed to the College vide letter No.5/15/ Acd.Gen/Aff/ 22 dated 24/05/2017.
	D 4.1.1 Programme: B.B.A	
	D 4.1.2 Programme: B.C.A	

D 4.1.3 M. A (English)	
D 4.2 Shree Damodar College of Commerce & Economics, Margao B.B.A (Fin. Services)	Conveyed to the College vide letter No.5/15/ Acd.Gen/Aff/583 dated 31/05/2017. Communicated to the DHE vide letter No.5/17/ Acad.Gen/718 dated 13/06/2017.
D 4.3 Government College of Commerce, Margao Programme: B.Com	Conveyed to the College vide letter No.5/15/ Acd.Gen/Aff/25 dated 30/05/2017.
D 4.4 Nirmala Institute of Education, Altinho D 4.4.1 Continuation of affiliation for P.G. Diploma in Guidance & Counselling program	Conveyed to College vide letter No. 1/89/ Acad-Gen/2017/ dated 06/06/2017
D 4.4.2 Continuation of affiliation for M.A. Wellness Counselling program	
D 4.4.3 B. Ed (Two Year)	
D 4.5 Goa Dental College & Hospital, Bambolim- Goa D 4.5.1 Continuation of Affiliation to MDS in Oral Pathology & Microbiology program	Conveyed to the College vide letter No.1/88/ Acd.Gen/2017/749 dated 14/06/2017.
D 4.5.2 Continuation of Affiliation to MDS in Conservative Dentistry & Endodontics program	
D 4.5.3 Continuation of Affiliation to MDS in Oral and Maxillofacial Surgery program	
D 4.5.4 Continuation of Affiliation to MDS in Periodontics program	
D 4.5.5 Continuation of affiliation for MDS in Oral Medicine, Diagnosis & Radiology for the academic year 2017-18.	
<b>D 5 STATUTES AND ORDINANCES</b>	
D 5.1 Proposed part amendment to Ordinance OC-30 relating to B.Sc. (Nursing) Program.	Forwarded to legal section to place it before Drafting and Vetting Committee.
D 5.2 Proposed part amendment to Statute SC-1 relating to affiliation and recognition of Colleges/Institutions and related matters.	Statute amended vide Notification No.2 / 405/2016-Legal/Amend-Stat/Vol.VIII/ 1297 date 25/07/2017.
<b>D 7 OTHER ITEMS</b>	
D 7.1 Proposal to Institute "Goa University Prize' for Biochemistry Topper, Dept. of Microbiology.	Noted
D 7.2 Request to permit conduct of 1 hr classes for Semester III, IV, V & VI.	Deferred to the next Academic Council meeting
D 7.3 To consider the proposal to conduct Ph.D. Viva-Voce examination in terms of Ordinance OB-9A.9(X).	Noted



	D 7.4 Revision of fees payable by students	Notified vide Circular No. GU/Colg/Fees/2017/162/374 dated 11/5/2017.
	D 7.5 5% increase in all the fees related to Post Graduate and Ph.D. programmes running in Goa University Campus	Increase of fees is notified on the University Hand Book 2017-18
	D 7.6 To consider the minutes of the meeting of Central Admission Committee held on 19/04/2017.	Noted
	D 7.7 Refund of tuition fees	Circular is issued to all the University Teaching Departments by vide No. GU/36/Acad-PG/Refund of Fees/2017/1322/446 dated 17/05/2017
	D7.8 Revised Academic Terms for the Academic year 2016-17 for B.Arch.	Notified vide Letter No. GU/ ACAD(colleges)/2017/158 dated 08.5.2017. <a href="#">(Back to Index)</a>
<b>D 2.3</b>	<b>Follow up action on the minutes of the 5<sup>th</sup> meeting of the IXth Academic Council held on 22<sup>nd</sup> May, 2017.</b>	
	<b>D DISCUSSIONS</b>	
	<b>D 3 BOARD OF STUDIES</b>	
	D 3.1 Minutes of the meeting of Board of Studies in Marathi held on 01/03/2017	Letter forwarded to the Chairperson conveying the decision by vide No. GU/ Acad-PG/3/BoS-Marathi/2017/21 dated 13/06/2017.
	D 3.2 Minutes of the meeting of Board of Studies in Pharmacy held on 28/04/2017	Letter forwarded to the Chairperson conveying the decision by vide No. GU/ Acad-PG/57/BoS-Pharm/2017/924 dated 29/06/2017 and Letter forwarded to the Secretary, Pharmacy Council of India seeking clarification various discrepancies in the syllabus by vide No. GU/Acad-PG/57/BoS-Pharmacy/725 dated 16/06/2017.
	D 3.3 Minutes of the meeting of Board of Studies in Homoeopathic Medicine held on 10/03/2017	Letter forwarded to the Chairperson conveying the decision by vide No. GU/ Acad-PG/60/BoS-Homeo-Med/2017/744 dated 14/06/2017.
	D 3.4 Minutes of the meeting of Board of Studies in Management Studies held on 02/05/2017	Letter forwarded to the Chairperson conveying the decision by vide No. GU/ Acad-PG/49/BoS-Mangmt-Stud/2017/20 dated 13/06/2017.  Affiliation Inquiry Committee visit conducted at S.S. Dempo College of Com. & Eco., Cujira on 3/8/2017 for

		Post Graduate Diploma in Management (Event Management)
	D 3.5 Minutes of the meeting of Board of Studies in Sanskrit held on 12/05/2017	Letter forwarded to the Chairperson conveying the decision by vide No. GU/ Acad-PG/Ad-hoc BoS-Sanskrit/18/722 dated 12/06/2017
	<b>D 4 REPORTS OF AFFILIATION INQUIRY COMMITTEE</b>	
	D 4.1 Don Bosco College Panjim Goa	Conveyed to the College vide letter No.5/17/ Acd.Gen/Aff/ 739 dated 14/06/2017.
	D 4.1.1 Master of Social Work	
	D 4.1.2 Bachelor of Social Work	
	D 4.1.3 Bachelor of Business Administration (Travel & Tourism)	
	D 4.1.4 Bachelor of Physical Education	
	D 4.2 Government College of Arts, Science and Commerce, Khandola	Conveyed to the College vide letter No.5/17/ Acd.Gen/Aff/ 37 dated 12/06/2017.
	D 4.2.1 M.Sc. – Inorganic Chemistry	Communicated to the DHE vide letter No.5/17/ Acad. Gen/801 dated 19/06/2017.
	D 4.2.2 M. Com.	
	D 4.3 M.E.S. College of Arts and Commerce, Zuarinagar	Conveyed to the College vide letter No.5/17/ Acd.Gen/Aff/ 784 dated 16/06/2017.
	D 4.3.1 M.Com.	
	D 4.3.2 M. A. - English	
	D 4.3.3 B. A. –Tourism and Travel	
	D 4.3.4 B.Com. 5 <sup>th</sup> division (Sem. V and VI)	
	D 4.3.5 B.B.A. ( Shipping and Logistics)	
	D 4.3.6 B.A. - English(6 Units)	
	<b>D 5 ORDINANCES/STATUTES</b>	
	D 5.1 Proposed part amendment to Statute SC-1 relating to affiliation and recognition of Colleges/Institutions and related matters.	Statute amended vide Notification No.2 / 405/2016-Legal/Amend-Stat/Vol.VIII/ 1297 date 25/07/2017.
	D 5.2 Proposed part amendment to OC-33 A, 34 A and 35 A	Approved Ordinance is forwarded to legal section to place it before Drafting & Vetting Committee.
	D 5.3 Part Amendment to Ordinance OC-45	Approved Ordinance is forwarded to legal section to place it before Drafting & Vetting Committee.
	D 5.4 Proposed amendments to Ordinance OC-66	Approved Ordinance is forwarded to legal section to place it before Drafting & Vetting Committee.

	D 5.5 Part Amendment to statute SSA-7 and Part Amendment to Statute SA-24	Approved Statute is forwarded to legal section to place it before Drafting & Vetting Committee.
	<b>D 7 OTHER ITEMS</b>	
	D 7.1 Implementation of Hindi medium in the Management Studies at the Universities	Matter is under process
	D 7.2 To consider the request received from Heads of the Departments of Social Sciences to revise OA-18 to reduce total Credits from 80 to 64.	Noted
	D 7.3 Grant of permanent affiliation to V. M. Salgaocar College of Law, Miramar	Decision of the AC conveyed vide letter No.1/228/Acad-Gen/2017/2623 dated 21/02/2017.
	D 7.4 Request of Vidya Prabodhini College of Commerce, Education, Computer and Management, Porvorim for grant of permanent affiliation to B. Com. programme.	Conveyed to the College vide letter No.5/17/ Acd.Gen/Aff/ 785 dated 16/06/2017.
	D 7.5 To consider Guidelines framed for admission of foreign students at the Goa University	The Committee is constituted by vide Order No. GU/41/Acad-PG/Ph.D-Foreign-Studn/074 dt. 17/07/2017 under the Chairpersonship of Prof. N.S. Bhat, Dean, Faculty of Social Sciences.
	D 7.6 Request for Additional Seats for First Year admission during 2017-18	Noted
	D 7.7 List of Journals for Career Advancement Scheme	A Circular was issued by vide No. GU/Acad-PG/2017/13 dated 07/06/2017 to obtain the list of teachers from affiliated colleges.
	D 7.8 Consideration of the proposal of Head, Department of Microbiology regarding the requirement of additional faculty and the continuation of the MSc. Marine Microbiology Degree and MSc. Biochemistry Program Degree.	Proposal sent to the Executive Council for approval. The same was approved and implemented.
	D 7.9 Development of ERP solution University Management System	Notified vide Circular No. GU/Acad-colg /Enll/2017-18/253/498 dated 24.5.2017.
	D 7.10 To consider the recommendations of the Committee for Common Course Codes for UG Programmes under CBCS.	Matter is under process
	D 7.11 Academic Terms for B.Arch program for the Academic year 2017-18	Academic Terms notified vide Circular No. 1/101/11-ACAD-I/2017/712 dated 12.6.2017.
	D 7.12 Payment of TA/DA to the Experts on the DRC	Under process
	D 7.13 Rescheduling of B.D.S. program second	Letter No. GU/AcadColleges/2017/645

	semester/term examination	dated 7/6/2017 sent to the Dean, Goa Dental College informing revision of BDS program.
	D 7.14 Exemption for Minimum attendance for eligibility to appear for Examinations conducted by Goa University.	Notified vide Letter No. GU/Acad-Colleges/2017/920 dated 29.6.2017.
	<b>D 9 RESOLUTIONS</b>	
	D 9.1 Resolution submitted by Dr. Anthony Rodrigues Improvement in Examination, for all Undergraduate Courses at Goa University.	Forwarded to legal section to place it before Drafting and Vetting Committee
	D 9.2 Resolution submitted by Dr. Anthony Rodrigues Status Report on Choice Based Credit System (CBCS) to be implemented from academic year 2017-18 for all undergraduate courses at Goa University.	Noted
	D 9.3 Constitution of Cluster of Colleges for grant of Research Centre	Matter processed for names of Committee members. <a href="#">(Back to Index)</a>
<b>D 2.4</b>	<b>Follow up action on the minutes of the 4<sup>th</sup> meeting of the Standing Committee of the IXth Academic Council held on 21<sup>st</sup> June, 2017.</b>	
	<b>D DISCUSSION</b>	
	<b>D 3 BOARD OF STUDIES</b>	
	D 3.1 Minutes of the meeting of Board of Studies in Education held on 16/05/2017	Matter is under process
	D 3.2 Minutes of the meeting of Board of Studies in Management Studies held through circulation.	Letter forwarded to the Chairperson conveying the decision by vide No. GU/Acad-PG/49/BoS-Mgmt-Stud/2017/1225 dated 25/07/2017
	D 3.3 Minutes of the meeting of Board of Studies in Mathematics held on 12 <sup>th</sup> May, 2017.	Mail sent to the Chairperson conveying the decision on 25/07/2017
	<b>D 4 REPORTS OF AFFILIATION INQUIRY COMMITTEE</b>	
	D 4.1 Government College of Arts, Science and Commerce, Quepem D 4.1.1 Programme: M.A. Economics	Conveyed to the College vide letter No.5/15/ Acd.Gen/Aff/169 dated 14/07/2017.
	D 4.1.2 Programme: B.A. Sociology (6 Units) at T.Y. B.A.	
	D 4.1.3 Programme: B.A. Hindi (6 Units) at T.Y. B.A.	
	D 4.1.4 Programme: Core Course in English at F.Y. B.A.	
	D 4.2 Dr. Dada Vaidya College of Education,	Conveyed to the College vide letter

	Farmagudi D 4.2.1 M.Ed. (2 year duration)	No.1/90/ Acad. Gen/2017/962 dated 04/07/2017.
	D 4.2.2 Diploma in Pre-Primary Teachers Training (One year) under Community College	
	D 4.2.3 B.Ed. (2 year duration)	Conveyed to the College vide letter No.1/90/ Acad. Gen/2017/961 dated 04/07/2017.
	D 4.3 Shree Rayeshwar Institute of Engineering & I.T., Shiroda. D 4.3.1 Programme : B.E. Computers	Conveyed to the College vide letter No.1/97/ Acad.Gen/2017/1402 dated 02/08/2017.
	D 4.3.2 Programme :B.E. Information Technology	
	D 4.3.3 Programme : B.E. ETC.	
	D 4.4 Ramanata Crisna Pai Raikar School of Agriculture, Savoi Verem,Ponda- Goa. Affiliation for Advance Diploma in Agriculture	Conveyed to the College vide letter No.1/99/ Acad.Gen/ 2017/71 dated 14/07/2017. A Committee has been constituted vide Order No. GU/Acad-Gen/Agnel/2017/ 1539 dated 10/08/2017
	D 4.5 Swami Brahmanand Mahavidyalayam, Shree Kshetra Tapobhoomi Gurupith, Kundaim B.A. Sanskrit	Conveyed to the College vide letter No.5/17/ Acad.Gen/Aff/1128 dated 17/07/2017.
	D 4.6 Mandre College of Commerce, Economics and Management, Mandre Programme: B.Com.- 2016-17 (post facto) and 2017-18	Conveyed to the College vide letter No.5/15/ Acd.Gen/Aff/ 1127 dated 17/07/2017.
	D 4.7 Rajaram & Tarabai Bandekar College of Pharmacy, Farmagudi. D 4.7.1 B.Pharm.	Conveyed to the College vide letter No.1/90/ Acad.Gen/2017/1399 dated 02/08/2017.
	D 4.7.2 M.Pharm. Pharmaceutics	
	D 4.7.3 M Pharm. Pharmaceutical Chemistry	
	D 4.8 Shri Kamaxidevi Homeopathic Medical College & Hospital, Shiroda	Conveyed to the College vide letter No.1/97/ Acad.Gen/2017/1403 dated 02/08/2017.
	<b>D 7 OTHER ITEMS</b>	
	D 7.1 Practical for 4 <sup>th</sup> year Bachelor of Occupational Therapy Engineering subjects	Letter forwarded to the Chairperson conveying the decision by vide No. GU/ Acad-PG/32/BoS-Allied-Health/2017/ 1257 dated 25/07/2017.
	D 7.2 Regularization of the Ph.D. Registration of Shri. Narayan Tulshidas Vetrekar	Letter forwarded to Mr. Narayan Vetrekar conveying the decision of Academic Council by vide No. 3/97/16/ Acad-PG /Ph.D-EL/1521 dated 16/08/2017.

	D 7.3 Issue of NOC to Don Bosco College, Panaji, for i) B.B.A., ii) B.A.M.M. and iii) B.S.W.	Committee constituted vide Order No. 5/15/Acad.Gen/ Aff./1194 dated 19/7/2017.
	D 7.4 Request for re-admission for T.Y. B.Com. to Shri Rajat Ravindra Shinde	Notified vide Letter No. GU/Aca-Colleges/2017/747 dated 27.6.2017. <a href="#">(Back to Index)</a>
<b>D 3</b>	<b>BOARDS OF STUDIES</b>	
<b>D 3.1</b>	<b>Minutes of the meeting of Board of Studies in Wellness Counselling held on 23/05/2017</b>	
	<p><b>Part A.</b></p> <p>i. Recommendations regarding courses of study in the subject or group of subjects at the undergraduate level: NIL</p> <p>ii. Recommendations regarding courses of study in the subject or group of subjects at the postgraduate level:</p> <p>Reorganization of courses in the present syllabus is recommended. Inclusion of two new courses 'Overview of Counselling Theories' and 'Grief Counseling' is also recommended. New numbers are allotted to courses as papers are arranged trimester wise. <a href="#">Annexure I (refer page no 19)</a> contains details of Reorganized Courses, New Courses and Change in Course Titles.</p> <p><b>Annexure 2</b> contains the revised syllabus after incorporating the above mentioned changes.</p> <p><b>Part B</b></p> <p>i. Scheme of Examinations at undergraduate level: NIL</p> <p>ii. Panel of examiners for different examinations at the undergraduate level: NIL</p> <p>iii. Scheme of Examinations at postgraduate level: NIL</p> <p>iv. Panel of examiners for different examinations at post-graduate level: NIL</p> <p><b>Part C.</b></p> <p>i. Recommendations regarding preparation and publication of selection of reading material in the subject or group of subjects and the names of the persons recommended for appointment to make the selection: NIL</p> <p><b>Part D</b></p> <p>i. Recommendations regarding general academic requirements in the Departments of University or affiliated colleges: NIL</p> <p>ii. Recommendations of the Academic Audit Committee and status thereof: NIL</p> <p><b>Part E.</b></p> <p>i. Recommendations of the text books for the course of study at undergraduate level:</p>	

	<p>NIL</p> <p>ii. Recommendations of the text books for the course of study at post graduate level: NIL</p> <p><b>Part F.</b>  <u>Important points for consideration/approval of Academic Council</u></p> <p>i. The important points/recommendations of BoS that require consideration/approval of Academic Council (points to be highlighted) as mentioned below</p> <p>a) Approval of the revised syllabus (<b>Annexure 2</b>).</p> <p>ii. The declaration by the chairman that the minutes were read out by the Chairman at the meeting itself.</p> <p>The minutes were read out by me at the meeting itself.</p> <p>Date: 10/7/2017 <span style="float: right;">(Dr. Mahesh Pai)</span>  Place: Panaji <span style="float: right;">Signature of the</span>  Chairman</p> <p><b>Part G.</b> The Remarks of the Dean of the Faculty</p> <p>i) The minutes are in order  ii) The minutes may be placed before the Academic Council with remarks if any.  iii) May be recommended for approval of Academic Council.  iv) Special remarks if any.</p> <ol style="list-style-type: none"> <li>1) E.33/E.34 – Course of Guided Study. Why two code numbers is this course as per Ordinance OC-58?</li> <li>2) It is suggested that the contents of course be divided into modules, and the number of lectures to be taken may be indicated against them.</li> <li>3) What about the practical component of each course? The ordinance provides for it.</li> </ol> <p>Date: <span style="float: right;">(Prof. N.S. Bhat)</span>  Place <span style="float: right;">Signature of the Dean</span></p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 3.2</b>	<p><b>Minutes of the meeting of Board of Studies in Microbiology held on 16/08/2017</b></p> <p>Part A</p> <p><b>(i) Recommendations regarding courses of study in the subject or group of subjects at the under-graduate level.</b>  Syllabus of S.Y.B.Sc and F.Y.B.Sc. MIC GC-2 (Semester 2), as per CBCS <a href="#">Annexure I</a> (refer page no 34)</p> <p><b>(ii) Recommendations regarding courses of study in the subject or group of subjects at the Post-graduate level-meeting</b>  Not in Agenda of this meeting</p>

- (i) **Scheme of examinations at the under-graduate level.** Not in Agenda of this meeting
- (ii) **Panel of examiners for different examinations at the under-graduate level.** Not in Agenda of this meeting
- (iii) **Scheme of examinations at the post-graduate level.** Not in Agenda of this meeting
- (iv) **Panel of Examiners for different examinations at post-graduate level.** Not in Agenda of this meeting
  
- (i) **Recommendations regarding preparation and publication of selection of reading material in any subject or group of subject or group of subjects and names of persons recommended for appointment to make the selection.** Not in Agenda of this meeting

**Part D**

- (i) **Recommendations regarding general academic requirements in the Departments of University or affiliated colleges.** -- Not in Agenda of this meeting
- (ii) **Recommendations of the Academic Audit Committee and status thereof:** Not Applicable.

**Part E**

- (i) **Recommendations of text books for the courses of study at the under-graduate level.** Submitted along with the syllabus.
- (ii) **Recommendations of text books for the courses of study at the post-graduate level.** Not in Agenda of this meeting.

**Part F**

- (i) **Important points for consideration and approval of academic council:** The important recommendations of BOS that require approval of academic council (points to be highlighted) are mentioned below:

***Syllabus of S.Y.B.Sc. and F.Y.B.Sc. MIC GC-2 (Semester 2) as per CBCS (Annexure I)***

**The declaration by the Chairman, that the minutes were read out by the Chairman at the meeting itself.**

Minutes were read by the Chairman and confirmed by the members.



(Prof. Sarita Nazareth)

**Date: 16/08/2017**

**Signature of the Chairperson**

**Place: IQAC Hall, Administrative Block, Goa University.**

**The remarks of the Dean of the faculty**

- (i) The minutes are in order.
- (ii) The minutes may be placed before the Academic Council with remarks if any.
- (iii) May be recommended for approval of Academic Council.
- (iv) Special remarks if any.

(Prof. M.K. Janarthanam)

**Date :**

**Signature of the Dean**

**Place: Office of the Dean,**

**Faculty of Life Science and Environment**

**Faculty of Life Science & Environment**

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**D 3.3**

**Minutes of the meeting of the Board of Studies in French held on 11/08/2017**

**PART – A**

- i)** Recommendations regarding courses of study in the subject or group of subjects at the undergraduate level.

- I)** **With respect to the conversion of the existing undergraduate programme into the CBCS, the BOS recommended the following.**

In the meeting held on 22<sup>nd</sup> February 2017, BOS had already recommended the FYBA and SYBA (Honours) courses which were duly approved by the Academic Council in its meeting held on 29 April 2016.

After due deliberation the BOS recommended the List of Courses for the TYBA (Honours) of the programme as per [Annexure I](#) (refer page no 42).

The BOS examined and discussed in detail the syllabi and the proposed syllabus for all 12 courses at TYBA are enclosed as *Annexure A1 to A12*.

- II)** **After due discussion on the rationale of introducing a BA Honours programme in the Department of French and Francophone Studies in Goa University, it was proposed to offer this programme in the next academic year ie. 2018-2019 for the following reasons:**

- 1. Presently there are only one affiliated colleges of Goa University offering undergraduate studies in French and that too only at FYBA (General) . There is no college offering French at the TYBA level .**

**2. There is a demand for undergraduate study in French in Goa and nearby regions and no BA programme exists in the nearby towns (eg. Kolhapur, Belgaum, Mangalore, Manipal, Karwar, Sawantwadi,...)**

- A) Recommendations regarding courses of study in the subject or group of subjects at graduate level.
- B) Recommendations regarding courses of study in the subject for postgraduate programme.
- 1) After due discussion the BOS approved the syllabus for the above courses which are as Appendices.

**PART – B**

- i) Scheme of Examinations at the undergraduate level.
- ii) Panel of examiners for different examinations at the undergraduate level
- iii) Scheme of examinations at the post graduate level
- iv) Scheme of examinations at the post-graduate level

**PART-C**

- i) Recommendations regarding preparation and publication of selection of reading material in any subject or group of subjects and name of persons recommended for appointment to make the selection.

**The BOS recommended that the Teaching Faculty in the Department of French and Francophone Studies should draw up and/or add to the selection of reading material already recommended in each syllabus.**

**PART D:**

Recommendation regarding general academic requirements in the Departments of Universities or Affiliated Colleges

**The BOS recommended the following academic requirements for the implementation of this programme on the campus of Goa University.**

- 1) **Availability of infrastructure to run the courses**
- 2) **Availability of additional faculty to take up the work load as the Department has only 2 permanent faculty members and one contract faculty at present.**
- 3) **Availability of computers, books and multimedia tools in the Department.**

**PART E**

- i) Recommendations of text books for the courses of study at the undergraduate level.  
**Textbooks for all courses in the Programme of Study have been recommended in the corresponding course syllabus.**
- ii) Recommendations of text books for the courses of study at the post-graduate

	<p>level.</p> <p>iii) Recommendations of text books for the courses of study at the Certificate, Diploma and Advanced Diploma Level Courses.</p> <p><b>PART – F</b> Important points of the minutes/ recommendations of BOS that require the consideration/approval of the Academic Council as mentioned below.</p> <ol style="list-style-type: none"> <li>1. <i>Approval of the courses and syllabi under the existing CBCS programme for TYBA French(Honours) programme</i></li> <li>2. <i>Approval for holding the BA Honours Programme in the Department of French , Gauhati University</i></li> </ol> <p>The declaration by the Chairman that the minutes were read out by the Chairman at the Meeting itself.</p> <p style="text-align: center;"><i>The minutes were read and approved</i> <span style="float: right;"><i>(Dr. Anuradha Wagle)</i></span></p> <p>Date: <span style="float: right;">Signature of the Chairman</span></p> <p><b>PART – G</b> The remark of the Dean of Faculty.</p> <ol style="list-style-type: none"> <li>i) The minutes are in order.</li> <li>(ii) The following important points/ recommendations of the BOS may be considered / approved by the Academic Council.</li> </ol> <p><b>1) The BA (Honours) in French may be conducted in the Department of French and Francophone Studies.</b></p> <ol style="list-style-type: none"> <li>(iii) May be recommended for approval of the Academic Council</li> <li>(iv) Special remarks if any.</li> </ol> <p style="text-align: right;">(Prof. Ishrat Bi. Khan)</p> <p>Date: <span style="float: right;">Signature of the Dean</span></p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 3.4</b>	<p><b>Minutes of the meeting of Board of Studies in Dentistry held on 17/08/2017</b></p> <p><u>PART- A</u></p> <ol style="list-style-type: none"> <li>i. Recommendations regarding courses of study in the subject or group of subjects at the under-graduate level.</li> <li>ii. Recommendations regarding courses of study in the subject or group of subjects at the Post-graduate level.</li> </ol> <p><b><a href="#">Annexure I (refer page no 65)</a></b></p> <p><b>Correction of Nomenclature of the specialties for M.D.S. Degree</b></p> <ol style="list-style-type: none"> <li>a) Conservative Dentistry:-to .... Conservative Dentistry and Endodontics</li> </ol>

b) Prosthodontics:- to .....Prosthodontics and Crown & Bridge.

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PART - B

- |   |   |     |
|---|---|-----|
| i. Scheme of examinations at the undergraduate level.                         | } |     |
| ii. Panel of examiners for different examinations at the undergraduate level. |   |     |
| iii. Scheme of examination at the post-graduate level.                        |   |     |
| iv. Panel of examiners for different examinations at the Post-graduate level  |   |     |
|   |   | NIL |

PART-C

Recommendation regarding preparation and publications of selection of reading material in the group of subjects and the names of the persons recommended for NIL appointment to make the selection.

PART-D

- |  |     |
|--|-----|
| i. Recommendations regarding general academic requirements in the Department of University or Affiliated colleges. | NIL |
| ii. Recommendation of the Academic Audit Committee and status thereof:-<br>NIL                                     |     |

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PART-E

- |   |     |
|---|-----|
| i. Recommendation of textbooks for the course of study at the undergraduate level.      | NIL |
| -----   |     |
| ii. Recommendation of textbooks for the course of study at the Post-graduate level..... | NIL |

PART-F

Important points for consideration/approval of Academic Council

i. The important points/recommendations of BoS that require consideration/ Approval of Academic Council (points to be highlighted) as mentioned below:- **As above at part - A (ii)** Amendment of the nomenclature of the specialties for M.D.S. degree

- i) **Conservative Dentistry:- to .... Conservative Dentistry and Endodontics**  
ii) **Prosthodontics:- to .....Prosthodontics and Crown & Bridge.**

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ii. The declaration by the chairman that the minutes were readout by the Chairman at the meeting itself.

Dated:-17th August, 2017  
Place:- Goa Dental College & Hospital  
Bambolim – Goa.

**(Dr. Anita Spadigam)**

	<b>Chairman/Dean, Goa Dental College &amp;</b>		
	<p><b>Hospital Bambolim Goa.</b></p> <p><b><u>MEMBERS</u></b></p> <p>1. Dr. (Mrs.) Alka Kale .... Principal &amp; External Member</p> <p>2. Dr. Nandini V. Kamat ..... Prof. &amp; Head, Member</p> <p>3. Dr.IvyCoutinhoFernandes .... Asst. Professor, Member</p> <p><b><u>PART - G</u></b></p> <p><b>Remarks of the Dean, Faculty of Medicine</b></p> <p>i) The minutes are in order</p> <p>ii) The minutes may be placed before the Academic Council with remarks if any.</p> <p>iii) May be recommended for approval of the Academic Council.</p> <p>iv) Special remarks if any.</p> <p style="text-align: right;"><b>(Prof. Pradeep Naik)</b> <b>Signature of the Dean, Faculty of</b></p> <p><b>Medicine</b> <b>Dated:-17 /08/2017</b> <b>Place:- Goa Dental College &amp; Hospital</b> <b>Bambolim– Goa</b></p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>		
<b>D 3.5</b>	<p><b>Minutes of the meeting of Board of Studies in Computer Science &amp; Technology (PG) held on 11/08/2017</b></p> <p>Part A.</p> <p>i. Recommendations regarding courses of study in the subject or group of subjects at the undergraduate level:</p> <p>(a) The syllabus of the Elective CST 602 – Computational Geometry &amp; Geometric Modeling, has been revised. Appendix-A contains the syllabus approved by the members. <a href="#">Annexure I</a> (refer page no 67)</p> <p>(b) Members discussed the recent initiative of MHRD to make available large number courses under Swayam platform to University students. It was decided that faculty members could make use of some of the video lectures/quiz questions etc. in the regular course offerings and also encourage students to register for online course/certification. In principle, following list of courses under NPTEL/Swayam were approved. However, members felt that there should be a University wide policy to decide on modalities in offering credit based courses under Swayam /NPTEL platform.</p>		
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; border-right: 1px solid black; padding: 5px;">1. Distributed Systems</td> <td style="width: 50%; padding: 5px;">15. Theory of computation</td> </tr> </table>	1. Distributed Systems	15. Theory of computation
1. Distributed Systems	15. Theory of computation		

2. Introduction to Parallel Programming in OpenMP	16. Programming in C++
3. Cloud Computing	17. Computer Organization and Architecture
4. Digital Speech Processing	18. Fundamentals Of Database Systems
5. Graph Theory	19. Educational Leadership
6. Design and analysis of algorithms	20. Outcome based pedagogic principles for effective teaching
7. Introduction to Wireless and Cellular Communications	21. Introduction to Research
8. Model Checking	22. Software testing
9. Design for internet of things	23. An Introduction to Information Theory
10. Applied linguistics	24. Introduction to Data Analytics
11. Regression analysis	25. Programming, data structures and algorithms using python
12. Object Oriented Analysis and Design	
13. Technical English for Engineers	
14. Introduction to R Software	

(c) In order to prepare a vision document for the department, general discussion was held on planning and restructuring of MCA programme. Some of the suggestions included starting a Five-Year integrated BCA/MCA programme with entry from 12<sup>th</sup> Science stream. Another possibility is to provide dual degrees like MCA-MBA with one additional year. It was decided that all these possibilities need to be worked out in detail keeping in view human resource, infrastructure requirement and demand. A subcommittee has been appointed to study the matter and submit the report.

- ii. Recommendations regarding courses of study in the subject or group of subjects at the postgraduate level: NIL

#### Part B

- i. Scheme of Examinations at undergraduate level:

(a) It was observed that in last 4 years, significant number of students have been failing in some of the core courses repeatedly and they continue to have backlog in Sem-I and Sem-II, even after being admitted to Sem-V. Therefore it has been proposed that student should be admitted to Sem-V, only if they do not have a backlog of more than four courses from the preceding Semesters. Further, students may not be allowed to take internship in the Sem-VI, unless they clear all papers till Sem-III. The proposed ordinance specifying the eligibility condition for admission to Sem-V and Sem-VI is submitted in three column format at Appendix-B.

- ii. Panel of examiners for different examinations at the undergraduate level: NIL
- iii. Scheme of Examinations at postgraduate level: NIL

- iv. Panel of examiners for different examinations at post-graduate level:  
Revised Master Panel of Examiners approved by BoS is placed in sealed Envelope

Part C.

- ii. Recommendations regarding preparation and publication of selection of reading material in the subject or group of subjects and the names of the persons recommended for appointment to make the selection: NIL

Part D

- i. Recommendations regarding general academic requirements in the Departments of University or affiliated colleges:

In the 8th meeting of VIIIth Academic Council held on 16th April 2014 and 23rd April 2014, it was resolved to revise the eligibility condition for admission to MCA program at Goa University from the academic year 2017-18. As per the revised eligibility condition, "Graduates applying to MCA programme should pass in Mathematics paper at 10+2 Science stream". Keeping in view the revised eligibility condition, it is recommended that the course structure of BCA programme is revised to include Mathematics paper covering the portion of 10+2 Mathematics paper of Science stream. This recommendation is primarily to help the students to satisfy the eligibility requirement and not in relief of eligibility requirement of passing in 10+2 Mathematics paper in Science stream.

The proposed ordinance reflecting the change of eligibility requirement for admission to Sem-I is submitted in three column format in Appendix-B.

- ii. Recommendations of the Academic Audit Committee and status thereof:

Part E.

- i. Recommendations of the text books for the course of study at undergraduate level:
- ii. Recommendations of the text books for the course of study at post graduate level:

Part F.

Important points for consideration/approval of Academic Council

- i. The important points/recommendations of BoS that require consideration/approval of Academic Council (points to be highlighted) as mentioned below
- Revision of syllabus of Elective CST 602 – Computational Geometry & Geometric Modeling
  - Approval given to list of courses under NPTEL/Swayam platform for the department
  - Proposal for revision/amendment of MCA ordinances considering revised eligibility condition for admission to Sem-I, Sem-V and Sem-VI.
  - Revised Master Panel of Examiners approved by BoS for PG courses.

	<p>ii. The declaration by the chairman that the minutes were readout by the Chairman at the meeting itself.</p> <p>Date: (Dr. V.V. Kamat) Place: Signature of the Chairman</p> <p>Part G. The Remarks of the Dean of the Faculty</p> <p>i) The minutes are in order ii) The minutes may be placed before the Academic Council with remarks if any. iii) May be recommended for approval of Academic Council. iv) Special remarks if any.</p> <p>Date: (Prof. G.M. Naik) Place: Signature of the Dean</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 3.6</b>	<p><b>Minutes of the meeting of Board of Studies in Mathematics held on 10/08/2017</b></p> <p><b>Part A</b></p> <p>(i) (Recommendations regarding courses of study in the subject or group of subject at the Undergraduate level.) The syllabi for following courses were discussed and are recommended for approval. Semester III: DSC 1C: Ordinary Differential Equations and Discrete Mathematics. SEC 1 : Statistical Methods. Semester IV: DSC 1D: Analysis and Operations Research. SEC 2 : Analytical Geometry. Syllabi for following two Generic courses for non mathematics students were discussed and are recommended for approval. GE-3 : Mathematics for Competitive Examinations –I GE-4 : Mathematics for Competitive Examinations –II (See <b>Annexure I</b> for detailed syllabus). <a href="#">Annexure I</a> (refer page no 70)</p> <p>(ii) (Recommendations regarding courses of study in the subject or group of subject at the Postgraduate level and undergraduate level) The syllabus for the following elective course was discussed and is recommended for approval. MATH-122 : Graphs and Networks. (4 Credits Course) (See <b>Annexure II</b> for detailed syllabus)</p> <p><b>Part B.</b></p> <p>(i) (Scheme of examinations at the under-graduate level.) The following pattern of question paper for Semester End Examination was discussed and approved. There will be FOUR questions of 20 marks each. In each question there will be Sub-questions and may carry 1/2/3/4/5/8 mark/s. Each sub-question may have sub-sub-</p>



	<p>questions. There can be choice in sub-questions and sub-sub-questions. Paper setter can decide the number of sub-questions and sub-sub-questions.</p> <p>(ii) (Panel of examiners for different examinations at the under-graduate level.) <b>NIL</b></p> <p>(iii) (Scheme of examinations at the post-graduate level.)      <b>NIL</b></p> <p><b>Part C:</b> (Recommendations regarding preparation and publication of selection of reading material in any subject or group of subject or group of subjects and names of persons recommended for appointment to make the selection) <b>NIL</b></p> <p><b>Part E:</b> (i) Recommendations of text books for the course of study at the under-graduate level. <b>NIL</b></p> <p>(ii) Recommendations of text books for the course of study at the post-graduate level. <b>NIL</b></p> <p><b>Part F:</b> (i) (The declaration by the Chairman, that the minutes were read out by the Chairman at the meeting itself.)</p> <p><b>Important points for the approval of the academic council.</b></p> <ol style="list-style-type: none"> <li>1. Proposal of UG Courses. (Annexure I)</li> <li>2. Proposal of PG Course. (Annexure II)</li> <li>3. Pattern of Question Paper for Semester End Examination.</li> </ol> <p>The meeting ended with a formal vote of thanks to the Chair. I hereby declare that the minutes are circulated to the members and decisions are informed to the members in the meeting itself.</p> <p>Place: Goa University Date: 10<sup>th</sup> August, 2017</p> <p style="text-align: right;">(Prof. Y.S. Valualiker) Chairman, Board of Studies in Mathematics.</p> <p><b>Part G; The remarks of the Deans, FNS</b></p> <ol style="list-style-type: none"> <li>1. The minutes are in order.</li> <li>2. The minutes may be placed before the Academic Council.</li> <li>3. Important points of the minutes that needs policy decision of the Academic Council to be recorded.</li> </ol> <p>Place: Goa University Date:</p> <p style="text-align: right;">(Prof. G.M. Naik) Dean, Faculty of Natural Sciences</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 3.7</b>	<p><b>Minutes of the meeting of Board of Studies in Physical Education held on 18/08/2017</b></p> <p><b>Part A</b></p> <p>i. Recommendations regarding courses of study in the subject or group of subjects at</p>

the undergraduate level:

I) Modification of the B.P.Ed syllabus for the 2<sup>nd</sup> and 4<sup>th</sup> semester  
**(Kindly refer to Annexure II)**

- ii. Recommendation regarding courses of study in the subject or group of subjects at the postgraduate level : NIL

**Part B**

i. Scheme of examinations at the undergraduate level

- (a) Shortfall of two credits in B.P.Ed Syllabus [Annexure I](#) (refer page no. 80)

ii. Panel of examiners for different examinations at the undergraduate level:

**Part C**

- i. Recommendations regarding preparation and publication of selection of reading material in any subject or group of subjects and the names of persons recommended for appointment to make the selection: NIL

**Part D**

- i. Recommendations regarding general academic requirements in the in the Departments of the University or Affiliated College: NIL
- ii. Recommendation of Academic Audit Committee and status thereof: Nil

**Part E**

- i. Recommendations of textbooks for the courses of study at the undergraduate level  
NIL
- ii. Recommendation of text books for the courses of study at the postgraduate level  
NIL

**Part F**

The important points/recommendations of BoS that require approval of Academic Council (points to be highlighted) as mentioned below:

- i) Shortfall of two credits and proposed solution. Refer to Annexure-I  
ii) Modification in the Syllabus Second and Fourth Semester. Refer to Annexure-II

The minutes were read out by the Chairman to bring the meeting to an end.

(Dr. Shyam Sunder Rath)

Date: 18.08.2017

Signature of the Chairman

**Part G**

- (i) The remarks of the Dean of the Faculty  
a) The minutes are in order

	<p>The following important points/recommendations of BoS (points to be highlighted) may be considered for the approval of the Academic Council as mentioned below:</p> <ul style="list-style-type: none"> <li>i) Shortfall of two credits in B.P.Ed Syllabus</li> <li>ii) Modification of the B.P.Ed Syllabus for the 2<sup>nd</sup> and 4<sup>th</sup> Semester</li> </ul> <p>Date : 22<sup>nd</sup> August 2017 Place : Ponda, Goa</p> <p style="text-align: right;">(Dr. Allan Abreo) Signature of the Dean</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 3.8</b>	<p><b>Minutes of the meeting of Board of Studies in Botany held on 21/08/2017</b></p> <p>Part A</p> <ul style="list-style-type: none"> <li>i. Recommendations regarding courses of study in the subject or group of subjects at the undergraduate level: <b>Nil</b></li> </ul> <p>AOB: <b>BoS initiated identification of Online Courses for Colleges under SWAYAM Programme.</b></p> <ul style="list-style-type: none"> <li>ii. Recommendations regarding courses of study in the subject or group of subjects at the postgraduate level: <b>Two Core papers viz., BOC-413: Fungal Biodiversity, Bioprospecting and Biotechnology and BOC-414: Lab in Fungal Biodiversity, Bioprospecting and Biotechnology has been replaced by the existing optional papers BOO-312: Plant Biotechnology (3 Credits) and BOO-313: Lab in Plant Biotechnology (1 credit) which are now coded as BOC- 413: Plant Biotechnology (3 credits) and BOC-414: Lab in Plant Biotechnology (1 credit).</b> <b>The earlier two Core papers viz., BOC- 413: Modern Concepts in Plant Ecology and BOC-414: Lab in Modern Concepts in Plant Ecology now being optional papers are coded as BOO-435: Modern Concepts in Plant Ecology and BOO-436: Lab in Modern Concepts in Plant Ecology.</b></li> </ul> <p style="text-align: center;"><b><a href="#">Annexure I</a> (refer page no 99)</b></p> <p style="text-align: center;"><b>Part B</b></p> <ul style="list-style-type: none"> <li>i. Scheme of Examinations at undergraduate level: <b>Model question paper of Semester I Practical SEA for Core paper I was prepared along with the Key.</b></li> </ul> <p>Panel of examiners for different examinations at the undergraduate level: <b>Revised and updated.</b></p> <ul style="list-style-type: none"> <li>ii. Scheme of Examinations at postgraduate level: <b>Nil</b></li> <li>iii. Panel of examiners for different examinations at post-graduate level: <b>Nil</b></li> </ul>

**Part C.**

- i. Recommendations regarding preparation and publication of selection of reading material in the subject or group of subjects and the names of the persons recommended for appointment to make the selection: **Nil**

**Part D**

- i. Recommendations regarding general academic requirements in the Departments of University or affiliated colleges: **Nil**
- ii. Recommendations of the Academic Audit Committee and status thereof: **Nil**

**Part E.**

- i. Recommendations of the text books for the course of study at undergraduate level: **Nil**
- ii. Recommendations of the text books for the course of study at post graduate level: **Nil**

**Part F.**

Important points for consideration/approval of Academic Council

- i. The important points/recommendations of BoS that require consideration/approval of Academic Council (points to be highlighted) as mentioned below
  - a. **Model question papers for Core and Generic Elective have been revised and submitted for approval. Also, model question paper of Semester I Practical SEA for Core paper I along with the Key is submitted for approval.**
  - b. **Revised Master Panel of examiners for UG courses be approved.**
  - c. **The Core papers viz., BOC- 413: Plant Biotechnology (3 credits) and BOC-414: Lab in Plant Biotechnology (1 credit) be approved.**
  - d. **The code numbers of optional papers viz., BOO-435: Modern Concepts in Plant Ecology and BOO-436: Lab in Modern Concepts in Plant Ecology be approved.**
- ii. The declaration by the chairman that the minutes were readout by the Chairman at the meeting itself.

Date: 21.08.2017

Place: Goa University  
Chairman

(Prof. Vijaya Kerkar)  
Signature of the

**Part G.** The Remarks of the Dean of the Faculty

- i) The minutes are in order
- ii) The minutes may be placed before the Academic Council with remarks if any.
- iii) May be recommended for approval of Academic Council.
- iv) Special remarks if any.

	Date: (Prof. M.K. Janarthanam) Place: Signature of the Dean  <a href="#">(Back to Index)</a>
D 3.9	<p><b>Minutes of the meeting of Board of Studies in Zoology held on 07/08/2017 &amp; 16/08/2017</b></p> <p><b><u>Part A</u></b></p> <p>1. <b>Recommendations regarding courses of study in the subject or group of subjects at the undergraduate level:</b></p> <p>Modalities for the implementation of the part amendment to OC-66 as per the University Circular No.2/403/2016-Legal(Vol.XII)/561 dated 29<sup>th</sup> May 2017 towards the B.Sc. Programme offered under the CBCS were discussed at length. Accordingly, the overall programme structure/ framework of the course involving the papers / courses to be taught to the B.Sc. (Zoology) (General and Honours) students for all the six semesters under different categories such as Core Courses, Elective Courses, Discipline Specific Elective Courses and Skill Enhancement Courses were formulated. Detailed syllabi for the first two years were also finalized. <a href="#">Annexure I</a> (refer page no 102)</p> <p>A detailed review of the recently implemented syllabus of the first year B.Sc. (CBCS Scheme) was undertaken and few modifications are recommended to the papers, viz. ZOCC1 (Diversity of Non-Chordates and Cell Biology) of I<sup>st</sup> Semester and ZOCC2 (Diversity of Chordates and Genetics) of the II<sup>nd</sup> semester of the Academic year 2017-18 (Annexure II).</p> <p>2. <b>Recommendations regarding courses of study in the subject or group of subjects at the PG level:</b> NA</p> <p>3. <b>Recommendations regarding courses of study in the subject or group of subjects at the M. Phil / Ph.D. level and the eligibility of admission:</b> NA</p> <p><b><u>Part B</u></b></p> <p>I. <b>The scheme of examinations at Under Graduate level :</b> NA</p> <p>II. <b>PANEL of Examiners for various examinations at the U.G. level:</b> In the light of superannuation of several senior teachers and in order to update the Master Panel for the Board of Examiners for the V<sup>th</sup> and VI<sup>th</sup> semesters, the DC recommended to procure the new list of teachers from the UG colleges who are engaged in teaching various courses of the V<sup>th</sup> and VI<sup>th</sup> semesters of B.Sc. (Zoology) programme.</p> <p>III. <b>Scheme of examination at P.G. level:</b> NA</p> <p>IV. <b>Panel of examiners at P.G. level:</b></p>

NA

**V. Scheme of examination for P. G. Diploma level:**

NA

**VI. Panel of examiners at P.G. Diploma level:**

NA

**Part C****Recommendations regarding preparation and publication of selection of reading material in the subject and group of subjects and the names of persons recommended for appointment to make selection :**

Chairman informed the members about the list of courses which are/will be available as the online courses to the Undergraduate and Postgraduate Zoology students on the SWAYAM portal of Govt. of India. He added that they are floated by the Govt. of India under the 'Digital initiatives in higher education' to popularize these courses among the UG and PG students so that maximum students can enroll and benefit from these courses. Further, members were requested to go through the portal, participate in this activity and make our students to get the maximum benefit from these digital initiatives of the central government.

**Part: D****1. Recommendations regarding general academic requirements in the developments of University or affiliated colleges:**

NA

**2. Recommendations of Academic Audit Committee and status thereof:**

NA

**Part E****I. Recommendations of the textbooks for the course of study at U.G. level:**

A list of the standard textbooks in the syllabus, subject wise, at the end of each paper are recommended.

**Recommendations of the textbooks for the course of study at P.G. level:**

NA

**Part F****I. Important points for the consideration / approval of the academic council :**

1. The **framework / full structure** of the various courses to be taught in the **FY, SY and TY** of the **B.Sc. (Zoology)** under CBCS scheme (**General and Honors**) and the **detailed syllabi** of the various courses to be taught in the **FY and SY** (under **Part-A:1**) (Annexure I).
2. **Modifications** to the syllabus of First Year B.Sc. course of academic year (2017-18) (under **Part-A: I**) (Annexure II).

- II. The declaration by the Chairman that the minutes was read out by him at the meeting itself:

The minutes were read out at the end of meeting and approved by B.O.S. unanimously.

Date: 16<sup>th</sup> August 2017  
 Place: Taleigao Plateau.

(Prof. S.K. Shyama)  
 Signature of the Chairman

**Part G: The Remarks of the Dean of the Faculty**

- i) The minutes are in order.
- ii) The minutes may be placed before the Academic Council with remarks, if any.
- iii) May be recommended for approval of Academic Council.
- iv) Special remarks if any.

**Course Codes shall be modified as per the approved guidelines of AC.**

Date:  
 Place: Taleigao Plateau

(Prof. M.K. Janarthanam)  
 Dean, Faculty of Life Sciences & Env.

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**D 3.10**

**Minutes of the meeting of Board of Studies in Earth Science held on 02/08/2017**

**Part A**

**i. Recommendations regarding courses of Study in the subject or group at Under-graduate level**

- The committee finalized a list of 10 **SEC Courses**, to offer for the new undergraduate program under CBCS. (Annexure -1A the list of SEC courses)
- It is also recommended that a sub-committee comprising of 3 members (Dr. Anthony Viegas (as Convener), Dr. Manoj Ibrampurkar and Shri Anil Karambelkar as members, will prepare the syllabus for the recommended SEC courses submit to BoS for finalization in next meeting. [Annexure I \(refer page no 139\)](#)

**ii. Recommendations regarding courses of Study in the subject or group at the post Graduate level:**

**The committee recommended for introduction of a new optional Course (GLO-276 : Long-term Internship Training in Geospatial Technologies) during the Final Year of M.Sc. program (details of courses is given at Annexure- IB)**

**Part B**

**i. Scheme of examination at the undergraduate level:**

**a. Specimen Question paper for SEE (GCC/DSE) was discussed with regard to the number of questions and marks allocation. The specimen format as agreed is enclosed as Annexure-II (a & b).**

**ii. Panel of examiners for different examinations at the under-graduate level: Not**

Discussed

**iii. Scheme of examinations at the Post-graduate level:**

- Not Discussed -

**iv. Panel of examiners for different examinations at the M.Sc. level :**

- Not Discussed -

**Part C**

**i. Recommendations regarding preparation and publication of reading material in any subject or group of subject (s) and names of persons for appointment to make the selection.**

- Not Discussed -

**Part D**

**i. Recommendations regarding general academic requirements in the Departments of the University or affiliated colleges. Nil**

**Part E**

**i. Recommendations of text books for the courses of study at the post-graduate level**

Nil

**Part F : Important points for consideration/approval of Academic Council.**

- To approve format of the Question paper for SEC courses of BSC(Geology) program (under the CBCS)
- To approve the new optional course GLO-276 as part of MSc(Applied Geology) program

Date: 04.08.2017

(Prof. K. Mahender)

Place: Goa University

Signature of the Chairman

**Part G: Remark of the Dean of the Faculty.**

**a. The Minutes are in order**

**b. The following important points/recommendations of BoS (to be highlighted) may be considered/approved by the Academic Council**

*i. Part-A (i)(b) Restructuring of TY BSc practical curriculum.....*

*ii. Part-A (ii)(a) Approval of Proposed subcommittee.....*

*iii. Part-A(ii) (b) & (c) Introduction of New courses.....*

**c. May be recommended for approval of Academic Council**



	<p>d. Special remarks, if any -</p> <p style="text-align: center;"><b>The detailed syllabus is not included along with minutes.</b></p> <p>Date: (Prof. G.M. Naik)</p> <p>Place: Goa University Signature of the Dean</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
D 3.11	<p><b>Minutes of the meeting of Board of Studies in Electronics held on 21/08/2017</b></p> <p><b>Part A (I) Recommendations regarding courses of study in the subject or group of subjects at the undergraduate level:</b></p> <p>Curriculum was revised as per amendment dated 29 May 2017 to OC-66. The recommended course title and full syllabus is placed at ANNEXURE-I. BOS also discussed about SWAYAM Courses and Flipped Class rooms. BOS recommended 4 SWAYAM elective Courses at TYBSc. Also, Flipped class rooms have been included at SYBSc. <a href="#">Annexure I</a> (refer page no 143)</p> <p><b>(II) Recommendations regarding courses or group of subjects at postgraduate level:</b></p> <p>BOS also discussed about SWAYAM Courses and Flipped Class rooms for PG program. BOS recommended 4 SWAYAM elective Courses at various levels. Also, Flipped class rooms have been included one each at all four semesters. The revised structure is placed at ANNEXTURE-II</p> <p><b>Part B : (I) Scheme of the Examinations at Undergraduate Level:</b></p> <p>Model question paper for papers having 4 credits and 3 credits theory are placed at ANNEXTURE-III</p> <p><b>(II) Panel of examiners for different examinations at Undergraduate Level:</b></p> <p>Will be provided in due course of time for T.Y.B.Sc</p> <p><b>(III) Scheme of the examinations at post-graduate level: NA</b></p> <p><b>(IV) Panel of examiners for different examinations at post-graduate Level: NA</b></p> <p><b>Part C (I) Recommendations regarding preparation and publication and selection of Anthologies in any subject or group of subjects and the names of person recommended for appointment to make the selection: Nil</b></p> <p><b>Part D (I) Recommendations regarding general academic requirements in the Departments of University or affiliated colleges:</b></p> <ol style="list-style-type: none"> <li>1.For B.Sc(general) the colleges have sufficient infra-structure.</li> <li>2. For B.Sc(honors)electronics, colleges may be advised to procure the equipment as per newly introduced CBCS scheme, the same may verified by AIC.</li> </ol>

	<p><b>II) Recommendation of Academic Audit committee and status thereof</b> No recommendations received so far by BoS electronics</p> <p><b>Part E (I) Recommendations of text books for the course for study at the Undergraduate level:</b> List of books required is indicated below each subject in the syllabus.</p> <p><b>(II) Recommendations of text books for the courses of study at the post Graduate level: A</b></p> <p><b>Part F</b> <b>Important points for consideration/approval of Academic Council:</b> Full syllabus for electronics component of B.Sc(general) , B.Sc(honors) Electronics is Provided along with specimen question paper</p> <p>The declaration by the Chairman, that the minutes were read out by the Chairman at the meeting itself.</p> <p style="text-align: right;">(Prof. G.M. Naik) Signature of Chairman</p> <p>Date: Place: Goa University</p> <p><b>Part G: The remarks of the Dean of the Faculty.</b></p> <ul style="list-style-type: none"> <li>(I) The minutes are in order.</li> <li>(II) The minutes may be placed before the Academic Council with remarks if any.</li> <li>(III) May be recommended for approval of Academic Council</li> <li>(IV) Special remarks if any: Nil</li> </ul> <p style="text-align: right;">(Prof. G.M. Naik) Signature of the Dean</p> <p>Date: 23-08-2017 Place: Goa University</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 4</b>	<b>REPORTS OF AFFILIATION INQUIRY COMMITTEE</b>
<b>D 4.1</b>	<p><b>Goa Institute of Management, Sanquelim-Goa.</b></p> <p>Date of Visit: 21/07/2017</p> <p><a href="#">AIC Report</a> (refer page no 214)</p> <p>Programme: Ph.D. Research Centre in Management Type of Programme: Self Financing</p> <p>Observations:</p> <ol style="list-style-type: none"> <li>1. Although the Research Centre was recognised for 2014-2017 no Research students were registered.</li> <li>2. The Institute has more than two recognised Research Guides.</li> </ol>

3. PGDM offered by the Institute is equivalent to MBA of an Indian University during 01/01/2017 to 30/12/2018 vide letter dated 09/02/2017 from AIU.
4. Fee structure is approved by DTE i.e. 4.00 lakhs.
5. The PGDM has NBA accreditation vide letter dated 24/04/2016 from NBA.

**(I) Essential Conditions to be fulfilled before the commencement of the academic year 2017-18:**

The Institute to nominate a Research Centre co-ordinator.

**(II) Overall recommendations of the AIC:**

The Affiliation Inquiry Committee recommends continuation of affiliation for three academic years 2017-18, 2018-19 and 2019-20, subject to condition that the Institute seeks equivalence recognition from AIU for PGDM program.

**(III) Suggestions of the AIC:**

1. Increase the on line journals from other Publishers.
2. The Institute to conduct Research related workshops.
3. The Research Guides to focus on publishing good quality research papers in reputed journals recognised by UGC.

Position	Name	Signature
Chairperson	Prof. K.B. Subhash	Sd/-
Expert-1	Prof.A.M.Gurav.	Sd/-
Expert-2	Prof.CH.V.V.S.N.V.Prasad	Sd/-
Member of AC	Dr. Lakshangi Charya	Sd/-
Co-ordinator, CDC – Member	Dr. D.B. Arolkar	-
Representative of DHE– Member	Dr. Remy Dias	-
Ex-Engineer – Member	A. Srivastava	-
Member Secretary	A. Fernandes	Sd/-

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**D 5 STATUTES AND ORDINANCES**

**D 5.1 Proposed amendment to Ordinance OB-8.8 relating to the Formation of Teaching Departments under faculties in Goa University.**

	<p>There is a provision under Ordinance OB-8.8 which states that in case there is neither Professor nor a Reader in the Department, the Dean of the Faculty concerned will act, as the Head of the Department. In order to minimize the burden of the Dean of the concerned Faculty, a provision for an Assistant Professor to act as teacher-in-charge in the absence of any Professor/Associate Professor in the department has been proposed to be included in the existing Ordinance OB-8.8. The said amendment has been vetted by the Standing Committee for Drafting and Vetting of Statutes and Ordinance in its meeting held on 16.6.2017. The proposed amendment to Ordinance OB-8.8 is placed as <a href="#">Annexure I</a> (refer page no 218)</p> <p>The Academic Council may kindly consider and approve.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
D 5.2	<p><b>Proposed part amendment to Ordinance OA-5.15 Instructions relating to the revaluation of answer books at a University Examination.</b></p> <p>The proposed part amendment to Ordinance OA-5.15 Instructions relating to the revaluation of answer books at a University Examination in three column format is placed as <a href="#">Annexure I</a> (refer page no 219) for consideration and approval of the Academic Council.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
D 5.3	<p><b>Provision for One Time and final Chance to appear for examination and complete the program.</b></p> <p>The Academic Council at its meeting held on 30/9/2016 decided to set up a Committee under the Chairpersonship of Dean, Faculty of Law, with Dean, Faculty of Engineering as Member and Controller of Examinations as Member Secretary to examine the Resolution submitted by Dr. M.R.K. Prasad for giving a one time opportunity to students to appear/pass all examinations prescribed for the program beyond the duration available for completing the program under the provisions of OA-16.11.</p> <p>Further, the Academic Council at its meeting held on 6<sup>th</sup> and 7<sup>th</sup> March 2017, approved the recommendations of the Committee to grant one time chance to appear for examination to those students who could not complete their studies within the prescribed double duration with a rider that such an opportunity should not be extended on a regular basis and therefore need to be considered once in a decade. The Academic Council also decided that clear guidelines for implementing this decision need to be framed and given wide publicity to ensure eligible students benefit with this facility.</p> <p>The Executive Council at its meeting held on 15<sup>th</sup> March 2017 noted that in the absence of a clear provision in the Ordinance, additional chance/attempt to clear the backlog papers/examinations, cannot be provided and suggested that appropriate amendment to be framed and placed before the Academic Council for consideration.</p> <p>Proposed amendment to Ordinance OA-16.11 is placed as <a href="#">Annexure I</a> (refer page</p>

	<p>no 220).</p> <p>The Academic Council may kindly consider.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 5.4</b>	<p><b>To examine issues pertaining to admission of foreign students to the Ph.D. programme and frame guidelines and suggest amendments needed to Ordinance OA-19A governing the Ph.D. programme.</b></p> <p>It may be recalled that the Academic Council in its meeting held on 22<sup>nd</sup> May 2017 had decided to constitute a Committee to check the suitability of the foreign students and also amend the Ordinance governing the Ph.D. degree to permit in absentia admission of foreign applicants.</p> <p>A Committee was constituted under the Chairperson of Prof. N. S. Bhat for the said purpose. The Committee has submitted its Report along with the amended Ordinance which is placed at <a href="#">Annexure I (refer page no 222)</a></p> <p>The Academic Council may kindly consider.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 5.5</b>	<p><b>Proposed part amendment to Ordinance OA 5.16 Instructions relating to the grace mark at the University Examinations.</b></p> <p>The proposed part amendment to Ordinance OA 5.16 Instructions relating to the grace mark at the University Examinations in three column format is submitted as <a href="#">Annexure I (refer page no 235)</a> for consideration and approval of the Academic Council.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 5.6</b>	<p><b>To consider the Representation received from students of V.M. Salgaocar College of Law regarding amended Ordinance OC-34A and OC-35A.</b></p> <p>The Academic Council is informed that during its meeting held on 6<sup>th</sup> and 7<sup>th</sup> March, 2017 it had approved the part amendments to Ordinances OC-34A and OC-35A relating to permitting students who have backlog to keep terms to the next Academic Year.</p> <p>The part amendments/addendums after Drafting and Vetting were placed and approved by the Executive Council in its meeting held on 15<sup>th</sup> March, 2017. However, as the University received an email from Dr. M. R. K. Prasad, Dean, Faculty of Law suggesting language corrections to the minutes of the Academic Council as the text of the Ordinance required clarity, the part amendments were not forwarded to the Chancellor for approval. Thereafter the Academic Council in its meeting held on 22/5/2017 approved the corrections made to the minutes to bring in clarity in the Ordinances.</p> <p>The part amendments in the three column formats incorporating the corrections approved by the Academic Council remained to be placed before the Executive Council on 26/5/2017.</p> <p>As the amendments were to be implemented for students during the current</p>

	<p>Academic Year and non-implementation of the same would cause a lot of hardship to students who would have to lose an entire year of their studies, the corrected part amendment were approved by the Vice-Chancellor on behalf of the Executive Council under Section 11 (3) of the Goa University Act 1984. However, due to oversight, the earlier amendments approved by the Executive Council on 15.03.2017 were sent to the office of the Chancellor and notified after approval.</p> <p>In the meanwhile students admitted during the academic year 2015-16 have submitted a representation stating that the facility of ATKT has been denied to them for admission during the current academic year 2017-18 which is placed as <a href="#">Annexure I (refer page no 236)</a></p> <p>The part amendments in three-column format submitted by Dr. M. R. K. Prasad, Dean, Faculty of Law incorporating the language correction approved by the Academic Council in its meeting held on 22/5/2017 is place as <a href="#">Annexure II (refer page no 242)</a></p> <p>The Academic Council may kindly decide.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 7</b>	<b>OTHER ITEMS</b>
<b>D 7.1</b>	<p><b>To consider the recommendation of the Committee to devise a faculty wise common question paper format for the B.A./B.Sc./B.Com. programs under CBCS.</b></p> <p>Pursuant to the decision of the Standing Committee of Academic Council, a Committee under the Chairpersonship of Prof. P.K. Sudarsan was appointed to discuss and devise faculty wise common question paper format for the programs under Choice Based Credit System.</p> <p>The Committee has submitted its recommendation which is placed as <a href="#">Annexure I (refer page no. 251)</a> for consideration.</p> <p>The Academic Council may kindly consider and approve</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 7.2</b>	<p><b>Recognition of Indian Council of Higher Education, India, Navi Mumbai for admission to degree programs of Goa University.</b></p> <p>As per the existing procedure for admission to Goa University Bachelor's Degree program the students of other than Goa Board are required to obtain Provisional Eligibility Certificate from Goa University for submission to the concerned College.</p> <p>Students who have completed their XII examination and declared pass by the Secondary &amp; Higher Secondary boards and recognized by Council of Boards of School Education in India are considered eligible for their admission within the prescribed Ordinances for the respective degrees.</p> <p>Council of Boards of School Education in India publishes and update the list of the</p>

	<p>recognized boards on their website. However, some of the Higher Secondary Education Boards recognized by State Governments are not included in the list of recognized Boards published by Council of Boards of School Education in India.</p> <p>Indian Council of Higher Secondary Education, India, Navi Mumbai, Maharashtra vide their letter dated 08/06/2017 placed as <a href="#">Annexure I</a> (refer page no. 259) has requested to consider the students of their Council for admission to degree programs of Goa University. However, Indian Council of Higher Secondary Education, India, Navi Mumbai does not figure in the list of recognized boards notified by Council of Boards of School Education in India.</p> <p>Academic Council may kindly advise.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
D 7.3	<p><b>To consider the request made by Prof. G. N. Nayak, Department of Marine Science to review amended Ordinance OA-19A.6 (iv).</b></p> <p>It may be recalled that the Academic Council in its meeting held on 06<sup>th</sup> and 7<sup>th</sup> March 2017 had approved the proposed new Ordinance OA-19A governing the Ph.D. degree. This Ordinance is applicable for candidates registering from the academic year 2017-18 onwards.</p> <p>As per the provisions in earlier Ordinance OA-19.5(iv) a guide was permitted to register a candidate for Ph.D. degree, 3 years prior to superannuation with a Co-Guide provided he/she gives an undertaking that she/he would be available to provide guidance to the candidate.</p> <p>However, under the new Ordinance OA-19A.6 (iv), the above was changed to “A guide shall not be permitted to register a candidate for Ph.D. degree within the period of 3 years prior to superannuation”.</p> <p>A note received from Prof. G. N. Nayak addressed to the Vice-Chancellor which is self explanatory is placed at <a href="#">Annexure I</a> (refer page no.260).</p> <p>The Academic Council may kindly deliberate.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
D 7.4	<p><b>Report submitted by the Committee constituted to examine the provisions for students with special needs.</b></p> <p>The Academic Council may kindly recall that during its meeting held on 30/9/2016, it was decided to set up a Committee under the Chairpersonship of Dean, Faculty of Medicine, with Dr. Ketan Govekar and Shri Vasant V. Sail as members, to examine the present provisions of the Ordinance for students with special needs and propose suitable amendments, in order to address all the issues pertaining to the students with special needs.</p> <p>The Report submitted by the Committee which consists of the following is placed as <a href="#">Annexure I</a> (refer page no. 262) for the consideration of the Academic Council:</p>

	<ol style="list-style-type: none"> <li>1. Minutes of the meetings of the Committee.</li> <li>2. Proposed draft for amendment of OA-12.41</li> <li>3. Proposed draft guidelines/instructions to promote and facilitate the inclusive education of children with Disabilities in Colleges and University.</li> <li>4. Resolution to be moved in the Academic Council for the establishment of Department of Disability Studies.</li> </ol> <p>The Academic Council may kindly consider.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<p><b>D 7.5</b></p>	<p><b>To review the provision of Statutes SC-1 with regards to Corpus Fund to be maintained by affiliated colleges.</b></p> <p>As Statute SC-1 stipulates that the College shall produce evidence of creating and maintaining a Corpus Fund permanently in the name of the college by way of irrevocable Government Securities of Rs. 35 lakhs per programme or as prescribed by the relevant Statutory/Regulatory body, if it proposes to offer professional programmes and Rs. 15 lakhs per programme, if the college proposes to conduct other programmes. Alternatively, such Society or Trust shall produce evidence of FDRs for like amounts jointly held by the college and the University for a minimum lock in period of three years. The interest accrued out of it may be utilized by the college with the prior permission of the University for strengthening its infrastructure facilities.</p> <p>The Principal, Shree Damodar College of Commerce and Economics, Margao vide letter dated 8/7/2017 has informed that this condition will not apply to Colleges which were in existence prior to the amendment to SC-1. A copy of letter dated 8/7/2017 from the College is placed as <a href="#">Annexure I (refer page no. 268)</a>.</p> <p>The Academic Council may kindly consider and decide.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<p><b>D 7.6</b></p>	<p><b>Nomination of members on General Body of the Goa Board of Secondary and Higher Secondary Education for the term 2017-2021.</b></p> <p>Letter No. GBSHSE/I.T./Brd-Ele-2017/1573 dated 13/7/2017 received from Chairman, Goa Board of Secondary and Higher Secondary Education, Alto Betim regarding reconstitution of the General Body of the Goa Board of Secondary and Higher Secondary Education for the term 2017-2021 is placed as <a href="#">Annexure I (refer page no. 269)</a></p> <p>The Board has requested for nomination of two members one each from Science and Arts faculties to be elected by the Academic Council of the University from amongst its members of whom at least one member shall represent the colleges, and until the first such to represent the Goa University for the term 2017-21.</p> <p>The Academic Council may kindly nominate the members on the Committee.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>



D 7.7	<p><b>Requirement of a separate undergraduate and post-graduate Board of Studies in Management Studies</b></p> <p>The Academic Council may kindly recall that during its meeting held on 22.5.2017, the issue of considering the syllabus of Travel and Tourism for the B.A. Programme came up for discussion whether the BA Program in Travel and Tourism was to be assigned to the Board of Studies in M.A. in Tourism and Heritage Studies.</p> <p>Presently, there is a single Board of Studies in Management Studies which looks after all PG, UG as well as the Integrated Management Programmes.</p> <p>As per Ordinance OA-14.1 “There shall be a Board of Studies for every subject or group of subjects taught at undergraduate and post - graduate level, as prescribed by the Statutes. However, depending upon the exigencies/requirements of a subject or group of subjects, the Academic Council shall decide, if necessary, to have separate Board of Studies for undergraduate and post–graduate subjects”.</p> <p>Presently, the Academic Council has approved separate Board of Studies in the subjects of Commerce, Chemistry and Computer Science.</p> <p>The issue whether there is a need for having separate UG and PG Board of Studies in Management Studies is placed before the Academic Council for consideration.</p> <p>The Academic Council may kindly consider and decide.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
D 7.8	<p><b>Evaluation of present state of Research work of the Ph.D. students registered under Prof. R. B. Lohani in the subject of Electronics and Telecommunication Engineering at Goa College of Engineering.</b></p> <p>It may be recalled that the Executive Council in its meeting held on 15<sup>th</sup> March 2017 had decided to withdraw the recognition of Prof. R. B. Lohani as Ph.D. guide of Goa University. Further, it was decided that the three students who are already assigned for research work under his guidance shall be allotted to other research guide for the completion of their Ph.D. work.</p> <p>Since Prof. H. G. Virani was the only recognized guide available in the subject of Electronics and Telecommunication Engineering at Goa College of Engineering. The University vide letter dated 26.04.2017 made a request to Prof H. G. Virani to guide the three students.</p> <p>Further, a Committee was constituted to evaluate the present state of research work made by those students. The Report of the Committee is placed as <a href="#">Annexure I (refer page no 270)</a>.</p> <p>It is informed that Prof. H. G. Virani has expressed that the research orientation of these three scholars does not suit his line of working and he would like to be excused from being a Guide to these students.</p>

	<p>The Academic Council may kindly decide.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 7.9</b>	<p><b>Request received from Mr. Andrew Menezes, Research Scholar, Department of Earth Science to waive of his Ph.D. fee.</b></p> <p>Mr. Andrew Menezes, a Research Scholar who has superannuated from his service at National Institute of Oceanography, Dona Paula Goa had registered for the Ph.D. Programme on 15<sup>th</sup> May 2012 under Ordinance OB-9A in the Department of Earth Science. The student has submitted his synopsis on 15.06.2017 and is under process to submit the thesis.</p> <p>Meanwhile, the student had made a request vide letter dated 20<sup>th</sup> July 2017 to waive of his Ph.D. fee for the years 2016-17 and 2017-18 amounting to Rs 27,000/- approxiametly which is forwarded through Guide/HOD. The request of the student is placed as <a href="#">Annexure I (refer page no 272)</a></p> <p>The Academic Council may kindly decide.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 7.10</b>	<p><b>Creation of new “Faculty of Pharmacy” or “Faculty of Pharmaceuticals Sciences” as faculty for Interdisciplinary sciences.</b></p> <p>The University has received a letter 27/07/2017 from the Registrar-cum-Secretary of Pharmacy Council of India with regards to creation of a new Faculty of Pharmacy or Pharmaceutical Sciences for the pharmacy courses approved under the Pharmacy Act, 1948 and award diploma/degree certificate under the “Faculty of Pharmacy” or “Faculty of Pharmaceutical Sciences”. Copy of the letter is placed as <a href="#">Annexure I (refer page no 273)</a></p> <p>Presently, there are two affiliated colleges offering the B. Pharm and M. Pharm Programmes. Goa College of Pharmacy also offers the Ph.D Programme in Pharmacy.</p> <p>The Academic Council may kindly decide.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 7.11</b>	<p><b>Revised Academic Terms of LL.B. and B.Ed. Programme for the Academic Year 2017-18.</b></p> <p>The Directorate of Higher Education, Porvorim, Goa has informed that the FIFA World Cup U-17 Tournament is scheduled to be held in the State of Goa in the month of October, 2017 and has requested the University vide its letter No. 2/59/FIFA U-17WorldCupIndia/DHE/2017-18/1014 dated 07-07-2017, to re-schedule the examination term scheduled to be held in October, 2017 so that the tournament does not clash with the same.</p> <p>Considering the above, the Standing Committee of the Academic Council at its meeting held on 10<sup>th</sup> August, 2017, approved the revised Academic Terms for B.A./B.Sc./B.Com. and B.C.A. Programme for the Academic Year 2017-18.</p>

	<ol style="list-style-type: none"> <li>1. Recommendations have been received from Dean, Faculty of Law, to hold the supplementary examination for LL.B. Programme from 26<sup>th</sup> September, 2017 to 5<sup>th</sup> October, 2017 and the regular examinations from 23<sup>rd</sup> October till 1<sup>st</sup> November, 2017.</li> <li>2. Principal, Nirmala Institute of Education has submitted the revised examination term for B.Ed. Special Education Programme which has been accepted by Dean, Faculty of Education to hold examinations from 25<sup>th</sup> September to 29<sup>th</sup> September, 2017.</li> <li>3. No change is required for the B.Ed. Programme Academic Terms.</li> </ol> <p>The Second Term for the above programmes will commence as per the approved academic schedule.</p> <p>The Academic Council may kindly approve the above revised Academic Terms for the academic year 2017-18.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 8</b>	<b>REPORTING ITEMS</b>
<b>D 8.1</b>	<p><b>Minutes of the meeting of Board of Studies in Mathematics held on 27/07/2017 along with syllabus for 2 Generic Elective Papers for Undergraduate Programme.</b></p> <p>The Academic Council is informed that the minutes of the meeting of the Board of Studies in Mathematics held on 27/02/2017 recommending the Syllabus for 2-Generic Elective Papers was approved by the Vice-Chancellor on behalf of Academic Council in view of urgency.</p> <p>The Academic Council may kindly ratify the action taken by the Vice-Chancellor.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 8.2</b>	<p><b>Revised Academic Terms of BBA Programme for the Academic year 2017-18.</b></p> <p>The Academic Council is informed that the Chairperson, Board of Studies in Management Studies had suggested the revised Academic Terms for BBA Programme for the Academic year 2017-18.</p> <p>The Vice-Chancellor on behalf of the Academic Council has accepted the suggestions of the Chairperson, Board of Studies in Management Studies and the concerned colleges were informed accordingly.</p> <p>The Academic Council may kindly ratify the approval of the Vice-Chancellor.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>

D 8.3	<p><b>Minutes of the meeting of Board of Studies in M.E. Information Technology &amp; Engineering held on 06/07/2017 along with Scheme, Syllabus along with Master Panel of Examiners.</b></p> <p>The minutes of the meeting of the Board of Studies in Information Technology &amp; Engineering held on 06/07/2017 recommending the Scheme, Syllabus with Master Panel of Examiners was approved by the Vice-Chancellor on behalf of the Academic Council in view of urgency.</p> <p>The Academic Council may kindly ratify the action taken by the Vice-Chancellor.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
D 8.4	<p><b>REPORTS OF AFFILIATION INQUIRY COMMITTEE</b></p> <p>The following reports of the Affiliation Inquiry Committee (AIC) were placed before the Vice Chancellor for approval.</p> <p>In view of the urgency, these reports of the AIC have been approved by the Vice Chancellor on behalf of the Academic Council.</p> <p>Accordingly, the recommendations of the AIC, as approved by the Vice Chancellor has already been communicated to the Colleges.</p>
D 8.4.1 D 8.4.1.1	<p><b>Fr. Agnel College of Arts and Commerce, Pilar</b></p> <p><b>Programme: Research Centre in Commerce</b></p> <p>Date of visit: 7/07/2017 <span style="float: right;">Type of Programme: Self Financing</span></p> <p>Part - 1 AIC Report Part - 2 Recommendations of the AIC.</p> <p><b><u>OBSERVATIONS:</u></b> Nil</p> <p><b><u>Essential conditions to be fulfilled:</u></b> Nil</p> <p><b><u>Overall recommendations of the AIC:</u></b> Affiliation Inquiry Committee recommends continuation of affiliation for three years i.e. 2017-18, 2018-19 and 2019-20. Extension of affiliation is granted only to continue with already registered students.</p> <p><b><u>Suggestions of the AIC:</u></b></p> <ol style="list-style-type: none"> <li>1. Related research software of SPSS may be purchased.</li> <li>2. Open access in the library to be given to the Research students.</li> <li>3. Research related publications upto Rs. 10,000/- to be purchased.</li> <li>4. Non teaching support; Library and computer facilities to be extended to the Research Centre.</li> </ol>

Position	Name	Signature
Chairperson	Prof. K.B. Subhash	Sd/-
Expert	Prof. A. M. Gurav	Sd/-
Expert	Prof. A. Barbole	Sd/-
Member of AC	Dr. Lakshangy Charya	Sd/-
Co-ordinator, CDC – Member	Dr. D. B. Arolkar	-
Representative of DHE	Dr. Remy Dias	-
Ex- Engineer – Member	A. Srivastava	-
Member Secretary	Shri A. Fernandes	Sd/-

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**D 8.4.1.2 B.A. 2<sup>nd</sup> division(2015-16, 2016-17(post facto) and 2017-18)**

Date of visit: 20/06/2017 Type of Programme: Aided

Part - 1 AIC Report  
Part - 2 Recommendations of the AIC.

**OBSERVATIONS:**  
The Committee members visited all the classrooms allotted for FY B.A. (A) and (B), SY B.A. (A) and (B), TY B.A. 3 rooms. Most of the classrooms were found fitted with LCD projectors and were adequately ventilated. The Committee also visited the Library and found the staff and facilities satisfactory. Initiatives taken by the Librarian were appreciated (website development, uploading of material, training of Librarians/students etc.). The College has several student development programmes which are appreciated.

**Essential conditions to be fulfilled:**  
Nil

**Overall recommendations of the AIC:**  
Affiliation Inquiry Committee recommends extension of affiliation post facto for 2<sup>nd</sup> division B.A. for 2015-16 and 2016-17 and extension of affiliation for 2017-18.

**Suggestions of the AIC:**

Position	Name	Signature
Chairperson	Prof. Ishrat Khan	Sd/-
Expert	Dr. R. Fernandez	Sd/-
Member of AC	Dr. Lakshangy Charya	Sd/-
Co-ordinator, CDC – Member	Dr. D. B. Arolkar	-
Representative of DHE	Dr. Remy Dias	-
Ex- Engineer – Member	A. Srivastava	-
Member Secretary	Shri A. Fernandes	Sd/-

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**D 8.4.1.3**

**B.C.A.**

Date of visit: 20/06/2017

Type of Programme: Self Financing

Part - 1 AIC Report

Part - 2 Recommendations of the AIC.

**OBSERVATIONS:**

Nil

**Essential conditions to be fulfilled before the commencement of the academic year 2017-18:**

Faculty with SET/NET (on contract) to be paid Rs. 36,000/- per month while without SET/NET it should be Rs. 30,000/- per month as per DHE Order dated 23/1/2014 and as per Annexure 'A' with teaching experience.

**Overall recommendations of the AIC:**

Affiliation Inquiry Committee recommends continuation of affiliation for the academic year 2017-18 subject to fulfillment of essential conditions.

**Suggestions of the AIC:**

Programming skill need to be strengthened by organizing workshop for students.

Position	Name	Signature
Chairperson	Prof. Ishrat Khan	Sd/-
Expert	Dr. S. Baskar	Sd/-

Member of AC	Dr. Lakshangy Charya	Sd/-
Co-ordinator, CDC – Member	Dr. D. B. Arolkar	-
Representative of DHE	Dr. Remy Dias	-
Ex- Engineer – Member	A. Srivastava	-
Member Secretary	Shri A. Fernandes	Sd/-

[\(Back to Index\)](#)**D 8.4.1.4 B. Com.- 3<sup>rd</sup> division (2015-16 and 2016-17 Post facto)**

Date of visit: 20/06/2017

Type of Programme: Aided

Part - 1 AIC Report

Part - 2 Recommendations of the AIC.

**OBSERVATIONS:**

1. Adequate lighting and ventilation to be provided in class rooms.
2. The College canteen is under renovation.
3. The NOC to open new additional Division for i) FY B.A. and FY B. Com. for 2015-16 onwards and ii) New additional division of FY B.A. and FY B.Com. for the year 2015-16 is granted by DHE vide letter dated 7/4/2015.

**Essential conditions to be fulfilled before the commencement of the academic year 2018-19:**

1. Corpus Fund of Rs. 15 lakhs per programme to be maintained as per SA-1 2(b).

**Overall recommendations of the AIC:**

Affiliation Inquiry Committee recommends extension of affiliation post facto for the academic year 2015-16 and 2016-17 for 3<sup>rd</sup> division of B. Com.

**Suggestions of the AIC:**

1. Suggested to complete the renovation of canteen as early as possible.
2. Suggested to provide adequate lighting in class rooms and in corridors.

Position	Name	Signature
Chairperson	Prof. Ishrat Khan	Sd/-
Expert	Dr. P. Sri Ram	Sd/-
Member of AC	Dr. Lakshangy Charya	Sd/-
Co-ordinator, CDC –	Dr. D. B. Arolkar	-

Member		
Representative of DHE	Dr. Remy Dias	-
Ex- Engineer – Member	A. Srivastava	-
Member Secretary	Shri A. Fernandes	Sd/-

[\(Back to Index\)](#)**D 8.4.2****V.M. Salgaocar Institute of International Hospitality Education Manora, Raia.  
B.Sc. International Hospitality Management**

Date of visit: 20/06/2017

Type of Programme: Self Financing

Part - 1 AIC Report

Part - 2 Recommendations of the AIC.

**OBSERVATIONS:**

1. Infrastructure facilities are well maintained.

**I. Essential conditions to be fulfilled :**

1. Posts of Faculty (4 nos.) to be advertised and filled as per SA-19 especially the post of Principal.

**II. Overall recommendations of the AIC:**

Affiliation Inquiry Committee recommends continuation of affiliation for the academic year 2017-18 subject to fulfilment of essential conditions.

**Suggestions of the AIC:**

Improve the research facilities for the Faculty.

Position	Name	Signature
Chairperson	Prof. K. B. Subhash	Sd/-
Expert	Shri Edgar D'Souza	Sd/-
Member of AC	Dr. Prakash Morkar	Sd/-
Co-ordinator, CDC – Member	Dr. D. B. Arolkar	-
Representative of DHE	Dr. Remy Dias	-
Ex- Engineer – Member	A. Srivastava	-
Member Secretary	Shri A. Fernandes	Sd/-

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## D 8.4.3

**St Joseph Vaz College, Cortalim  
Affiliation to B. Sc. programme (2017-18).**

Programme: Aided

Date: 10/07/2017

Part - 1 AIC Report

Part - 2 Recommendations of the AIC.

**Observations:**

1. The College has produced a copy of the Affidavit for 20,000 sq. mts. of land.
2. Canteen area is being developed.
3. The College has shown to the AIC all the well equipped Labs and spacious Library.
4. Common classroom to accommodate students upto 60 are available.
5. A complete Lab. With 20 computers is available with wifi.

**Essential conditions to be fulfilled:**

Nil

**Overall recommendations of the AIC:**

Affiliation Inquiry Committee recommends affiliation for FY B.Sc. with an intake of 60 students for the academic year 2017-18.

**Suggestions of the AIC:**

1. Joint FDR need to be in the name of the College and University.
2. Few more latest edition of books in Botany, Maths and Physics as per curriculum to be procured.
3. Grievance Committee, Anti-ragging and Internal Complaints Committee to be constituted.
4. Follow up action on the appointment of Faculty from the University may be done.
5. Principal/Incharge Principal to be appointed as per SA-19. The Committee felt that Principal incharge Fr. Walter De Sa may not fit in SA-19.
6. The generic elective for PCM could be Botany or Computer Awareness and for PCB could be Maths or Computer Awareness.
7. The College should work towards completion of the registration process of land in the name of the society.
8. The budgetary requirements for 2017-18 may be worked out and submitted to the University.

Position	Name	Signature
Chairperson	Prof. G.M. Naik	Sd/-
Expert (Physics)	Prof. R.V. Pai	Sd/-
Expert (Chemistry)	Dr. V. J. Pissurlekar	Sd/-
Expert (Maths)	Dr. Y.S. Valaulikar	Sd/-
Expert (Botany)	Prof. V.U. Kerkar	Sd/-
Member of AC	Dr. Nagesh Colvalkar	Sd/-
Co-ordinator, CDC	Dr. D. B. Arolkar	-

Representative of DHE	Dr. Remy Dias	-
Ex- Engineer	A. Srivastava	-
Member Secretary	A. Fernandes	Sd/-

[\(Back to Index\)](#)**D 8.4.4****Carmel College for Arts, Science and Commerce for Women, Nuvem.  
Programme : M. Sc. - Food Technology****Date of Visit:** 14/7/2017**Type of programme:** Self Financing

Part - 1 AIC Report

Part - 2 Recommendations of the AIC.

**Observation:**

1. The AIC noted that the College has appointed one faculty on Contract & 2 on lecture basis and sent the appointments for approval to the University. Arrangement has been made for conducting practicals.
2. As regards syllabus the BOS has carried out the reshuffling of the courses programme is being offered under Ordinance OA – 18.
3. The college has procured 6 additional equipment including Cooking Range, Hot Air Oven, Microwave, Muffle Furnace, Pasta Maker etc.
4. 11 new books have been added since the last visit as per the syllabus.  
The AIC also visited the laboratories of Agnel Institute, Verna which will be partially used for the programme.

**(I) Essential conditions to be fulfilled by:** Nil.**(II) Overall recommendations of the AIC:**

Affiliation Inquiry Committee recommends extension of affiliation to FY M. Sc Food Technology for the academic year 2017 – 18 with an intake of 20 students.

**(III) Suggestions of the AIC:**

1. College should procure additional books related to Food Technology of Post Graduate level and latest editions.
2. College may develop their own in house laboratory facilities for the smooth conduct of practical component.
3. Optional courses to be made available to students from the II Semester onwards.

Position	Name	Signature
Chairperson	Prof. G. M. Naik	Sd/
Expert	Prof. Savita Kerkar	Sd/
Member of AC	Dr. Prakash Morkar	Sd/
Co-ordinator, CDC	Dr. D. B. Arolkar	-
Representative of DHE	Dr. Remy Dias	-
Ex. Engineer	A. Srivastava	-
Member Secretary	Shri Donald A. E. Rodrigues (Joint Registrar – Acad.)	Sd/

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D 8.4.5

**S. S. Dempo College of Commerce and Economics, Cujira, Integrated Education Complex, Cujira, Bambolim, Goa  
PG Diploma in Management (Event Management).**

Date of visit: 03/08/2017

Type of Programme: Self Financing

Part – 1 AIC Report

Part – 2 Recommendation of AIC

**OBSERVATIONS:**

1. The College has one Full time Faculty for the programme and appoints additional Faculty on lecture basis per semester.
2. The syllabus has been approved by the University.
3. The College has adequate titles and number of copies exclusively related to Event Management. Adequate facilities associated with event production such as studio, editing facility and equipments are available, including computational facilities exclusively for the programme.

**Essential conditions to be fulfilled before the commencement of the Academic Year 2017 - 18.**

Nil

**Overall recommendations of the AIC:**

The affiliation Inquiry Committee recommends affiliation to start the new programme of PG Diploma in Management (Event Management) with an intake of 30 students for the academic year 2017 – 18.

**Suggestions of the AIC:**

Nil .

Position	Name	Signature
Chairperson	Prof. R.V. Pai	Sd/-
Expert	Dr. M.S. Dayanand	Sd/-
Member of AC	Dr. Lakshangi Charya	Sd/-
Co-ordinator, CDC – Member	Dr. D. B. Arolkar	-
Representative of DHE	Dr. Remy Dias	-
Ex- Engineer – Member	A. Srivastava	-
Member Secretary	Shri Donald A.E. Rodrigues	Sd/-

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D 8.4.6

**Goa College of Engineering, Farmagudi-Goa.****ME. Information Technology and Engineering for the academic year 2017-18.**

Date of AIC visit: 28/07/2017

Program: Aided

Part 1 – AIC Report

Part 2 – Recommendations of the Affiliation Inquiry Committee.

**Observations:**

1. The present BE Faculty (19 Nos.) will take lectures initially for the programme. and the College also showed the detailed Time-Table.
2. NOC from DTE and approval from AICTE for the programme is available.
3. The number of practicals for the programme seems to be less.
4. The College has intimated to the Govt. for recruitment of additional contract faculty.
5. The College has adequate space and infrastructure to run the programme.
6. The Dept. has a fulfilled departmental Library with adequate number of books.

**(I) Essential conditions to be fulfilled:**

Nil.

**(II) Overall recommendation of the AIC:**

Affiliation Inquiry Committee recommends affiliation to ME. Information Technology and Engineering program for the academic year 2017-18 with an intake of 18 students.

**(III) Suggestions of the AIC:**

1. Latest editions of books for the programme to be procured.
2. The College may ask the BOS to look into possibility of having more number of practicals for the course.
3. The College may make efforts to recruit Faculty to handle the PG teaching work load.
4. A Co-Ordinator for the program to be appointed preferably a senior Faculty.
5. Drinking water facility at each level of the Department premises to be made available.

Position	Name	Signature
Chairperson	Prof. G.M. Naik	Sd/-
Expert	Prof. Luis C. Mesquita	Sd/-
Member of AC	Dr. Vikas Pissurlekar	Sd/-
Co-ordinator, CDC	Dr. D.B. Arolkar	-
Representative of DHE	Dr. Remy Dias	-
Ex-Engineer	A. Srivastava	--
Member Secretary	A. Fernandes	Sd/-

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D 8.5	<p><b>Minutes of the meeting of Board of Studies in Commerce (U.G.) held on 20/07/2017 alongwith syllabus of Computer Application Paper –I and II recommended by the Board of Studies in Commerce (U.G.)</b></p> <p>The Academic Council is informed that the minutes of the meeting of Board of Studies in Commerce (U.G.) held on 20/07/2017 alongwith the syllabus for Computer Application Paper–I and II recommended by the Board of Studies in Commerce(U.G) was approved by the Vice-Chancellor on behalf of Academic Council in view of urgency.</p> <p>The Academic Council may kindly ratify the action taken by the Vice-Chancellor. <a href="#">(Back to Index)</a></p>
D 8.6	<p><b>Certificate issued stating that the Sports Marks can be aggregated to the overall marks.</b></p> <p>A letter dated 04/08/2017 received from Purohit Shivprasad Rajesh, a student of Dhempe College of Arts &amp; Science, Miramar, stating that he has passed his T.Y. B.Sc. Semester VI in the Subject of Computer Science Examination held in April 2017 securing an aggregate of 621 #26\$01. <a href="#">Annexure I (refer page no.....)</a></p> <p>The student had requested that a certificate be issued to him stating that the sports marks are included for overall percentage for admission purpose.</p> <p>As per Ordinance OA5.16.1C Sport marks are to be shown separately with a # sign.</p> <p>The matter was referred to the Vice Chancellor and due to the urgency, Vice Chancellor on behalf of the Academic Council has approved to issue the certificate stating that Sports Marks can be aggregated to the overall marks. Copy of the certificate issued is placed as <a href="#">Annexure II (refer page no....)</a>.</p> <p>The Academic Council may kindly ratify the action taken by the Vice Chancellor. <a href="#">(Back to Index)</a></p>
D 9	<b>RESOLUTIONS</b>
D 9.1	<b>Resolutions submitted by Dr. Anthony Rodrigues</b>
D 9.1.1	<p><b>Video Recording of Proceedings of Academic Council Meetings</b></p> <p>Goa University, under its banner has various Departments and more than 50 Affiliated colleges, equally divided into professional and non-professional colleges plus various institutions, bodies connected directly or indirectly.</p> <p>As we all know, that Academic Council is the body, where all the decisions relating to Higher education are being discussed, deliberated, debated and approvals are being given. Unfortunately, not all colleges and institutions get an opportunity to address their issues. It is true that not all these institutions are part of the Academic council body. In order to bring transparency, rationality and justice, There is a dire need for video recording of Academic Council meetings. So that the stakeholders know the objectivity and the need for such decision. It is not fair, that only the members get an opportunity to</p>

discuss, whereas the others don't even know, what has happened.

Secondly, all the institutions as being affected by the decision taken by the Academic Council directly or indirectly. Therefore, All the stakeholders should know, as to, how a particular decision is being taken, a video recording of the proceeding is a must.

It may therefore be unanimously resolved by this august Body asunder:

**Resolution**

Therefore, It is most crucial, that this august house resolve this issue, by unanimously approving that, the proceedings of the Academic Council should be kept, in the form of video recording, for the transparency and raising the level of higher Education in the state of Goa.

Requesting the members of this august house to kindly resolve and approve this resolution.

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**D 9.1.2**

**Live Telecast of The Proceedings of Academic Council Meetings**

Goa University, under its banner has various Departments and more than 50 Affiliated colleges, equally divided into professional and non-professional colleges plus various institutions, bodies connected directly or indirectly.

Goa is one of the well managed state in India. So, in the same line, I request, Goa university, that the Academic Council proceedings should be broadcasted live. In order to bring transparency, rationality and justice in higher education in the state of Goa. It should be on the Same principles like, our Parliamentary Democracy proceedings in our Country. This will bring a massive change in our higher Educational system. It will be a very good precedence to connect with everyone- every stakeholder in the state of Goa.

Secondly, all the institutions as being affected by the decision taken by the Academic Council directly or indirectly. Therefore, All the stakeholders should know, as to, how a particular decision is being taken, a live broadcast of the Academic Council proceeding will solve their various issues.

It may therefore be unanimously resolved by this august Body asunder:

**Resolution**

Therefore, It is most crucial, that this august house resolve this issue, by unanimously approving that, the proceedings of the Academic Council shall be broadcasted live, for the transparency and raising the level of higher Education in the state of Goa.

Requesting the members of this august house to kindly resolve and approve this resolution.

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<b>D 9.2</b>	<b>Resolutions submitted by Dr. Radhika Nayak.</b>
<b>D 9.2.1</b>	<p><b>Students who have backlogs in the various subjects in semester I to IV be allowed to enrol in semester V and VI in the academic year 2018-19.</b></p> <p><b>Resolution</b> In view of the transition period from old structure to CBCS in the under graduate programs affiliated to Goa University, it is proposed that all students who have backlogs in the various subjects in semester I to IV be allowed to enrol in semester V and VI in the academic year 2018-19. The final results of such students to be declared only after clearing all the backlog papers.</p> <p><b>Justification:</b></p> <p>(i) The above resolution is necessitated to ensure smooth transition from old structure to CBCS as otherwise the students kept back after IV semester for want of clearing their backlog papers would have to enroll in the CBCS structure which would be against the principles of natural justice.</p> <p>(ii) Conducting the old course and the CBCS course simultaneously shall be impossible for the colleges therefore it is imperative to accept the above proposal.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 9.2.2</b>	<p><b>Academic terms of the under graduate BBA program to be modified to coincide with the other under graduate programs to ensure smooth functioning on college campuses.</b></p> <p><b>Resolution</b> Academic terms of the under graduate BBA program to be modified to coincide with the other under graduate programs to ensure smooth functioning on college campuses.</p> <p><b>Justification:</b> Varying academic terms creates difficulty on college campus for co-ordination of activities that have to be taken up during the vacation such as NSS camp, study tours etc thus to ensure smooth functioning of the colleges, it is requested to bring the academic terms of the BBA programme in sync with the other Undergraduate programs.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 9.2.3</b>	<p><b>Proposal to constitute separate Board of Studies for Under Graduate programs</b></p> <p><b>Resolution</b> It is proposed to constitute separate Board of Studies for Under Graduate programs.</p> <p><b>Justification:</b> In view of the introduction of the CBCS structure in under graduate programs and the need to work on preparation of syllabi for the Second and Third year in detail as well as keeping in mind the quantum of work, it is honestly requested to constitute separate Boards of Studies for all the subjects in the under graduate programs. This shall facilitate easy coordination considering the frequency at which syllabi drafting meetings would</p>

	<p>need to be conducted in view of the CBCS structure.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 9.3</b>	<b>Resolution submitted by Shri Ramrao Wagh</b>
<b>D 9.3.1</b>	<p><b>Appointment of University Research Ethics Committee</b></p> <p><b>Resolution</b></p> <p>Resolved to appoint a University Research Ethics committee and to formulate detailed guidelines in order to ensure that ethical practices are adhered while carrying our research and projects that involves humans or animals in the form of intervention(such as in Medical &amp; health related research), interaction and any other means that involves collection of private information.</p> <p><b>Justification:</b></p> <p>Research ethics govern the standards of conduct for scientific researchers. It is important to adhere to ethical principles in order to protect the dignity, rights and welfare of research participants. As such, all research involving human beings should be reviewed by an ethics committee to ensure that the appropriate ethical standards are being upheld. Discussion of the ethical principles of beneficence, justice and autonomy are central to ethical review. The WHO Manual (Section XV.2) defines research with human subjects as 'any social science, biomedical, behavioural, or epidemiological activity that entails systematic collection or analysis of data with the intent to generate new knowledge, in which human beings:</p> <ul style="list-style-type: none"> <li>• are exposed to manipulation, intervention, observation, or other interaction with investigators either directly or through alteration of their environment; or</li> <li>• become individually identifiable through investigator's collection, preparation, or use of biological material or medical or other records.</li> </ul> <p>To facilitate this, the University may appoint a Research Ethics committee that will</p> <ul style="list-style-type: none"> <li>• Foster a research culture that embraces the principles of ethical research to protect the dignity, rights, safety and privacy of those involved in research;</li> <li>• Provide clear and easily accessible guidance on best ethical practice and regulatory requirements;</li> <li>• Offer support and training to staff and students and any others engaged in University research projects to maintain awareness and high ethical standards;</li> <li>• Maintain an ethical review process that enables research projects to be subject to a level of scrutiny in proportion to the ethical risk;</li> <li>• Maintain an oversight of the policies and practices of Ethics Committees and to take appropriate action where there is evidence that the University's policy is not being followed.</li> </ul> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
<b>D 9.4</b>	<b>Resolution submitted by Dr. Naguesh Colvalcar</b>



**D 9.4.1**

**Proposed Amendment to SA-14(vi) to add a Proviso**

For the purpose of Election to the Academic Council of Goa University a teacher of Affiliated Colleges, shall mean a qualified person permanently/ Regularly appointed as Assistant Professor and above. Only such candidates shall be eligible to contest the election of Academic Council.

**Justification** : This Amendment is necessary as in the past several teachers who are appointed on lecture basis or on Contract basis (appointed for Eleven months) contested the election for Academic Council. The term of the Academic Council being of minimum two years, they may not be in a position to represent the interest of the Affiliated Colleges as they are temporary and there is no guarantee that they may be continued for further period. There were also the instances where Part-Time and Laboratory Assistants of Affiliated Colleges had contested the Election for the Academic Council. To avoid such practices, this amendment is proposed.

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Additional Agenda

D 3.12	<p><b>Minutes of the meeting of Board of Studies in English held on 10/08/2017</b></p> <p><b>Part A.</b></p> <p>i. Recommendations regarding courses of study at the postgraduate level: One credit course under VRPP, EGO-130.</p> <p><a href="#">Annexure I</a> (refer page no. 276)</p> <p><b>Part B</b></p> <p>i Scheme of Examinations at postgraduate level: iv. Panel of examiners for different examinations at the postgraduate level (in view of a local college starting a PG Programme in English): <b>Enclosed in Envelope marked 'Confidential'</b></p> <p>The declaration by the chairman that the minutes were readout by the Chairman at the meeting itself.</p> <p>Date: 10<sup>th</sup> August, 2017 Place: Goa University</p> <p style="text-align: right;">(Dr. Nina Caldiera) Signature of the Chairman</p> <p><b>Part G.</b> The Remarks of the Dean of the Faculty</p> <p>i) The minutes are in order ii) The minutes may be placed before the Academic Council with remarks if any. iii) May be recommended for approval of Academic Council. iv) Special remarks if any.</p> <p>Date: Place</p> <p style="text-align: right;">(Prof. Ishrat B. Khan) Signature of the Dean</p> <p style="text-align: right;"><a href="#">(Back to Index)</a></p>
D 7.14	<p><b>Request for Issue of Eligibility Certificate to a candidate from Jharkhand State Open School.</b></p> <p>The University has received a letter from Govt. College of Commerce &amp; Economics, Margao, Goa forwarding Application for Provisional Statement of Eligibility of Mr. Shaikh Arfaaz.</p> <p>The College has inadvertently admitted Mr. Shaikh Arfaaz to the F.Y. B.Com programme without obtaining Provisional Eligibility Certificate from Goa University.</p> <p>From the documents submitted it is seen that Mr. Shaikh Arfaaz has passed XII Std from Jharkhand State Open School, Ranchi which is not included in the list of the</p>

recognized Boards notified by the Council of Boards of School Education in India, Delhi on their website.

The student has however submitted a No Objection letter regarding admission issued by the Council of Boards of School Education in India, Delhi, and a Public Notice from Jharkhand State Open School, Ranchi alongwith the marksheet & Migration Certificate are placed as [Annexure I](#) (refer page no 277)

The Academic Council may consider and decide.

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**ANNEXURES**

**D 1.1 To confirm the minutes of the 5<sup>th</sup> meeting of the IXth Academic Council held on 22<sup>nd</sup> May, 2017.**

**Annexure I**

**Minutes of the Fifth Meeting of the IX Academic Council**

Date: 22<sup>nd</sup> May, 2017

Time: 10.30 a.m.

Venue: Council Hall, Goa University, Taleigao Plateau, Goa.

A list of members who attended the meeting of Academic Council and those who sought leave of absence is appended.

The Chairperson welcomed the members to the Fifth meeting of the IX Academic Council.

<b>D</b>	<b>DISCUSSION ITEMS</b>
<b>D 1</b>	<b>CONFIRMATION</b>
<b>D 1.1</b>	<p><b>To confirm the minutes of the 3rd Meeting of the IX Academic Council held on 6<sup>th</sup> and 7<sup>th</sup> March, 2017.</b></p> <p>The Member Secretary brought to the notice of the House the following changes suggested by the members that need to be incorporated to the minutes:</p> <p><b>D 3. 1 Minutes of the Board of Studies in Law held on 24/10/2016</b></p> <p>The Academic Council approved the minutes of the Board of Studies in Law. It was however decided to implement the proposed part amendment prospectively to all students of LL.B. Degree</p> <ol style="list-style-type: none"> <li>1. who are admitted to First Year during the academic year 2016-17 and thereafter.</li> <li>2. who are admitted to Second Year during the academic year 2018 - 19 and thereafter.</li> </ol> <p>It was also decided to implement the proposed part amendment prospectively to all students of B.A. LL.B.</p> <ol style="list-style-type: none"> <li>1. who are admitted to First Year during the academic year 2016-17 and thereafter.</li> <li>2. who are admitted to Second Year during the academic year 2018 - 19 and thereafter.</li> <li>3. who are admitted to Third Year during the academic year 2019 - 20 and thereafter.</li> <li>4. who are admitted to Fourth Year during the academic year 2020 - 21 and thereafter.</li> </ol> <p><b>D 5.4 Review of Ordinances OA-19, OA-2 and OB-9A</b></p> <p>The Chairperson of the Committee, Prof. H. B. Menon briefed the members on the Report of the Committee and the Proposed new Ordinance OA 19A and amendments to</p>

Ordinances OA-19, OA-2 and OB-9A.

The Academic Council deliberated on the Ordinance and approved the same with the following corrections/suggestions:

Proposed New Ordinance OA – 19A

1. Syllabus for the Entrance Test in the subjects under Life Sciences such as Botany and Zoology need to be notified while announcing the Admissions.
2. OA – 19A 1(v) – List of allied subjects need to be drawn up and notified by the University.
3. OA – 19A 1(iv) The validity of the Goa University Ph.D. Test to be increased to two years instead of one year. Similarly, clause to be edited to clarify that the candidates should have valid certificate in case of GATE.
4. OA – 19A 1(vi) Provision to be made for giving all JRF first preference.
5. OA – 19A 1(xi) - The requirement of compulsory residence to be limited to Three Years.
6. Under OA-19A 2 (iii) the term interdisciplinary needs to be elaborated.
7. OA – 19A 6.4 Last two sentences of the clause to be dropped.
8. OA – 19A 11 (xiv) the line “in which the Research Scholar has incorporated all the revision/ modifications/ correction if any,” to be deleted.
9. OA – 19A 11 (xv) (a) to be reviewed by the Committee to incorporate suggestions made by the members for reducing spacing to 1.5 and printing on both sides.
10. OA – 19A.9 The words “from the list of Journals approved by the UGC” to be deleted. The word “referred journals” to be corrected to “refereed journals”.
11. Identifying the candidates after the interview to be indicated as either “Selected” or “Not Selected” instead of placing them under category A, B or C.
12. Under OA-19.A (1) (iv) delete ICAR/ICMR/DBT and add M.Phil. through regular mode after clearing entrance exam and interview.
13. In the annexure I table, percentage of marks in the qualifying PG degree exam is to be added.

Ordinance OA – 2

1. OA-2.12 (e) - The words “Post-Doctoral” and “from the list of Journals approved by the UGC” to be deleted. The word “referred journals” to be corrected to “refereed journals”.

General points

1. Consequential amendments, based on the suggestions made under Ordinance OA-19A to be also carried out, wherever applicable, under Ordinances OA-19, OB-9A.
2. The part amendments to SA-17 proposed by Prof. M. K. Janarthnam and approved by the Academic Council earlier was withdrawn by the Academic Council.
3. The Academic Council decision to limit the number of students to be allotted to newly recognised guides to four was withdrawn in view of the UGC regulation 2016.
4. The overall limit of candidate that a guide can supervise as specified by the UGC to be strictly followed irrespective of the Institutions the guide may be recognised. All Head of the Research Centres/institution to be informed to submit details of the number of research scholars under the supervision of each guide in various

	<p>Universities while forwarding vacancies to the University.</p> <p>5. A list of recognised guides of Goa University Departments along with number of Research Scholars registered under them to be drawn up and submitted to the Chairperson of the Academic Council.</p> <p>6. The Evaluation Report Form to be reviewed and suitably modified and placed before the Academic Council.</p> <p>With regard to the objections raised by Dr. Anthony Rodrigues, Member, the Chairperson informed that the decisions taken by the Academic Council cannot be objected to at the time of approving the Minutes and that members are free to make fresh proposals for the consideration of the Academic Council.</p> <p>The minutes of the 3rd Meeting of the IX Academic Council held on 6<sup>th</sup> and 7<sup>th</sup> March, 2017 were confirmed with the above corrections.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 1.2</b>	<p><b>To confirm the minutes of the 2<sup>nd</sup> Meeting of the Standing Committee of the IXth Academic Council held on 31<sup>st</sup> March, 2017.</b></p> <p>As there were no observations received from the members, the minutes of the 2<sup>nd</sup> Meeting of the Standing Committee of the IX Academic Council held on 31<sup>st</sup> March, 2017 were confirmed.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 1.3</b>	<p><b>To confirm the minutes of the 3<sup>rd</sup> meeting of the Standing Committee of the IX Academic Council held on 2<sup>nd</sup> May, 2017.</b></p> <p>The Academic Council considered the observations received from the COE with regards to the minutes of the BOS in Dentistry which were approved by the Standing Committee of the Academic Council in its meeting held on 2.5.2017. It was also informed that the University has subsequently received a formal letter from the Chairperson Bos indicating the correct position. After deliberations it was decided to convey the displeasure of the House to the Chairperson, BOS as the correct picture was not given to the Standing Committee of the Academic Council.</p> <p>The minutes of the 3<sup>rd</sup> meeting of the Standing Committee of the IX Academic Council held on 2<sup>nd</sup> May, 2017 were confirmed with the above observation.</p> <p style="text-align: center;"><b>(Action: AR-PG/General)</b></p>
<b>D 2</b>	<b>FOLLOW UP ACTION</b>
<b>D 2.1</b>	<p><b>Follow up action on the minutes of the 3rd Meeting of the IX Academic Council held on 6<sup>th</sup> and 7<sup>th</sup> March, 2017.</b></p> <p>The Academic Council noted the action taken/initiated on various decisions taken in its meeting held on 6<sup>th</sup> and 7<sup>th</sup> March, 2017.</p> <p style="text-align: center;"><b>(Action: Concerned AR's)</b></p>
<b>D 2.2</b>	<p><b>Follow up action on the minutes of the 2<sup>nd</sup> Meeting of the Standing Committee of the IX Academic Council held on 31<sup>st</sup> March, 2017.</b></p> <p>The Academic Council noted the action taken/initiated on various decisions taken in its</p>

	<p>meeting held on 31<sup>st</sup> March, 2017. Prof. M. K. Janarthanam, Chairperson of the CBCS Committee requested that the Syllabus for the CBCS in the various subjects should be uploaded on the University website.</p> <p style="text-align: center;"><b>(Action: Concerned AR's)</b></p>
<b>D 3</b>	<b>BOARD OF STUDIES</b>
<b>D 3.1</b>	<p><b>Minutes of the meeting of Board of Studies in Marathi held on 01/03/2017</b></p> <p>The Academic Council approved the minutes of the meeting of Board of Studies in Marathi held on 01/03/2017 with the following conditions:</p> <ol style="list-style-type: none"> <li>1. Credits and Marks indicated in the syllabus to be deleted.</li> <li>2. New code numbers to be given for revised courses.</li> </ol> <p>It was informed that it would be appropriate that the titles of the courses in languages should also be indicated in their respective script in the syllabi as well as the statement of marks.</p> <p>The Academic Council did not accept the list of Experts suggested by the Board as the same was included in the agenda. The Chairperson BoS was requested to submit a fresh one in a confidential envelope. The Vice-Chancellor was authorised to approve the same on behalf of the Academic Council.</p> <p style="text-align: center;"><b>(Action: AR-PG)</b></p>
<b>D 3.2</b>	<p><b>Minutes of the meeting of Board of Studies in Pharmacy held on 28/04/2017</b></p> <p>The Academic Council did not approve the minutes of the meeting of Board of Studies in Pharmacy held on 28/04/2017 as there were a lot of discrepancies in the syllabus. The Chairperson was requested to forward a soft as well as hard copy of the various discrepancies in the syllabus and regulations to the Registrar who was requested to write a letter to the Pharmacy Council of India seeking clarification on the anomalies. Until and unless the reply is received from PCI, the Programme would need to be offered as per the existing Ordinance.</p> <p style="text-align: center;"><b>(Action: AR-PG)</b></p>
<b>D 3.3</b>	<p><b>Minutes of the meeting of Board of Studies in Homoeopathic Medicine held on 10/03/2017</b></p> <p>The Academic Council approved the minutes of the meeting of Board of Studies in Homoeopathic Medicine held on 10/03/2017. The Chairperson was requested to give explanation at pg. no. 112 of the annexure.</p> <p style="text-align: center;"><b>(Action: AR-PG)</b></p>
<b>D 3.4</b>	<p><b>Minutes of the meeting of Board of Studies in Management Studies held on 02/05/2017</b></p> <p>The Academic Council approved the PG Diploma in Management (Event Management) Programme with the recommended syllabus with the following corrections/suggestions:</p> <ol style="list-style-type: none"> <li>1. The column indicating months in the structure to be deleted.</li> <li>2. Contact Hours under Duration to be deleted.</li> </ol>



	<p>3. The words “Christian and Ethnic (Hindu)” indicted in the syllabus of the Course WEDDINGS AND SPECIAL EVENTS to be deleted.</p> <p>The Syllabus for the B.B.A Programme was also approved.</p> <p>The Registrar informed the Chairperson, BoS that it was the responsibility of the Board of Studies in Management to frame the syllabus of Travel and Tourism for the B.A Programme as done earlier and until the Boards are reconstituted not accepting to undertake this task was not appropriate. The Chairperson informed that clarification was sought in this regard and it was the opinion of the Board that the syllabus should be framed by the Board of Studies in Tourism and Heritage Management. After discussion the Chairperson BoS was informed to consider the syllabus for the Travel and Tourism subject and place the minutes of the BoS before the Standing Committee of the Academic Council for approval.</p> <p>The Academic Division to arrange for the Affiliation Inquiry visit to the college.</p> <p style="text-align: center;"><b>(Action: AR-PG/General)</b></p>
<b>D 3.5</b>	<p><b>Minutes of the meeting of Board of Studies in Sanskrit held on 12/05/2017</b></p> <p>The Academic Council approved the minutes of the meeting of Board of Studies in Sanskrit held on 12/05/2017 with the following corrections/ suggestions:</p> <ol style="list-style-type: none"> <li>1. Marks indicted in the syllabus to be dropped.</li> <li>2. Syllabus of Compulsory English approved by the Boards of studies in English under Ordinance OC-66.</li> <li>3. Course on Environmental Studies should be the one recommended by the BoS in Environmental Studies and approved by the Academic Council.</li> </ol> <p>The Chairperson BoS was requested to contact the Deputy Registrar (Academic) for the syllabus.</p> <p>The Vice-Chancellor extended best wishes of the Academic Council to the college for starting of the B.A (Honours) Programme in Sanskrit under Goa University.</p> <p style="text-align: center;"><b>(Action: AR-PG)</b></p>
<b>D 4</b>	<p><b>REPORTS OF AFFILIATION INQUIRY COMMITTEE</b></p>
<b>D 4.1</b> <b>D 4.1.1</b>	<p><b>Don Bosco College Panjim Goa</b> <b>Master of Social Work</b></p> <p>The Academic Council approved the recommendations of the Affiliation Inquiry Committee for continuation of affiliation for the M.S.W. Programme for the academic year 2017-2018.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.1.2</b>	<p><b>Bachelor of Social Work</b></p> <p>The Academic Council approved the recommendations of the Affiliation Inquiry Committee for continuation of affiliation for the B.S.W. Programme for the academic year 2017-2018.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>

<b>D 4.1.3</b>	<p><b>Bachelor of Business Administration (Travel &amp; Tourism)</b> The Academic Council approved the recommendations of the Affiliation Inquiry Committee for continuation of affiliation for B.B.A.-Travel and Tourism Programme for the academic year 2017-2018 with an intake of 30 seats.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.1.4</b>	<p><b>Bachelor of Physical Education</b> The Academic Council approved the recommendations of the Affiliation Inquiry Committee for continuation of affiliation for B.P.Ed. Programme (two year duration) for the academic year 2017-2018.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.2</b> <b>D 4.2.1</b>	<p><b>Government College of Arts, Science and Commerce, Khandola</b> <b>M.Sc. – Inorganic Chemistry</b> The Academic Council approved the recommendations of the Affiliation Inquiry Committee for affiliation for M.Sc. Inorganic Chemistry for the academic year 2017 – 2018 with an intake of 20 students subject to fulfilment of essential conditions. The College should submit a compliance report after which the Affiliation Inquiry Committee will revisit the College.</p> <p>It was also informed to delete the word “preferably” at Sr.No.1 of the Essential conditions.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.2.2</b>	<p><b>M. Com.</b> The Academic Council approved the recommendations of the Affiliation Inquiry Committee for affiliation for M.Com. for the academic year 2017–2018 with an intake of 40 students subject to fulfillment of essential conditions.</p> <p>The word “Regular” at Sr. No. 2 of the Essential conditions to be deleted.</p> <p>The Academic Council noted the procedure adopted in Government Colleges for teaching at PG level where Senior Faculty from the UG programmes are permitted to teach at the PG programmes and appoint Contract faculty to teach at the UG level. As such an arrangement is not available at the government aided colleges, as the PG Programmes are normally run on self-financed basis, it was resolved to approach the DHE to consider extending this arrangement to the aided affiliated colleges so that the expertise and experience of senior faculty is utilized for teaching at the Post Graduate level.</p> <p>The Academic Council also decided that the Affiliation Inquiry Committee should revisit the College to check the facilities for the programme.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.3</b> <b>D 4.3.1</b>	<p><b>M.E.S. College of Arts and Commerce, Zuarinagar</b> <b>M.Com.</b> The Academic Council approved the recommendations of the Affiliation Inquiry Committee for continuation of affiliation for M.Com. for the academic year 2017 – 2018.</p>

	<b>(Action: AR-General)</b>
<b>D 4.3.2</b>	<p><b>M. A. - English</b> The Academic Council approved the recommendations of the Affiliation Inquiry Committee for affiliation for M.A. – English for the academic year 2017 – 2018 with an intake of 30 students subject to compliance of the Essential conditions.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.3.3</b>	<p><b>B. A. –Tourism and Travel</b> The Academic Council approved the recommendations of the Affiliation Inquiry Committee for temporary affiliation for B.A. - Tourism and Travel (3 units) for the academic year 2017 – 2018 with an intake of 40 students.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.3.4</b>	<p><b>B.Com. 5<sup>th</sup> division (Sem. V and VI)</b> The Academic Council approved the recommendations of the Affiliation Inquiry Committee for continuation of affiliation for B.Com. 5<sup>th</sup> division (Sem. V and VI) for the academic year 2017 – 2018 with an intake of 60 students.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.3.5</b>	<p><b>B.B.A. ( Shipping and Logistics)</b> The Academic Council approved the recommendations of the Affiliation Inquiry Committee for temporary affiliation for B.B.A. (Shipping and Logistics) for the academic year 2017 – 2018 with an intake of 30 students.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.3.6</b>	<p><b>B.A. - English(6 Units)</b> The Academic Council approved the recommendations of the Affiliation Inquiry Committee for continuation of affiliation for B.A. – English (6 Units) for one academic year 2017 – 2018.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 5</b>	<b>ORDINANCES/STATUTES</b>
<b>D 5.1</b>	<p><b>Proposed part amendment to Statute SC-1 relating to affiliation and recognition of Colleges/Institutions and related matters.</b> The Academic Council approved the Proposed part amendment to Statute SC-1 relating to affiliation and recognition of Colleges/Institutions and related matters with the following:</p> <ol style="list-style-type: none"> <li>1. Under SC-1(iv) 6 Dean, College Development Council to be replaced by Director, College Development Council. An equivalent academician of the University to be deleted.</li> <li>2. Under the Clause SC-1 (vi) (3), 80% of regular teaching staff and all sanctioned non-teaching staff to be added.</li> </ol> <p>With regard to the discussion on SC-1 (x) relating to Recognition of Institutions/ Post Graduate Departments of affiliated colleges for Ph.D Programme, Dr. Anthony Rodrigues was of the opinion that the status of Research Centre, once granted, should not be</p>

	<p>withdrawn and requested that his dissent be recorded. <b>(Action: AR-General)</b></p>
<b>D 5.2</b>	<p><b>Proposed part amendment to OC-33 A, 34 A and 35 A</b> The Academic Council approved the Proposed part amendment to OC-33 A, 34 A and 35 A. It was decided to indicate the Bar Council Notification in the justification column. <b>(Action: AR-PG)</b></p>
<b>D 5.3</b>	<p><b>Part Amendment to Ordinance OC-45</b> The Academic Council approved the Part Amendment to Ordinance OC-45. It was decided to mention "To bring uniformity with Ordinance OC-66" in the justification column. It was decided to place the Part Amendment to Ordinance OC-45 before the Executive Council for approval. <b>(Action: AR-PG)</b></p>
<b>D 5.4</b>	<p><b>Proposed amendments to Ordinance OC-66</b> The Chairperson of the Committee, Prof. M. K. Janarthanam briefed the members the salient points of the proposed amendments. After discussion, the Academic Council approved the Proposed amendments to Ordinance OC-66. It was resolved to permit Colleges to retain the division strength from 60 to 80 students for the B.Sc Programme for the academic year 2017-18 only.  It was further decided to place the Proposed amendments to Ordinance OC-66 before the Drafting and Vetting Committee and thereafter before to the forthcoming meeting of the Executive Council for approval.  The name of Chairperson indicated in the agenda to be read as Prof. N. S. Bhat and Prof. M. K. Janarthanam. <b>(Action: AR-PG)</b></p>
<b>D 5.5</b>	<p><b>Part Amendment to statute SSA-7 and Part Amendment to Statute SA-24</b> The Academic Council approved the Part Amendment to Statute SSA-7 and Part Amendment to Statute SA-24. It was informed to place the part amendment to Statute SSA-7 and Part Amendment to Statute SA-24 before the Drafting and Vetting Committee and thereafter before the Executive Council for approval. <b>(Action: AR-PG)</b></p>
<b>D 7</b>	<b>OTHER ITEMS</b>
<b>D 7.1</b>	<p><b>Implementation of Hindi medium in the Management Studies at the Universities</b> The Academic Council discussed the matter and informed the Dean, Faculty of Management Studies and HOD, Management Studies to explore the possibility of starting a Certificate Course in Management Studies in Hindi medium, with the help of Department of Hindi, in the Department of Management Studies. <b>(Action: AR-PG)</b></p>
<b>D 7.2</b>	<p><b>To consider the request received from Heads of the Departments of Social Sciences to revise OA-18 to reduce total Credits from 80 to 64.</b> The Dean, Faculty of Social Sciences pointed out that the request was neither included for</p>

	<p>discussion in the Faculty Board nor forwarded through the Dean of the Faculty. It was therefore decided to treat the item as withdrawn.</p> <p style="text-align: center;"><b>(Action: AR-PG)</b></p>
<b>D 7.3</b>	<p><b>Grant of permanent affiliation to V. M. Salgaocar College of Law, Miramar</b> The Academic Council decided not to grant permanent affiliation to the Programme as the fifth batch of B.A. LLB. Programme was yet to pass out in May/June, 2017. The College may apply for Permanent affiliation thereafter. Regarding LLM Programme, the Academic Council decided that since it is a self financing programme permanent affiliation cannot be granted.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 7.4</b>	<p><b>Request of Vidya Prabodhini College of Commerce, Education, Computer and Management, Porvorim for grant of permanent affiliation to B. Com. programme.</b> The Academic Council decided not to grant permanent affiliation to the Programme as the fifth batch of B.Com. Programme was yet to pass out in May/June, 2017. Moreover, the College does not have NAAC accreditation. The College may re apply after fulfilling the eligibility conditions for Permanent affiliation specified in Statute SC – 1.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 7.5</b>	<p><b>To consider Guidelines framed for admission of foreign students at the Goa University</b> The Academic Council deliberated and decided to constitute a Committee to check the suitability of the students. It was also decided to amend the Ordinance OA-19 to permit in absentia admission of foreign applicants.</p> <p style="text-align: center;"><b>(Action: AR-PG)</b></p>
<b>D 7.6</b>	<p><b>Request for Additional Seats for First Year admission during 2017-18</b> The Academic Council discussed the matter and the following was decided:</p> <ol style="list-style-type: none"> <li>1. College Principals are permitted to admit 10% additional students over and above the sanctioned intake for B.A./B.Sc./B.Com. programmes.</li> <li>2. No additional students shall be admitted beyond 10% of the sanctioned intake. Consequently, no Wait Lists are to be maintained beyond the permitted intake.</li> <li>3. Colleges applying for additional divisions shall not be permitted to admit additional 10% intake.</li> <li>4. The intake for B.A. and B.Com. shall continue to be 60 per division. The intake for B.Sc. shall be from 60 to 80 for the Academic Year 2017-18.</li> <li>5. Colleges may request for additional divisions subject to the following conditions;             <ol style="list-style-type: none"> <li>a. NOC from the Directorate of Higher Education</li> <li>b. Application in prescribed format (7 sets) along with the affiliation fees.</li> </ol> </li> </ol> <p style="text-align: center;"><b>(Action: AR-PG/AR-General)</b></p>
<b>D 7.7</b>	<p><b>List of Journals for Career Advancement Scheme</b></p>

	<p>The Academic Council deliberated and decided to set up Subject Committees with the Departmental Council and two college teachers to consider the suitability of Journals in their respective subjects. It was also decided to constitute a University Level Committee with a Dean of Faculty as Chairperson and also include two teachers from the Colleges holding Ph.D. Degree, Director, IQAC as one of the members and Librarian as Member Secretary to review the list of journals recommended by the Departmental Committees.</p> <p style="text-align: center;"><b>(Action: AR-PG)</b></p>
<b>D 7.8</b>	<p><b>Consideration of the proposal of Head, Department of Microbiology regarding the requirement of additional faculty and the continuation of the MSc. Marine Microbiology Degree and MSc. Biochemistry Program Degree.</b></p> <p>The Academic Council discussed the matter and after discussion it was resolved to offer the Programmes of M.Sc. Marine Microbiology and M.Sc. in Biochemistry on self-financed basis for students being admitted to Part I from the academic year 2017-18 onwards. The fees per student for the program shall be 80,000/- per year with an intake of 20 students per programme.</p> <p style="text-align: center;"><b>(Action: AR-Teaching)</b></p>
<b>D 7.9</b>	<p><b>Development of ERP solution University Management System</b></p> <p>The Academic Council approved the proposal for implementation of the UMS and conduct the orientation cum hands on training for the concerned administrative/ academic staff from the affiliated colleges. A Circular to be issued to all the Colleges to depute representatives for the training.</p> <p style="text-align: center;"><b>(Action: AR-Colleges/General)</b></p>
<b>D 7.10</b>	<p><b>To consider the recommendations of the Committee for Common Course Codes for UG Programmes under CBCS.</b></p> <p>The Academic Council discussed and approved the recommendations of the Committee for Common Course Codes for UG Programmes under CBCS. It was suggested to reduce the Letter indicating the type of Course to one letter instead of two. i.e. "C" instead of "CC" for Core Courses, "G" instead of "GE" for General Elective Courses, etc to reduce the size of the Code.</p> <p style="text-align: center;"><b>(Action: AR-PG)</b></p>
<b>D 7.11</b>	<p><b>Academic Terms for B.Arch program for the Academic year 2017-18</b></p> <p>The Academic Council approved the Academic Terms for B.Arch program for the Academic year 2017-18</p> <p style="text-align: center;"><b>(Action: AR-Colleges)</b></p>
<b>D 7.12</b>	<p><b>Payment of TA/DA to the Experts on the DRC</b></p> <p>The Academic Council approved the proposal for payment of TA/DA to the Experts on the DRC.</p> <p style="text-align: center;"><b>(Action: AR-PG)</b></p>
<b>D 7.13</b>	<p><b>Rescheduling of B.D.S. program second semester/term examination</b></p> <p>The Academic Council approved the Rescheduling of B.D.S. program second semester/term examination.</p> <p style="text-align: center;"><b>(Action: COE)</b></p>
<b>D 7.14</b>	<p><b>Exemption for Minimum attendance for eligibility to appear for Examinations conducted by Goa University.</b></p> <p>The request of Ms. Vinita D. Bicholkar received through the Principal, MES College of Arts and Science requesting exemption for regular attendance and to study on her own at the</p>

	<p>examinations was discussed.</p> <p>The opinion of the House was that although the case was required to be looked at sympathetically, the present Ordinance and the programme structure does not provide for pursuing one's studies without attending classes.</p> <p>The decision in this regard may be processed by the Administration and communicate the decision to the College.</p> <p style="text-align: center;"><b>(Action: AR-Colleges)</b></p>
<b>D 8</b>	<b>REPORTING ITEMS</b>
<b>D 8.1</b>	<p><b>Case of Shri Reetesh Pednekar and Students of IX semester, Goa College of Architecture, Panaji.</b></p> <p>The Academic Council ratified the action taken by the Vice-Chancellor on the case of Shri Reetesh Pednekar and Students of IX semester, Goa College of Architecture, Panaji.</p> <p style="text-align: center;"><b>(Action: COE)</b></p>
<b>D 9</b>	<b>RESOLUTIONS</b>
<b>D 9.1</b>	<p><b>Resolution submitted by Dr. Anthony Rodrigues</b> <b>Improvement in Examination, for all Undergraduate Courses at Goa University.</b></p> <p>The Academic Council accepted the resolution of Dr. Anthony Rodrigues to allow undergraduate students to improve in one or two papers instead of all the papers of the Semester. It was decided to suitable amend both OC – 45 as well as OC – 66 to incorporate the above provision.</p> <p style="text-align: center;"><b>(Action: AR-PG)</b></p>
<b>D 9.2</b>	<p><b>Resolution submitted by Dr. Anthony Rodrigues</b> <b>Status Report on Choice Based Credit System (CBCS) to be implemented from academic year 2017-18 for all undergraduate courses at Goa University.</b></p> <p>The resolution was not taken up as the matter was already discussed during the consideration of the amendments to Ordinance OC – 66 earlier during the meeting.</p> <p style="text-align: center;"><b>(Action: AR-PG)</b></p>
<b>D 9.3</b>	<p><b>Constitution of Cluster of Colleges for grant of Research Centre</b></p> <p>The Academic Council accepted the resolution from the Principals Forum to constitute a Cluster of Colleges for grant of Research Centre and for recognition of research guides. It was decided to constitute a Committee to work out the modalities, including amendment to the Statute for implementing the above decision.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>

The meeting ended with thanks to the Chair.

Date: 30/5/2017

Sd/-  
(Prof. Varun Sahni)  
Vice-Chancellor

Sd/-  
(Prof. Y. V. Reddy)  
Registrar and Member Secretary

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**D 1.2 To confirm the minutes of the 4<sup>th</sup> meeting of the Standing Committee of the IXth Academic Council held on 21<sup>st</sup> June, 2017.**

**Annexure I**

**Minutes of the Fourth Meeting of the Standing Committee of the IX Academic Council**

Date: 21<sup>st</sup> June, 2017

Time: 10.30 a.m.

Venue: Council Hall, Goa University, Taleigao Plateau, Goa.

The following members were present for the meeting:

- |  |                     |
|--|---------------------|
| 1. Prof. Varun Sahni<br>Vice-Chancellor, Goa University                    | - Chairperson       |
| 2. Prof. M. K. Janarthanam<br>Dean, Faculty of Life Sciences & Environment | - Member            |
| 3. Prof. N. S. Bhat<br>Dean, Faculty of Social Sciences                    | - Member            |
| 4. Prof. V. S. Nadkarni  | -Member             |
| 5. Dr. Radhika Nayak   | - Member            |
| 6. Dr. Anuradha Wagle<br>Controller of Examinations                        | - Permanent Invitee |
| 7. Prof. Y. V. Reddy<br>Registrar  | -Member Secretary   |

Prof. Pradeep Naik, Dean, Faculty of Medicine, Member, Dr. Naguesh Colvalcar, Member, Prof. Pranab Mukhopadhyay (Director, IQAC), Permanent Special Invitee, sought leave of absence.

The Chairperson welcomed the members to the Fourth meeting of the Standing Committee of the IX Academic Council. He informed the House that consequent to the assent of Hon'ble Governor (Chancellor), Shri M. Shreedhara, Deputy Registrar-Administration and Shri Donald Rodrigues, Deputy Registrar-Academic have been re-designated as Joint Registrars having completed five years of service.

He also welcomed Dr. Anuradha Wagle, Associate Professor, Department of French as the Controller of Examinations.

Thereafter, the agenda was taken up for discussion.



<b>D</b>	<b>DISCUSSION ITEMS</b>
<b>D 3</b>	<b>BOARD OF STUDIES</b>
<b>D 3.1</b>	<p><b>Minutes of the meeting of Board of Studies in Education held on 16/05/2017</b>  The Standing Committee of the Academic Council approved the syllabus of Semester V. The Chairperson, Board of Studies was requested to rework on the syllabus of Semesters VI-VII incorporating the observations made by the members. The number of contact hours and lectures need to be indicated; references to be updated and indicated at the end of each semester. It was also opined that it was the responsibility of the Board of Studies to ensure that the material is uniformly presented for all the methodologies. The House placed on record its displeasure to the Board of Studies for taking up the exercise of recommending the syllabus at this late stage.</p> <p style="text-align: center;"><b>(Action: AR-PG)</b></p>
<b>D 3.2</b>	<p><b>Minutes of the meeting of Board of Studies in Management Studies held through circulation.</b>  The Standing Committee of the Academic Council approved the minutes of the meeting of Board of Studies in Management Studies.</p> <p style="text-align: center;"><b>(Action: AR-PG)</b></p>
<b>D 3.3</b>	<p><b>Minutes of the meeting of Board of Studies in Mathematics held on 12<sup>th</sup> May, 2017.</b>  The Standing Committee of the Academic Council approved the minutes of the meeting of Board of Studies in Mathematics held on 12<sup>th</sup> May, 2017. The Chairperson was informed to indicate the number of contact hours in the syllabus and also the number of credits and resubmit the same to the Academic PG Section.</p> <p style="text-align: center;"><b>(Action: AR-PG)</b></p>
<b>D 4</b>	<b>REPORTS OF AFFILAITION INQUIRY COMMITTEE</b>
<b>D 4.1</b>	<b>Government College of Arts, Science and Commerce, Quepem</b>
<b>D 4.1.1</b>	<p><b>Programme: M.A. Economics</b>  The Standing Committee of the Academic Council approved the recommendations of the Affiliation Inquiry Committee for affiliation to M.A. Economics for the academic year 2017-18 with an intake of 10 students subject to fulfilment of essential conditions and suggestions. The College to be requested to send the compliance report on the recruitment of three Assistant Professors on regular basis and one Assistant Professor on contract basis before the commencement of the programme.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.1.2</b>	<p><b>Programme: B.A. Sociology (6 Units) at T.Y. B.A.</b>  The Standing Committee of the Academic Council approved the recommendations of the Affiliation Inquiry Committee for extension of affiliation for T.Y. B.A. Sociology (6 units) for the academic year 2017-18 subject to fulfillment of essential conditions and suggestions.</p> <p>The word 'constitutions' under point 1 of the suggestions to be corrected to 'Contributions'</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>

<b>D 4.1.3</b>	<p><b>Programme: B.A. Hindi (6 Units) at T.Y. B.A.</b></p> <p>The Standing Committee of the Academic Council approved the recommendations of the Affiliation Inquiry Committee for extension of affiliation for T.Y. B.A. Hindi (6 Units) for the academic year 2017-18 subject to fulfillment of essential conditions and suggestions.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.1.4</b>	<p><b>Programme: Core Course in English at F.Y. B.A.</b></p> <p>The Standing Committee of the Academic Council approved the recommendations of the Affiliation Inquiry Committee for extension of affiliation for B.A. English core papers at F.Y. B.A. for the academic year 2017-18 subject to fulfillment of essential conditions and suggestions.</p> <p>It was informed to delete 'above 5.1 system' under point 2 of the essential conditions.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.2</b> <b>D 4.2.1</b>	<p><b>Dr. Dada Vaidya College of Education, Farmagudi</b></p> <p><b>M.Ed. (2 year duration)</b></p> <p>The Standing Committee of the Academic Council approved the recommendations of the Affiliation Inquiry Committee for affiliation to M.Ed. (Two year duration) programme with an intake of 50 students for the academic year 2017 -18 subject to fulfilment of all the conditions of the AIC and the NCTE and submission of compliance report to the University.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.2.2</b>	<p><b>Diploma in Pre-Primary Teachers Training (One year) under Community College</b></p> <p>The Standing Committee of the Academic Council approved the recommendations of the Affiliation Inquiry Committee for affiliation to the One Year Diploma in Pre-Primary Teachers Training Programme for the academic year 2017-18 under Community College with an intake of 40 students.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.2.3</b>	<p><b>B.Ed. (2 year duration)</b></p> <p>The Standing Committee of the Academic Council approved the recommendations of the Affiliation Inquiry Committee for continuation of affiliation to B.Ed.(Two year duration) programme for the academic year 2017 -18 subject to fulfillment of essential condition.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.3</b> <b>D 4.3.1</b> <b>D 4.3.2</b> <b>D 4.3.3</b>	<p><b>Shree Rayeshwar Institute of Engineering &amp; I.T., Shiroda.</b></p> <p><b>Programme : B.E. Computers</b></p> <p><b>Programme :B.E. Information Technology</b></p> <p><b>Programme : B.E. ETC.</b></p> <p>The Standing Committee of the Academic Council approved the recommendations of the Affiliation Inquiry Committee to withhold the continuation of affiliation to the FY BE (ETC, IT and Computer) Degree Programme for the academic year 2017-18.</p> <p>It was informed to delete point no. 2 of the essential conditions and the other essential conditions to be shown as Observations.</p>

	<p>It was further decided that the Vice-Chancellor and Registrar would meet the Secretary, (Education) along with the Director of Technical Education (DTE) to discuss the issue.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.4</b>	<p><b>Ramanata Crisna Pai Raikar School of Agriculture, Savoi Verem, Ponda- Goa.</b> <b>Affiliation for Advance Diploma in Agriculture</b></p> <p>The Standing Committee of the Academic Council approved the recommendations of the Affiliation Inquiry Committee for extension of affiliation for the second year of Advance Diploma in Agriculture for the academic year 2017-18 subject to fulfilment of essential conditions and suggestions and submission of the compliance report to the University.</p> <p>The Vice-Chancellor informed that a Mentoring Committee with the following members has been constituted to assist the college:</p> <ol style="list-style-type: none"> <li>1. Prof. Bernard F. Rodrigues - Convenor</li> <li>2. Prof. P. K. Sharma, Department of Botany</li> <li>3. Dr. Sachin Tendulkar, Mineral Foundation</li> <li>4. Dr. R. Gaonkar, Retd. Principal, Chowgule College.</li> </ol> <p>The College was requested to interact with the Mentoring Committee at least once in two months. It was also suggested that the Ordinance for Community Colleges may need to be reviewed as the Programmes being run under them are different than the regular Programmes offered by the University.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.5</b>	<p><b>Swami Brahmanand Mahavidyalayam, Shree Kshetra Tapobhoomi Gurupith, Kundaim B.A. Sanskrit</b></p> <p>The Standing Committee of the Academic Council approved the recommendations of the Affiliation Inquiry Committee for affiliation to B.A. Sanskrit for the academic year 2017-18 with an intake of 30 students subject to fulfilment of essential conditions and suggestions.</p> <p>The title of the Programme to be shown as B.A. Sanskrit (Honours).</p> <p>It was decided to shift point 2 of the suggestions under essential conditions and communicate the same to the College. A member suggested that the College could appoint a retired Professor/Principal as a mentor to help the College in administrative matters.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 4.6</b>	<p><b>Mandre College of Commerce, Economics and Management, Mandre</b> <b>Programme: B.Com.- 2016-17 (post facto) and 2017-18</b></p> <p>The Standing Committee of the Academic Council approved the recommendations of the Affiliation Inquiry Committee for continuation of affiliation (post facto) for the academic year 2016-17 and continuation of affiliation for the academic year 2017-18 with an intake of 60 students subject to fulfilment of essential conditions.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>

<p><b>D 4.7</b> <b>D 4.7.1</b></p>	<p><b>Rajaram &amp; Tarabai Bandekar College of Pharmacy, Farmagudi.</b> <b>B.Pharm.</b> The Standing Committee of the Academic Council approved the recommendations of the Affiliation Inquiry Committee for continuation of affiliation for three academic years 2017 - 18; 2018 -19 and 2019 -20.  <b>(Action: AR-General)</b></p>
<p><b>D 4.7.2</b></p>	<p><b>M.Pharm. Pharmaceutics</b> The Standing Committee of the Academic Council approved the recommendations of the Affiliation Inquiry Committee for continuation of affiliation for three academic years 2017-18; 2018 -19 and 2019 -20.  <b>(Action: AR-General)</b></p>
<p><b>D 4.7.3</b></p>	<p><b>M Pharm. Pharmaceutical Chemistry</b> The Standing Committee of the Academic Council approved the recommendations of the Affiliation Inquiry Committee for continuation of affiliation for three academic years 2017-18; 2018 -19 and 2019 -20.  <b>(Action: AR-General)</b></p>
<p><b>D 4.8</b></p>	<p><b>Shri Kamaxidevi Homeopathic Medical College &amp; Hospital, Shiroda</b> The Standing Committee of the Academic Council decided to withhold the admissions for F.Y. B.H.M.S. for the academic year 2017-18 in view of the non-fulfillment of essential conditions indicated in the Affiliation Inquiry Report. It was also decided that this matter be discussed by the Vice-Chancellor with the Secretary, (Education) along with the Director of Technical Education (DTE).  <b>(Action: AR-General)</b></p>
<p><b>D 7</b></p>	<p><b>OTHER ITEMS</b></p>
<p><b>D 7.1</b></p>	<p><b>Practical for 4<sup>th</sup> year Bachelor of Occupational Therapy Engineering subjects</b> The Standing Committee of the Academic Council approved the Practical Scheme of Examination for Bio Engineering at the 4<sup>th</sup> year Bachelor of Occupational Therapy.  <b>(Action: AR-PG)</b></p>
<p><b>D 7.2</b></p>	<p><b>Regularization of the Ph.D. Registration of Shri. Narayan Tulshidas Vetrekar</b> After discussion, in view of the submission made by the Guide accepting procedural lapse on the part of the Guide it was decided to condone the lapse and regularize Ph.D. registration. Further, approved for Mr. Vetrekar visit to Norway from July to December, 2017.  <b>(Action: AR-PG)</b></p>
<p><b>D 7.3</b></p>	<p><b>Issue of NOC to Don Bosco College, Panaji, for i) B.B.A., ii) B.A.M.M. and iii) B.S.W.</b> After discussion, it was decided to form a Committee with the following members to inquire into the matter and submit its Report to the Academic Council:  <ol style="list-style-type: none"> <li>1. Dr. Radhika Nayak – Chairperson</li> <li>2. Dr. Dilip Arolkar – Member</li> <li>3. Prof. V. S. Nadkarni – Member</li> <li>4. Assistant Registrar-Academic (General) – Member Secretary</li> </ol> </p>

	<b>(Action: AR-General)</b>
<b>D 7.4</b>	<p><b>Request for re-admission for T.Y. B.Com. to Shri Rajat Ravindra Shinde</b> After discussion the Standing Committee of the Academic Council was of the opinion that given the extraordinary circumstances of Shri Rajat Ravindra Shinde being in judicial custody and his subsequent acquittal he should be given an opportunity to continue and complete his B.Com. Degree Programme.</p> <p style="text-align: center;"><b>(Action: AR-Colleges)</b></p>
<b>D 8</b>	<b>REPORTING ITEMS</b>
<b>D 8.1</b>	<p><b>Appointment of Chairperson, Discipline Committee (Unfair Means Inquiry Committee)</b> The Standing Committee of the Academic Council ratified the action taken by the Vice-Chancellor of nominating Prof. Gaurish M. Naik, Dean, Faculty of Natural Sciences as the Chairperson, Discipline Committee (Unfair Means Inquiry Committee).</p> <p style="text-align: center;"><b>(Action: COE)</b></p>
<b>D 8.2</b>	<b>REPORTS OF AFFILIATION INQUIRY COMMITTEE</b>
<b>D 8.2.1</b>	<p><b>St Joseph Vaz College, Cortalim</b> <b>Affiliation to B.Sc. programme</b> The Standing Committee of the Academic Council ratified the action taken by the Vice-Chancellor on behalf of the Academic Council to the recommendations of the Affiliation Inquiry Committee for affiliation to start F.Y. B.Sc. from the academic year 2017-18 with an intake of 60 students subject to the fulfilment of essential conditions and suggestions. The College is required to submit a compliance report to the University after which the AIC will revisit the College to check the actual compliance.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 8.2.2</b>	<p><b>Swami Brahmanand Mahavidyalayam, Shree Kshetra Tapobhoomi Gurupith, Kundaim</b> <b>Continuation of affiliation to B.A. Sanskrit programme</b> The Standing Committee of the Academic Council ratified the action taken by the Vice-Chancellor on behalf of the Academic Council to the recommendations of the Affiliation Inquiry Committee for affiliation to start B.A. Sanskrit from the academic year 2017-18. The College is required to submit a compliance report to the University after which the AIC will revisit the Institute to check the actual compliance.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 8.2.3</b>	<p><b>DM'S College &amp; Research Centre, Assagao</b> <b>M.Sc. Chemistry (Organic)</b> The Standing Committee of the Academic Council ratified the action taken by the Vice-Chancellor on behalf of the Academic Council to the recommendations of the Affiliation Inquiry Committee for affiliation to the M.Sc. Chemistry (Organic) programme for the academic year 2017-2018 with an intake of 30 students subject to fulfillment of essential conditions. The College to send compliance report to the University.</p> <p style="text-align: center;"><b>(Action: AR-General)</b></p>
<b>D 8.2.4</b>	<p><b>Carmel College for Arts, Science and Commerce for Women, Nuvem.</b> <b>M.Sc. Food Technology</b> The Standing Committee of the Academic Council ratified the action taken by the Vice-Chancellor on behalf of the Academic Council to the recommendations of the Affiliation Inquiry Committee for affiliation to M.Sc. Food Technology for academic year 2017-18</p>

	with an intake of 20 students subject to fulfilment of essential conditions. The College is required to send compliance report after which the AIC will revisit the College. <b>(Action: AR-General)</b>
<b>D 8.3</b>	<b>Implementation of the Scheme approved by the Standing Committee of the Academic Council for the B.S.W. Programme.</b> The Standing Committee of the Academic Council ratified the action taken by the Vice Chancellor on behalf of the Academic Council. <b>(Action: COE)</b>

The meeting ended with thanks to the Chair.

Date: 6/7/2017

Sd/-  
(Prof. Y. V. Reddy)  
Registrar and Member Secretary

Sd/-  
(Prof. Varun Sahni)  
Vice-Chancellor

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**D 3.1 Minutes of the meeting of Board of Studies in Wellness Counselling held on 23/05/2017****Annexure I****Reorganised Courses**

(The papers are rearranged trimester wise and hence new numbers are allotted.)

<b>Core Courses</b>	
C.01	Basic Counselling Techniques
C.02	Child Development
C.03	Cognition
C.04	Statistics for Social Sciences
C.05	Overview of Counselling Theories
C.06	Introduction to Strength Based Counselling
C.07	Adolescent Development
C.08	Counselling Techniques-1
C.09	Research Methodology
C.10	Assessing Personality Using Projectives
C.11	Career Counselling
C.12	Counselling Techniques-2
C.13	Legal/ Ethical Issues
C.14	Methods of Psychological Assessment
C.15	Person in Indian Tradition-1
C.16	Person in Indian Tradition-2
C.17	Health Psychology and Managing Stress
C.18	Mindfulness and Achievement
C.19	Counselling Techniques-3
C.20	Counsellor Competencies
<b>Elective Courses</b>	
E.21	Group Counselling
E.22	Marriage Counselling
E.23	Counselling in Addictive Behaviour
E.24	Adolescent and Youth Suicide
E.25	Counselling in Schools
E.26	Work, Careers, Self-Efficacy
E.27	Personality in Positive Psychology
E.28	Human Strengths, Personal and Organisational Change and Innovation
E.29	Motivation and Creativity
E.30	Developing Emotional Intelligence for Academic Success
E.31	Grief Counselling
E.32	Rorschach Method of Personality Assessment ( <a href="#">Back to Index</a> ) ( <a href="#">Back to Agenda</a> )

E.33/ E.34	Course of Guided Study.

### New Courses

<b>Core Courses</b>	
<b>C.05</b>	<p><b>Overview of Counselling Theories</b></p> <p>This course includes the various theories which were included in the courses titled Counselling Theories and Techniques-1/2/3 in the earlier approved syllabus.</p> <p>This course aims in providing an introduction to various theories in counselling.</p>
<b>Elective Courses</b>	
<b>E.31</b>	<p><b>Grief Counselling</b></p> <p>This course is a new course and aims in helping students understand the grieving process and help clients from a wellness perspective.</p>

### Reorganization of Courses

<b>Courses</b>	
<b>C.14</b>	<p><b>Methods of Psychological Assessment</b></p> <p>The following two courses are combined together as one course and are titled as 'Methods of Psychological Assessment'.</p> <p><b>(C.12) Introduction to Psychological Assessment</b> <b>(C.13) Cognitive Assessment</b></p>
<b>C.17</b>	<p><b>Health Psychology and Managing Stress</b></p> <p>The following two courses are combined together as one course and are titled as 'Health Psychology and Managing Stress'.</p> <p><b>(E.24) Health Psychology</b> <b>(E.27) Managing Occupational Stress</b></p>

### Change in Course Title

<b>Approved Syllabus</b>		<b>Proposed Changes</b>	
<b>Course Code</b>	<b>Course Title</b>	<b>Course Code</b>	<b>Course Title</b>
C.06	Basic Statistics in Social Sciences	C.04	Statistics for Social Sciences
C.07	Research Methods in Social Sciences	C.09	Research Methodology
C.09	Counselling Theories and Techniques-1	C.08	Counselling Techniques-1



C.10	Counselling Theories and Techniques-2	C.12	Counselling Techniques-2
C.11	Counselling Theories and Techniques-3	C.19	Counselling Techniques-3
C.14	Assessment of Personality-1	C.10	Assessing Personality Using Projectives
C.15	Assessment of Personality-2	E.32	Rorschach Method of Personality Assessment
E.24 E.27	Health Psychology Managing Occupational Stress	C.17	Health Psychology and Managing Stress
E.28	Work and Careers	E.26	Work, Careers and Self-Efficacy
E.29	Personality in the Psychology of Human Strengths	E.27	Personality in Positive Psychology
E.30	Human Strengths, Organisational Change and Innovation	E.28	Human Strengths, Personal and Organisational Change and Innovation
E.33	Mindfulness and Achievement	C.18	Mindfulness and Achievement

## M.A. WELLNESS COUNSELLING

### COMPULSORY COURSES

**C. 01. BASIC COUNSELLING TECHNIQUES** [Class sessions 30, each of 90 min.; 3 credits; 100 marks (40/60)] Introduction to Counselling Psychology – what is psychology, fields of psychology, counselling psychology. Basic counselling principles - key concepts, problems in living, goals, collaborative relationships, values, preparation, making a space, tasks, methods, responding to crisis. Where counselling takes place – significance of context; philosophical principles and underlying assumptions. Basic interviewing skills – lead in responses, reflection of feelings, open-ended questions, close-ended questions, clarification, summarization, confronting. Building counselling relationships, facilitating client self-exploration; the therapeutic relationship; therapeutic factors, processes, stages; therapeutic alliance; micro-skills. Skills of empathy; what empathy is not; ways to generate empathic responses; the five level scale; empathy fatigue in counselling; empathy in CBT and supervision; advanced empathy. Self-disclosure, confrontation, immediacy; validation; Transference, counter transference, verbal and non-verbal cues. **Prescribed Readings:** (1) From Counsellor-in-Training to Professional School Counsellor: Understanding Professional Identity Development. By Gibson, Donna M.; Dooley, Brenda A.; Kelchner, Viki P.; Moss, Julie M.; Bryan, Vacchio C. *Journal of Professional Counselling: Practice, Theory & Research*. Winter/Spring 2012, Vol. 39 Issue 1, p 17-25, 9p. (2) Counseling Techniques: The Best Techniques for Being the Most Effective Counsellor. By [Florence Ng](#), Apr. 30, 2014.

**C. 02. CHILD DEVELOPMENT** [Class sessions: 30, each of 90 min.; 3 credits; 100 marks (40/60)] **Erikson's** theory of psychosocial development – developmental crisis and tasks, and the various virtues developed at each stage; implication of these for the development of the individual and

in the counselling setting. **Piaget's** theory of cognitive development; Piaget's cognitive tasks, and stages of cognitive development. **Vygotsky's** theory of Socio-cultural development and the significance of his various concepts for school counselling. **Bandura's** Social Learning theory; learning through modelling; concepts of reinforcement and punishment and vicarious learning; reciprocal causation model. **Loevinger's** Ego Development theory -- the various stages and introspection about counsellor's as well as counselee's ego development in the counselling setting. **Kohlberg's** theory of moral development. **Maturing brain.** Comparison of various theories to formulate a conceptual framework. **Prescribed Readings:** (1) The Self's Development and Ego Growth: Conceptual Analysis and Implications for Counselors. By Hamachek, Don E., *Journal of Counseling & Development*, Oct. 85, Vol. 64 Issue 2, p 136, 7p. (2) Promoting Hope: Suggestions for School Counselors By Pedrotti, Jennifer Teramoto; Edwards, Lisa M.; Lopez, Shane. *Journal of Professional School Counseling*, Dec 2008, Vol 12, Issue 2, p 100-107, 8p.

**C - 03. COGNITION** [Class sessions: 30, each of 90 min.; 3 credits; 100 marks(40/60)] Deals with how a person acquires and processes information about the external and internal environments, and how it impacts on the individual's knowledge, affects and behaviours; and how it influences decision making. **Learning:** definition and principles; learning to learn; on-going learning; **Memory,** recall, and forgetting; **Perception** (perception is not determined simply by stimulus patterns; it is a dynamic searching for the best interpretation of the available data); **Attention:** models of selective attention; **Brain** and the recent knowledge about how it functions in a person's knowing, affect, and behaviour; **Creative problem solving;** blocks to problem-solving; **Decision-making;** **Intuition;** **Gender differences in cognition, learning and cognitive style;** **Cognitive-affective basis of behaviour.**

**NOTE:** *Journal entries should indicate clearly how this knowledge affects the counsellor's understanding of the client's perceptions and attitudes.* **Prescribed Readings:** (1) Intuition as an influence on creative problem-solving: the effects of intuition, positive affect, and training. By Eubanks, Dawn L, Murphy, Stephen T; Mumford, Michael D. *Creativity Research Journal*, Apr-Jun 2010, Vol. 22 Issue 2, p 170-184, 15 p. (2) The creative personality: A synthesis and Development of the Creative Person Profile. By Martinson, Oyvind L. *Creativity Research Journal*, 2011, Vol.23, Issue 3, p185-202, 18p.

**C 04. STATISTICS FOR SOCIAL SCIENCES** [Class sessions: 30; each of 90 min.; credits; 100 marks(40/60)] **Introduction:** statistics in social sciences; **Descriptive statistics** -- measures of central tendencies, mean, median, mode; measures of dispersion, range, standard deviation; variance and quartile deviation; **Inferential statistics** -- Meaning of tests of significance - parametric and non-parametric tests of significance; normal distribution, hypothesis testing, types of error, levels of significance, probability theory. **Analysis of group differences:** t-test, f-test; Analysis of Variance (ANOVA) - one way and two-way. Non-parametric tests, sign test, median test; Mann-Whitney U test; Chi-square test; Kruskal Wallis test. **Measures of relationships:** product moment correlation; rank order correlation; biserial and point biserial, Tetrachoric and phi-coefficient; Partial and multiple correlations; Linear regression. Multivariate Analysis: multiple regression, discriminant analysis, factor analysis. **Prescribed Text :** Gupta, S.C. (2004) Fundamentals of Statistics. Delhi: Himalaya Publishing House, 6<sup>th</sup>ed. **OR** Gaur, A.S. and Gaur, S. S. (2009) Statistical Methods for Practice and Research

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**C.05 OVERVIEW OF COUNSELING THEORIES** [Class sessions: 30, each of 90 min.; 3 credits; 100 marks (40/60)] Each theory will be studied under the following heads: (a) the author's view of human nature, (b) role of the counsellor, (c) goals of counselling intervention, (d) intervention techniques.. This course will introduce the following systems: Freud's psychoanalytical theory; Adler's Individual Psychology; Carl Roger's Person Centred Approach; Rollo May's and Viktor Frankl's Existential Counselling; Fritz Perls' Gestalt approach; Albert Ellis Rational Emotive Therapy; Eric Berne Transactional Analysis; B.F.Skinner's Behavioural Therapy; William Glasser's Reality Therapy. **Students will enter in their journals how each theory and technique influences the formulation of his or her own personal approach to counselling.** **Prescribed Readings:** (1) Freedom: Towards an Integration of the Counselling Profession. By Hanna, Fred, *Journal of Counsellor Education & Supervision*, Dec.2011, Vol. 50 Issue 6, p362-385, 24p. (2) "Nondirectivity" in the theory of Carl Rogers: An unprecedented premise. By Bozarth, Jerold. *Person-Centered and Experiential Psychotherapies*. Dec 2012, Vol 11, Issue 4, p262-276, 15p.

**C.06. INTRODUCTION TO STRENGTHS-BASED COUNSELLING** [Class sessions 30, each of 90 min.; 3 credits; 100 marks (40/60)]. This course introduces the non-pathologizing approach to counselling – *the basic premise is that optimum functioning, happiness, and fulfilment of people entails more than the identification and remediation of their problems and dysfunctions.* Pathological and non-pathological approaches; positive psychology; wellness counselling - a strengths based approach; habits and behaviour change – moving towards wellness; meaning of health and wellness; definition of health, illness and wellness; health and wellness counselling; how to identify and utilise a person's signature strengths in the pursuit of goals; formal and informal approaches for assessing wellness; evidence-base for the practice of wellness counselling; wellness evaluation of lifestyle; Five Factor Wellness Inventory; understanding the Wheel of Wellness and its components; Adler's Individual Psychology; Adler's "Indivisible Self"; components of the Indivisible Self; how to develop counselling objectives and empower clients, formal and informal methods. Values in Action; Character strengths; spirituality and wellness. **Prescribed Readings:** (1) Positive Psychology and Character Strengths: Application to Strengths-Based School Counselling. By Park, Nansook; Peterson, Christopher *Professional School Counseling*, Dec.2008, Vol 12, Issue 2, p85-92. 8 pages. (2) The Application of Signature Character Strengths and Positive Experiences at Work. By Harzer, Claudia; Ruch, Willibald. *Journal of Happiness Studies*, June 2013, Vol 14 Issue 3, p 965-983, 19p.

**C.07 ADOLESCENT DEVELOPMENT** [Class sessions 30, each of 90 min.; 3 credits; 100 marks (40/60)] Physical changes and their implications for growth; Sexual development -- understanding the implications of pornography addiction, sexual orientation and teenage pregnancies in the context of sexual development; development of gender identity - Bem's theory, Kohlberg's theory and biological theories; discussion on issues of transgendered youth; moral and cognitive development -Theories of Piaget and Kohlberg on adolescence; Emotional Development - Changing brain, emotional intelligence, role of counsellors; Social development - family, peers and romantic relationships; Loevinger's Sentence Completion; Self efficacy; Self-identity formation –Marcia's theory, value building; Most common and critical issues among adolescents - substance abuse, suicides, bullying. *Students will compile a list of basic issues related to development and the Counsellor's attitudes involved.* **Prescribed Readings:** (1) An integrated model for counselling adolescents by Whitmarsh, Lona; Mullette, Jaime. *Journal of humanistic counselling, education and development*. Fall 2009, vol.48 issue 2, p144-159.16p. (2)

A framework for exploring Adolescent wellness by Spurr, Shelley; Bally, Jill, et al. Pediatric Nursing. Nov/Dec2012, Vol.38 Issue 6, p320-326, 7p.

**C. 08 COUNSELLING TECHNIQUE-I (A) FREUD AND (B) ADLER** [Class sessions:30, each 1of 90 min; 3 credits, 100 marks (40/60)] Students are expected to acquire a clear understanding of the basic concepts of the two systems and know how these are being used in counselling. **(a) Freud's** view of human nature as dynamic; Freud's view of the mind; the structure of personality; developmental stages; fixation; ego defence mechanisms. Narcissistic personality. Role of the counsellor; goals of therapy; Techniques: free association, dream analysis, analysis of transference, analysis of resistance, interpretation; Critical evaluation. **(b) Alfred Adler's** Individual Psychology: social interest; the individual as part of a whole; feeling of belonging; Inferiority and superiority complex; striving to overcome inferiority for personal growth; the conscious is the mainstay of personality development; emphasis on personal responsibility; The birth order of children in the family and its influence on their personality development; parents the only role models for children with no siblings -- while they may mature early and be high achievers, they may lack socialization skills, expect pampering, and become selfish. Parent education; "Style of life", goal orientation and mental health. Self-determination and uniqueness. Social context; feeling of community. Socially responsible development for today. Clients are encouraged to overcome their feelings of insecurity, develop deeper feelings of connectedness, and redirect their striving for significance into more socially beneficial directions. They are challenged to correct mistaken assumptions, attitudes, behaviours and feelings about themselves and the world. The growth of confidence, pride, and gratification lead to a greater desire and ability to cooperate. Therapy aims to replace exaggerated self-protection, self-enhancement, and self-indulgence with courageous social contribution. The Counsellor helps client develop a healthy lifestyle and social interest; assists the client through *four goals* of the therapeutic process: establishing a therapeutic relationship, examining the style of life, developing client insight, and changing behaviour through the individual taking personal responsibility for behaviour. Techniques: establishing rapport, defining style of life, and helping the client to gain insight. Confrontation : asking clients "*the Question*" how their life would be different if they were well? What would be the problem if this child were not the problem? Affirming the client's ability to take responsibility and change their behaviour. *Acting "as if"* by instructing the client to behave "as if" there were no problem or as the person the client would like to be. *Spitting in the client's soup* means that the counsellor points out the purpose of the client's behaviour. The client may still continue the behaviour, but cannot do so without being aware of his motivation for engaging in the behaviour. *Catching oneself* consist of helping the client learn to bring destructive behaviour into awareness and stop it. *Task setting* consists of helping the client set short-term goals leading toward the attainment of long-term goals. **Prescribed readings:** (1) "Freudian Psychoanalytic Theory of Personality." *Boundless Psychology*, Boundless, 17 Aug. 2016. Retrieved 16 Feb. 2017. (2) [Individual Psychology in the 21st Century](#), By: Curlette, William L.; Kern, Roy M. *Journal of Individual Psychology*. Spring2013, Vol. 69 Issue 1, p1-4. 4p.

**C. 09 RESEARCH METHODOLOGY** [Class sessions: 30, each of 90 min.; 3 credits; 100 marks (40/60)] Students will acquire practical experience in research methodology through exercises which they must record in their journals. Meaning of Social Research – why, types, goals; Sources of research ideas; Steps in research process, cautions, construct operational definition; Problem and hypotheses, defining the problem; Formulating the hypotheses; Types of

hypotheses; Importance of the problem and the hypotheses; Methods of data collection: Interviews and interview schedules; Observation of behaviour; Objective tests and scales; Projective methods; Content analysis, Q methodology; Experimental design; complex design; small n designs; Research methods in counselling psychology; Use of computers in research. **Prescribed Readings:** (1) *Research in Education*, Best, John W., & Kahn, James V. (2006) New Jersey: Pearson Education Inc. 10<sup>th</sup> ed. (2) *Research Methodology*. By Sharma, K. R. (2002) New Delhi, National Publishing House.

**C.-10 ASSESSING PERSONALITY USING PROJECTIVES** [Class sessions: 30, each of 90 min.; 3 credits; 100 marks (40/60)] This is a Lab course in which the students have hands-on experience to administer various projective techniques, score, interpret and write a report on their findings, including the client's cognition, perception, affect, self-concept, interpersonal relations, conflicts, and defences. The tests to be studied are the MBTI, the Sentence Completion, the H-T-P, the D-A-P, and the TAT. Students will administer under supervision at least five examples of each of these tests. **Prescribed Readings:** (1) Some Thematic Apperception Test Norms And A Note On The Use of the Cards in the Guidance of College Students. By Wittenborn, J.R. *Journal of Clinical Psychology* Apr 1949, Vol 5, Issue 2, p 157-161, 5p. (2) Using Myers-Briggs Personality Type To Create A Culture Adapted To The New Century By Overbo, Jennifer, *T+D*, Feb 2010, Vol 64, Issue 2, p70-72, 3p.

**C. 11 CAREER COUNSELLING** [Class sessions: 30, each of 90 min; 3 credits, 100 marks (40/60)] Career development theories; Parson's Trait and Factor Theory; Super's self-concept theory; cognitive information processing theory; Holland's personality type theory; Bandura's self-efficacy theory and Social Cognitive career theory; Career development plan – step by step process; Career assessment techniques – Strong Interest Inventory, DAT, HSPQ, SATB; stages of career counselling; career counselling with special populations. **Prescribed Readings:** (1) **Positive psychology: A movement to reintegrate career counselling within counselling psychology?** By: Robertson, Peter J. *Counselling Psychology Review*. Sep2015, Vol. 30 Issue 3, p26-35. 10p. (2) Career [counsellors and suicide risk assessment](#). By: Popadiuk, Natalee Elizabeth. *British Journal of Guidance & Counselling*. Aug2013, Vol. 41 Issue 4, p363-374. 12p.

**C. 12 COUNSELLING TECHNIQUES – 2.** *Existential (Rollo May; Viktor Frankl); Person Centred (Carl Rogers); Gestalt (Perls Fritz)* [Class sessions: 30, each of 90 min; 3 credits, 100 marks (40/60)] Existentialists believe that individuals write their own life story by the choices they make. Psychopathology results from neglecting to make meaningful choices for developing one's potential. Anxiety is the motivational force that helps the clients to reach their potential ; it is also the paralyzing force that prevents clients from reaching their full potential; through awareness, anxiety can be helpful for living more fully. Viktor Frankl observed in the concentration camps that survival depended on resistance to despair through finding some spiritual meaning in life. The prime motive of human behaviour is "will-to-meaning" which is discovered through values; all have a moral duty to discover these values through work, through love for others, and through confrontation with our own suffering. Life's meaning can be discovered in three ways: (i) by doing a deed (accomplishments or achievements), (ii) by

experiencing a value (beauty, love, nature, and arts), (iii) by suffering (reconciling ourselves to fate). He devised a treatment he called Logotherapy. Rollo May: individuals can only be understood in terms of their subjective sense of self. Abnormal behaviour is often just a stratagem for protecting the subjective sense of self against perceived threats. The person may give up on self-growth if he or she feels the self is threatened, and retreat to the secure, known centre. This is a way of accepting nonbeing in order that some little being may be preserved. May was concerned with people's loss of faith in values because of which they feel lonely and empty. We need to take responsibility for ourselves and find meaning in our life. The counsellor aims at being authentic with the client and entering into a deep personal sharing relationship; the counsellor models how to be authentic, to realize personal potential, and to make decisions with emphasis on mutuality, wholeness, and growth. Existential counsellors do no diagnosis, nor do they use assessment models like the DSM-IV. Goals: (a). The goal of existential counselling is to have the clients take responsibility for their life and life's decisions. (b). develop self-awareness, to promote potential, freedom, and commitment to better life choices (c). to help the client develop an internal frame of reference, as opposed to the outward one . The most common technique used is the relationship with the client; confrontation is also used when the counsellor challenges the clients with their own responsibility for their lives. The Person-centred approach of Carl Rogers is based on the positive view of human nature; it is non-directive and supportive, providing the client the non-judgemental environment to develop his or her full inherent self-actualizing tendency, and become a fully functioning person. The counsellor's attitudes of genuineness, congruence, unconditional positive regard, empathy and the inherent drive to self-actualisation create the required environment for growth and health. Gestalt Therapy focuses on the integration between the "whole" person and his or her environment. The healthy individual is someone who has awareness in his or her life, and lives in the here and now. Several key concepts are similar to that of person-centred and existential therapy, and others are distinctive: like wholeness and integration, awareness, energy and blocks to energy, growth disorders, unfinished business, I - Thou relationship. Techniques used in therapy: experiments; use of language; empty chair; top dog – underdog dialogue; dreams; fantasy; body as a vehicle of communication – identification, locating emotions in the body, repetition and exaggeration, confusion, confrontation. **Prescribed Readings: (1)** Perls With Gloria Re-reviewed: Gestalt Techniques and Perl's Practices. By: Dolliver, Robert H. *Journal of Counseling & Development*. Mar/Apr91, Vol. 69 Issue 4, p299. 6p. **(2)** Person-Centered Counseling: The Culture Within. By: Glaser, Ann Shanks; Bozarth, Jerold D. *Journal of Counseling & Development*. Spring2001, Vol. 79 Issue 2, p142-147. 6p

**C - 13. LEGAL & ETHICAL ISSUES** [Class sessions: 30, each of 90 min.; 3 credits; 100 marks]  
The purpose of a Code of Ethics is to improve the qualifications and usefulness of psychologists by establishing high standards of ethics, conduct, education and achievement. The topics covered are: the counselling relationship; confidentiality and privacy; professional responsibility; relationships with other professionals; evaluation, assessment, and interpretation; supervision, training, and teaching; research and publication; distance counselling, technology, and social



media; resolving ethical Issues; Glossary of Terms. The Class should study carefully as a model the Code of Ethics of the American Counseling Association. Our mission is to enhance the quality of life in society by promoting the development of professional counsellors, advancing the counselling profession, and using the profession and practice of counselling to promote respect for human dignity and diversity.

**Prescribed Reading and Class Discussion:** (1) Ethical and Legal issues in Psychotherapy by Ajit Avasthi Sandeep Grover [www.indianjpsychiatry.org/cpg/cpg2009/article11.pdf](http://www.indianjpsychiatry.org/cpg/cpg2009/article11.pdf) . (2) ACA CODE OF ETHICS <https://www.counseling.org/resources/aca-code-of-ethics.pdf>

**C - 14 METHODS OF PSYCHOLOGICAL ASSESSMENT** [Class sessions 30, each of 90 min.; 3 credits; 100 marks (40/60)] Definition and uses of psychological tests; Historical antecedents to modern testing; Concepts and types of reliability and validity; Relationship between validity and reliability; Estimates of error; Correlation of coefficient; Item analysis: Item difficulty; Item discrimination; Item response theory. Commonly used psychological instruments for assessing social, educational, emotional, personal, intellectual, behavioural, and perceptual development; Ability and aptitude testing – DAT, GATB, Intelligence tests including performance tests; Personality testing – 16PF , EPQ, MMPI; Individual and group testing. Individual tests of intelligence and personality Wechsler's Adult Intelligence scale, 16 personality factor, Eyesenck's personality questionnaire Cognitive styles inventory. Contemporary issues pertinent to the assessment of intelligence; Synthesizing and integrating information from cognitive tests along with other sources to plan effective intervention. Appropriate use of tests in agencies and clinical practice. **Prescribed Text:** Anne Anastasi *Psychological Testing*

**C. 15 PERSON IN THE INDIAN TRADITION - 1** [Class sessions: 30, each of 90 min.; 3 credits; 100 marks (40/60)] Ways of knowing in the Indian tradition found in Samkhya, Vedanta, Yoga and Buddhism Yoga, Samkhya, Vedanta, Purva Mimamsa, Uttar Mimasa, Charvakism, Vaisheshika, Nyaya, Buddhism, Jainism; Notions of Self - Definition of Self, Philosophy of Self, Concept of Self; The Problem of Self and Understanding - Personal Beliefs, Socio-Cultural Beliefs, Personality; Notions of the Mind, Consciousness And Spirituality – Mind, Consciousness, Spirituality; Health and Well-being, Illness and Wellness [- Health, Wellbeing, Health and Wellbeing in eastern tradition; Yoga, Meditation, Pranayama, Mudra, Bandhas, Pratyahar, Dharma and Dhyana; Compassionate Action - Love, Altruism, Compassion, Compassionate action in counselling; Indian Perspective of Values Morality and Justice. **Prescribed Readings:** (1) Counselling **Psychology** in India: At the Confluence of Two Traditions. By: Arulmani, Gideon. **Applied Psychology: An International Review.** Jan2007, Vol. 56 Issue 1, p69-82. 14p. (2) What Is **Indian Psychology:** Transcendence In And While Thinking. By: Menon, Sangeetha. **Journal of Transpersonal Psychology.** Dec2005, Vol. 37 Issue 2, p83-98. 16p.

**C. 16 PERSON IN THE INDIAN TRADITION - 2** [Class sessions: 30, each of 90 min; 3 credits, 100 marks (40/60)] Conceptualizing Person-Environment Relationship – Person, Environment, Person-Environment Interaction; Social Behaviour: the challenge of individuality and relatedness - What is Social in Social Psychology?, The Indian Heritage, Social Psychology in the West, Social Psychology in India, Human Behavior, Social Niche, Individual in social context, challenge of individuality and relatedness; Insights into organizational dynamics of leadership, values, motivation.- Organizational Behaviour, Leadership, Values and organization behaviour;

Motivation - Human Development the idea of child, organization of adult life, Child development, Adolescent development, Adult; Process of Aging - Aging across cultures, Sociological perspectives on aging; Motivation, Intrinsic Motivation, ideas of anasakti, work, happiness, cognitive functions. **Prescribed Readings:** (1) Reinterpreting the Inner Self in Global India: 'Malevolent Mothers', 'Distant Fathers' and the Development of Children's Identity. By: Bhatia, Sunil. *Culture & Psychology*. Sep2006, Vol. 12 Issue 3, p378-392. 15p. (2) [Perception, Cognition and Consciousness in Classical Hindu Psychology](#). By: K. Ramakrishna Rao. *Journal of Consciousness Studies*. Mar2005, Vol. 12 Issue 3, p3-30. 28p.

**C. 17 HEALTH PSYCHOLOGY AND MANAGING STRESS** [Class Sessions: 30 each of 90 mins; 3 credits; 100 marks (40/60)] Overview of the rapidly expanding field of health psychology; psychological processes in health and health care; impact of stress on physical health; psychological factors that determine health-related behaviour; psychological aspects of the delivery of health care; assessment issues in health psychology; mental health and the practice of mindfulness; sources of occupational stress; cumulative effects of stressful events; hardiness; burnout; salutogenesis and the sense of coherence; social support and buffering effects; coping by means of BRIMS; five factor personality traits and health. **Prescribed Readings:** (1) The End Of Mental Illness Thinking? By Pemberton, Richard; Wainwright, Tony, *International Journal Of Clinical Health & Psychology*, Sept. 2014, Vol 14 Issue 3, P 216-220, 5p. (2) Guided Imagery As A Psychotherapeutic Mind-Body Intervention In Health Psychology – A Brief Review Of Efficacy Research. By Ozu, Oyku, *Europe's Journal Of Psychology*, Nov 2010, P 227- 237, 11p.

**C. 18 MINDFULNESS AND ACHIEVEMENT** [Class Sessions: 30 each of 90 mins; 3 credits; 100 marks (40/60)] Mindfulness - benefits of mindfulness; barriers to mindfulness; mindfulness for counsellors; making minds matter: infusing mindfulness into school counselling; mindfulness in organisational counselling; relations among mindfulness, achievement-related self-regulation, and emotions; relational aspects of mindfulness: implications for the practice of marriage and family therapy; clarifying values: access to mindfulness. Leadership and mindfulness; mental health and the practice of mindfulness. Leadership isn't for cowards. **Prescribed Readings:** (1) Mindfulness In Higher Education: Teaching, Learning, And Leadership By Davis, Danielle Joy, *International Journal Of Religion & Spirituality In Society*, 2014, Vol 4, Issue 3, P 1-6, 6p. (2) Wellness: A Conceptual Framework For School-Based Mindfulness Program By Albrecht, Nicole, *International Journal of Health, Wellness & Society*, 2014, Vol 4, Issue 1, p21-36. 16p.

**C. 19 COUNSELLING TECHNIQUES – 3.** REBT, TA, Behavior Modification, Reality Therapy. [Class sessions: 30, each of 90 min; 3 credits, 100 marks] Rational Emotive Behaviour Therapy. Irrational beliefs; the ABCD method of therapy; Transactional Analysis – Understanding of theoretical concepts in T.A., Games in T.A., Therapeutic process, Application of T.A. in practical settings; Behavior Therapy – Theoretical concepts, therapeutic process, techniques of behavior modification, cognitive behavior therapy; Reality Therapy: the identification of patient's basic needs, and how to meet them. **Prescribed Readings:** (1): [using reality therapy trained group counselors in comprehensive school counseling programs to decrease the academic achievement gap](#) By Mason, Cynthia Palmer. *International Journal of Choice Theory & Reality Therapy*, Spring 2016, Vol. 35 Issue 2, p14-24. 11p. (2) [a Multimodal Assessment And Rational Emotive Behavioural Approach To Stress Counselling: A Case Study](#) By: Jenkins, Dinah; Palmer, [\(Back to Index\)](#) [\(Back to Agenda\)](#)



Stephen. *Counselling Psychology Quarterly*. Sep2003, Vol. 16 Issue 3, p265-287. 23p.

**C-20. COUNSELLOR COMPETENCIES.** (Number of Credits: 03, Total teaching hours: 45, Duration of class sessions: 90 minutes. Marks: 100 (40/60)) This course aims at ensuring that the Counsellor is equipped with the required knowledge, abilities, skills, and attitudes to function professionally in setting up, maintaining, and enhancing a comprehensive counselling program that will foster the academic achievement, career planning and personal and social development of all students. This should be done through in-class presentations by students and discussions. The graduating Counsellors should be able to articulate and demonstrate an understanding of the organizational structure and governance of the current educational system. Emphasis will be placed on the leadership abilities required to accomplish the counsellor's responsibilities, his advocacy role, his role of systems change agent, and his role of developing partnering among the stakeholders – the principal, the teachers, the students, the staff, the parents, and the community. Counsellor must be able to self-evaluate his own competencies and to formulate a plan for his own professional development. The School Counsellor should be accountable for the results of the school counselling program. **Prescribed Reading:** American Counselling Association Advocacy Competencies

### **ELECTIVE COURSES**

*(Students are required to choose 10 out of the following self-standing courses. Each course carries 3 credits and involves 45 hours of class sessions in each trimester.)*

**E - 21. GROUP COUNSELLING** [Class sessions 30, each of 90 min.; 3 credits; 100 marks(40/60)] Theory and research on group process; group dynamics and leadership strategies; implications for group counselling; Adlerian group counselling and its emphasis on self-concept and the discovery of personal motivation; theory behind Adlerian group processes and practice; formation of group relationship; psychological assessment, awareness and disclosure; reorientation of lifestyle; selection of group members, group composition, group size, group setting; frequency, length and duration of group sessions; role of the counsellor; ethical considerations. **Prescribed readings:** (1) Corsini's Individual Education: A Democratic Model. By: Corsini, Raymond. *Group Dynamics*. Dec2007, Vol. 11 Issue 4, p247-252. 6p. (2) Adlerian Group Counselling Step by Step. By: Sonstegard, Manford A.; Bitter, James Robert. *Journal of Individual Psychology*. Summer98, Vol. 54 Issue 2, p176. 41p. (3) **Adlerian Group** Counselling and Therapy step-by-step. By Burchell, Lynda CPJ: *Counselling & Psychotherapy Journal*. Oct2004, Vol. 15 Issue 8, p56-57. 2p. (Book Review) [html full text](#)

**E – 22. MARRIAGE COUNSELLING** [Class sessions 30, each of 90 min.; 3 credits; 100 marks (40/60)] Introduction to counselling of couples, including survey of major theories and research. The Rochester Objective Structured Clinical Evaluation (ROSCCE). Ten truths for changing the relationships you have into the one you want; Creating a foundation of mutual support in couple relationships; Marriage counselling as an opportunity for catharsis; counsellor's intervention is often resisted; Seeing infertility in the context of meaning of life – logotherapy; premarital counselling; Children in alcoholic families; Children of divorce; Child abuse; Death and dying. **Prescribed Readings:** (1) Just Say It By: Flora Carlin *Psychology*

Today. Sep/Oct2014, Vol. 47 Issue 5, p52-61. 10p. (2) Why Power Matters: **Creating** a Foundation of **Mutual Support** in Couple Relationships. By: Knudson-Martin, Carmen. *Family Process*. Mar2013, Vol. 52 Issue 1, p5-18. 13p. (3) Self-Esteem, Coping Efforts and Marital Adjustment. By: Bélanger, Claude; Di Schiavi, Marie-France; Sabourin, Stéphane; Dugal, Caroline; Baalbaki, Ghassan El; Lussier, Yvan. *Europe's Journal of Psychology*. 2014, Vol. 10 Issue 4, p660-671. 12p.

**E –23. COUNSELLING IN ADDICTIVE BEHAVIOUR** [Class sessions 30, each of 90 min.; 3 credits; 100 marks (40/60)] Introduction to assessment, treatment and outcome evaluation of chemical and nonchemical addictive behaviours; overcoming "compulsive" behaviour; journaling about the cognitive, emotional and behavioural reactions during the abstinence period; attending 12-step meetings; participating in a quasi-12-step in class meeting; critiquing a film depicting dynamics of an alcoholic family; two myths of addiction – personality and free choice; recognizing and intervening with adolescents presenting signs of addictive behaviour; narratives of recovery from addictive behaviours; addictive behaviours and personality disorders; relapse prevention. **Prescribed Readings:** (1) Motivational Interview; Evidence Based Strategy In The Treatment Of Alcohol And Drug **Addiction**. By Ukachi, Madukwe Ann, IFE Psychologia. 2013 Special Edition, Vol. 21 Issue 3-S, p174-196. 23p. (2) Cannabis Use And Suicidal Ideations In High-School Students. By: Chabrol, Henri; Melioli, Tiffany; Goutaudier, Nelly. **Addictive Behaviors**. Dec2014, Vol. 39 Issue 12, 3p. (3) You're Distracted. By: PARRY, MARC. *Chronicle of Higher Education*. 3/29/2013, Vol. 59 Issue 29, Following pA26-A29. 4p.

**E - 24 ADOLESCENT & YOUTH SUICIDE** [Class sessions 30, each of 90 min.; 3 credits; 100 marks (40/60)] Suicidal behaviour; suicide risk assessment and prevention; process of risk assessment; discomfort intolerance and acquired capability for suicide; gatekeeper training for counsellors; suicide awareness training for faculty and staff; postvention in schools and colleges. **Prescribed Readings:** (1) Suicide Prevention in Schools: The Role of the School Counsellor By Fineran, Kerrie R. *Journal of Professional Counselling: Practice, Theory and Research*, Summer/Fall 2012, Vol. 39, Issue 2, p 14-28, 15p. (2) Web-Based and Mobile **Suicide** Prevention Interventions for Young People: A Systematic Review. By: Perry, Yael; Werner-Seidler, Aliza; Calear, Alison L.; Christensen, Helen. *Journal of the Canadian Academy of Child & Adolescent Psychiatry*. Spring2016, Vol. 25 Issue 2, p73-79. 7p. (3) Risk Factors for Farmers' **Suicides** in Central Rural India: Matched Case-control Psychological Autopsy Study. By: Changoji Bhise, Manik; Balkrushna Behere, Prakash. *Indian Journal of Psychological Medicine*. Nov/Dec2016, Vol. 38 Issue 6, p560-566. 7p (4) School-Wide Staff and Faculty Training in **Suicide** Risk Awareness: Successes and Challenges. By: Walsh, Elaine; Hooven, Carole; Kronick, Barbara. *Journal of Child & Adolescent Psychiatric Nursing*. Feb2013, Vol. 26 Issue 1, p53-61. 9p.

**E - 25 COUNSELLING IN SCHOOLS** [Class sessions 30, each of 90 min.; 3 credits; 100 marks (40/60)] The characteristics required of the Counsellor; Counsellor-Principal collaboration; collaboration with teachers; helping students and teachers belong; partnering with families and community; use of student data to effect systemic changes; action plans for prevention and intervention services; defining the desired student competencies and achievement results; students at risk ; students with suicide ideation; from school to work transition. **Prescribed readings:** (1) Supportive Learning Communities And The Transformative Role Of Professional

School **Counselors**. By: Sink, Christopher A.; Edwards, Cher. *Professional School Counseling*. Dec2008, Vol. 12 Issue 2, p108-114. 7p. (2) integrating A Suicide Prevention Program Into A **School** Mental Health System: A Case Example From A Rural **School** District. By: Schmidt, Robert C.; Iachini, Aidyn L.; George, Melissa; Koller, James; Weist, Mark. *Children & Schools*. Jan2015, Vol. 37 Issue 1, p18-26. 9p. (3) Climate, Culture And Collaboration: The Key to Creating Safe and Supportive **Schools** ) By: Cobb, Nicole. *Techniques: Connecting Education & Careers*. Oct2014, Vol. 89 Issue 7, p14-19. 6p.

**E - 26. WORK, CAREERS, SELF-EFFICACY** [Class sessions 30, each of 90 min.; 3 credits; 100 marks (40/60)] Some contemporary perspectives; definition of work; job satisfaction; work and mental health; work and leisure; vocational and career guidance theories: Holland's theory of vocational choice; Bandura's social cognitive theory; Parson's trait and factor theory; Krumboltz's happenstance theory; Super's developmental self-concept theory. Development of career behaviour and choice; career development and vocationalization; decision theory; approaches to career development and choice – situational, sociological, and contextual approaches. Prescribed Readings: (1) The Future Of Jobs And **Careers**. By: Gordon, Edward E. *Techniques: Connecting Education & Careers*. Sep2009, Vol. 84 Issue 6, p28-31. 4p. (2) The True Cost Of The Economic Crisis On Psychological Well-Being: A Review. By: Van Hal, Guido. *Psychology Research & Behavior Management*. 2015, Vol. 8, p17-25. 9p.

**E - 27. PERSONALITY IN POSITIVE PSYCHOLOGY** [Class sessions 30, each of 90 min.; 3 credits; 100 marks (40/60)] Human strengths and resilience in the face of disaster; Hemingway's portrayal of a hero with complete personality and the multi-faceted character; Natural resilience of the human spirit; Features of human resilience; The sources of strength, toughness, hardiness, and relative immunity from personal and psychological collapse; Lessons in teaching hope; Five-factor personality traits and health-related personality dimensions. Prescribed Readings: (1) Ego Strengths – And Their Absence By: Kardum, Igor; Hudek-Knezevic, Jasna. *International Journal of Clinical Health & Psychology*. Sep2012, Vol. 12 Issue 3, p373-387. 15p. (2) [On Human Resilience: Our Role As Counselors](#) By: Roland, Catherine B. *Adultspan Journal*. Spring2006, Vol. 5 Issue 1, P2-3. 2p. 3) [Integrating Positive Psychology Into Counseling: Why And \(When Appropriate\) How](#). By: Harris, Alex H. S.; Thoresen, Carl E.; Lopez, Shane J. *Journal Of Counseling & Development*. Winter2007, Vol. 85 Issue 1, p3-13. 11p

**E - 28. HUMAN STRENGTHS, PERSONAL AND ORGANIZATIONAL CHANGE, AND INNOVATION** [Class sessions 30, each of 90 min.; 3 credits; 100 marks (40/60)] This approach to personal and **organizational change** is based on the belief that people, individually and collectively, have unique gifts, skills and contributions and that the organizations in which they work are **human** social systems where, through inquiry and dialogue, people can shift their attention and action away from problem analysis to identify worthy ideals and possibilities for the future; intervention as a major tool of the psychology of human strengths; improving **organizational** performance in higher education institutions; what gives life to **human** systems when they function at their best; case study in human strengths and innovation; addressing important questions in the field of adolescent purpose. **Prescribed Readings: (1)** Understanding Human Emotions By: Jarymowicz, Maria. *Journal Of Russian & East European Psychology*. May/Jun2012, Vol. 50

Issue 3, P9-25. 17p (2) Environments Where Children Thrive: The Circle Of Courage Model  
By Brendtro, Larry K.; Brokenleg, Martin, Van Bockern, Steve. Reclaiming Children And  
Youth. Fall 2014, Vol 23 Issue 3, p 10-15, 6p. [\(Back to Index\)](#) [\(Back to Agenda\)](#)

**E - 29. MOTIVATION AND CREATIVITY** [Class sessions 30, each of 90 min.; 3 credits; 100 marks (40/60)] Idea generation using brainstorming; Motivation and giftedness; Creativity and understanding; Teaching for creativity; Individual differences of creative people; Project-based learning and skills for the future; What students would do if they did not do their homework; Context and Creativity: The theory of planned behaviour as an alternative; Promoting creativity at work: the role of problem solving demand. **Prescribed Readings:** (1) Lighting The Fire By McVeigh, Margaret, Screen Education, Spring 2014, Issue 75, p 56-63, 8p. (2) Teaching: The Lessons Of Hope By: Snyder, C. R. *Journal of Social & Clinical Psychology*. Feb2005, Vol. 24 Issue 1, p72-84. 13p.

**E - 30. DEVELOPING EMOTIONAL INTELLIGENCE FOR ACADEMIC SUCCESS** [Class sessions 30, each of 90 min.; 3 credits; 100 marks (40/60)] Definition of emotional intelligence; how is emotional intelligence correlated to verbal intelligence, and social support; implication of emotional intelligence for personal, social, academic, and workplace success; developing emotional intelligence in children – role of parents; emotional intelligence: a model for positive personal change; Yoga for developing emotional intelligence in mid-life managers; in search of authenticity: now more than ever, soft skills are needed; emotional intelligence relates to well-being. **Prescribed Readings:** (1) Emotional Intelligence As A Predictor Of Academic And/Or Professional Success. By: Romanelli, Frank; Cain, Jeff; Smith, Kelly M. *American Journal Of Pharmaceutical Education*. Aug2006, Vol. 70 Issue 3, P1-10. 10p. (2) Emotional Intelligence For School Administrators: A Priority For School Reform? By Moore, Bobby. *American Secondary Education* Summer 2009, Vol.37, Issue 3, P20-28, 9p.Fv

**E - 31 GRIEF COUNSELLING** [Class sessions 30, each of 90 min.; 3 credits; 100 marks (40/60)] Understanding Grief (video); Observing the grieving process; death and bereavement counselling; how children mourn; the more recent theories which also consider the cognitive, social, cultural and spiritual dimensions of grief and loss; emerging trends in bereavement theory; potential complications of grief and the evidence for the efficacy of grief interventions; techniques of grief counseling – cognitive restructuring; writing; role playing; evocative language; memory book. Adler’s Grief counseling Videos: The Adventure of Grief (Dr. Geoff Warburton); The Cure for Grief (Norah Casey); Changing the way we mourn (Laura Prince); Against Grieving in Silence (Rachel Stephenson); Good Grief! What I learned from Loss (Elaine Mansfield); The Effects of Trauma on the Brain and how it affects behaviours (John Rigg); After watching this, your brain will not be the same (Lara Boyd).

**E - 32 RORSCHACH METHOD OF PERSONALITY ASSESSMENT** [Class sessions 30, each of 90 min.; 3 credits; 100 marks (40/60)] Rorschach is studied here not as a personality test but as a multifaceted method of collecting data about personality processes and how they are scored; how people focus their attention and perceive their environment; how they think of the experiences they have – do they think logically, coherently, flexibly, constructively, and to a

moderate extent; how they modulate emotional experiences and deal with feelings arising from within themselves, and how they respond to the feelings of others, and to emotionally charged situations in general; how effectively are people able to muster adequate resources for meeting the demands of everyday living, and do they have effective ways of thinking about these demands and appropriate channels for experiencing and expressing feelings about them; the more realistic their self-perceptions, the more familiar and comfortable they are with themselves, maintaining adequate self-esteem, promoting positive self regard, enhancing self-awareness, forming a stable sense of identity; do they perceive people and social situations in an accurate and empathic manner.

**E- 33 and E34. COURSE OF GUIDED PERSONAL STUDY**

A student who desires to investigate special problems in wellness counselling under the guidance of a faculty member may be allowed by the Faculty Chair to do so in lieu of a 3-credit elective course. The student will be required to submit to the Faculty Chair, at the end of the trimester, a written report of his study for grading approved by his/ her faculty guide.

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**D 3.2 Minutes of the meeting of Board of Studies in Microbiology held on 16/08/2017****Annexure I****SEMESTER – III****MIC GC–3: ENVIRONMENTAL MICROBIOLOGY  
THEORY****CREDITS: 4****TOTAL HOURS: 60****Unit 1 Microorganisms and their Habitats****Hours: 18**

Structure and function of ecosystems, Terrestrial Environment: Soil profile and soil microflora; Aquatic Environment: Microflora of fresh water and marine habitats; Air: Aeromicroflora and dispersal of microbes; Animal Environment: Microbes in/on human body (Microbiomics) and animal (ruminants) body; Extreme Habitats: Microbes thriving at high and low temperatures, pH, high hydrostatic and osmotic pressures, salinity, and low nutrient levels. Microbial succession in decomposition of plant organic matter.

**Unit 2 Microbial Interactions****Hours: 12**

Microbe interactions: Mutualism, synergism, commensalism, competition, amensalism, parasitism, predation. Microbe-Plant interaction: Symbiotic and non-symbiotic interactions. Microbe-animal interaction: Microbes in ruminants, nematophagus fungi and symbiotic luminescent bacteria.

**Unit 3 Waste Management****Hours: 15**

Solid Waste management: Sources and types of solid waste, methods of solid waste disposal (composting and sanitary landfill).

Liquid waste management: Composition and strength of sewage (BOD and COD), primary, secondary (oxidation ponds, trickling filter, activated sludge process and septic tank) and tertiary sewage treatment.

**Unit 4 Microbial Bio-remediation****Hours: 07**

Microbial remediation of common pesticides, organic (hydrocarbons, oil spills) and inorganic matter (metals).

**Unit 5 Water Potability****Hours: 08**

Treatment and safety of drinking (potable) water, methods to detect potability of water samples: (a) standard qualitative procedure: presumptive test/ MPN test, confirmed and completed tests for faecal coliforms, (b) Membrane filter technique.

**PRACTICALS****CREDITS: 2****TOTAL HOURS: 60**

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1. Analysis of soil - pH, moisture content, water holding capacity.

2. Isolation of microbes (bacteria and fungi) from soil (28°C and 55°C).
3. Assessment of microbiological quality of air.
4. Assessment of potability of water by MPN, routine analysis – presumptive, confirmed, completed tests; detection of faecal streptococci and clostridia.
5. Determination of BOD of sewage.
6. Isolation of bioluminescent bacteria from sea food.
7. Isolation of *Rhizobium* from root nodules.

#### **SUGGESTED READING (Latest editions)**

- Atlas RM and Bartha R. Microbial Ecology: Fundamentals and Applications. Benjamin Cummings Science Publishing, USA.
- Madigan MT, Martinko JM, Dunlap PV and Clark DP. Brock Biology of Microorganisms. Pearson International Edition
- Maier RM, Pepper IL and Gerba CP. Environmental Microbiology. Academic Press.
- Okafor, N. Environmental Microbiology of Aquatic and Waste systems. Springer, New York.
- Singh A, Kuhad, RC and Ward OP. Advances in Applied Bioremediation. Springer-Verlag, Berlin Hedeilberg
- Barton LL and Northup DE. Microbial Ecology. Wiley Blackwell, USA
- Campbell RE. Microbial Ecology. Blackwell Scientific Publication, Oxford, England.
- Coyne MS. Soil Microbiology: An Exploratory Approach. Delmar Thomson Learning.
- Lynch JM and Hobbie JE. Microorganisms in Action: Concepts and Application in Microbial Ecology. Blackwell Scientific Publication, U.K.
- Martin A. An Introduction to Soil Microbiology. John Wiley and Sons Inc. New York and London.
- SubbaRao NS. Soil Microbiology. Oxford and IBH Publishing Co. New Delhi.
- Willey JM, Sherwood LM and Woolverton CJ. Prescott's Microbiology. McGraw Hill Higher Education.

**SEMESTER – IV**  
**MIC GC-4: MOLECULAR BIOLOGY**  
**THEORY**

**CREDITS: 4**

**TOTAL HOURS: 60**

**Unit 1 Nucleic acids**

**Hours: 10**

**DNA:** Watson – Crick model of DNA; Prokaryotic DNA (Circular DNA, Supercoiled, Palindromic), Plasmids; Eukaryotic DNA (Repetitive sequences, split genes, nucleosomes), mitochondrial and chloroplast DNA; Guanine quadruplex (G4) DNA.

**RNA:** mRNA, rRNA, tRNA, non-coding RNA, micro RNA and Si RNA.

**Unit 2 Replication of DNA**

**Hours: 20**

Modes of replication - Conservative, semi conservative (Meselson - Stahl experiment) and dispersive; Processes and enzymes involved in replication; Inhibitors of replication; Models of

replication in prokaryotes and eukaryotes - Rolling circle model/sigma, theta and linear. Differences between prokaryotic and eukaryotic replication process.

### Unit 3 Transcription

**Hours: 15**

Initiation, Elongation, Termination; post transcriptional modification - RNA splicing (Ribozyme), Reverse transcriptase and its implication, Inhibitors of transcription. Concept of operon. Differences between prokaryotic and eukaryotic transcription process.

### Unit 4 Translation

**Hours: 15**

Concept of genetic code, Properties: codon / anticodon, Wobble hypothesis, start and stop codons; Ribosomes as sites of protein biosynthesis; amino acid activation and specificity; Initiation, Elongation, Termination; post translational processing and modification; Inhibitors of protein synthesis. Differences between prokaryotic and eukaryotic translation process.

## PRACTICALS

**CREDITS: 2**

**TOTAL HOURS: 60**

1. Study of different types of DNA and RNA using micrographs.
2. Extraction of genomic DNA, quantitative estimation ( $A_{260}$ ) and estimation of purity ( $A_{260/280}$ ).
3. Estimations: DNA by Diphenylamine method; RNA by Orcinol method; Protein by Folin-Lowry method
4. Effect of replication inhibitor on bacterial growth
5. Effect of transcription inhibitor on bacterial growth
6. Effect of protein synthesis inhibitor on bacterial growth

## SUGGESTED READING (Latest editions)

- Frobisher M, Fundamentals of Microbiology, W. B. Saunders Co, Philadelphia.
- Pelczar MJ, Chan ECS and Krieg NR. Microbiology. McGraw Hill Book Company. Willey JM, Sherwood LM, and Woolverton CJ. Prescott's Microbiology. McGraw Hill Higher Education.
- Stanier RY, Ingrahm JI, Wheelis ML and Painter PR. General Microbiology. McMillan Press.
- Tymoczko JL, Berg JM and Stryer L. Biochemistry, W.H. Freeman and Company
- Nelson DL and Cox MM. Lehninger Principles of Biochemistry, W.H. Freeman and Company.
- Goodenough U, Genetics, Holt, Rinehart & Winston of Canada Ltd.
- Gardner EJ, Simmons MJ, Snustad DP. Principles of Genetics. Wiley-India.
- Maloy SR, Cronan JE and Friefelder D. Microbial Genetics, Jones and Barlett Publishers.
- Strickberger M, Microbial Genetics, Prentice Hall India Learning Private Limited
- Goldstein ES, Lewin's Genes, Jones and Bartlett Publishers.
- E-books / Journals.

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**SEMESTER –III**  
**MIC SEC-1: FOOD AND DAIRY MICROBIOLOGY**  
**THEORY**

**CREDITS: 3**

**TOTAL HOURS: 45**

**Unit 1 Food as a substrate for microorganisms**

**Hours: 08**

Intrinsic and extrinsic factors that affect spoilage of food. Principles and spoilage of vegetables, fruits, meat, eggs, milk and butter, bread, canned foods.

**Unit 2 Principles and methods of food preservation**

**Hours: 07**

Principles, physical methods of food preservation: temperature (low, high, canning, drying), irradiation, hydrostatic pressure, microwave processing and aseptic packaging, chemical methods of food preservation: salt, sugar, organic acids, sulphites, nitrite and nitrates, ethyleneoxide, antibiotics and bacteriocins.

**Unit 3 Fermented foods**

**Hours: 15**

Dairy starter cultures, fermented dairy products: yogurt, acidophilus milk, kefir, dahi and cheese, other fermented foods: dosa, sauerkraut, soy sauce and tempeh.  
Probiotics: Health benefits, types of microorganisms used, probiotic foods available in market.

**Unit 4 Food borne diseases (causative agents, foods involved, symptoms and preventive measures)**

**Hours: 08**

Food poisoning: Toxins of *Staphylococcus aureus*, *Clostridium botulinum* and mycotoxins.  
Food infections: *Bacillus cereus*, *Vibrio parahaemolyticus*, pathogenic *Escherichia coli*, Salmonellosis, Shigellosis, *Yersinia enterocolitica*, *Listeria monocytogenes* and *Campylobacter jejuni*.

**Unit 5 Food sanitation and control**

**Hours: 07**

Indices of food sanitary quality and sanitizers, methods of detection of food-borne pathogens, HACCP.

**PRACTICALS**

**CREDIT: 1**

**TOTAL HOURS: 30**

1. MBRT of milk samples and their standard plate count.
2. Alkaline phosphatase test to check the efficiency of pasteurization of milk.
3. Isolation of spoilage microorganisms from spoiled vegetables/ fruits/ bread.
4. Preparation of Yogurt/ Dahi/ Sanna.

**SUGGESTED READING (Latest editions)**

- Adams MR and Moss MO. Food Microbiology. New Age International (P) Limited Publishers, New Delhi, India.
- Banwart JM. Basic Food Microbiology. CBS Publishers and Distributors, Delhi, India.
- Davidson PM and Brannen AL. Antimicrobials in Foods. Marcel Dekker, New York.

- Dillion VM and Board RG. Natural Antimicrobial Systems and Food Preservation. CAB International, Wallingford, Oxon.
- Frazier WC and Westhoff DC. Food Microbiology. Tata McGraw-Hill Publishing Company Ltd, New Delhi, India.
- Gould GW. New Methods of Food Preservation. Blackie Academic and Professional, London.
- Jay JM, Loessner MJ and Golden DA. Modern Food Microbiology. CBS Publishers and Distributors, Delhi, India.
- Lund BM, Baird Parker AC, and Gould GW. The Microbiological Safety and Quality of Foods. Vol. 1-2, ASPEN Publication.
- Gaithersberg MD, Tortora GJ, Funke BR, and Case CL. Microbiology: An Introduction. Pearson Education.

#### SEMESTER – IV

#### MIC SEC-2: INSTRUMENTATION AND BIOTECHNIQUES THEORY

**CREDITS: 3**

**TOTAL HOURS: 45**

**Unit 1 Microscopy**

**Hours: 08**

Phase contrast, Fluorescence, Confocal and Electron (Scanning and Transmission) Microscopy; Micrometry.

**Unit 2 pH and Buffers**

**Hours: 02**

pH Meter: Principle, calibration and application. Buffers and buffering capacity.

**Unit 3 Spectroscopy**

**Hours: 05**

Principle of UV-Vis and IR spectroscopy and their application in analysis of biomolecules.

**Unit 4 Chromatography**

**Hours: 10**

Principles and applications: Paper, Thin layer, Si gel Column, HPLC, Reverse phase, Gel filtration, Ion exchange and Affinity Chromatography.

**Unit 5 Electrophoresis**

**Hours: 10**

Principle and applications: Native polyacrylamide gel electrophoresis, SDS- polyacrylamide gel electrophoresis, and Agarose gel electrophoresis.

**Unit 6 Centrifugation**

**Hours: 10**

Preparative and analytical centrifugation, fixed angle and swinging bucket rotors. RCF and sedimentation coefficient, differential centrifugation, density gradient centrifugation and ultra centrifugation.

#### PRACTICALS

**CREDIT: 1**

**TOTAL HOURS: 30**

1. Measurement of bacterial and yeast cell by micrometry.
2. Preparation of buffer.
3. Determination of  $\lambda_{max}$  and extinction coefficient of a given sample.
4. Separation of mixture of sugars/amino acids by paper and thin layer chromatography.

5. Silica gel column chromatography.
6. Separation of proteins by Polyacrylamide Gel Electrophoresis (PAGE).
7. Centrifugation of bacterial and yeast cultures as a function of speed and time.

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#### **SUGGESTED READING (Latest editions)**

- Wilson K and Walker J. Principles and Techniques of Biochemistry and Molecular Biology. Cambridge University Press.
- Nelson DL and Cox MM. Lehninger Principles of Biochemistry, W. H. Freeman and Company.
- Willey MJ, Sherwood LM and Woolverton C J. Prescott, Harley and Klein's Microbiology. McGraw Hill.
- Karp G. Cell and Molecular Biology: Concepts and Experiments. John Wiley and Sons. Inc.
- De Robertis EDP and De Robertis EMF. Cell and Molecular Biology. Lipincott Williams and Wilkins, Philadelphia.
- Cooper GM and Hausman RE. The Cell: A Molecular Approach. ASM Press and Sunderland, Washington D.C.
- Nigam A and Ayyagari A. Lab Manual in Biochemistry, Immunology and Biotechnology. Tata McGraw Hill.

### **SEMESTER - II**

#### **MIC GC-2: MICROBIOLOGY AND BIOCHEMISTRY – II**

##### **THEORY**

**CREDITS: 4**

**TOTAL HOURS: 60**

**Unit 1 Introduction to protozoa, fungi, algae and viruses**

**Hours: 08**

Discovery, nature, definition and general properties.

**Unit 2 Microbial Growth and Effect of Environment on Microbial Growth Hours: 12**

Definitions of growth, measurement of microbial growth, Batch culture, Continuous culture, generation time and specific growth rate.

Microbial growth in response to environment - temperature (psychrophiles, psychrotrophs, mesophiles, thermophiles, thermodurics), pH (acidophiles, alkaliphiles), solute and water activity (halophiles, xerophiles, osmophiles), oxygen (aerobes, anaerobes, microaerophilic, facultative aerobes, facultative anaerobes), hydrostatic pressure (barophiles).

Microbial growth in response to nutrition and energy – autotroph/phototroph, heterotroph; photoorganoheterotroph, chemolithotroph: chemolithoautotroph, chemolithoheterotroph, chemoheterotroph, photolithoautotroph.

**Unit 3 Nutrient uptake and transport**

**Hours: 05**

Passive and facilitated diffusion.

Primary and secondary active transport, concept of uniport, symport and antiport.

Group translocation.

**Unit 4 Chemoheterotrophic Metabolism – Aerobic respiration****Hours: 12**

Concept of aerobic and anaerobic respiration, fermentation.

Sugar degradation pathways: EMP, ED, Pentose phosphate pathway, TCA cycle and its amphibolic nature.

Electron transport chain: components of respiratory chain.

**Unit 5 Chemoheterotrophic Metabolism- Anaerobic respiration and fermentation****Hours: 05**

Fermentation - Alcohol fermentation and Pasteur effect; lactate fermentation (homofermentative and heterofermentative pathways), concept of linear and branched fermentation pathways.

**Unit 6 Eukaryotic Cell Structure and functions****Hours: 18**

Eukaryotic cell organelles: nucleus, endoplasmic reticulum, golgi apparatus, mitochondria, chloroplast, lysosomes, peroxisomes, protein sorting and transport, cytoskeleton and cell movement, the plasma membrane.

Signal transduction – Receptors involved in signal transduction, extracellular matrix and cell interactions.

Introduction to cell signalling: components of various signalling pathways, downstream effects of signalling on cell adhesion, cellular differentiation, cell cycle and apoptosis.

Stem cells and their applications.

**PRACTICALS****CREDITS: 2****TOTAL HOURS: 60**

1. Study and plot the growth curve of *E. coli* by turbidometric and standard plate count methods.
2. Calculations of generation time and specific growth rate of bacteria from the graph plotted with the given data.
3. Effect of temperature, pH and salt on growth of *E. coli*.
4. Demonstration of alcoholic fermentation.
5. Demonstration of the thermal death time and decimal reduction time of *E. coli*.
6. Isolation and enumeration of bacteriophages (PFU) from water/sewage sample using double agar layer technique.
7. Study of permanent slides of protozoans
8. Study of morphological characteristics of fungi
9. Study of morphological characteristics of algae.
10. Study of the structure of cell organelles through electron micrographs.
11. Cytochemical staining of DNA (Feulgen stain).

**SUGGESTED READING (Latest Editions)**

- Alberts B, Johnson A, Lewis J, Raff M, Roberts K, Walter P. Molecular Biology of The Cell. Garland science, Taylor and Francis group.

- Carter J and Saunders V. Virology: Principles and Applications. John Wiley and Sons.
- Cooper GM and Hausman RE. The Cell: A Molecular Approach. ASM Press and Sunderland, Washington, D.C., Sinauer Associates, MA.
- De Robertis EDP and De Robertis EMF. Cell and Molecular Biology. Lipincott Williams and Wilkins, Philadelphia.
- Dimmock NJ, Easton AL and Leppard KN. Introduction to Modern Virology. Blackwell Publishing Ltd.
- Flint SJ, Enquist LW, Krug RM, Racaniello VR and Skalka AM. Principles of Virology, Molecular biology, Pathogenesis and Control. ASM press Washington DC.
- Gottschalk G. Bacterial Metabolism. Springer Verlag
- Levy JA, Conrat HF and Owens RA. Virology. Prentice Hall publication, New Jersey.
- Lodish H, Berk A, Kaise C, Krieger M, Scott M, Bretscher A, Ploegh H and Matsudaira P. Molecular cell biology .W. H. Francis and company, New York.
- Madigan MT and Martinko JM. Brock Biology of Microorganisms. Prentice Hall International Inc.
- Moat AG and Foster JW. Microbial Physiology. John Wiley and Sons
- Reddy SR and Reddy SM. Microbial Physiology. Scientific Publishers India.
- Stanier RY, Ingrahm JI, Wheelis ML and Painter PR. General Microbiology. McMillan Press.
- Verma PS and Agarwal PK. Genetics, Molecular biology, Evolution and Ecology. S. Chand.
- Wagner EK and Hewlett MJ. Basic Virology. Blackwell Publishing.
- Willey JM, Sherwood LM and Woolverton CJ. Prescott's Microbiology. McGraw Hill Higher Education.

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## D 3.3 Minutes of the meeting of the Board of Studies in French held on 11/08/2017

Annexure I

**GOA UNIVERSITY**  
**Department of French and Francophone Studies**  
**Syllabus of TYBA Honours Programme as per CBCS**

**TYBA HONOURS**

**SEMESTER V**

DS CODE	COURSE CODE	COURSE TITLE	CREDIT	REFER
DSC 9	FRCC-05	Advanced French Grammar and Composition 1	4	A1
DSC 10	FRCCH-05	Stylistics and Rhetorics	4	A2
DSC 11	FRCCH-06	Readings in French Literature- 17 <sup>th</sup> and 18 <sup>th</sup> Centuries	4	A3
DSE 1	FRCE-01	Study of Cultural Objects	4	A4
DSE 2	FRCE-02	Business Communication in French	4	A5
DSE 3	FRCE-03	Contemporary France- Issues and Debates	4	A6

**SEMESTER VI**

DS CODE	CODE	COURSE TITLE	CREDIT	REFER
DSC 12	FRCC-06	Advanced French Grammar and Composition 2	4	A7
DSC 13	FRCCH-07	Introduction to Translation Studies	4	A8
DSC 14	FRCCH-08	Readings in French Literature – 19 <sup>th</sup> Century	4	A9
DSE 4	FRCE-04	French through Francophone texts	4	A10
DSE 5	FRCE-05	Study of French Cinema	4	A11
DSE 6 / DSP	FRCE-06	Project	4	A12

\* In lieu of one of the DSE's, a compulsory Discipline Specific Project (DSP) has to be taken up

**GOA UNIVERSITY**  
**Department of French and Francophone Studies**  
**Syllabus of TYBA Honours Programme ( as per CBCS)**

**TYBA Honours**  
**SEMESTER V**  
**Course Code: DSC 9**  
**FRCC-05 Advanced French Grammar and Composition 1**

**Credits : 4**  
**Hours : 60**

**Marks:100**

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**Aims:** This course aims at consolidating and enhancing the skills previously acquired. More specifically it aims at further developing the ability to:

- communicate orally and in writing in social and professional situations,
- reflect on and talk about own experiences and cultural background;
- read and analyse documents in the target language ( press, short stories etc)
- write compositions on subjects of personal interest

Secondly, it introduces students to intercultural awareness and skills. It aims, firstly, at enabling them to rapidly integrate a multicultural social or academic environment in a French speaking country:

- socially position themselves in relation to the French culture
- use multimedia and internet tools for language learning, information retrieval and communication in French.

**Learning Outcomes:** At the end of the course, students will be expected to demonstrate their ability:

- to initiate and to respond to requests in a variety of contexts,
- to express themselves in a manner appropriate to the situation in which they find themselves.

### **Course content**

#### **Module 1- Oral Skills- Listening and spoken interaction + production (1credit)**

- Pronunciation, intonation , rythme-understand the different accents and registers in French  
-comment on a wide range of topics and participate in debates on Education, Vacations, Theatre in France, Politics

#### **Module 2- Reading Skills (1 credit)**

-Read text from newspapers, journals, emails, advertisements, extracts of interviews, tourist brochures and short literary passages

#### **Module 3- Writing Skills (1 credit)**

-Write essays on a wide range of topics discussed during the semester  
-Writing formal and informal letters

#### **Module 4- Grammar and vocabulary (1 credit)**

-Past tense, Passé composé and Imparfait, Si+imparfait, pronoun COD and Agreement with avoir. Conditional, Past conditional tense, Present subjunctive.  
-Adverbs.  
-Expressions to express condition, restriction, hypothesis, cause and consequence  
-Vocabulary specific to: holidays, touristic activities, feelings and emotions, ecology, Politics, education, sms language

**PRESCRIBED TEXT BOOK : A PROPOS B1/ VERSION ORIGINALE -3 / Panorama 3**

**Teaching Methodology:**

Teaching methods and syllabus are based on the introduction of students to principles of autonomous and self-directed learning and LSP methodologies. This module will contain LSP in various media and forms of presentation (oral: lectures; audio-visual: TV, video; ICT: Internet, CD-ROMs). Independent work (group and individual) .Exercises in task setting and fulfilling

Course taught in **French**

## **BIBLIOGRAHY**

### **Textbooks**

Abbadie C. (1994) L'expression française écrite et orale. Grenoble : PUG flem.  
Alter Ego 3, Hachette  
A Propos B1, PUG  
Boularès, M. & Frérot J-L. (1999) Grammaire progressive du Français niveau avancé, avec 400 exercices. Paris : CLE International  
Chovelon, B. & Barthe, M (2002) Expression et style, français de perfectionnement. Grenoble : PUG  
Connexions 3, Didier  
Compréhension écrite B1 / B2, CLE  
DELFB1/B2 200 activités, CLE  
GRÉGOIRE M., Grammaire progressive du français : niveau débutant, CLE.  
ROWLINSON et al., Oxford Paperback French Dictionary & Grammar, OUP.  
Panorama 3, CLE by Jacky Girardet and Jean-Marie Cridlig  
Saisons3 Niveau B1, Didier  
VERSION ORIGINALE3, Méthode de français, Student's Book, (sold with CD and DVD), Paris, Éditions Maison des langues.  
VERSION ORIGINALE3, Méthode de français, A French Course for English Speakers, Workbook, Paris, Éditions Maison des langues.

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**GOA UNIVERSITY**  
**Department of French and Francophone Studies**  
**Syllabus of TYBA Honours Programme ( as per CBCS)**

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**TYBA Honours**  
**SEMESTER V**  
**Course Code: DSC 10**  
**FRCCH-05 Stylistics and Rhetorics**

**Credits : 4**

**Hours: 60**

**Marks:100**

**Aims :** This course aims at introducing students to several stylistic and rhetorical forms and reading and analyzing texts to explain use of stylistic and rhetorical strategies. The course also



aims at improving written skills in different styles and contexts representing a wide variety of prose styles and genres.

**Learning outcomes:** The student will be able to

- analyze and interpret samples of good writing that include a variety of nonfiction selections to identify and explain use of rhetorical strategies and techniques
- read a variety of fiction, poetry and drama to gain an understanding of how various effects are achieved by writers' linguistic and rhetorical choices
- write in informal contexts to become increasingly skillful in creating and maintaining one's own voice, using appropriate words, varying sentences structure, increasing coherence and controlling tone
- *write for a variety of purposes: complete narrative, expository, analytical and argumentative writing assignments that are based on readings that represent a wide variety of prose styles and genres*
- *analyze visual images (art, paintings, advertisements, graphs, cartoons etc)*

### Course work

#### Module 1

- Introduction– theoretical definition of stylistics and rhetorics. Concept of style.
- Poetic function of language – codes, versification, syllabism, rhyme and stanza.

**(1 credit)**

#### Module 2

- Figures of style : comparisons, metaphors, metonymy and synecdoque.

**(1 credit)**

#### Module 3

Language registers

**(2 credits)**

**PRESCRIBED TEXT BOOKS :** Selected bibliography included

#### Teaching Methodology:

Teaching methods and syllabus are based on the introduction of students to principles of autonomous and self-directed learning and LSP methodologies. This module will contain LSP in various media and forms of presentation (oral: lectures; audio-visual: TV, video; ICT: Internet, CD-ROMs). Independent work (group and individual research projects).

Course taught in **French**

#### Bibliography

Groupe µ (J. Dubois, F. Edeline, J.-M. Klinkenberg, P. Minguet, F. Pire, H. Trinon), *Les Exercices de style de Queneau Rhétorique générale*, Paris, Seuil, 1982 (Centre d'études poétiques, université de Liège)

BARTHES, Roland, *L'ancienne rhétorique*, in *L'aventure sémiologique*, Paris, Seuil, 1985.

DUPRIEZ, Bernard, *Gradus. Les procédés littéraires*, Paris, UGE, 1984.

FONTANIER, Pierre, *Les figures du discours* (intr. G. Genette), Paris, Flammarion, 1997.

MOLINIE, Georges, *Dictionnaire de rhétorique*, Paris, Librairie Générale Française, 1992.

MILLY, Jean, *Poétique des textes*, Paris, Nathan, 1992.

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GOA UNIVERSITY  
Department of French and Francophone Studies  
Syllabus of TYBA Honours Programme ( as per CBCS)

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TYBA Honours  
SEMESTER V  
Course Code: DSC 11  
FRCCH-06 Readings in French Literature- 17<sup>th</sup> and 18<sup>th</sup> Centuries

Credits : 4  
Hours:60

Marks:100

**Aims:** The course functions as an introduction to French literature through texts of varied length from the 17<sup>th</sup> and 18<sup>th</sup> century periods and genres with a focus on the use of language. It is meant to build a familiarity with the literature of France, especially literature falling into the broad genres of poetry, drama and prose. Increase in French vocabulary, improvement in speaking and comprehension, along with knowledge and appreciation of several *chefs d'oeuvre littéraires* will be focussed on in this course.

**Learning Outcomes:** After completing the course, students will be able to:

- Recognize and make connections between the literary texts and various historical aspects of French culture
- Identify the major intellectual and literary movements that correspond to the works studied
- Make oral presentations and write essays and exposés in french.

**Course content**

**Module 1- *Le classicisme*- The movement, historical background, features, main authors (Racine, Moliere, Corneille, La Fontaine)**

Study of literary extracts from works of the above authors.

(2 Credits)

**Module 2- Les Lumières – The Philosophers of the Age of Enlightenment- Historical background, main works, main authors.( Voltaire, Montesquieu, Beaumarchais, Rousseau)**

Choice of one novel/ play in *texte facile*.

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(2 Credits)

**PRESCRIBED TEXT BOOKS** : Selected bibliography included

**Teaching Methodology:**

Teaching methods and syllabus are based on the introduction of students to principles of autonomous and self-directed learning and LSP methodologies. This module will contain LSP in various media and forms of presentation (oral: lectures; audio-visual: TV, video; ICT: Internet, CD-ROMs). Independent work (group and individual research projects).

Course taught in **French**

**BIBLIOGRAPHY**

[Ferroudja Allouache](#) , [Nicole Blondeau](#), Littérature progressive du français, niveau debutant, avec 600 activités, CLE

[Ferroudja Allouache](#) , [Nicole Blondeau](#), Littérature progressive du français, niveau intermédiaire, avec 650 activités, CLE

Lagarde et Michard : Littérature du XVIIe siècle

Lagarde et Michard : Littérature du XVIIIe siècle

P.-G. **Castex**, P.Surer, G.Becker **Histoire de la littérature française, Hachette**

C. Desaintghislain, C. Morisset, P. Rosenberg, F. Toulze, P. Wald Lasowski, Français Littérature - Édition 2011, Nathan

**WEBSITES**

<https://www.britannica.com/art/French-literature>

<http://www.litteratureaudio.com/>

<http://www.lire-des-livres.com/>

<http://matierevolution.org/spip.php?article3499> \ <http://www.cndp.fr/crdp-amiens/cddpoise/mediatheque/plus-de-100-000-livres-en-ligne.html>

<http://www.youscribe.com/>

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GOA UNIVERSITY  
Department of French and Francophone Studies  
Syllabus of Honours Programme ( as per CBCS)

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Honours  
SEMESTER  
Course Code: DSE 1

## FRCE-01 Study of Cultural Objects

**Credits:** 4

**Hours:** 60

**Marks:**100

**Aims:**This course aims at strengthening the base in French language by exploring contemporary Francophone societies through their cultural objects. Cultural objects (people, artefacts, signs, objects, rituals, historical events, etc.) are symbolic figures that play an essential role in constructing and maintaining national and social imagination, as well as establishing a collective identity. This course investigates a range of cultural objects shared by the francophones in the areas of history and culture, work and education, celebrities, daily life, food. Participants will reflect critically on these iconic figures and assess the way they interrelate with each other so as to form a cultural grammar. Simultaneously, participants will be led to conduct a critical appraisal of their own iconic figures. All the materials used in this course will be in French.

**Learning Outcomes:** At the end of the course, students will be able

- to read, understand and appreciate cultural objects and their role in contemporary French society
- to evaluate cultural objects in other francophone countries and understand their specificity to the country and the eventual difference vis-à-vis France.
- to identify and evaluate Indian cultural objects and their place in life in modern India
- to produce short texts describing and analysing Indian cultural objects with the effective use of short text writing techniques.

Furthermore, students will be able to

- better understand life in France and French society
- better understand the Indian collective identity
- learn basic techniques of translating and defining language specific cultural terms

### **Course content :**

**Module 1-**Studying French cultural objects through selected texts and images and the interrelation between them.

**(1credit)**

**Module 2-**Initiation to selected cultural objects of Francophone countries (two countries)

**(2credits)**

**Module 3-**Identification and appraisal of Indian cultural icons.

Production of texts describing and analysing Indian cultural objects using creative writing techniques

**(1credit)**

### **PRESCRIBED TEXT BOOKS :** ,

MEYER Denis, Clés pour la France en 80 icônes culturelles: pour comprendre la France et les Français / Buch, Hachette

Njike, J (2003), Civilisation Progressive de la Francophonie 500 activités-Niveau Intermédiaire, CLE International

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Njike, J (2005), *Civilisation Progressive de la Francophonie 350 activités-Niveau Débutant*, CLE International

**Teaching Methodology:** Teaching methods and syllabus are based on the introduction of students to principles of autonomous and self-directed learning and LSP methodologies. This module will contain LSP in various media and forms of presentation (oral: lectures; audio-visual: TV, video; ICT: Internet, CD-ROMs). Independent work (group and individual). Exercises in task setting and fulfilling

Course taught in **French**

**BIBLIOGRAPHY**

WAGLE, MEYER, *Au Bord de l'Inde, portraits d'objets, d'icônes et de célébrités*, Editions GOYAL

Roland BARTHES, *Mythologies*

Richard BERNSTEIN, *Fragile Glory - A Portrait of France and the French*, Plume, New York, 1990

Ina CARO, *The Road from the Past - Traveling through History in France*, A Harvest Book, 1994

Raymonde CARROLL, *Cultural Misunderstandings - The French-American Experience*, Univ. of Chicago Press, 1987

Charles DICKENS, *Dickens in France, Selected pieces by Charles Dickens on France and the French*, In Print Publishing Ltd., Brighton, 1996

Dominique FRISCHER, *La France vue d'en face - L'image de la France analysée et jugée par*

Sudhir HAZAREESINGH, *How the French Think. An Affectionate Portrait of an Intellectual People*, Penguin, 2015

Sanche DE GRAMONT, *The French - Portrait of a People*, Putnam's Sons, New York, 1969J.

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**GOA UNIVERSITY**  
**Department of French and Francophone Studies**  
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**TYBA Honours**  
**SEMESTER V**  
**Course Code: DSE 2**  
**FRCE-02 Business Communication in French**

**Credits : 4**

**Hours : 60**

**Marks:100**

**Aims:** This course introduces students to a specialized business language in order to help them to work and succeed in an international French-speaking environment. It lays emphasis on oral and written communication, as well as the acquisition of a business and commercial vocabulary dealing with the varied activities of a commercial firm. It aims, at

- introducing students to the cultural and commercial etiquettes in Francophone societies.
- developing student's linguistic skills and working knowledge of the vocabulary and expressions used in business transactions

- helping students imagine and construct a letter of interest for a position in a French-speaking company and also plan a strategy for responding to a French interview and determine its efficiency by participating in a job interview in French.
- Analyzing a product, its potential success and devise a marketing campaign in French.

Furthermore, the course will engage students with the working world through practice in the job search process, CV preparation, interviewing, interacting and performing in a French-speaking working environment. In doing so, students will draw on valuable crossover skills from their own culture and their native language.

**Learning Outcomes:** At the end of the course, students will be expected to demonstrate a marked ability to communicate in the target language, in particular to

- develop specialized terminology for the French-speaking workplace and use appropriate vocabulary/expressions and appropriate manners to hold business conversations
- acquire basic knowledge of French socio-cultural values, which often inform French ways of doing business
- design and compose their CV in French and appear for an interview in french

#### **Course content**

##### **Module 1- Apply for a Job**

**(1 credit)**

-Job search, Job application: Cover letter and CV,  
-the fundamentals of a formal job interview: Prepare for an Interview, Do's and Don't during an interview. Simulation: Job Interview

##### **Module 2-Oral business communication:**

**(1 credit)**

-receiving calls & leaving voicemails  
- exchanging information on the phone  
- checking & clarifying facts & figures  
- making polite requests & enquiries  
- talking about professional experiences  
- delivering a presentation

##### **Module 3-Written business communication**

**(1 credit)**

Business Letter and email  
Writing letters following up sales  
Taking notes for a presentation  
Report writing

##### **Module 4- Marketing**

**(1credit)**

-Introducing one's own company and product description  
-Placing an order, making a payment  
-study of advertisements and publicity material

**PRESCRIBED TEXT BOOK :** Selected bibliography and recommended websites included

**Teaching Methodology:** The general methodological principles adopted for this course are based on integrating all four skills (reading, writing, speaking and listening) into highly motivational activities where the student is the protagonist, and in doing so reflects real life. Teaching

methods and syllabus are based on the introduction of students to principles of autonomous and self-directed learning and LSP methodologies. This module will contain LSP in various media and forms of presentation (oral: lectures; audio-visual: TV, video; ICT: Internet, CD-ROMs). Independent work (group and individual) .Exercices in task setting and fulfilling. Role-plays will be used to reinforce the content learnt.

Course taught in **French**

### **BIBLIOGRAPHY**

La correspondance commerciale française. Nathan  
Le français de l'entreprise  
Penfornis, J L. Vocabulaire progressif du français des Affaires- IntermediaireCLE International  
Larousse, 500 lettres pour tous les jours  
Close, Le français du monde de travaille PUG  
Scénarios professionnels 1 & 2  
La pratique de l'expression écrite, Nathan  
Penfornis, Le français de la communication professionnelle.  
Communication progressive du français des Affaires- Intermediaire CLE International  
Objectif Express 1 Nouvelle Edition  
Affaires A suivre  
Affaire.com  
Comment vont les affaires ?  
Bloomfield, Anatole , Tauzin, Béatrice ,*Affaires à suivre*  
Calmy, Anne-Marie *Le français du tourisme*  
Sanchez-Macagno, Marie-Odile, Corado, Lydie, *Faire des affaires en français : analyser-  
s'entraînercommuniquer,*

### **WEBSITE**

<http://www.ciel.fr/learn-french/business-french-exercises.htm>

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**GOA UNIVERSITY**  
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**TYBA Honours**  
**SEMESTER V**  
**Course Code: DSE3**  
**FRCE-03 Contemporary France- Issues and debates**

**Credits : 4**

**Hours : 60**

**Marks:100**

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**Aims:** This course is intended to investigate current issues and debates taking place in France today, and to examine the way these issues are presented in the French and international media. The notions of French cultural identity and national citizenship will be looked at, as well as France's relations with its European neighbours and with the rest of the world. To provide essential references in support of the discussions, the course will bring in background information on various aspects of France, its government and its political, social, demographic environment. At the same time the course will relate these facts to significant moments of the country's recent history, such as the post-war period of recovery, the decolonization process, the construction of the Francophone community, the European Union project, students' and workers' upheavals, and the current debates related to immigration and integration.

**Learning Outcomes:** Students will be better equipped with the language skills required to present an issue and take a stand on it. They will have gained a deeper understanding of the issues of concern in contemporary French society.

### **Course content**

#### **Module 1- Global challenges ( ANY 2) (1 credit )**

- Economic Issues
- Environmental Issues
- Health Issues
- Human Rights
- Nutrition and Food Safety
- Peace and War

#### **Module 2- Families and Communities (ANY 2) (1 credit )**

- Age and Class
- Citizenship
- Customs and celebrations
- Family Structures
- Housing and Shelter
- Beliefs and Values

#### **Module 3- Contemporary Life and Identities (ANY 2) (1 credit )**

- Education and Travel
- Leisure and Sports
- Multiculturalism
- Nationalism and Patriotism
- Alienation and Assimilation
- Language and Identity

#### **Module 4- Science and Technology (ANY2) (1 credit )**

- Discoveries and Inventions
- Ethical Questions
- Future Technologies
- Intellectual property
- The New Media
- Social Impact of Technology

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**PRESCRIBED TEXT BOOK** : Selected bibliography and recommended websites included

**Teaching Methodology:** The course is designed around a series of themes thus promoting the inclusion of a variety of language concepts into a context that is interesting, meaningful and worth exploring. Themes provide an integrated approach to teaching and learning, bring content to the language lesson and connect the modes of communication in meaningful ways. They help teachers integrate language, content and culture into an interrelated series of lessons and activities that promote the use of the language in a variety of contexts.

The themes are indicative in nature and are meant to serve as a *point de départ* towards meaningful discussions in class. The course content delivered through the LSP methodologies will be augmented through conversation classes stressing on debates and discussions among the students.

Course taught in **French**

**BIBLIOGRAPHY**

Mauchamp, Nelly. La France D'aujourd'hui : civilisation. CLE international

**WEBSITES**

<http://www.rfi.fr/>

<http://www.francetvinfo.fr/>

<https://www.scienceshumaines.com/>

<https://asia.tv5monde.com/>

<http://la1ere.francetvinfo.fr/>

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**GOA UNIVERSITY**  
**Department of French and Francophone Studies**  
**Syllabus of TYBA Honours Programme ( as per CBCS)**

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**TYBA Honours**  
**SEMESTER VI**  
**Course Code: DSC12**  
**FRCC-06 Advanced French Grammar and Composition 2**

**Credits : 4**

**Hours : 60**

**Marks:100**

**Aims:** This course aims at consolidating and enhancing the skills previously acquired. More specifically it aims at further developing the ability to:

- communicate orally and in writing in social and professional situations,
- reflect on and talk about own experiences and cultural background;
- read and analyse documents in the target language ( press, short stories etc)
- write compositions on subjects of personal interest

Secondly, it introduces students to intercultural awareness and skills. It aims, firstly, at enabling them to rapidly integrate a multicultural social or academic environment in a French speaking country:

- socially position themselves in relation to the French culture

- use multimedia and internet tools for language learning, information retrieval and communication in French.

**Learning Outcomes:** At the end of the course, students will be expected to demonstrate their ability:

- to initiate and to respond to requests in a variety of contexts,
- to express themselves in a manner appropriate to the situation in which they find themselves.

### **Course content**

#### **Module 1- Oral Skills- Listening and spoken interaction + production (1credit)**

- pronunciation, intonation, rhythm
- understand the different accents and registers in French
- comment on a wide range of topics and participate in debates on Cinema, Reality shows Francophony, French poetry, Music, Business, Press.

#### **Module 2- Reading Skills (1 credit)**

- comprehension of specialised texts, scientific and journalistic articles, film reviews.

#### **Module 3- Writing Skills (1 credit)**

- Write essays on a wide range of topics discussed during the semester
- Precise writing.

#### **Module 4- Grammar and vocabulary (1 credit)**

- Indirect speech. Suffixes. Passive, active voice.
  - Frequently used impersonal verbs,
  - Prepositions, Characterisation of nouns, Qualifying adjectives, Placement of adjectives,
  - Expressions of resemblance, difference, comparison
- Vocabulary specific to: Cinema, Work, natural disasters, written press, Television shows, neologisms

**PRESCRIBED TEXT BOOK : A PROPOS B1/ VERSION ORIGINALE -3/ PANORAMA 3**

#### **Teaching Methodology:**

Teaching methods and syllabus are based on the introduction of students to principles of autonomous and self-directed learning and LSP methodologies. This module will contain LSP in various media and forms of presentation (oral: lectures; audio-visual: TV, video; ICT: Internet, CD-ROMs). Independent work (group and individual). Exercises in task setting and fulfilling

Course taught in **French**

### **BIBLIOGRAPHY**

#### **Textbooks**

Abbadie C. (1994) L'expression française écrite et orale. Grenoble : PUG flem.  
Alter Ego 3, Hachette  
A Propos B1, PUG

Boularès, M. & Frérot J-L. (1999) Grammaire progressive du Français niveau avancé, avec 400 exercices. Paris : CLE International  
Chovelon, B. & Barthe, M (2002) Expression et style, français de perfectionnement. Grenoble : PUG  
Connexions 3, Didier  
Compréhension écrite B1 / B2, CLE  
DELFB1/B2 200 activités, CLE  
GRÉGOIRE M., Grammaire progressive du français : niveau débutant, CLE.  
ROWLINSON et al., Oxford Paperback French Dictionary & Grammar, OUP.  
Panorama 3, CLE by Jacky Girardet and Jean-Marie Cridlig  
Saisons3 Niveau B1, Didier  
VERSION ORIGINALE3, Méthode de français, Student's Book, (sold with CD and DVD), Paris, Éditions Maison des langues.  
VERSION ORIGINALE3, Méthode de français, A French Course for English Speakers, Workbook, Paris, Éditions Maison des langues.  
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**GOA UNIVERSITY**  
**Department of French and Francophone Studies**  
**Syllabus of TYBA Honours Programme ( as per CBCS)**

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**TYBA Honours**  
**SEMESTER VI**  
**Course Code: DSC 13**  
**FRCCH-07 Introduction to translation Studies**

**Credits : 4**

**Hours : 60**

**Marks:100**

**Aims:**The course is designed to introduce students to basic concepts of translation theory, Linguistics and comparative stylistics. It is focused on the history, theory, and practice of **translation**. It has been designed to ensure that theoretical knowledge goes hand in hand with a practical understanding.

The main goal of this course is to

- initiate students to basic translation techniques
- introduce students to translation studies as separate discipline of knowledge
- enable them to link theory and practice
- develop students' contrastive knowledge and their critical thinking skills
- and improve students' writing skills and language fluency through the practice of translation.

**Learning Outcomes:**At the end of the course, students will be able

- to translate different types of general texts and documents from French to English
- To translate elementary texts into French
- to understand structures and functions of languages in general
- to understand the differences between the source and target languages and cultures
- to understand the limits and effectively use modern technology as a translation tool

Furthermore, students will be able to

- produce a short glossary of specialised terms
- translate and define culture specific terms.

### **Course content**

#### **Module 1.Introduction to Linguistics**

A introduction to linguistics: This module introduces the structures and functions of languages. (Characteristics of Human Language, Language and Communication, Language Functions and relation between Language and Culture)

**(1 credit)**

#### **Module 2.Translation Theory**

This module introduces the different schools of translation and their applications to help students achieve a systematic understanding of translation. It reveals to students the fundamental workings of translation through analysis and interpretation of cases drawn from daily life.

**(1 credit)**

#### **Module 3.Contrastive Stylistics**

This module presents students with a systematic comparison of the English and French languages from the macro to the micro points of view, so as to deepen their understanding of the nature of the two languages and enable them to handle problems encountered in the process of translation more competently.

**(1 credit)**

#### **Module 4.Use of Translation resources and Translation Practice**

-Types of texts and their translations, to demonstrate their stylistic and linguistic features and recommends strategies to translate them. It covers genres such as basic business documents, news reports and texts from elementary literary works to raise students' awareness of styles and techniques.

-Use of translation resources

Identification of common problems in translation and their solutions. It helps students to make effective use of translation resources in the information age .

**(1 credit)**

**PRESCRIBED TEXT BOOKS :** Selected bibliography included – Books are available in the library or the Department

**Teaching Methodology:** Learning centre, interactive and experiential.

Introductory lectures by instructor followed by guided practice, Group work and individual work.

Course taught in **French/English**

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## **BIBLIOGRAPHY**

- Baker, Mona (1992): *In Other Words: A Coursebook on Translation*, London/New York: Routledge.
- Ballard, Michel (1984): *La Traduction de la théorie — la didactique : études*, Université de Lille III .
- Ballard, M. (ed.) (1990): *La traduction plurielle*, Lille: Presses universitaires de Lille.
- Ballard, Michel (1995): *De Cicéron à Benjamin: traducteurs, traductions, réflexions. Étude de la traduction*, Lille: Presses universitaires de Lille.
- Berman, Antoine (1999) : *La traduction et la lettre ou l'Auberge du lointain*, Paris: Seuil.
- Brisset, Annie (1998) "L'identité culturelle de la traduction. En réponse à Antoine Berman", *Palimpsestes* 11, pp. 31-51.
- Catford, J. C. (1965): *A Linguistic Theory of Translation: An Essay in Applied Linguistics*, Oxford University Press.
- Chesterman, Andrew (1989): *Readings in translation theory*, Helsinki: Finn Lectura.
- Delisle, Jean (1981): *L'enseignement de l'interprétation et de la traduction: de la théorie a la pédagogie*, Ottawa : Editions de l'Université d'Ottawa.
- Delisle, J. (1982): *L'analyse du discours comme méthode de traduction : initiation — la traduction française de textes pragmatiques anglais;*
- Théorie et pratique*, Ottawa : Editions de l'Université d'Ottawa.
- Holmes, James S. (1988): *Translated! Papers on Literary Translation and Translation Studies*, Amsterdam: Rodopi.
- Holmes, James S. et al. (ed.) (1970): *The Nature of Translation: Essays in the Theory and Practice of Literary Translation*, The Hague: Mouton.
- Holmes, J. S. et al. (eds.) (1978): *Literature and Translation: New Perspectives in Literary Studies*, Leuven: Acco.
- Ladmiral, Jean-René (1979) *Traduire : théorèmes pour la traduction*. Paris: Payot.
- Lederer, Marianne & D. Seleskovitch (1981): *La traduction simultanée –Fondements théoriques*, Paris: Minard Lettres Modernes.
- Lederer, M. (1994): *La traduction aujourd'hui - le modèle interprétatif*, Paris:Hachette.
- Lederer, M. & D. Seleskovitch (1993): *Interpréter pour traduire*, 3rd ed., Paris: Didier Erudition.
- Lederer M. & D. Seleskovitch (2001): *Pédagogie raisonnée de l'interprétation*, Margot, Jean-Claude (1979): *Traduire sans trahir : la théorie de la traduction et son application aux textes bibliques*, Lausanne: Age d'homme.
- Mounin, Georges (1955): *Les belles infidèles*, Paris: Cahiers du Sud.
- Mounin, G. (1963): *Les problèmes théoriques de la traduction*, Paris: Gallimard.
- Mounin, G. (1976) : *Linguistique et traduction* , Brussels: Dessart& Mardaga1976.
- Newmark, Peter (1981): *Approaches to Translation* Oxford/New York: Pergamon.
- Newmark, P. (1988): *A Textbook of Translation*, New York/London: Prentice Hall.
- Nida, Eugene (1964): *Toward a Science of Translating*, Leiden; E. J. Brill.

Nida, A. & C. R. Taber (1969): The Theory and Practice of Translation, Leiden: E. J. Brill.

Shuttleworth, M. & M. Cowie (1997): Dictionary of Translation Studies, Manchester: St Jerome Press.

Snell-Hornby, Mary et al. (ed.) (1994): Translation Studies: An Interdiscipline, Amsterdam: John Benjamins.

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Toury, G. (1995): Descriptive Translation Studies and Beyond, Amsterdam:JohnBenjamins.

Van Hoof, Henri (1991): Histoire de la traduction en Occident: France, Venuti, Lawrence (ed.) (1992): Rethinking Translation: Discourse, Subjectivity, Ideology, London: Routledge.

Vinay, J.P. & J. Darbelnet (1967): Stylistique comparée du français et de l'anglais, Paris: Didier; Eng.Trans.

J. M. Sager & M.-J. Hamel, Comparative Stylistics of French and English: A Methodology for Translation, Amsterdam: John Benjamins, 1995.

[Hélène Chuquet](#), [Michel Paillard](#): Approche linguistique des problèmes de traduction anglais-- français Editions OPHRYS, 1987

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**GOA UNIVERSITY**  
**Department of French and Francophone Studies**  
**Syllabus of TYBA Honours Programme ( as per CBCS)**

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**TYBA Honours**  
**SEMESTER VI**  
**Course Code: DSC 14**  
**FRCCH-08 Readings in French Literature- 19<sup>th</sup> Century**

**Credits : 4**

**Hours : 60**

**Marks:100**

**Aims:** This course presents a survey of French authors and literary movements of the 19th century. Emphasis will be placed on the literary ideas and styles that emerged during this period. The discussions will also cover the most important moments in French history of the time as imagined and rendered by writers.

**Learning Outcomes:**

- At the end of the course, students will be able to

- demonstrate knowledge and understanding of 19<sup>th</sup> century French culture and society through the study of major modern literary works.
- identify and trace the development of major themes that appear in the texts studied
- demonstrate the ability to read and to discuss perceptively representative works of French literature.
- understand various cultural aspects and social issues of the period under discussion.
- identify and describe the major literary movements the texts reflect, including romanticism, realism and naturalism, symbolism.

### Course content

#### **Module 1- Romanticism and Realism - The movements, historical background, features, main authors ( Hugo, Lamartine, Balzac)**

Study of a selection of extracts and poems from works by above authors.

**(2 Credits)**

#### **Module 2- Naturalism and Symbolism- The movements, historical background, features, main authors ( Maupassant, Zola, Baudelaire)**

Study of a selection of extracts and poems from works by above authors.

**(2 Credits)**

**PRESCRIBED TEXT BOOK** : Selected bibliography and recommended websites included

**Teaching Methodology:** Teaching methods and syllabus are based on the introduction of students to principles of autonomous and self-directed learning and LSP methodologies. This module will contain LSP in various media and forms of presentation (oral: lectures; audio-visual: TV, video; ICT: Internet, CD-ROMs). Independent work (group and individual research projects).  
Course taught in **French**

### **BIBLIOGRAPHY**

[Ferroudja Allouache](#) , [Nicole Blondeau](#), Littérature progressive du français, niveau debutant, avec 600 activités, CLE

[Ferroudja Allouache](#) , [Nicole Blondeau](#), Littérature progressive du français, niveau intermédiaire, avec 650 activités, CLE

Lagarde et Michard : Littérature du XIXe siècle

P.-G. **Castex**, P.Surer, G.Becker **Histoire de la littérature française, Hachette**

C. Desaintghislain, C. Morisset, P. Rosenberg, F. Toulze, P. Wald Lasowski, Français Littérature - Édition 2011, Nathan

### **WEBSITES**

<https://www.britannica.com/art/French-literature>

<http://www.litteratureaudio.com/>

<http://www.lire-des-livres.com/>

<http://matierevolution.org/spip.php?article3499><http://www.cndp.fr/crdp-amiens/cddpoise/mediatheque/plus-de-100-000-livres-en-ligne.html>  
<http://www.youscribe.com/>

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**GOA UNIVERSITY**  
**Department of French and Francophone Studies**  
**Syllabus of TYBA Honours Programme ( as per CBCS)**

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**TYBA Honours**  
**SEMESTER VI**  
**Course Code: DSC 4**  
**FRCE-04 French through Francophone texts**

**Credits : 4**

**Hours : 60**

**Marks:100**

**Aims:** This course focus on the study of the French language through short stories and graphic novels. The main aim is to

- develop aesthetic sensibilities, appreciation of literary beauty,
- develop different modes of proposing and furthering a point of view or argument
- improve students' writing skills and language fluency through contact with and study of these genres and formats

Through diverse readings, the students will explore the ways in which words and images structure thought, communication and interactions of individuals and societies.

**Learning Outcomes:** At the end of the course, students will be expected to demonstrate a marked ability to communicate in French, in particular to

- Identify how language is used in the different genres and formats
- Comparatively study literary texts in the short story and the graphic novel format
- Write texts in different formats
- Appreciate linguistic and cultural content from the Francophone world.

**Course content**

**Module 1- French language through short stories**

-Understanding of short stories in French. Corpus would include short stories from French and francophone literature.

**(2 Credits)**

**Module 2- French language through the Graphic novel genre**

-Readings from Comic strips and Graphic novels in French. Colloquialisms, slang, regionalisms, popular French.



-Linguistic and cultural content from the Francophone world.

**(2 Credits)**

**PRESCRIBED TEXT BOOK :** Selected bibliography and recommended websites included

**Teaching Methodology:**

Teaching methods and syllabus are based on the introduction of students to principles of autonomous and self-directed learning and LSP methodologies. This module will contain LSP in various media and forms of presentation (oral: lectures; audio-visual: TV, video; ICT: Internet, CD-ROMs). Independent work (group and individual). Exercises in task setting and fulfilling.

Course conducted in **French**

**BIBLIOGRAPHY**

FIEVET, Martine. Littérature en classe de FLE, CLE International

[Ferroudja Allouache](#) , [Nicole Blondeau](#), Littérature progressive du français, niveau debutant, avec 600 activités, CLE

[Ferroudja Allouache](#) , [Nicole Blondeau](#), Littérature progressive du français, niveau intermédiaire, avec 650 activités, CLE

Lagarde et Michard : Littérature du XIXe siècle

P.-G. **Castex**, P.Surer, G.Becker **Histoire de la littérature française, Hachette**

C. Desaintghislain, C. Morisset, P. Rosenberg, F. Toulze, P. Wald Lasowski, Français Littérature - Édition 2011, Nathan

**WEBSITES**

<https://www.britannica.com/art/French-literature>

<http://www.litteratureaudio.com/>

<http://www.lire-des-livres.com/>

<http://matierevolution.org/spip.php?article3499> \ <http://www.cndp.fr/crdp-amiens/cddpoise/mediatheque/plus-de-100-000-livres-en-ligne.html>

<http://www.youscribe.com/>

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**GOA UNIVERSITY**  
**Department of French and Francophone Studies**  
**Syllabus of TYBA Honours Programme ( as per CBCS)**

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**TYBA Honours**  
**SEMESTER VI**  
**Course Code: DSE 5**  
**FRCE-05 Study of French Cinema**

**Credits : 4**  
**Hours : 60**

**Marks: 100**

**Aims:** In this course, students will watch, discuss and analyze a dozen landmark French films through the lens of style and culture. Students will study film genres and movements in relation to social, cultural and aesthetic trends. Since French film, as in all national cinemas, is deeply tied to its country's history and culture, we will also discuss the socio-historical backgrounds in which these films were made. This course focuses on movies not primarily for their entertainment value but for their contributions to cinema as an art form and a means of commentary upon human society.

**Learning Outcomes:**

At the end of the course, students will be able to

- understand the evolution and diversity of French cinema
- develop critical thinking in analyzing the films and comparing with Hollywood/Bollywood movies.
- experience the art of cinema itself and how it represents French society and culture
- identify France's principal directors, movements, and actors

**Course content**

**Module1- Appreciating French Cinema**

**(2 credits)**

- Masterpieces of French cinema
- Characteristics of New wave Cinema.

**(2 credits)**

**Module 2- Diversity in French cinema**

- Film festivals and awards
- Les cahiers du cinema, Journals and websites
- Film reviews

**PRESCRIBED TEXT BOOK :** Selected bibliography and recommended websites included

**Teaching Methodology:**

Introductory lectures by instructor, accompanied by films and followed by class discussions. Class presentations by individuals or team of students on various directors and aspects of French society. Viewing of feature films in French with subtitles, class discussions. Writing papers on major films and creation of youtube videos

Course in **French**

**BIBLIOGRAPHY**

- Jacques Lourcelles : Dictionnaire du cinéma - Les films, coll. Bouquins, 1992  
André Bazin : Qu'est-ce que le cinéma ? Editions du Cerf , 1962  
Jean Douchet : L'art d'aimer, Cahiers du cinéma, 1970.  
Lanzoni , Rerni Fournier, French Cinema. From Its Beginnings to the Present (NY: Continuum, [2002] 2011 ). ISBN: 978-08264-1600-1

Williams, Alan: Republic of Images : A History of French Filmmaking. Cambridge : Harvard University Press, 1992.

Tim Palmer, Brutal Intimacy: Analysing Contemporary French Cinema, USA: Wesleyan University Press, 2011.

**WESITES:**

Les Leçons de Cinéma :

<http://www.youtube.com/watch?v=BMwN2JloosE&list=PL0416194348A330A5>

Quand je serai grand, je ferai cinéma ! 30 épisodes: Le Métier de... :

<http://www.youtube.com/watch?v=hUxLzpb3hjs&list=PL27830E0807C7669E>

Internet Movie Database: <http://us.imdb.com/search/>

French Film Guide: <http://www.topfrenchfilms.info/>

Film and video resources (Northwestern U.)

:<http://www.library.northwestern.edu/media/resources/film.html>

CineCritic : <http://cinecritic.free.fr/> Les frères Lumière:

[http://web.culture.fr/culture/villalum/expo\\_lum.htm](http://web.culture.fr/culture/villalum/expo_lum.htm)

Lexique du cinéma : <http://www.cegep-ste-foy.qc.ca/~cinema/LEXIQUE/LEXIQUE.HTM> Y

magin - petit lexique du vocabulaire cinématographique :

<http://sidonie9.free.fr/cine/lexique.html>

Petit lexique du cinéma : [http://www.ac-](http://www.ac-creteil.fr/sugerstedenis/audiovisuel/Lexique/Lexique.htm)

[creteil.fr/sugerstedenis/audiovisuel/Lexique/Lexique.htm](http://www.ac-creteil.fr/sugerstedenis/audiovisuel/Lexique/Lexique.htm)

Première (magazine du cinéma) : <http://www.premiere.fr/> Histoire du cinéma :

<http://netia59.ac-lille.fr/tgn/0592374k/histoireducinema.htm>

**GOA UNIVERSITY**  
**Department of French and Francophone Studies**  
**Syllabus of TYBA Honours Programme ( as per CBCS)**

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**TYBA Honours**  
**SEMESTER VI**  
**Course Code: DSE 6/ DSP**  
**FRCE -06 Project**

**Credits : 4**

**Hours : 60**

**Marks:100**

All students undertake an independent research project which culminates in a dissertation. The project can be carried out individually or in a group on any topic related to the program under the supervision of the Project guide.

Dissertations need to demonstrate knowledge and understanding of a given topic and should also reach a level of scope and depth beyond that taught in class. All dissertations must be presented according to the guidelines laid down by Goa University and in an appropriate academic style and format to ensure that the precise aims of the dissertation are met.

Students can begin working on their dissertation after semester 4 and need to submit the final copy in the prescribed format before the end of semester 6, on a date decided by the Department of French and Francophone studies. [\(Back to Index\)](#) [\(Back to Agenda\)](#)

**Aims:** The aims of the dissertation are to:

- put into practice theories and concepts learned in the programme;
- provide an opportunity to study a particular topic in depth;
- show evidence of independent investigation;
- enable interaction with practitioners (where appropriate to the chosen topic);
- show evidence of ability to plan and manage a project within deadlines

**Learning Outcomes:** After completion of the dissertation students should be able to:

- define, design and deliver an academically rigorous piece of research;
- understand the relationships between the theoretical concepts taught in class and their application in specific situations;
- show evidence of a critical and holistic knowledge and have a deeper understanding of their chosen subject area;
- appreciate practical implications and constraints of the specialist subject;
- Understand the process and decisions to be made in managing a project within strict deadlines

### **Assessment**

The dissertation is assessed on the basis of the content of the submitted document and a viva voce examination. All dissertations will be read by two internal examiners including the project guide. In addition, some dissertations may be read by an External Examiner to ensure a uniform standard is maintained.

The dissertation will be written in **French**

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**D 3.4 Minutes of the meeting of Board of Studies in Dentistry held on 17/08/2017**

**Annexure I**

**Part Amendment to Ordinance OC – 44 relating to the course of study for the degree of Master of Dental Surgery (M.D.S.)**

Ordinance Number	EXISTING PROVISION	PROPOSED AMENDMENT	JUSTIFICATION
OC-44.2	<p>The following shall be the nine areas of specialization in which the M.D.S. degree of Course is offered:</p> <ol style="list-style-type: none"> <li>1. Prosthodontics including Crown and Bridge and Implantology</li> <li>2. Orthodontics and Dentofacial Orthopaedics</li> <li>3. Oral Medicine and Radiology</li> <li>4. Periodontics</li> <li>5. Conservative, Endodontic and Aesthetic Dentistry</li> <li>6. Oral and Maxillofacial Surgery</li> <li>7. Oral Pathology, Microbiology and Forensic Odontology</li> <li>8. Pedodontics and Preventive Dentistry</li> <li>9. Community Dentistry (Preventive and Social Dentistry)</li> </ol>	<p>The following shall be the nine areas of Specialization in which the M.D.S. degree of Course is offered:</p> <ol style="list-style-type: none"> <li>1. Prosthodontics and Crown and Bridge</li> <li>2. Orthodontics and Dentofacial Orthopaedics</li> <li>3. Oral Medicine and Radiology</li> <li>4. Periodontics</li> <li>5. Conservative Dentistry and Endodontics</li> <li>6. Oral and Maxillofacial Surgery</li> <li>7. Oral Pathology and Microbiology</li> <li>8. Pedodontics and Preventive Dentistry</li> <li>9. Public Health Dentistry</li> </ol>	<p>Nomenclatures of the Specializations require to be revised as per the Dental Council of India Revise MDS Course Regulations, <b>2007</b>.</p>

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candidate must achieve a high degree of clinical proficiency in the subject matter and develop competence in research and its methodology as related to the field concerned.

The above objectives are to be achieved by the time the candidate completes the course. The objectives may be considered as under:-

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. Human values, ethical practice and communication abilities

**KNOWLEDGE:**

- Demonstrate understanding of basic sciences relevant to speciality.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problems within the speciality in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case and take them into account for planning treatment.
- Recognise conditions that may be outside the area of speciality/competence and to refer them to an appropriate specialist.
- Update knowledge by self study and by attending courses, conferences and seminars relevant to speciality.
- Undertake audit, use information technology and carryout research both basic and clinical with the aim of publishing or presenting the work at various scientific gatherings.

**SKILLS:**

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Acquire adequate skills and competence in performing various procedures as required in the speciality.

**HUMAN VALUES, ETHICAL PRACTICE AND COMMUNICATION ABILITIES:**

- Adopt ethical principles in all aspects of practice.
- Professional honesty and integrity are to be fostered.
- Patient care is to be delivered irrespective of social status, caste, creed or religion of the patient.
- Develop communication skills, in particular and skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

**SPECIALITIES FOR THE MDS DEGREE:**

- i) Prosthodontics and Crown & Bridge
- ii) Periodontology
- iii) Oral & Maxillofacial Surgery
- iv) Conservative Dentistry and Endodontics
- v) Orthodontics & Dentofacial Orthopedics
- vi) Oral Pathology & Microbiology
- vii) Public Health Dentistry
- viii) Paedodontics & Preventive Dentistry
- ix) Oral Medicine & Radiology

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**D 3.5 Minutes of the meeting of Board of Studies in Computer Science & Technology (PG) held  
on 11/08/2017**

**Annexure I**

**CST 602 – Computational Geometry & Geometric Modeling**

**Credits: 4**

**Mesh Models**

From Point Clouds to Mesh, Mesh Representations: Implicit Representations, Parametric, Transitioning between representations, Mesh types: Triangular Meshes, Polygonal Meshes, Surface fundamentals: discrete differential geometry and topology, Data structures for representing Static Triangle Meshes: Indexed Mesh storage, Triangle Strips & Fans, Data Structure for Dynamic Mesh: Triangle-neighbor Structure, Winged-Edge Structure, Half-edge Structure, Operations on meshes like Fairing, Smoothing, Remeshing etc. Distances on Mesh: Geodesics, Mesh/Geometry Processing Pipeline: Scanning, Pre-processing, Triangulation, Visualization.

**Curves and surface design**

Parametric space of curves, blending functions, Spline curves, Bezier curves, B-Spline curves, rational polynomials, cylindrical surface, ruled surface, surface of revolution, conic surfaces, composite surfaces, Bezier surface, B-spline surface

**Solid modeling**

Parametric space of solid, topology of closed path, piecewise flat surfaces, topology of closed curved surfaces, generalized concept of a boundary, set theory, Boolean operation operators, Euler operators, solid modeling representations cell decomposition and spatial occupancy enumeration, sweep representation, CSG

**Computational geometry data structures and algorithms**

Line segment intersection, orthogonal range searching, Voronoi diagrams and Delaunay triangulations, convex hull, Quadtree, orthogonal range searching kD-tree, and binary space partitioning

**Main Reading**

1. Fundamentals of Computer Graphics; Peter Shirley, Michael Ashikhmin, Steve Marschner
2. Polygon Mesh Processing, Mario Botsch, Leif Kobbelt, Mark Pauly, et al.
3. Computational geometry and computer graphics in C++ by Laszlo, Michael, Prentice Hall
4. Berg, van Kreveld, Overmars, and Schwarzkopf. Computational Geometry: Algorithms and Applications,' by (2nd ed, Springer Verlag, 2000).
5. Farin, G. E. Curves and Surfaces for Computer Aided Geometric Design. 3rd ed. Academic Press, 1993.
6. Faux, I. D., and M. Pratt. Computational Geometry for Design and Manufacture. Halsted Press,1979.
7. Lawrence, J. D. A Catalog of Special Plane Curves. Dover, 1972.
8. Mortensen, M. E. Geometric Modeling. J. Wiley, 1985.

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9. Mantyla M. An Introduction to Solid Modeling, Computer Science Press, 1988.

RELATED LINKS

<http://people.eecs.berkeley.edu/~jrs/mesh/>

<http://www.cs.ubc.ca/~sheffa/dgp/>

Ordinance	Existing Ordinance	Revised Ordinance	Justification
OB-19A.2	Eligibility and Admission to Sem-I	OB-19A.2 Revised Ordinance	Eligibility and Admission to Sem-I
	<p>Eligibility and Admission (effective from 20th September, 2014)</p> <p>1. To be eligible for admission to the three year, six semester, full time course leading to the degree of "Master of Computer Applications" (MCA), a candidate shall have:</p> <p>(i) A Graduate Degree in any discipline with at least 55% aggregate marks or equivalent grade at the first degree examination, and 50% aggregate marks or equivalent grade for OBC, ST, SC, candidates.</p> <p>(ii) Mathematics as one of the subjects at HSSCE (10+2) level or at a higher level</p> <p>.</p>	<p>Eligibility and Admission (effective from academic year 2017-18)</p> <p>Same as before</p> <p>Same as before</p> <p>Mathematics as one of the subjects at HSSCE (10+2) from Science stream</p>	<p>In the 8th meeting of VIIIth Academic Council held on 16th April 2014 and 23rd April 2014, it was resolved to revise the eligibility condition for admission to MCA program at Goa University from the academic year 2017-18. As per the revised eligibility condition, "Graduates applying to MCA programme should pass in Mathematics paper at 10+2 Science stream".</p> <p>As per the AICTE regulations, MCA programme comes under Science discipline and one of the eligibility requirements is Mathematics at 10+2.</p> <p>The syllabus for 12th Mathematics paper under CBSE is same for Science, Arts and Commerce stream. Under Goa Board, syllabus for 12th Mathematics paper for Science and Arts stream is same but for Commerce and Vocational stream it is</p>



			different.
OB-19A.6.15	New Ordinance	Eligibility and Admission to Sem-V	Eligibility and Admission to Sem-V
		Students to be admitted to Sem-V, only if they do not have a backlog of more than four courses from the preceding Semesters.	It was observed that in last 4 years, significant number of students have been failing in some of the core courses repeatedly and they continue to have backlog in Sem-I and Sem-II, even after being admitted to Sem-V.
OB-19A.6.16	New Ordinance	Eligibility for internship in Sem-VI	Eligibility for internship in Sem-VI
		Students to be allowed to take internship in the Sem-VI, only on passing in all papers till Sem-III.	All core courses in Computer Science are covered in first three semesters of MCA programme

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**D 3.6 Minutes of the meeting of Board of Studies in Mathematics held on 10/08/2017****Annexure I****ANNEXURE I****Discipline Specific Core (Mathematics) Papers for B.Sc.**

Sl. No.	Paper Code	Semester	Title	No. Of Credits.
1*	DSC 1A	I	Calculus and Numerical Methods	4+2
2.*	DSC 1B	II	Matrices and Linear Algebra	4+2
3.	DSC 1C	III	Ordinary Differential Equations and Discrete Mathematics	4+2
4.	DSC 1D	IV	Analysis and Operations Research	4+2

\* Already approved in 2016-17.

**Skilled Enhancement Courses**

Sl. No.	Paper Code	Semester	Title	No. Of Credits.
1	SEC 1	III	Statistical Methods	4
2.	SEC 2	IV	Analytical Geometry	4

**Generic Courses for Non Mathematics Students**

Sl. No.	Paper Code	Semester	Title	No. Of Credits.
1	GE-3	III	Mathematics for Competitive Examination -I	4
2.	GE-4	IV	Mathematics for Competitive Examination -II	4

**SYLLABUS OF S. Y.B. Sc. MATHEMATICS UNDER CBCS**Semester – IIICredits: 4+2**DSC 1C: Differential Equations and Discrete Mathematics****1. FIRST ORDER ORDINARY DIFFERENTIAL EQUATIONS:-**

Review of Basic concepts such as order, degree, formation, solution and their types of differential equations. First order first degree differential equation and initial value problem. Method of separation of variables. Homogeneous and Non - homogeneous differential equation. First order linear differential equations. Bernoulli's differential equation. Exact and Non – exact differential equations. Condition for exactness. Integrating factors and rules to find integrating factors. Clairaut's differential equation and differential equations reducible to Clairaut's form. Ricatti's differential equation. Applications of first order differential equations. Modeling with differential equations.

**(8 Hours)**[\(Back to Index\)](#) [\(Back to Agenda\)](#)

## 2. SECOND ORDER LINEAR DIFFERENTIAL EQUATIONS:-

General form of second order linear differential equation and its classification. Existence and Uniqueness theorem for solution of second order linear differential (Only statement). Second order homogeneous linear differential equation and its properties. Wronskian of solutions of homogeneous linear differential equation and its properties. Linear dependence and independence of solutions of homogeneous differential equation. Complementary function. Use of known solution to find second linearly independent solution of homogeneous differential equation. Homogeneous linear differential equations with constant coefficients and with variable coefficients. Method of undetermined coefficients. Method of variation of parameters. Applications of second order linear differential equations.

**(10 Hours)**

## 3. D – OPERATORS:-

D – Operator method to solve  $n^{\text{th}}$  order homogeneous linear differential equation with constant coefficients. Properties of D – Operator. Inverse D – operator and its properties. Inverse D – operator method to solve  $n^{\text{th}}$  order Non - homogeneous linear differential equation with constant coefficients  $f(D) = R(x)$ , where  $R(x) = e^{ax}$ ,  $\cos ax$ ,  $\sin ax$ , polynomial in 'x' and their products.

**(8 Hours)**

## 4. SYSTEM OF 1<sup>ST</sup> ORDER DIFFERENTIAL EQUATIONS:-

Conversion of  $n^{\text{th}}$  order differential equation to first order system of differential equations. Existence and uniqueness of solution (statement only). " $2 \times 2$ " homogeneous linear first order system of differential equations and their solution. Wronskian of " $2 \times 2$ " homogeneous linear first order system of differential equations and its properties. Linear dependence and independence of solutions of " $2 \times 2$ " homogeneous linear first order system of differential equations. Matrix method to solve " $2 \times 2$ " homogeneous linear first order system of differential equations with constant coefficients. Method of solving " $2 \times 2$ " Non - homogeneous linear first order system of differential equations with constant coefficients.

**(10 Hours)**

## 5. GRAPH THEORY:-

Introduction. Basic terminology. Types of Graphs. Multigraphs and Weighted graphs. Isomorphism of graphs. Paths and circuits. Shortest path in weighted graphs. Eulerian paths and circuits. Hamiltonian paths and circuits. Factors of graphs. planar graphs.

**(12 Hours)**

## 6. TREES AND CUT-SETS:-

Trees. Rooted trees. Path lengths in rooted trees. Prefix codes. Binary search trees. Spanning trees and cut- sets. Minimum spanning tree. Kruskal's algorithm. Prim's algorithm. Transport network.

**(12 Hours)**

## List of practical sessions (4 hours each):

1. General solution of  $\frac{dy}{dx} = \frac{a_1x + b_1y + c_1}{a_2x + b_2y + c_2}$ .
2. General solution of  $M(x, y)dx + N(x, y)dy = 0$ .
3. Method of undetermined coefficients.
4. Method of variation of parameters.
5. Inverse D – operator method to solve  $f(D) = R(x)$ .
6. Matrix method to solve “  $2 \times 2$  ” homogeneous linear first order system of differential equations.
7. Shortest path using Dijkstra’s algorithm for weighted graphs.
8. Eulerian paths and circuits in graphs.
9. Hamiltonian paths and circuits in graphs.
10. Prefix Codes in trees.
11. Minimum Spanning tree using Kruskal’s algorithm.
12. Minimum Spanning tree using Prim’s algorithm.

**Principal texts:**

1. Differential Equations and Their Applications: Martin Braun (Springer)
2. Elements of Discrete Mathematics: C. L. Liu and D. P. Mohapatra  
(Tata Mcgraw Hill)

**References:**

1. Differential Equations with Applications and with Historical Notes:  
G. F. Simmons (Tata Mcgraw Hill)
2. Ordinary Differential Equations: E. A. Coddington (PHI Learning Pvt. Ltd.)
3. Shaum’s Outline on Differential Equations: Richard Brownson  
(Tata Mcgraw Hill)
4. Discrete Mathematical Structures: Kolman, Busby and Ross  
(PHI Learning Pvt. Ltd.)
5. Discrete Mathematics and Applications: Kenneth Rosen ( TMH)

6. Shaum's Outline on Discrete Mathematics: Seymour Lipschutz and Marc Lipson  
(Tata Mcgraw Hill)

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Semester – IV

Credits: 4+2

### **DSC 1D: Analysis and Operations Research**

#### **1. Infinte Series [Ajit kumar, Chapter 5]:**

Convergence of infnite series, absolute convergence, Conditional convergence, Geometric series, Cauchy criterion for convergence, Algebra of convergent series, Comparision test, Convergence of Harmonic P-series, D'Alembert ratio test, Cauchy nth root test, Leibniz test or alternating series test.

**[10 hours]**

#### **2. Riemann Integration [Ajit kumar, Chapter 6]:**

Darboux Integrability, Criterion for integrability, Properties of integrabilities. First fundamental theorem of calculus, Second fundamental theorem of calculus, integration by parts, Mean value theorems for integrals, First mean value theorem for integrals, Second mean value theorem I, Second mean value theorem II, Riemann original definition.

**[20 hours]**

#### **3. Sequences and Series of functions[Ajit kumar, chapter 7]:**

Pointwise convergence of sequence of functions and examples, Uniform convergence of sequence of functions and examples, Mn-Test, Cauchy Criterion for uniform convergence, Consequences of Uniform convergence, Continuity of limit function, Series of functions, Absolute convergence, Cauchy Criterion for uniform convergence of a series, Weierstrass M-test, Weierstrass Approximation Theorem.

**[10 hours]**

#### **4. Operations Research**

Fundamentals: Linear Programming problems, Convex sets ,Extreme points of Convex sets, Convex Polyhedron ,hyperplanes, Graphical Method, Simplex Method, Theorems on simplex method ,Big-M method, Two phase method, Unrestricted variables, Duality and solution using duality, Theorems on Duality, Dual Simplex method, Post Optimal Analysis (Discrete changes in cost and requirement vector) Transportation Problems, North west corner method, Vogel's approximation method, Modi Method, Assignment Problems, Hungarian Method, Basics of Inventory control, Inventory model with No shortages and Instantaneous production, Inventory model with Shortages allowed and Instantaneous production. Basics of Queueing theory, Queueing Model (M/M/1):(1/FIFO), Queueing Model (M/M/1):(N/FIFO).

**[20 hours]**

#### **List of Practical sessions [ 4 hours each]**

1. Basics of Linear Programming problems including Formulation.
2. Graphical Method
3. Simplex Method, Unbounded solution, Alternate solution
4. Big-M method, unrestricted variables.
5. Two phase method
6. Duality and solution using duality.
7. Dual Simplex method
8. Post Optimal Analysis (Discrete changes in cost and requirement vector)
9. Transportation Problems, existence of solution ( North west corner method, Vogel's approximation method)
10. Transportation Problems ( Modi Method, Problems to Minimize/Maximize objective function)
11. Assignment Problems (Hungarian Method)
12. Basics of inventory control, Inventory model with No shortages and Instantaneous production.
13. Inventory model with Shortages allowed and Instantaneous production.
14. Queueing Model (M/M/1):(1/FIFO)
15. Queueing Model (M/M/1):(N/FIFO)

**Principal texts:**

1. A Basic Course in Real Analysis, Ajit Kumar and S.Kumaresan ; CRC Press.
2. Linear Programming by G. Hadley; Addison.

**References:**

1. Mathematical Analysis I, R.D.Bhat, Vipul Prakashan, Mumbai.
2. Mathematical Analysis II, R.D.Bhat, Vipul Prakashan, Mumbai.
3. Introduction to Real analysis ,Robert G.Bartle, Donald R.Sherbert, Third edition, Wiley Publication.
4. Methods of Real analysis , Richard R.Goldberg, Oxford and IBH publishing Co.pvt.ltd.
5. Calculus Vol-I, Tom M.Apostol, Second edition, Wiley Publication.
6. Operations Research, Kanti Swarup and Gupta, S. Chand and company , Delhi.

Semester – III

Credits: 4

**SEC 1 : Statistical Methods**

1. **Introduction- Meaning and Scope:** Definition of Statistics, Importance and scope of Statistics, Limitations of Statistics, Distrust of Statistics. **(2 hours)**
2. **Correlation and Regression Analysis:** Introduction. Karl Pearson's coefficient of Correlation, Rank correlation method. Regression Analysis. **(10 hours)**
3. **Theory of Probability:** Introduction, Mathematical probability, Statistical probability, Axiomatic probability, Addition theorem of probability.(Proof omitted), Multiplication theorem of probability. Pair wise and mutual independence, Inverse probability – Baye's theorem. **(6 hours)**

4. **Random Variables:** Probability Distributions and Mathematical Expectation: Random variable, Probability distribution of a Discrete Random Variable, Probability distribution of a Continuous Random Variable, Mathematical Expectations. **(3 hours)**
5. **Theoretical Distributions:** Binomial distribution, Poisson Distribution, Normal Distribution. **(5 hours)**
6. **Testing of Hypothesis:** Interval Estimation, Testing of Hypothesis. **(3 hours)**
7. **Large sample tests:** Introduction, Sampling of Attributes, Sampling of Variables. **(4 hours)**
8. **Parametric tests:** Student's 't' distribution, ANOVA, Post-hoc analysis. **(10 hours)**
9. **Non-Parametric tests:** Chi Square test, Mann-Whitney test, Kruskal walli's test. **(7hours)**

**List of Practicals (Using R or similar softwares) (10 hours)**

1. Finding measures of central tendency, namely, mean, median and mode.
2. Finding measures of dispersion, namely, range, quartile deviation, mean deviation and standard deviation.
3. Testing of hypothesis for single mean and difference of means using 't- test' and paired 't- test'.
4. Testing of hypothesis for more than two means using ANOVA.
5. Testing of hypothesis regarding independence of attributes using Chi square test.
6. Testing the hypothesis stating that the k independent samples have been drawn from the populations which have identical distributions using Kruskal Walli's test.

**References:**

1. Fundamentals of Statistics, S.C Gupta, Himalaya Publishing House, Seventh Edition. **(Principal)**

\*Reference for purpose of conducting practicals only.

- 1) Fundamentals of Mathematical Statistics, S.C Gupta, V.K Kapoor, S.Chand Publications.
- 2) Mathematical Statistics, J.N Kapur, H.C Saxena, S.Chand Publications.
- 3) Probability, Statistics and Random Processes, T Veerarajan, McGraw Hill Education (India) Private Limited.
- 4) Probability Theory, B. R. Bhat, New Age International, 2007.

Semester – IV

Credits: 4

**SEC 2 : Analytical Geometry**

1. **Metric Properties on the Plane.** (3 hours)
2. **Straight Lines in the Plane.** (3 hours)
3. **Circles in Plane.** (3 hours)
4. **Conics in the Plane and its plane sections.** (12 hours)
5. **Classification of Conics.** (5 hours)
6. **Polar Co-ordinate System.** (3hours)

7. **Co-ordinates in 3-space.** (3 hours)
8. **Plane in 3-space.** (4 hours)
9. **Lines in 3-space.** (3 hours)
10. **Transformation of Co-ordinates.** (4 hours)
11. **Sphere.** (4 hours)
12. **Cones.** (4 hours)
13. **Cylinder.** (4 hours)
14. **The Conicoid.** (5 hours)

**Reference:**

1. Analytic Geometry: Two and Three Dimension, D. Chatterjee, Narosa Publishing House, 2009.
2. Analytic Geometry, Shanti Narayan and P. K. Mittal, S. Chand and Company Ltd, 2007.

**Remark:**

1. Tracing of general second degree conics/conicoids using the mathematical software GEOGEBRA, SAGE, MATH and PYTHON.
2. Properties of pair of lines, circles, parabola, Ellipse etc., may be verified using mathematical softwares like GEOGEBRA/SAGEMATH.

**Generic Courses for Non Mathematics Students**

Semester – III

Credits: 4

**GE-3: Mathematics for Competitive Examination –I**

Ratio and proportion; Indices; Logarithms; Linear, Quadratic and cubic equations; Inequalities; Simple & compound interest, annuity & loans

Problem sets on

Time & distance; Time & work; Percentages; Profit & Loss; Boats & Streams; Testing directional sense; Problems on age calculation; Pattern analysis; Data interpretation

Short cut techniques for

Multiplication; Finding squares, square roots; Cubes, cube roots; Magic squares; Digit sum method; Subtraction; solving Linear, Quadratic and cubic equations;

**References:**

1. Quantitative Aptitude for Common Admission Test by Arun Sharma , Mc Graw Hill (6<sup>th</sup> edition)
2. Common Proficiency test Quantitative Aptitude, published by The institute of chartered accountants of India



Semester – IV

Credits: 4

**GE-4: Mathematics for Competitive Examination –II**

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Permutation and combinations; Sequences & Series (Arithmetic progression/Geometric progression); Number systems; Sets, relations and functions

Problem sets on

Partnerships; Age; LCM/GCD; simplification of decimal fractions; unitary method; Mensuration (2D/3D); conics; trigonometry; alphabet & number series; Coding & Decoding; Number ranking; stocks & shares; blood relations; surds

Short cut techniques for

Analytical conics; Division; Factorization; Partial fractions

**References:**

1. Quantitative Aptitude for Common Admission Test by Arun Sharma , Mc Graw Hill (6<sup>th</sup> edition)
2. Common Proficiency test Quantitative Aptitude, published by The institute of chartered accountants of India.

**ANNEXURE II**

**Elective Course For M.Sc.**

**COURSE TITLE - MATH- 122 : Graphs & Networks**

Number of Credits: 4

Prerequisites: Elementary Algebra and Matrix theory.

**SCOPE & OBJECTIVE:** Graph theory is a basic course needed in several areas not only in sciences but also in engineering disciplines such as Electrical & Electronics, Networking and data structures in Computer Science, Biotechnology, etc. Objective is not only to present concepts definitions & theorems in a mathematical manner, but also to tell relevance of graphs in different context, ranging from puzzles & games to social science/engineering/ computer science. Relevance of the shortest paths & maximal flows in a network, travelling salesman

problem, relevance of chromatic number to scheduling problem. Problem solving & learning

algorithms is also an essential part of graph theory.

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**COURSE DESCRIPTION :** Course deals with the basics of graph theory, basic definition of simple graphs, types of graph, matrix representation of graphs, isomorphism in graphs, Euler & Hamiltonian graphs, trees & their properties, spanning trees, colouring of graphs, independence number and chromatic number of simple graphs, connectivity, cut-set, directed graphs, directed trees, directed spanning trees, shortest paths & maximal flows in a network.

**TEXT BOOKS:**

T-1: G. Agnarsson and R. Greenlaw, Graph Theory: Modeling, Applications and algorithms, Pearson , 2011.

T-2: Gary Chartrand and Ping Zhang, Introduction to Graph Theory, Tata Mc-Graw-Hill Edition, 2006.

**REFERENCE BOOKS:**

R1. F. Harary, Graph Theory, Narosa Publishing House, 2001.

R2. Gary Chartrand and O.R. Oellermann, Applied Algorithmic Graph Theory, McGraw-Hill Inc. 1993.

R3. L.R. Foulds, Graph Theory Applications, Springer Verlag, New York, 2009.

**Course Plan:**

Lecture No.	Learners Objective	Subject
1-5	To appreciate concept of graphs & simple graphs & their representations	Graphs, Representation of Graphs & Types of Graphs, Degree Sequences,
6-10	Some Graph Theoretic Properties	Subgraphs, Walk, Trail, Path, Cycle, Circuit, Connectedness, Isomorphism on Graphs
11-14	Distinguish clearly between different concepts in graphs & difference between edge traversal & vertex traversal	Operation on Graphs, Euler & Hamiltonian Graphs, Depth First Search & Breadth First Search, Fleury's Algorithm, Traveling Salesman Problems
14-20	Appreciate different equivalent definitions of tree & importance of tree as a structure	Trees, Spanning Trees, Minimal Spanning Trees, Prim's & Kruskal's Algorithms
21-25	Concept of distance between spanning trees, trees and rooted binary trees	Distance, Eccentricity, Centre(s), Radius and Diameter of Trees & Connected Graphs

26-30	How spanning tree is connected with concept of special type of cut set & circuit in a connected graph	Cut-sets & Fundamental Cut-Sets, Edge & Vertex Connectivity, Separability and Menger's Theorem
31-35	How simple concept of planarity of a graph is relevant to several problems as planar maps & electrical circuits	Planar Graphs, Euler's formula, Detection of Planarity, Dual Graphs
36-43	How graph coloring problem is related to independent sets of graph, scheduling problems, planer map, chromatic polynomial as a theoretical tool	Independent Sets, Coloring of Graphs, Chromatic Number, Chromatic Polynomials, Map Coloring, Matching & Covering of Graphs
44-48	How concept of isomorphism is different in digraphs	Directed Graphs (Digraphs), Isomorphism in Digraphs
49 -51	Difference between different type connected digraphs & spanning tree & directed spanning tree	Strongly Connected & Weakly Connected Digraphs, Networks
52-57	Directed weighted network, relevance of maximum flow, searching a graph	Network flows, Max-Min Theorem Ford-Fulkerson Algorithm, Shortest Path Problems & Dijkastara's Algorithm
58-60	Applications to Science and Engineering	Applications of Graph Theory in Social Sciences, Economics, Social Networks, Computer Science, Bioinformatics, Molecular Biology, Chemistry, Electrical Engineering, Industrial Engineering etc.

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**D 3.7 Minutes of the meeting of Board of Studies in Physical Education held on 18/08/2017**

**Annexure I**

**Proposal given to introduction of two credits which is short fall in the two years BPEd**

**course**

All the students admitted in the B.P.Ed from the session 2017-18 onwards will chose a major game as their specialization game in their 4<sup>th</sup> semester given below. The students have learned the skills, techniques, rules and regulations of different major games which were included in their First, Second and Third semesters in the syllabus.

1-Athletics

2-Football

3-Basketball

4-Volley ball

5-Kho-Kho/ Kabaddi

6- Yoga

**Evaluation Procedure:**

All the students will be evaluated on their game specialization with 50 marks (two credits).

**1-Practical examination (15 marks for skill and 10 marks for Officiating)**

All the students will demonstrate the skills and officiating in their respective games and they will be evaluated by both internal and external examiners.

**2-Specialization record book and viva voca test (10 marks for records and 15 marks for viva)**

After the Practical examination, the students will present their specialization (hand written) record book to their examiners. The record books must contain brief history of the games, skills, techniques, tactical applications, rules and regulations.

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**ANNEXURE II**

MODIFIED SYLLABUS	REMARKS
<p><b>SEMESTER II</b> <b>COURSE V</b> <b>ANATOMY, PHYSIOLOGY AND HEALTH EDUCATION</b> <b>(60 Hours)</b></p> <p><b>OBJECTIVES:</b></p> <ol style="list-style-type: none"> <li><b>1. To enable the learner to understand the basic structure and function of human body.</b></li> <li><b>2. To acquire the knowledge regarding effect of exercise on the body as a whole.</b></li> <li><b>3. To enable the learner to understand the need and importance of health education and community health.</b></li> <li><b>4. To acquaint the learner with school health programme.</b></li> <li><b>5. To acquire the knowledge regarding awareness, precaution &amp; understanding HIV/ AIDS preventive education.</b></li> </ol> <p><b>I Introduction to human body (12 Hours)</b></p> <ol style="list-style-type: none"> <li><b>a. Definition, Meaning, need, importance and Scope of anatomy and physiology.</b></li> <li><b>b. Importance of study of anatomy in physical education and sports</b></li> <li><b>c. Anatomical and physiological difference between male and female</b></li> <li><b>d. Introduction of cell and tissue</b></li> </ol> <p><b>II Organs and Systems (12 Hours)</b></p> <ol style="list-style-type: none"> <li><b>a. Musculoskeletal system:-</b> <ol style="list-style-type: none"> <li><b>a. Classification and functions of bones and joints</b></li> <li><b>b. Movements at various joints</b></li> <li><b>c. Structural classification of muscle and types of muscles</b></li> </ol> </li> <li><b>b. Cardio- respiratory system:-</b> <ol style="list-style-type: none"> <li><b>a. Structure, working and function of human heart</b></li> </ol> </li> </ol>	<p><b>To have a sequence of matter from general to specific</b></p> <p><a href="#">(Back to Index)</a> <a href="#">(Back to Agenda)</a></p>

<p><b>b. Processes of circulation</b> <b>c. Respiration – Mechanism and types and respiratory volumes</b></p> <p><b>c. Nervous system:-</b> <b>a. Central nervous system- structure and function</b> <b>b. Autonomic nervous system- Structure and function</b> <b>c. Effect of exercise on nervous system</b></p> <p><b>d. Digestive system</b> <b>a. Importance of digestion</b> <b>b. Organs of digestive system</b> <b>c. Mechanism of digestive system</b></p> <p><b>III Exercise Physiology (12 Hours)</b></p> <p><b>a) Definition of exercise physiology and its importance in the field of physical education and sports.</b> <b>b) Mechanism of muscular contraction</b> <b>c) Fuel for muscular activity</b> <b>d) Oxygen debt, second wind and vital capacity</b></p> <p><b>IV Effect of exercise on various systems (12 Hours)</b></p> <p><b>a. Effect of exercise on musculo-skeletal system</b> <b>b. Effect of exercise on cardio-vascular system</b> <b>c. Effect of exercise on respiratory system</b> <b>d. Effect of exercise on nervous system</b></p> <p><b>V Health Education (12 Hours)</b></p> <p><b>a) Definition, Aims ,objectives and principles of health education</b></p>	<p><b>Arranged in order</b></p>
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- b) Objectives and necessity of school health programme
- c) Communicable and non communicable disease
- d) Postural deformities and corrective measures

**REFERENCES :**

1. Beashel, Paul & Taylor, John : Advance Studies in Physical Education and Sports, Thomas Nelson & Sons Ltd., U.K., 1996.
2. Brown M.C. & Sommer B.K. – Movement Education- Its Evaluation and Modern Approach, Adchison, wesely publication, London, 1978.
3. Crouch James E. – Essential Human Anatomy A Text – Lea & Febriger , Philladelphia, 1980.
4. Desai V., Sequeira, T. – Aids Prevention Education Programme : Workbook For Teachers in Secondary Schools of Mumbai, B.M.C. Public Health Dept., Mumbai, 2001.
5. Dr. Uppal A.K. & Dr. Gautam G.P. : Physical Education and Health, India, 2000.
6. Hay, James G & Reid J.G. – Anatomical and Mechanical Basis of Human Motion, Prentice hall, New Jersey, 1985.
7. Lock Hurt and others – Anatomy of the human body, Feber & Feber Oxford University, 1975
8. Murgesh N. – Anatomy, Physiology and Health Education, Sathya, Chinnalapatti, 1990.
9. Pearce Evelyn – Anatomy and Physiology for Nurses, Oxford University, 1975.
10. Rasch & Bruke – Kinesiology and applied Anatomy, Lea Febriger, Philladelphia, 1978.
11. Rasch, Philip J. – Kinesiology and Applied Anatomy, Lea Febriger, Philladelphia, 1989.

Topics are repeating in Sem IV in subject “kinesiology and biomechanics”

Topics are repeating

Arranged in order

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12.	Dr. Sathe. V., Principles of Anatomy, Physiology and Clinical Basis of Disease (International Edition), Narmada Prakashan, Nagpur., 1998.	
<p><b>SEMESTER II</b> <b>COURSE VI</b> <b>OFFICIATING, COACHING AND SPORTS TRAINING</b></p> <p style="text-align: right;"><b>(60 Hours)</b></p> <p><b>OBJECTIVES :</b></p> <ol style="list-style-type: none"> <li><i>1. To understand the basic concept and principles of officiating and coaching of different games and sports.</i></li> <li><i>2. To enable the students to understand the rules, regulations and officiating of different games and sports.</i></li> <li><i>3. To acquaint the students with the duties and responsibilities of an officials and coaches.</i></li> <li><i>4. To acquaint the students with dimensions and actual markings of different play fields, courts and arenas.</i></li> <li><i>5. To understand the concept, principles and forms of sports training.</i></li> </ol> <p><b>I Theory of officiating (12 Hours)</b></p> <ol style="list-style-type: none"> <li>a Meaning, purpose and principles of officiating</li> <li><b>b Duties and responsibilities of officials</b></li> <li><b>c Qualification and qualities of officials</b></li> <li><b>d Professional growth of officials</b></li> </ol> <p style="text-align: center;"><b>II Theory of Coaching (12 Hours)</b></p> <ol style="list-style-type: none"> <li>a Meaning, purpose, Philosophy and Principles of coaching</li> <li><b>b Qualification, qualities and responsibilities of coach</b></li> </ol>		Same



<p>c <b>Role of coach to build a strong coaching support team</b></p> <p>d Talent identification and development</p> <p><b>III Theory of Sports Training (12 hours)</b></p> <p>a) <b>Meaning, Importance and types of warm-up and limbering down exercise.</b></p> <p>b) Meaning, definition and Characteristics of sports training.</p> <p>c) Principles of sports training</p> <p>d) Overload: Principles, causes, symptoms and tackling over load.</p> <p><b>IV Training Components (12 Hours)</b></p> <p>a. Strength- Means and methods of strength development</p> <p>b. Speed - Means and methods of speed development</p> <p>c. c Endurance- Means and methods of endurance development</p> <p>d. d Flexibility &amp; Coordination - Means and methods of flexibility development</p> <p><b>V Training Programming and Planning (12 hours)</b></p> <p>a. <b>Concept of Technique, Tactics and Strategy</b></p> <p>b. <b>Periodization- Meaning and types of periodization</b></p> <p>c. Aim and Content of periods/phases- Preparatory, competition and transitional</p> <p>d. Planning- Training sessions</p> <p><b>REFERENCES :</b></p> <p>1 Beashel, P.,&amp; Taylor, J. (1996). <i>Advance Studies in Physical Education and Sports</i>. U.K.: Thomas Nelson and Sons Ltd.</p>	<p>Topic is required in coaching</p> <p>This is required to understand the “training components”</p> <p>Unit III &amp; IV interchanged and some topic were repeated</p>
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2	Bompa, T.O., & Carrera, M.C. (2005). <b><i>Periodization Training For Sports</i></b> . USA : Human Kinetics.	<b>Change of terms in heading of unit</b>
3	Bunn, J.W. (1968). <b><i>The Art of Officiating Sports</i></b> . New Jersey : Prentice-Hall, Inc; Englewood Cliffs.	
4	Bunn, J.W. (1972). <b><i>Scientific Principles of Coaching</i></b> . New Jersey : Prentice-Hall Inc Englewood Cliff.	
5	Chu, D.A. (1998). <b><i>Jumping Into Plyometrics Human Kinetics</i></b> . U.S.A : printed	
6	Davis, K.L. (1996). <b><i>The Art of Sports Officiating</i></b> . London : Allyn and Bacon Boston ISBN.	
7	Frank, W. (1999). <b><i>Sports Training Principles</i></b> . London : A & C Black Publishers Ltd.	
8	Fuoss, D.E. and Troppmann, R.J. (1981). <b><i>Effective Coaching A Psychological Approach</i></b> . New York : Macmillan Publishing Co. A division Of Macmillan Inc.	
9	Galloway, R.W. (1999). <b><i>Sports Training (Anatomy and Physiological Aspect)</i></b> . Delhi : Sports Publications.	
10	Gummerson, T. (1992). <b><i>Sports Coaching and Teaching</i></b> . London : A and C Black Publisher Ltd.	
11	Harre, D. (1982). <b><i>Principles of Sports Training</i></b> . Barlin :Sportver lag.	
12	Bunn, Johan. W. : Art of Officiating Sports, Prentice hall, New Jersey, 1968	
13	Bunn. W. : Scientific Principles of Coaching, Prentice Hall, New Jersey, 1972.	
14	Davis, K.L. : The Art of Sport Officiating, Boston, Allyn and Bacon, 1996.	
15	Fuoss, D.E. & Troppmann, R.J. : Effective Coaching, Mac Millan Publication, New York, 1985.	
<b>SEMESTER II</b> <b>COURSE VII</b> <b>ORGANIZATION, ADMINISTRATION AND MANAGEMENT IN PHYSICAL EDUCATION</b> <b>(60 Hours)</b> <b>OBJECTIVES :</b>		

1. *To understand the importance of management of Physical Education.*
2. *To gain knowledge regarding management of Physical Education and Sports at different level.*
3. *To gain knowledge regarding the organization of various Physical Education programmes.*
4. *To gain knowledge of various schemes and plans of State/Central Government.*
5. *To gain the knowledge regarding planning and personal management, facility management and budget management.*

**I MANAGEMENT OF PHYSICAL EDUCATION AND SPORTS (12 HOURS)**

- A) MEANING, NEED AND SCOPE OF MANAGEMENT IN PHYSICAL EDUCATION**
- b) Functions of management- planning, organizing, staffing, directing, communicating, coordinating, controlling, evaluating, and innovating**
  - c) Principles of Sports Management**
  - d) Maintenance and marking of play grounds, ,gymnasium, swimming pool and track & field .**

**II Organization of co-curricular activities and Physical Education programmes.  
(12 Hours)**

- a Physical Education Budget : Need, Importance, procedure and principles of budget making,**
- b Physical Education and sports programmes for - Primary, secondary and higher secondary School for sports awareness – demonstration, play days, sports rallies, sports exhibitions.**
- c Organization of National days (15<sup>th</sup> August & 26<sup>th</sup> January)., Organization of mass Participation- sports day, hiking, trekking, Camp and picnics**

**Base of management & as per the requirement, one topic is added**

<p><b>d Ceremonies of competition – Opening, closing and victory</b></p> <p><b>III Administration in Physical Education (12 hours)</b></p> <ul style="list-style-type: none"><li>a. Meaning, and importance of administration in Physical education and sports</li><li>b. Types and essential of administration of sports</li><li>c. Qualities and Qualification of administrator</li><li>d. Process of administration</li></ul> <p><b>IV The Management Process: (12 hours)</b></p> <ul style="list-style-type: none"><li>a. meaning definition, and importance of supervision</li><li>b. Techniques of supervision</li><li>c. Organization and function of sports bodies</li><li>d. Meaning, need and importance of public relation</li></ul> <p><b>V Aspects in Physical education and Sports Management (12 hours)</b></p> <ul style="list-style-type: none"><li>a. Meaning and organization of Intramural and Extramural</li><li>b. Management of Equipment: Need, selection, purchase, storing, issuing, maintaining and supplier</li><li>c. Management of Infrastructure, financial and personal</li><li>d. Types of management: Authoritarian Management, Laissez- Fair management</li></ul> <p><b>REFERENCES :</b></p> <ul style="list-style-type: none"><li>1 Bucher, Charles A. : Administration of Physical Education and Athletic Programme 8th Ed., C.V. Mosly Co., London, 1983.</li><li>2 Dheer &amp; Kamal Radhiks : Organization and Administration of Physical Education, Friends Publication, New Delhi, 1991</li></ul>	<p><b>No change</b></p> <p><b>No change</b></p> <p><b>Interchange has been done</b></p>
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3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19	Gandhi, S.S. : India's Highest Sports Awards And Those Who Won Them, The Defense Review, New Delhi, 2001 Horin, Lory : Administration of Physical Education and Sports Programme, Sounders College, Philadelphia, 1985. Joseph, P.M. : Organization of Physical Education, the old student Asso. Bombay publication, 1956 Kamlesh M.L. : Management Concept of Physical Education and Sports, Metropolitan, Delhi, 2000. Luthans and Martinko : The practice of Supervision and Management, Dryden Press, Japan, 1983. Sidentop, Daryl – Introduction to Physical Education and Sports, 2nd Ed., Mayfield publishing Co., London,1994. Two Experienced Professors : Organization and administration and Recreation in Physical Education, Prakash Brother, Ludhiana, 1991. Vltmer. Edward & other : Organization and administration of Physical Education 5th Ed., Prencice hall, Newjeresy, 1979. Wesson, Kevin, Wiggins, N. : Sports and Physical Education : A Complete Guide to Advanced Level Study, Hodder & Stoughton, London,1998. Zeigler E.F./ Bowie, G.W. : Management Competency Development in Sports and Physical Education, Philadelphia, 1983. Agarwal K.K. and Jain R.R. : Officiating and Coaching, Agarwal & Jain , Delhi, 1983. Anand, R.L. : Playing Field Manual, Sports Authority of India, Patiala,1986. Anne, Princess : Coach Education : Preparation for a Profession, E & FN Spon, London, 1986. Bhandari, P.K. & Malhotra, G.D. : Training Manual, Badminton, Sports Authority of India, Patiala, 2002. Bose, Tapan & Mukherjee, Bhawani : Training Manual-Table Tennis, SAI, Patiala, 2001. Bunn, Johan. W. : Art of Officiating Sports, Prentice hall, New Jersey, 1968 Bunn. W. : Scientific Principles of Coaching, Prentice Hall, New Jersey, 1972.	<b>No change</b>
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<p>20 Davis, K.L. : The Art of Sport Officiating, Boston, Allyn and Bacon, 1996.</p> <p>21 Two Experienced Professors : Officiating and Coaching, Prakash Brothers, Jalandar 1982,</p> <p>22 Wade, Allen : F.A. Guide to Training and Coaching, Heinmann, London, 1967</p> <p>23 Bucher, C.A.( 2002). <b>Management of Physical Educational and Sports</b>.(12<sup>th</sup> Ed.). USA : McGarw Hill Co.</p> <p>24 Chakraborti, S.(2007). <b>Sports Management</b>. New Delhi : Friends Publication.</p> <p>25 Frosdick, S., &amp; Walley, L. (2003). <b>Sports and Safety Management</b>. USA : A division of Reed Education and Professional Publishing Ltd.</p> <p>26 Govindrajulu, .N. (2005). <b>Management of Physical Education and Sports Programme</b>. New Delhi : Friends Publication.</p> <p>27 Horine., Larry. (1985). <b>Administration of Physical Education and Sports Programmes</b>. New York : Saundress college publication.</p> <p>28 Kamlesh, M. L. (2000). <b>Management Concepts in Physical Education and Sports</b>. New Delhi : B.V. Gupta Publication.</p> <p>29 Roy, S. S. (2002). Sports Management. New Delhi : Friends publication.</p>	
<p style="text-align: center;"><b>SEMESTER IV COURSE XIV MEASUREMENT, EVALUATION AND STATISTICS IN PHYSICAL EDUCATION (60 Hours) OBJECTIVES :</b></p> <ol style="list-style-type: none"><li><b>1. To understand the concept of Measurement, Evaluation and Assessment Procedure in Physical Education.</b></li><li><b>2. To understand different tests in Physical Education.</b></li><li><b>3. To acquire the knowledge of various tests regarding Physical fitness, motor and health related fitness.</b></li><li><b>4. To understand various sports skill tests.</b></li></ol>	<p style="text-align: right;"><a href="#">(Back to Index)</a> <a href="#">(Back to Agenda)</a></p>

<p><b>5. To understand and application of simple statistical procedures for evaluation.</b></p> <p style="text-align: center;"><b>I Introduction (12 Hours)</b></p> <p>a. Meaning, Need and importance of Test, Measurement and Evaluation in Physical Education</p> <p>b. Types, purpose and Principles of evaluation</p> <p>c. Criteria of test selection</p> <p>d. <b>Types and Classification of tests- Written test, Psychomotor test</b></p> <p style="text-align: center;"><b>II Physical Fitness Test (12 Hours)</b></p> <p>a. <b>AAPHERD Health Related Physical Fitness Test (as per school syllabus for std. V to XII)</b></p> <p>b. <b>Indiana Motor fitness test (as per school syllabus std. V to XII)</b></p> <p>c. Strength and Power test - Phillips JCR Test, Flexed Arm hang test, Bent knee sit-ups, Standing Broad Jump test, Vertical Arm pull test</p> <p>d. Cardio-vascular test – Harvard step test, Flexibility – Sit and Reach test, Agility - shuttle run test, Speed –sprint, 30 M flying start</p> <p style="text-align: center;"><b>III Sports Skill Tests (12 Hours)</b></p> <p>a <b>Johnson basket ball test</b></p> <p>b <b>SAI football skill test</b></p> <p>c <b>AAPEHRD volleyball skill test</b></p> <p>d <b>Badminton - Miller wall Volley test</b></p> <p style="text-align: center;"><b>IV Evaluation of Physical Education Activities (12 Hours)</b></p> <p>a <b>Importance and role of evaluation in Physical Education</b></p>	<p>The word 'Type' is added</p> <p>Changed as per the requirement</p> <p>Latest test has been included</p>
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<p><b>b</b> Evaluation procedure of Physical Education activities (<i>as per school syllabus of std. V – XII</i>)</p> <p><b>c</b> Internal and External evaluation</p> <p><b>d.</b> Merits and demerits of evaluation</p> <p><b>V</b> Statistics in Physical Education (12 Hours)</p> <p><b>a</b> Meaning, Concept, definition, importance and classification of statistics</p> <p><b>b</b> Meaning and kinds of data, frequency distribution, control tendency, application and interpretation of Mean, Mode, Median, Standard deviation and quartile deviation</p> <p><b>c</b> Normal Probability curve and its interpretation, Percentile and percentile rank</p> <p><b>d</b> <b>graphical presentation of class distribution – Histogram, Frequency Polygon, Frequency curve, cumulative frequency polygon, ogive, and pie diagram</b></p> <p style="text-align: center;"><b>REFERENCES :</b></p> <ol style="list-style-type: none"><li>1. Andrew and Jackson : Instructors manual, measurement, evaluation in Physical Education, Allanta Dullas, Geneva, 1981.</li><li>2. Banmgartner and Jackson : Measurement for Evaluation in Physical Education, Instructor's Manual, Houghton Mifflin Col. Boston,1975.</li><li>3. Barrow and Rosemary Mc. Gee : Practical Approach to Measurement in Physical Education, Lea and Febiger, Philadephia,1979.</li><li>4. Bosco J.S. and F.G. William : Measurement and Evaluation Fitness and Sports, Prentice Hall, New Jersey, Inc. 1983.</li><li>5. Clarke, Harison and Clark H. David : Application of Measurements in Physical Education , Prentice Hall, Englewood Cliff, New Jersey, 1987.</li><li>6. Eckert H.M. : Practical Measurement of Physical Performance, Lea and Febiger, Philadephic,1974.</li><li>7. Garretl, H. E. and Woodward : Statistics in Psychology and Education, Greenwood Press, Westport,1966.</li><li>8. Haskins, M.J. : Statistical Evaluation in Physical Education, WMC Brown Dubuque, 1971.</li></ol>	<p style="text-align: center;">No change</p> <p style="text-align: center;">Added latest topics</p> <p style="text-align: center;"><a href="#">(Back to Index)</a> <a href="#">(Back to Agenda)</a></p>
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<p>9. Johnson Barry L. and Nelson K. : Practical Measurement for Evaluation in Physical Education, Indian Reorint, Surjeet publication, Delhi, 1982.</p> <p>10. Kansal, Devinder K. : Test and Measurement in sports and Physical Education, D.V.S. Publication, 100 T.K. Giri Nagar, Kulkaji, New Delhi, 1996.</p> <p>11. Montoye Henry J. : An introduction to Measurement in Physical Education, Allyn and Bucon Inc. 470, Atlantic Avenue Boston, 1970.</p> <p>12. Morehouse, C.A. and Stull, G.A. : Statistical Principles and Procedures with Applications for Physical Education , Henry Kimpton, London, 1975.</p> <p>14. Philips and Hornak James E. : Measurement and Evaluation in Physical Education,1979.</p> <p>15. Safrit, Margaret J. : Introduction to Measurement in Physical Education and Exercise Science, Times Mirror/Mosby College publishing, St. louis, Toronto, Bastan,1990.</p>	
<p style="text-align: center;"><b>SEMESTER IV</b></p> <p style="text-align: center;"><b>COURSE –XV</b></p> <p style="text-align: center;"><b>SPORTS MEDICINE, PHYSIOTHERAPY AND REHABILITATION</b></p> <p style="text-align: right;"><b>(60 hours)</b></p> <p><b>OBJECTIVES :</b></p> <ol style="list-style-type: none"><li><b>1. To understand the nature and importance of sports medicine in Physical Education and Sports.</b></li><li><b>2. To gain knowledge regarding the medical problems of athletes and its rehabilitation.</b></li><li><b>3. To acquire knowledge regarding sports injuries and their management.</b></li><li><b>4. To gain knowledge regarding the therapeutic modalities.</b></li><li><b>5. To understand medical problems and its rehabilitation.</b></li></ol>	<p style="text-align: right;"><a href="#">(Back to Index)</a> <a href="#">(Back to Agenda)</a></p>

<p><b>I Introduction: (12 hours)</b></p> <p><b>a. Definition , aim, objectives, and Concept of Sports Medicine</b></p> <p>b. Need &amp; importance of Sports Medicine</p> <p>c. Role of physician, athlete trainer &amp; coaches, Team medical care- concept &amp; approaches</p> <p>d. History of Sports medicine in India and abroad</p>	<p>Definition has been added</p>
<p><b>II Injury &amp; tissue response: (12 hours)</b></p> <p>a. Micro &amp; macro trauma, over use trauma.</p> <p>b. Tissue response to stress Different steps of wound healing</p> <p>c. Regional, Specific injuries related to games and sports &amp; their management (head, neck, face, thorax, abdomen, pelvis, upper &amp; lower limbs)</p> <p>d. Prevention of sports injuries</p>	<p>No change</p>
<p><b>III Therapeutic modalities &amp; rehabilitation: (12 hours)</b></p> <p>a. Hydrotherapy, Cryotherapy, thermotherapy, Contrast &amp; paraffin bath</p> <p>b. <b>Sauna bath</b>, Jacuzzi bath &amp; Whir-pool bath</p> <p>c. Diathermy, infra-red, ultra sound</p> <p>d. Approach to rehabilitation</p>	<p>Rectification of word</p>
<p><b>IV Medical Problem and Rehabilitation: (12 hours)</b></p> <p>a. Lower Back, old age and postural problems and there corrections</p> <p><b>b. Effect and use of therapeutic exercises</b></p> <p><b>c. Sports Massage and massage manipulations.</b></p> <p>d. Psychiatric rehabilitation</p>	<p>Addition has been done to the missing topics</p>

IV Sports Medicine: (12 hours)

- a. Role of sports Medicine in talent searching
- b. Importance of recovery
- c. **Common sports injuries and diagnosis**
- d. Doping in sports

REFERENCES :

- 1 Appen zeller, Otto and Atkinson Ruth.(1983). **Sports Medicine :Fitness Training, Injuries**. U.S.A : Urban and Schwar Zenberg.
- 2 Bean, A. (2000). **The Complete Guide to Sports Nutrition (3<sup>rd</sup> Ed.)**. London : A & C Black.
- 3 Beashel, P.,& Taylor, J. (1996). **Advance Studies in Physical Education and Sports**. U.K.: Thomas Nelson and Sons Ltd.
- 4 Flink, H., Burgoon. L. & Milksky, A. (2006). **Practical Nutrition**. Boston Jones and Bartlet Publishers.
- 5 Kent, Michael.(1997). **Oxford Dictionary of Sports Science and Medicine**. Delhi : Friends publication.
- 6 Oakey Barry, et.al. (1986).**Sports Injuries**. Allahabad : A.h. Wheeler.
- 7 **Pande, P.K.(1989)**. **Know How Sports Medicine**. Jalandhar : **A.P.Publisher**.
- 8 Pande, P.K., & Gupta, L.G.(1987). **Outline of Sports Medicine**. New Delhi : Jaypee Brother.
- 9 Prentice, Williams E. (1986).**Therapeutic Modalities in Sports Medicine**. New Jersey : Mosbay College Publication.
- 10 Reilly, Thomas.(1981). **Sports fitness and Sports injuries**. London : Fabiger and Fabiger.
- 11 Roy, Steven., & Irvin, Richard.(1983). **Sports Medicine**. New Jersey : Englewood cliffs, Prentice Hall.

“sports massage” has been deleted & “sports injuries” added

<p style="text-align: center;"><b>SEMESTER IV</b></p> <p style="text-align: center;"><b>COURSE –XVI</b></p> <p style="text-align: center;"><b>KINESIOLOGY AND BIOMECHANICS</b></p> <p style="text-align: right;"><b>(60 hours)</b></p> <p><b>OBJECTIVES :</b></p> <ol style="list-style-type: none"><li><i>1. To understand the nature and scope of Biomechanics in Physical Education &amp; Sports.</i></li><li><i>2. To understand the importance of movement analysis, kinesiological analysis and biomechanical Analysis.</i></li><li><i>3. To understand the knowledge regarding antagonistic and agonistic muscles in the movements.</i></li><li><i>4. To gain knowledge of the application of mechanical principles to fundamental skills and sports techniques.</i></li><li><i>5. To understand basic mathematical problems related to motion, force and levers.</i></li></ol> <p><b>I. Introduction of Kinesiology: 12 hours)</b></p> <ol style="list-style-type: none"><li><b>a. Meaning, Definition, Scope and importance of Kinesiology in Physical Education and Sports</b></li><li><b>b. Aim, objectives and need of kinesiology</b></li><li><b>c. Terminologies of fundamental movements</b></li><li><b>d. Fundamental concepts of following terms- axis and plane, center of gravity, line of gravity, equilibrium.</b></li></ol>	<p style="text-align: center;"><b>As per the requirement</b></p> <p style="text-align: center;"><a href="#">(Back to Index)</a> <a href="#">(Back to Agenda)</a></p>
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<p><b>II. Structural kinesiology (12 Hours)</b></p> <ul style="list-style-type: none"><li>a. Classification of joints and muscles.</li><li>b. Types of muscle contraction.</li><li>c. Posture, postural deformity and their corrective measures.</li><li>d. Fundamental concepts of following terms- angle of pull, all or none law, reciprocal innovation.</li></ul>	<p>Re-arranged</p>
<p><b>III. Applied kinesiology: (12 hours)</b></p> <ul style="list-style-type: none"><li>a. Joints and their movements</li><li>b. Motor skills- Fine motor skills and Gross motor skills (locomotors, non-locomotors and manipulative)</li><li>c. Application of kinesiology to basic skills- Walking, Jumping, Running and Throwing</li><li>d. Difference between kinesiology and biomechanical analysis of human movement.</li></ul>	<p>As per the requirements Simple to complex</p>
<p><b>IV. Introduction of Biomechanics: (12 hours)</b></p> <ul style="list-style-type: none"><li>a. Meaning, Definition, Scope and importance of Biomechanics in Physical Education and Sports</li><li>b. Newton's law of motion- meaning, definition and its application to sports activities.</li><li>c. Force – meaning, definition, types and its application to sports activities.</li><li>d. Lever- meaning, definition, types and its application to human body.</li></ul>	
<p><b>V. Human movement and biomechanics: (12 hours)</b></p> <ul style="list-style-type: none"><li>a. Projectile, factors influencing projectile projector.</li><li>b. Basic concept related to kinetics and kinematics.</li><li>c. Equilibrium- types, principles and factors affecting equilibrium.</li></ul>	<p>Interchanged as per simple to complex</p>

d. **Mechanical analysis of fundamental movements- running, jumping, throwing, pulling and pushing**

**REFERENCES:**

- 1 Beashel, P.,& Taylor, J. (1996). ***Advance Studies in Physical Education and Sports***. U.K.: Thomas Nelson and Sons Ltd.
- 2 Hall, S.(2004). ***Basic Biomechanics***. New York : WCB. Megraw Hill.
- 3 Hamilton, N., & Luttgens,K.(2002). ***Kinesiology Scientific Basis of Human Motion***. New York : Me Graw-Hill.
- 4 Hay, J. (1993). ***The Biomechanics of Sports Techniques***. New Jersey : Prentice-Hall International. Inc
- 5 Jenson, C., & Schultz, G. (1977). ***Applied Kinesiology***. New York : McGraw. Hill Book company.
- 6 Kundson, D. (2007). ***Fundamentals of Biomechanics***. USA : Springer.
- 7 Me Ardle, W., Katch, F.,& Katch, V. (1981). ***Exercise Physiology Energy, Nutrition and Human Performance***. Philadelphia :Lea & Febiger.
- 8 Me Ginnis. P. (2005). ***Biomechanics of Sports and Exercise***. USA : Human.
- 9 Rameshwaran, N. (1984). ***Kinesiology Physical Education and Sports***. Jalandhar : Prakash Brothers educational publishers.
- 10 Shaw, D. (1998). ***Biomechanics and Kinesiology of Human motion***. New Delhi : Sports Publication.
- 11 Shaw, D. (1998). ***Pedagogic Kinesiology***. Delhi : Sports Publication.
- 12 Thompson,C., & Floyd. R. (2004). ***Manual of Structural Kinesiology***. New York : McGraw-Hill.

**Interchanged to keep the flow of learning from simple to complex**

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**BOC-413: Plant Biotechnology**  
**(3 Credits Theory)**

**Syllabus:**

- 1. Plant Tissue Culture:** Totipotency; A brief history of plant tissue culture; chronology of important developments in plant tissue culture; General Techniques; Laboratory Organisation; Media Composition and Preparation, Aseptic Manipulation; Cell Cultures (including Bergmann's plating technique); Application of cell culture (Mutant selection, production of secondary metabolites, transformations). **(8h)**
- 2. Applications of Plant cell, tissue and organ cultures:** Applications in agriculture – improvement of hybrids, encapsulated cells, production of disease and stress resistant plants. Applications in horticulture and Forestry – Micropropagation, *in vitro* establishment of Mycorrhiza; Applications in industries – Secondary metabolites from cell cultures, from immobilized plant cells. **(6h)**
- 3. Micropropagation and somaclonal variation:** Clonal propagation or micropropagation; Mechanism of somaclonal variation, Role of somaclonal variation in plant breeding; Applications. **(4h)**
- 4. Germplasm conservation:** Modes of Conservation, significance; Cryopreservation: Cryopreservation of plant stock cells - Methods of cryopreservation, cryobank, Pollen bank; Prospects in agricultural and forest biotechnology. **(5h)**
- 5. Production and uses of Haploids:** Production of haploids (anther culture, ovule culture, bulbosum technique), detection of haploids (morphology, genetic markers); uses of haploids; Pollen as a tool in crop improvement; Pollen storage; Effect of radiation on pollen. **(6h)**
- 6. Protoplast culture, regeneration and somatic hybridization:** Isolation of protoplasts, Purification of protoplasts, viability and plating density of protoplast; protoplast culture and regeneration of plants; protoplast fusion and somatic hybridization, Cytoplasmic hybrids or hybrids, genetic modification of protoplasts. **(6h)**
- 7. Transgenic Plants:** Selectable marker genes and their use in transformed plants; Transgenic plants for crop improvement; Molecular farming from transgenic plants; transgenic plants to study regulated gene expression; Bioethics in plant genetic engineering. **(3h)**
- 8. Gene transfer methods in plants:** Target cells for transformation, vector for gene transfer. *Agrobacterium* mediated gene transfer; selectable and scorable markers (reporter genes), agroinfection and gene transfer, DNA mediated gene transfer (DMGT); Methods of direct gene transfer. **(3h)**
- 9. Application of Biotechnology in Agriculture, Forest and human welfare:** Marker assisted selection (MAS); Biofertilizers (Microbial bioinoculants); Biopesticides; Environmental biotechnology; Enzyme biotechnology. **(4h)**

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**BOC-414: Lab in Plant Biotechnology**  
**(1 Credit - any 15 practicals)**

1. Familiarizing with various physical and chemical sterilization techniques.
  2. Preparation of solid and liquid nutrient media.
  3. Preparation of explants, inoculation and callus development.
  4. Study of callus morphology.
  5. Technique of sub culturing the callus.
  6. Preparation of differentiation media.
  7. Inoculation of the callus on differentiation media and regeneration of explants.
  8. Embryo culture.
  9. Seed culture.
  10. Preparation of media for anther/pollen culture and inoculation.
  11. Preparation of cell suspension cultures.
  12. Study of cell viability methods.
  13. Isolation of protoplast.
  14. Study of protoplast viability.
  15. Root organ culture (ROC) technique.
  16. Preparation of synthetic seeds (alginate beads).
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**B.Sc. (Botany) Semester end Examination, October/April 2017-18**

**Paper: Core/Generic Elective**

Duration: 2 Hours

Total Marks: 80

Instructions: Draw diagrams wherever required.

- Q. 1 Answer **any six** of the following (out of 8): (6 x 2 = **12**)
- Q. 2 Answer **any five** of the following (out of 7): (5 x 4 = **20**)
- Q. 3 A. or A (Any one of the two) (1 x 6 = **06**)
- Q. 3 B. (1 x 6 = **06**)
- Q. 4 A. or A (Any one of the two) (1 x 6 = **06**)
- Q. 4 B. (1 x 6 = **06**)
- Q. 5 A. or A (Any one of the two) (1 x 6 = **06**)
- Q. 5 B. (1 x 6 = **06**)
- Q. 6 A. or A (Any one of the two) (1 x 6 = **06**)
- Q. 6 B. (1 x 6 = **06**)
- 

**B.Sc. (Botany) Semester end Examination, October/April 2017-18**

**Paper: Core (to be deleted)**

Duration: 2 Hours

Total Marks: 80

Instructions: Draw diagrams wherever required.

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- Q. 1 Answer **any five** of the following (out of 7): (5 x 2 = **10**)  
 Q. 2 Answer **any five** of the following (out of 7): (5 x 2 = **10**)  
 Q. 3 A. or A (Any one for the two) (1 x 5 = **05**)  
 Q. 3 B. (1 x 5 = **05**)  
 Q. 4 A. or A (Any one for the two) (1 x 5 = **05**)  
 Q. 4 B. (1 x 5 = **05**)  
 Q. 5 A. or A (Any one for the two) (1 x 5 = **05**)  
 Q. 5 B. (1 x 5 = **05**)  
 Q. 6 A. or A (Any one for the two) (1 x 5 = **05**)  
 Q. 6 B. (1 x 5 = **05**)
- 

**B.Sc. (Botany) Practical Examination**

Paper- BCC –I (Biodiversity – I)

Key / Marking scheme

Max. Marks: 50

Duration :3hrs

- |   |                 |
|---|-----------------|
| Q.1.  | (4X3 =12 marks) |
| 1 mark –Identification,                             |                 |
| 1 mark- Classification                              |                 |
| 2 marks – Description                               |                 |
| Q.2. 2 marks - Slide preparation                    | (04)            |
| 2 marks – Procedure (flow chart)                    |                 |
| Q.3. 2 marks - Slide preparation                    | (04)            |
| 2 marks – procedure (flow chart)                    |                 |
| Q.4. 1 mark - Identification                        | (5x2=10)        |
| 1 mark – Description                                |                 |
| Q.5.Viva. (Questions related to practical syllabus) | (10)            |
| Q.6. Journal  | (10)            |

(Student should submit - Neat, Clean and certified journal)

**B.Sc. (Botany) Practical Examination**

Paper- BCC –I (Biodiversity – I)

Max. Marks - 50

Duration: 3hrs

- |   |      |
|---|------|
| Identify, Classify and describe specimen A, B and C giving reasons.   | (12) |
| Q.2. From the bacterial culture provided prepare the slide with the help of Monochrome staining/ Gram staining technique and show the slide to the examiners. | (04) |
| Q.3. Preparation of endomycorrhizal slide from the given material D.  | (04) |
| Q.4. Identify and describe specimens/slides/model/photograph /preparations E , F G, H, and I  | (10) |
| Q.5.Viva.   | (10) |
| Q.6. Journal  | (10) |

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**D 3.9 Minutes of the meeting of Board of Studies in Zoology held on 07/08/2017 & 16/08/2017  
Annexure I**

**CBCS B.Sc. ZOOLOGY GENERAL COURSE SYLLABUS**

<b>SEMESTER I (F.Y. B.Sc)</b>				
<b>PAPER CODE</b>	<b>TITLE</b>		<b>CREDITS</b>	<b>TOTAL CREDITS</b>
ZOCG 1	Diversity of Non-chordates & Cell Biology	Theory	04	<b>06</b>
		Practical	02	
ZOGE 1	Food , Nutrition and Health	Theory	04	<b>04</b>
<b>SEMESTER II (F.Y. B.Sc)</b>				
ZOCG 2	Diversity of Chordates & Genetics	Theory	04	<b>06</b>
		Practical	02	
ZOGE 2	Animal Behavior	Theory	04	<b>04</b>
<b>SEMESTER III (S.Y.B.Sc)</b>				
<b>PAPER CODE</b>	<b>TITLE</b>		<b>CREDITS</b>	<b>TOTAL CREDITS</b>
ZOCG 3	Anatomy of Animal Body systems	Theory	04	<b>06</b>
		Practical	02	
ZOSE 1	Aquarium Fish keeping	Theory	03	<b>04</b>
		Practical	01	
<b>SEMESTER IV (S.Y.B.Sc)</b>				
ZOCG 4	Animal Physiology and Biochemistry	Theory	04	<b>06</b>
		Practical	02	
ZOSE 2	Wildlife and Eco-tourism	Theory	03	<b>04</b>
		Practical	01	
<b>SEMESTER V (T.Y.B.Sc)</b>				
<b>PAPER CODE</b>	<b>TITLE</b>		<b>CREDITS</b>	<b>TOTAL CREDITS</b>
ZOEG 1	Applied Genetics & Evolution	Theory	03	<b>04</b>
		Practical	01	
ZOSE 3	Apiculture	Theory	03	<b>04</b>
		Practical	01	
ZOSE 4	Medical Diagnostics	Theory	03	<b>04</b>
		Practical	01	
<b>SEMESTER VI (T.Y.B.Sc)</b>				
ZOEG 2	Fundamentals of Animal Biotechnology	Theory	03	<b>04</b>
		Practical	01	
ZOSE 5	Aquaculture	Theory	03	<b>04</b>
		Practical	01	

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**COURSE CURRICULUM:****SEMESTER I (ZOCG 1, ZOGE 1)****PAPER CODE: ZOCG 1****TITLE: DIVERSITY OF NON-CHORDATES AND CELL BIOLOGY****Theory****Credits: 04**

**Learning Objective:** To know the general characters and classification of Nonchordates and understand the structure and function of animal cell.

**Learning Outcome:** On completion of the course the student should be able to know the general organization of Non-chordates as a group and know the taxonomy and characteristic features of the various Non-chordate phyla. The student should also understand the architecture and functions of a cell and its organelles.

<b>Topics</b>	<b>Duration - 60</b> (Clock hours)
<b>Unit 1: Kingdom Protista</b> General characters and classification up to classes; Locomotory Organelles and locomotion in Protozoa	<b>3</b>
<b>Unit 2: Phylum Porifera</b> General characters and classification up to classes; Canal System in <i>Sycon</i>	<b>3</b>
<b>Unit 3: Phylum Cnidaria</b> General characters and classification up to classes; Polymorphism in Hydrozoa	<b>3</b>
<b>Unit 4: Phylum Platyhelminthes</b> General characters and classification up to classes; Life history of <i>Taenia solium</i>	<b>3</b>
<b>Unit 5: Phylum Nematelminthes</b> General characters and classification up to classes; Life history of <i>Ascaris lumbricoides</i> and its parasitic adaptations	<b>4</b>
<b>Unit 6: Phylum Annelida</b> General characters and classification up to classes; Metamerism in Annelida	<b>3</b>
<b>Unit 7: Phylum Arthropoda</b>	<b>5</b>

General characters and classification up to classes; Vision in Arthropoda, Metamorphosis in Insects

**Unit 8: Phylum Mollusca** **3**

General characters and classification up to classes; Torsion in gastropods

**Unit 9: Phylum Echinodermata** **3**

General characters and classification up to classes; Water-vascular system in Asteroidea

**Unit 10: Introduction to cell biology** **2**

Overview of general organization of cells (Prokaryotic cells and Eukaryotic cells)

**Unit 11: Cell Environment** **05**

- Chemical bonds
- Inorganic- water, salts and ions
- Organic- proteins, carbohydrates, lipids, nucleic acids, vitamins
- Effect of radiation on cells (UV radiations, photodynamic sensitization)

**Unit 12: Cell Organelles** **15**

Structure and function of Plasma membrane, Mitochondria- Structure, and function (ETC system)

Structure and functions of Endoplasmic reticulum, Ribosomes, Golgi complex, Lysosomes (polymorphism of lysosomes), Microbodies (Peroxisomes and Glyoxysomes), Cytoskeleton (Microtubules, microfilaments and centrioles)

**Unit 13: Nucleus** **04**

Nuclear envelope, Nucleoplasm, Euchromatin and Heterochromatin, Nucleolus, Nucleosomes

**Unit 14: Cancer Biology** **04**

Characteristics of cancer cell

- Carcinomas, Sarcomas, Lymphomas, Leukemia
- Carcinogenesis

**PRACTICALS**

**Credits: 02**

- Study of animals belonging to Protozoa, Porifera, Cnidaria, Ctenophora, Platyhelminthes, Nematelminthes, Annelida, Arthropoda, Mollusca, Echinodermata with special reference to systematic position up to class level, habit, habitat, characteristic features and economic importance (one example of each class and Local examples are to be given more emphasis) with the help of Museum specimens , models, charts, Microslides, Photographs and Digital sources.

- Identification of Protozoans and Coelenterates in pond water sample
- Digestive system of Earthworm (Museum specimen/digital sources)
- Nervous system of Earthworm (Museum specimen/digital sources)
- Parapodium of Nereis, Nephredia and setae in earthworm
- larval forms of liverfluke with the help of Permanent slides/ Microphotographs/ digital sources
- Study of Prokaryotic cells- Gram's staining technique
- Study of Eukaryotic Cell using suitable staining technique (Buccal epithelial Cells)
- Method of protozoan culture (Any one)
- Study of cytoplasmic movements in *Paramecium*
- Study of osmosis using human RBC's
- Localization of Mitochondria by Janus Green stain
- Study of Cancer cells through permanent slides
- Study of cell organelles through electron micrographs

#### **SUGGESTED READINGS**

- Ruppert and Barnes, R.D. (2006). *Invertebrate Zoology*, VIII Edition. Holt Saunders International Edition.
  - Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002). *The Invertebrates: A New Synthesis*, III Edition, Blackwell Science
  - Barrington, E.J.W. (1979). *Invertebrate Structure and Functions*. II Edition, E.L.B.S. and Nelson
  - Jordan E.L., Verma P.S. (2001), *Invertebrates Zoology.*, S. Chand and company, New Delhi
  - Barnes, R.D. *Invertebrate Zoology* (1982) VI Edition. Holt Saunders International Edition.
  - D.W. and J.I., Spicer (2002) *The Invertebrates: A New Synthesis*. III Edition. Blackwell Science.
  - Boradale, L.A. and Potts, E.A. (1961) *Invertebrates: A Manual for the use of Students*. Asia Publishing Home.
  - Bushbaum, R. (1964) *Animals without Backbones*. University of Chicago Press.
  - Karp, G. (2010). *Cell and Molecular Biology: Concepts and Experiments*. VI Edition. John Wiley and Sons. Inc.
  - De Robertis, E.D.P. and De Robertis, E.M.F. (2006). *Cell and Molecular Biology*. VIII Edition. Lippincott Williams and Wilkins, Philadelphia.
  - Cooper, G.M. and Hausman, R.E. (2009). *The Cell: A Molecular Approach*. V Edition. ASM Press and Sunderland, Washington, D.C.; Sinauer Associates, MA.
  - Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. (2009). *The World of the Cell*. VII Edition. Pearson Benjamin Cummings Publishing, San Francisco.
  - Bruce Albert, Bray Dennis, Levis Julian, Raff Martin, Roberts Keith and Watson James (2008). *Molecular Biology of the Cell*, V Edition, Garland publishing Inc., New York and London.
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**PAPER CODE: ZOG 1**  
**TITLE: FOOD, NUTRITION AND HEALTH**

**THEORY****(Credits 4)**

**Learning Objective:** To know the basic concepts of food, nutrients and its impact on health.

**Learning Outcome:** On completion of the course the student should be able to know the concept of balanced diet, special nutritional requirements in various age groups and the diet related disorders in humans.

**Topics****Duration - 60***(Clock hours)***Unit 1: Basic concept of food and nutrition****10**

Food Components and food-nutrients

Concept of a balanced diet, nutrient needs and dietary pattern for various groups adults, pregnant and nursing mothers, infants, school children, adolescents and elderly

**Unit 2: Nutrients****20**

Dietary source and role of Carbohydrates, Lipids, Proteins

Vitamins- Fat-soluble and Water-soluble vitamins- their dietary source and importance

Minerals- Iron, calcium, phosphorus, iodine, selenium and zinc: their biological functions

**Unit 3: Health****15**

Introduction to health- Definition and concept of health Major nutritional Deficiency diseases- Protein Energy Malnutrition (kwashiorkor and marasmus), Vitamin A deficiency disorders, Iron deficiency disorders, Iodine deficiency disorders- their causes, symptoms, treatment, prevention and Government programmes, if any.

Life style related diseases- hypertension, diabetes mellitus, and obesity- their causes and prevention through dietary and lifestyle modifications Social health problems- smoking, alcoholism, drug dependence and Acquired Immuno Deficiency Syndrome (AIDS) - their causes, treatment and prevention. Common ailments- cold, cough, and fevers, their causes and treatment

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**Unit 4: Food hygiene:****15**

Potable water- sources and methods of purification at domestic level.

Food and Water borne infections: **Bacterial infection:** Cholera, typhoid fever, dysentery; **Viral infection:** Hepatitis, Poliomyelitis, **Protozoan infection:** amoebiasis, giardiasis; **Parasitic infection:** taeniasis and ascariasis their transmission, causative agent, sources of infection, symptoms and prevention Brief account of food spoilage: Causes of food spoilage and their preventive measures.

**Suggested Readings**

- Mudambi, SR and Rajagopal, MV. Fundamentals of Foods, Nutrition and Diet Therapy; Fifth Ed; 2007; New Age International Publishers
- Srilakshmi B. Nutrition Science; 2002; New Age International (P) Ltd.
- Srilakshmi B. Food Science; Fourth Ed; 2007; New Age International (P) Ltd.
- Swaminathan M. Handbook of Foods and Nutrition; Fifth Ed; 1986; BAPPCO.
- Bamji MS, Rao NP, and Reddy V. Text Book of Human Nutrition; 2009; Oxford & IBH Publishing Co. Pvt Ltd.
- Wardlaw GM, Hampl JS. Perspectives in Nutrition; Seventh Ed; 2007; McGraw Hill.
- Lakra P, Singh MD. Textbook of Nutrition and Health; First Ed; 2008; Academic Excellence.
- Manay MS, Shadaksharaswamy. Food-Facts and Principles; 1998; New Age International (P) Ltd.
- Gibney et al. Public Health Nutrition; 2004; Blackwell Publishing

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**SEMESTER II (ZOCG 2, ZOG 2)****PAPER CODE: ZOCG 2****TITLE: DIVERSITY OF CHORDATES & GENETICS****Theory****Credits: 04**

**Learning Objective:** To know the general characters and classification of Chordates and understand the fundamentals of genetics.

**Learning Outcome:** On completion of the course the student should be able to identify and classify the Chordates and also know about the abnormalities of the chromosomes and the pattern of inheritance of genetic traits

**Topics****Duration- 60***(Clock hours)*

<b>Unit 1: Introduction to Chordates</b>	<b>2</b>
General features and Phylogeny of Protochordata	
<b>Unit 2: Agnatha</b>	<b>3</b>
General features of Agnatha and classification of cyclostomes up to classes	
<b>Unit 3: Pisces</b>	<b>5</b>
General features and Classification up to orders; Migration and parental care in Fishes	
<b>Unit 4: Amphibia</b>	<b>5</b>
General features and Classification up to orders; Parental care in Amphibia	
<b>Unit 5: Reptiles</b>	<b>5</b>
General features and Classification up to orders, Mesozoic Reptiles, Venomous and non-venomous snakes	
<b>Unit 6: Aves</b>	<b>5</b>
General features and Classification up to orders; Volant adaptations in birds, Migration in Birds.	
<b>Unit 7: Mammals</b>	<b>5</b>
Classification up to orders; Origin of mammals,	
<b>Unit 8: Mendelian Genetics &amp; its Extension</b>	<b>10</b>
Overview of Mendelian Genetics Epistasis and Hypostasis, Multiple genes and multiple alleles, Sex linked, sex limited and sex influenced inheritance	
<b>Unit 9: Chromosome Structure</b>	<b>06</b>
Eukaryotic Chromosome, Types of Eukaryotic Chromosome (based on centromere position), Eukaryotic and prokaryotic chromosomal organisation, Giant chromosomes	
<b>Unit 10: Gene Mutation</b>	<b>05</b>
Natural and Induced Mutations, Types of gene mutation (base pair substitution and frame shift) Types of chromosomal aberration, Spontaneous and induced mutations (chemical mutagens and radiations)	
<b>Unit 11: Inbreeding and Heterosis</b>	<b>04</b>
Definition of Inbreeding, Inbreeding depression, Practical applications of Inbreeding. Heterosis – Genetic basis; Application and Evolutionary significance.	

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**Unit 12: Inheritance of Human traits**

05

Human karyotype, Pedigree analysis

Inheritance of human traits: Brown eyes, Polydactyly, Diabetes insipidus, Sickle cell anemia, PKU

Eugenics and Genetic counseling

**PRACTICALS****Credits: 02**

- Study of following specimens:  
*Balanoglossus, Herdmania, Branchiostoma, Petromyzon, Sphyrna, Pristis, Torpedo, Labeo, Exocoetus, Anguilla, Ichthyophis/Ureotyphlus, Salamandra, Bufo, Hyla, Chelone, Hemidactylus, Chamaeleon, Draco, Vipera, Naja, Crocodylus, Gavialis, Any six common birds from different orders, Bat, Funambulus, Loris*
- Key for Identification of poisonous and non-poisonous snakes
- Problems on multiple alleles, multiple genes and epistasis (one on each)
- Inheritance problems based on Epistatic interactions
- ABO blood grouping and Rh factor in humans
- Study of Polytene chromosome in *Drosophila*/Chironomous larva
- Determination of genetic sex by Barr body
- Study of Human Karyotype (Normal male and female, Turner's syndrome and Down's syndrome)
- Determination of allelic frequency of following Mendelian human traits: Tongue rolling, earlobes, Widow's peak, hand clasping, folding of arms, thumb cross pattern, Hitch-hiker's thumb.

**SUGGESTED READINGS**

- Young, J. Z. (2004). *The Life of Vertebrates*. III Edition. Oxford university press.
- Pough H. *Vertebrate life*, VIII Edition, Pearson International.
- Darlington P.J. *The Geographical Distribution of Animals*, R.E. Krieger Pub Co.
- Hall B.K. and Hallgrimsson B. (2008). *Strickberger's Evolution*. IV Edition. Jones and Bartlett Publishers Inc.
- Gardner, E.J., Simmons, M.J., Snustad, D.P. (2008). *Principles of Genetics*. VIII Edition. Wiley India
- Snustad, D.P., Simmons, M.J. (2009). *Principles of Genetics*. V Edition. John Wiley and Sons Inc
- Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). *Concepts of Genetics*. X Edition. Benjamin Cummings
- Russell, P. J. (2009). *Genetics- A Molecular Approach*. III Edition. Benjamin Cummings
- Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C. and Carroll, S.B. *Introduction to Genetic Analysis*. IX Edition. W. H. Freeman and Co

- Fletcher H. and Hickey I. (2015). *Genetics*. IV Edition. GS, Taylor and Francis Group, New York and London.

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**PAPER CODE: ZOG2**  
**TITLE: ANIMAL BEHAVIOUR**

**THEORY****(Credits 4)**

**Learning Objective:** To know the theories and patterns of animal behavior.

**Learning Outcome:** On completion of the course the student should be able to understand stereotyped and social behaviors of animals and know about the biological rhythms governing the behavior of animals.

Topics	Duration- 60 (Clock hours)
<p><b>Unit 1: Introduction to Animal Behaviour</b></p> <p>Origin and history of Ethology; Brief profiles of Karl Von Frish, Ivan Pavlov, Konrad Lorenz, Niko Tinbergen, Proximate and ultimate causes of behaviour, Methods and recording of a behaviour</p>	<b>10</b>
<p><b>Unit 2: Patterns of Behaviour</b></p> <p>Stereotyped Behaviours (Orientation, Reflexes); Individual Behavioural patterns; Instinct vs. Learnt Behaviour; Associative learning, classical and operant conditioning, Habituation, Imprinting.</p>	<b>15</b>
<p><b>Unit 3: Social and Sexual Behaviour</b></p> <p>Social Behaviour: Concept of Society; Communication and the senses; Altruism; Insects' society with Honey bee as example; Foraging in honey bee and advantages of the waggle dance. Sexual Behaviour: Asymmetry of sex, Sexual dimorphism, Mate choice, Intra-sexual selection (male rivalry), Inter-sexual selection (female choice), Sexual conflict in parental care.</p>	<b>15</b>
<p><b>Unit 4: Biological Rhythm</b></p> <p>Types and characteristics of biological rhythms: Short- and Long- term rhythms; Circadian rhythms; Tidal rhythms and Lunar rhythms; Concept of synchronization and masking; Photic and non-photic zeitgebers; Circannual rhythms; Photoperiod and regulation seasonal reproduction of vertebrates; Role of melatonin.</p>	<b>15</b>
<p><b>Unit 5: Biological Clocks</b></p> <p>Relevance of biological clocks; Chronopharmacology, Chronomedicine, Chronotherapy.</p>	<b>05</b>

### Suggested Readings

- David McFarland, Animal Behaviour, Pitman Publishing Limited, London, UK.
- Manning, A. and Dawkins, M. S, An Introduction to Animal Behaviour, Cambridge, University Press, UK.
- John Alcock, Animal Behaviour, Sinauer Associate Inc., USA.
- Paul W. Sherman and John Alcock, Exploring Animal Behaviour, Sinauer Associate Inc., Massachusetts, USA.
- Chronobiology Biological Timekeeping: Jay. C. Dunlap, Jennifer. J. Loros, Patricia J. DeCoursey (ed). 2004, Sinauer Associates, Inc. Publishers, Sunderland, MA, USA
- Insect Clocks D.S. Saunders, C.G.H. Steel, X., Afopoulou (ed.)R.D. Lewis. (3rdEd) 2002 Barends and Noble Inc. New York, USA
- Biological Rhythms: Vinod Kumar (2002) Narosa Publishing House, Delhi/ Springer-Verlag, Germany.

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### SEMESTER III (ZOCG 3, ZOSE 1)

**PAPER CODE: ZOCG 3**

**TITLE: ANATOMY OF ANIMAL BODY SYSTEMS**

**THEORY**

**(CREDITS 4)**

**Learning Objective:** To know structure and functions of the different systems in the vertebrates.

**Learning Outcome:** On completion of the course the student should be able to know the general plan and functioning of different components of the systems in the body.

Topics	Duration- 60 (Clock hours)
<b>Unit 1: Integumentary System</b> Structure, functions and derivatives of integument	<b>8</b>
<b>Unit 2: Skeletal System</b> Overview of axial and appendicular skeleton, Jaw suspensorium, Visceral arches	<b>8</b>
<b>Unit 3: Digestive System</b> Alimentary canal and associated glands, dentition	<b>8</b>

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<b>Unit 4: Respiratory System</b>	<b>8</b>
Skin, gills, lungs and air sacs; Accessory respiratory organs	
<b>Unit 5: Circulatory System</b>	<b>8</b>
General plan of circulation, evolution of heart and aortic arches	
<b>Unit 6: Urinogenital System</b>	<b>6</b>
Succession of kidney, Evolution of urinogenital ducts, Types of mammalian uteri	
<b>Unit 7: Nervous System</b>	<b>8</b>
Comparative account of brain, Autonomic nervous system, Spinal cord, Cranial nerves in mammals	
<b>Unit 8: Sense Organs</b>	<b>6</b>
Classification of receptors Brief account of visual and auditory receptors in man	

#### **PRACTICALS**

**(CREDITS 2)**

- Study of placoid, cycloid and ctenoid scales through permanent slides/photographs
- Disarticulated skeleton of Frog, *Varanus*, Fowl, Rabbit
- Carapace and plastron of turtle /tortoise
- Mammalian skulls: One herbivorous and one carnivorous animal
- Dissection of rat to study arterial and urinogenital system (subject to permission)
- Study of structure of any two organs (heart, lung, kidney, eye and ear) from video recording/models/charts (may be included if dissection not permitted)
- Project on skeletal modifications in vertebrates (may be included if dissection not permitted)

#### **Suggested Readings**

- Kardong, K.V. (2005) *Vertebrates' Comparative Anatomy, Function and Evolution*. IV Edition. McGraw-Hill Higher Education
- Kent, G.C. and Carr R.K. (2000). *Comparative Anatomy of the Vertebrates*. IX Edition. The McGraw-Hill Companies
- Hilderbrand, M and Gaslow G.E. *Analysis of Vertebrate Structure*, John Wiley and Sons
- Walter, H.E. and Sayles, L.P; *Biology of Vertebrates*, Khosla Publishing House

**PAPER CODE: ZOSE 1**  
**TITLE: AQUARIUM FISH KEEPING**

**THEORY****(CREDITS 3)**

**Learning Objective:** To know the technique of rearing /maintaining fishes in an aquarium.

**Learning Outcome:** On completion of the course the student should be able to know the biology of aquarium fishes, their nutritional requirements and care. The student should be able to know the requirements for setting up an aquarium.

Topics	Duration- 45 (Clock hours)
<b>Unit 1: Introduction to Aquarium Fish Keeping</b> The potential scope of Aquarium Fish Industry as a Cottage Industry, Exotic and Endemic species of Aquarium Fishes	<b>5</b>
<b>Unit 2: Biology of Aquarium Fishes</b> Common characters and sexual dimorphism of Fresh water and Marine Aquarium fishes such as Guppy, Molly, Sword tail, Gold fish, Angel fish, Blue morph, Anemone fish and Butterfly fish	<b>7</b>
<b>Unit 3: Food and feeding of Aquarium fishes</b> Use of live fish feed organisms. Preparation and composition of formulated fish feeds	<b>6</b>
<b>Unit 4: Fish Transportation</b> Live fish transport - Fish handling, packing and forwarding techniques.	<b>6</b>
<b>Unit 5. Common Aquarium Fish diseases</b> Fin rot, swim bladder disorders, body flukes and dropsy, Ich	<b>6</b>
<b>Unit 6: Maintenance of Aquarium</b> General Aquarium maintenance – budget for setting up an Aquarium Fish Farm as a Cottage Industry	<b>7</b>
<b>Unit 7: Introduction to Aquarium plants</b> Introduction to aquarium plants and their export potential, profiles of some selected aquarium plants, Indigenous ornamental plants of Western Ghats, management of ornamental aquatic plants and its trading.	<b>8</b>

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### Practicals

(CREDITS 1)

- Identification of common Aquarium fishes
- Identification of live feed organisms
- Study of different types of formulated feeds
- Preparation of formulated feed
- Study of slides of parasites and diseases
- Setting up of an aquarium
- Study of ornamental plants

### Suggested Readings

- Rath, R.K. (2000) Freshwater Aquaculture. Scientific Publishers (India). PO Box:91, Jodhpur.
- Jhingran, AVG (1991) Fish and Fisheries of India. Hindustan Publishing Co.
- Baradach, JE, JH Ryther and WO Mc Larney (1972). Aquaculture. The Farming and Husbandry of Freshwater and Marine Organisms. Wiley Interscience, New York.
- Jameson, J.D. and R.Santhanam (1996). Manual of ornamental fisheries and farming technology. Fisheries College and Research Institute, Thoothukudi.
- Mitchell Beazley, 1998. The complete guide to tropical aquarium fish care. Read and Consumes Book Ltd., London.
- Everything for the aquarist. Tetra Werke Publication, West Germany.
- Jameson, J.D. Alangara Meen Valarpu (in Tamil). National Book House, New Delhi.

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### SEMESTER IV (ZOCG 4, ZOSE 2)

PAPER CODE: ZOCG 4

TITLE: ANIMAL PHYSIOLOGY & BIOCHEMISTRY

### THEORY

(Credits 4)

**Learning Objective:** To understand the physiology of the different processes of the body systems and the micromolecules and macromolecules of the cells.

**Learning Outcome:** On completion of the course the student should be able to know mechanism of body functions and the basic knowledge of chemistry of biomolecules.

Topics

Duration- 60

(Clock hours)

<b>Unit 1: Physiology of Digestion</b>	<b>6</b>
Structural organization and functions of gastrointestinal tract and associated glands; Mechanical and chemical digestion of food; Hormonal control of secretion of enzymes in Gastrointestinal tract.	
<b>Unit 2: Physiology of Respiration</b>	<b>7</b>
Mechanism of respiration, Pulmonary ventilation; Respiratory volumes and capacities; Transport of oxygen and carbon dioxide in blood; Respiratory pigments, Dissociation curves and the factors influencing it; Control of respiration	
<b>Unit 3: Renal Physiology</b>	<b>5</b>
Structure of kidney and its functional unit; Mechanism of urine formation; Regulation of water balance; Regulation of acid-base balance	
<b>Unit 4: Cardiovascular Physiology</b>	<b>6</b>
Composition of blood, blood volume, Origin and conduction of the cardiac impulse, Cardiac cycle, Regulation of blood pressure and heart rate.	
<b>Unit 5: Muscle Physiology</b>	<b>6</b>
Types of muscles, Ultrastructure of skeletal muscles, properties of skeletal muscles, theories of muscle contraction,	
<b>Unit 6: pH and buffer</b>	<b>1</b>
Definition of pH, buffer, types of buffer.	
<b>Unit 7: Carbohydrates</b>	<b>7</b>
Structure and Biological importance: Monosaccharides, Disaccharides, Polysaccharides and Glycoconjugates	
<b>Unit 8: Lipids</b>	<b>7</b>
Structure and Significance: Physiologically important saturated and unsaturated fatty acids, Triacylglycerols, Phospholipids, Glycolipids, Steroids	
<b>Unit 9: Proteins</b>	<b>8</b>
<b>Amino acids:</b> Structure, Classification and General properties of $\alpha$ -amino acids; Physiological importance of essential and non-essential $\alpha$ -amino acids <b>Proteins:</b> Bonds stabilizing protein structure; Levels of organization in proteins; Denaturation; Introduction to simple and conjugate proteins	

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**Unit 10: Enzymes****7**

Nomenclature and classification; Cofactors; Specificity of enzyme action; Isozymes; Mechanism of enzyme action; Enzyme kinetics; Factors affecting rate of enzyme-catalyzed reactions, Concept of Michaelis-Menten equation, Lineweaver-Burk plot, Enzyme inhibition.

**PRACTICALS****(Credits 2)**

- Measurement of blood pressure
- Hemoglobin estimation\
- Preparation of Haemin crystals
- Observation of Pulse rate under normal and stressed condition
- Respiratory rate of cockroach/any insect
- Qualitative tests to identify functional groups of carbohydrates in given solutions (Glucose, Fructose, Sucrose, Lactose)
- Estimation of total protein.
- Study of activity of salivary amylase under optimum conditions (pH, temperature)
- Study of normal and abnormal constituents in Urine
- Study of different types of muscle cells.

**Suggested Readings**

- Tortora, G.J. and Derrickson, B.H. (2009). *Principles of Anatomy and Physiology*, XII Edition, John Wiley & Sons, Inc.
- Widmaier, E.P., Raff, H. and Strang, K.T. (2008) *Vander's Human Physiology*, XI Edition., McGraw Hill
- Guyton, A.C. and Hall, J.E. (2011). *Textbook of Medical Physiology*, XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company
- Berg, J. M., Tymoczko, J. L. and Stryer, L. (2006). *Biochemistry*. VI Edition. W.H Freeman and Co.
- Nelson, D. L., Cox, M. M. and Lehninger, A.L. (2009). *Principles of Biochemistry*. IV Edition. W.H. Freeman and Co.
- Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009). *Harper's Illustrated Biochemistry*. XXVIII Edition. Lange Medical Books/Mc Graw3Hill.

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**PAPER CODE: ZOSE 2****PAPER TITLE: WILDLIFE AND ECOTOURISM****THEORY****Credits: 03**



**Learning Objective:** To learn the objectives and strategies of wildlife conservation and monitoring.

**Learning Outcome:** On completion of the course the student should be able to know the current status and conservation strategies for wildlife conservation and management.

Topics	Duration- 45 (Clock hours)
<p><b>Unit1: Introduction to Wildlife, Current Scenario &amp; Conservation categories</b></p> <p>Meaning, Values, Global &amp; Indian scenario Biogeographic zonation and wildlife endowments of India, Wildlife as a sustainable tourism resource. Contemporary status of Indian Wildlife and Impediments to conservation of wildlife in India</p>	<b>04</b>
<p><b>Unit2: Causes of depletion, extinction of wildlife &amp; Conservation Categories</b></p> <p>Causes of Wild Depletion -Proximate &amp; Root causes. Extinct Species, Drivers of Extinction &amp; Extinction Threshold North East and Western Ghats; as 'Centers of Endemicity' Conservation categories with relevant examples (Endangered, Vulnerable, Rare, Threatened, Out of Danger, Indeterminate, Insufficiently Known, Extinct, Extinct in Wild ,Critically Endangered, Lower Risk, Conservation Dependent, Near Threatened, Least Concern, Data Deficient, Not Evaluated) IWPA 1972, Schedule I species (Mammals, Birds and Reptiles).</p>	<b>10</b>
<p><b>Unit 3: Wildlife Conservation-Objectives &amp; Methods</b></p> <p>Meaning of conservation, Objectives of wildlife conservation Conservation strategies, <i>Ex situ</i> &amp; <i>In situ</i> methods of wildlife Conservation (<b>PAN, CCA, Zoos, Aquaria, Captive Breeding &amp; Ranching etc</b>) Centrally Sponsored Schemes for Wildlife Conservation (<b>Integrated Development of Wildlife Habitats, Project Tiger, Project Elephant</b>)</p>	<b>06</b>
<p><b>Unit 4: Wildlife Tourism in India: Prospects &amp; Challenges</b></p> <p>Difference between Tourism, leisure and recreation Ecotourism versus Conventional Mass tourism, a SWOT analysis. Natural area Tourism (Adventure tourism, Wildlife tourism and Ecotourism) Wildlife Tourism: <b>Advantages</b> (Sustainability of enterprise, Assured backflow of profits to local communities, Upholding conservation ethos)</p>	<b>10</b>

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Wildlife Tourism: **Impacts** (Altered landscape, Impact of roads on wildlife habitats, , Tourism generated litter, Introduction of Invasive species, Zoonotic disease transmissions, Violation of 'Visitors carrying Capacity' & visitor induced stress and disturbance Tour to wildlife)

**Unit 5: Planning, Management & Monitoring of Wildlife Tourism**

**15**

Wildlife as a specific component of ecosystem and major wildlife destinations in India.(Wildlife of Indian Himalayas, Indian Deserts, Indian Coral Reefs, Western Ghats)

Rationale for Visitor Planning and stakeholder involvement

Carrying Capacity & 'Acceptable' Change

Visitor Management: Zoning, Roads & Trails, Regulating Visitor numbers, Visitor Communication & Education.

Interpretation: Fundamental Principles & major interpretation techniques (Publication & Websites, Visitor Centres, Self-guided Trails, Guided Tours

Visitor Monitoring: Reasons for Monitoring, Monitoring Techniques (Counting visitors, Questionnaires & Interviews, Observing visitors, Focus Groups)

**Reference Books**

- S K Singh (2010) *Text Book of wildlife Management* International Book Distributing Company, Lucknow
- Vivek Menon (2014) *Indian Mammals :A Field Guide* Hachette Book Publishing India Pvt Ltd, Gurgaon
- S S Negi (1992) *Himalayan Wildlife*. Indus Publishing Company, New Delhi
- Mohan Pai (2005) *The Western Ghats*. M/S Narcinva damodar Naik Margao ,Goa
- Richard Carmichael (2007). *Indian Wildlife*. Apa Publications GmbH Co. Verlag KG (Singapore )
- Ravee Chauhan (2006) *Ecotourism Trends & Challenges*. Vista International Publishing House Delhi
- David Newsome, Susan Moore and Ross K Dowling (2006) *Natural Area Tourism Ecology, Impacts and Management*. Viva Books Pvt Ltd Ac Delhi
- C.Michael Hall and Stephen Boyd (2006) *Nature based tourism in peripheral areas - Development or disaster ?* Viva Books Pvt Ltd New Delhi
- Ministry of Environment & Forests Gol, (2002), *National Biodiversity Strategy & Action Plan*

**Practicals**

**Credits: 01**

- Use of Maps and other GIS resources to understand the biogeographic zones of India and understand the location of our State in this scheme.

- Prepare an Inventory of state's Wildlife Resources (Forest Types, Carnivores, Wild Ungulates, Birds, Reptiles) from secondary sources and classify them under them under various PAN, IUCN conservation categories & IWPA Schedules
- Visit to a state WPA and CCA to understand and prepare Report on the management and conservation action.
- To prepare an inventory of your Taluk's existing and potential Ecotourism sites with special reference to Birdlife. Evaluate any one extant ecotourism site with reference to
  - Visitor's Carrying Capacity
  - Visitor Education & Interpretation
  - Visitor Facility
- Observing the effect Habitat improvement on diversity of butterflies (Diversity estimation pre and post food plants introduction)
- Understanding Carnivore Pug Biometry by analysis of Pug Marks/Whisker Spot study in Asiatic Lion (Printed Lion Pug Imprints / Lion Head sketches with Reference Rows & Identification Rows of Whisker Spots to be provided)
- Population enumeration by Lincoln & Peterson's Index Method (Coloured Beads to represent marked to unmarked individuals)

### References

1. William J. Sutherland, Lynn V. Dicks, Nancy Ockendon & Rebecca K. Smith(2015) *What works in conservation*. Open Book Publishers, UK
2. S K Singh (2010) *Text Book of wildlife Management* International Book Distributing Company, Lucknow
3. Paresh Porb, Raman Kulkarni and Varad Giri (2014) *Biodiversity of Goa*. Pug Marks Art Gallery, Kolhapur
4. Goa State Biodiversity Board (2014) *Island Biodiversity , Goa:Biological Treasure of Chorao, Divar and St Jacinto Island*. National Biodiversity Authority.
5. Richard Grimmet, Tim Inskipp (2005) *Birds of Southern India*. Om Books International
6. Issac Kehimkar (2011) *The Book of Indian Butterflies*. Oxford.
7. Luigi Boitani & Roger Powell (2012) *Carnivore Ecology and Conservation*. Oxford University Press
8. Romulus Whitaker & Ashok captain (2008) *Snakes of India*. Draco Books Tamil Nadu
9. Asad R Rehmani (2012) *Threatened Birds of India*. Oxford University Press
10. Ravee Chauhan (2006) *Ecotourism Trends & Challenges*. Vista International Publishing House Delhi

11. David Newsome, Susan Moore and Ross K Dowling (2006) *Natural Area Tourism Ecology, Impacts and Management*. Viva Books Pvt Ltd Ac Delhi  
 12. *The Wildlife (Protection) Act, (1972)* Natraj Publishers

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**CBCS B.Sc. ZOOLOGY HONOURS COURSE SYLLABUS**

<b>SEMESTER I (F.Y. B.Sc.)</b>				
<b>PAPER CODE</b>	<b>TITLE</b>		<b>CREDITS</b>	<b>TOTAL CREDITS</b>
ZOCG 1	Diversity of Non-chordates & Cell Biology	Theory	04	<b>06</b>
		Practical	02	
ZOGE 1	Food , Nutrition and Health	Theory	04	<b>04</b>
<b>SEMESTER II (F.Y. B.Sc.)</b>				
ZOCG 2	Diversity of Chordates & Genetics	Theory	04	<b>06</b>
		Practical	02	
ZOGE 2	Animal Behaviour	Theory	04	<b>04</b>
<b>SEMESTER III (S.Y. B.Sc.)</b>				
<b>PAPER CODE</b>	<b>TITLE</b>		<b>CREDITS</b>	<b>TOTAL CREDITS</b>
ZOCG 3	Anatomy of Animal Body systems	Theory	04	<b>06</b>
		Practical	02	
ZOSE 1	Aquarium Fish keeping	Theory	03	<b>04</b>
		Practical	01	
<b>SEMESTER IV (S.Y. B.Sc.)</b>				
ZOCG 4	Animal Physiology and Biochemistry	Theory	04	<b>06</b>
		Practical	02	
ZOSE 2	Wildlife and Eco-tourism	Theory	03	<b>04</b>
		Practical	01	
<b>SEMESTER V (T.Y. B.Sc.)</b>				
<b>PAPER CODE</b>	<b>TITLE</b>		<b>CREDITS</b>	<b>TOTAL CREDITS</b>
ZOCG 5	Anatomy of Vertebrates	Theory	04	<b>06</b>
		Practical	02	
ZOCG 6	Biochemistry of Metabolic Processes	Theory	04	<b>06</b>
		Practical	02	
ZOCG 7	Molecular Biology & Evolution	Theory	04	<b>06</b>
		Practical	02	
ZOEH 1	Research Methodology and Bio-statistics	Theory	03	<b>04</b>
		Practical	01	
ZOEH 2	Endocrinology	Theory	03	<b>04</b>
		Practical	01	
ZOEH 3	Fish and Fisheries	Theory	03	<b>04</b>
		Practical	01	
<b>SEMESTER VI (T.Y. B.Sc.)</b>				

ZOCG 8	Developmental Biology	Theory	04	<b>06</b>
		Practical	02	
ZOCG 9	Environmental Biology & Toxicology	Theory	04	<b>06</b>
		Practical	02	
ZOCG 10	Animal Biotechnology	Theory	04	<b>06</b>
		Practical	02	
ZOEH 4	Parasitology	Theory	03	<b>04</b>
		Practical	01	
ZOEH 5	Environment Impact Assessment	Theory	03	<b>04</b>
		Practical	01	
ZP (Project)*	Project Work			<b>04</b>

\*In lieu of any one ZOEH

### COURSE CURRICULUM:

#### SEMESTER I (ZOCG 1, ZOG E 1)

#### PAPER CODE: ZOCG 1

#### TITLE: DIVERSITY OF NON-CHORDATES AND CELL BIOLOGY

#### Theory

**Credits: 04**

**Learning Objective:** To know the general characters and classification of Nonchordates and understand the structure and function of animal cell.

**Learning Outcome:** On completion of the course the student should be able to know the general organization of Non-chordates as a group and know the taxonomy and characteristic features of the various Non-chordate phyla. The student should also understand the architecture and functions of a cell and its organelles.

#### Topics

**Duration - 60**

(Clock hours)

#### **Unit 1: Kingdom Protista**

**3**

General characters and classification up to classes; Locomotory Organelles and locomotion in Protozoa

#### **Unit 2: Phylum Porifera**

**3**

General characters and classification up to classes; Canal System in *Sycon*

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**3**

**Unit 3: Phylum Cnidaria**

General characters and classification up to classes; Polymorphism in Hydrozoa

**Unit 4: Phylum Platyhelminthes** **3**

General characters and classification up to classes; Life history of *Taenia solium*

**Unit 5: Phylum Nemathelminthes** **4**

General characters and classification up to classes; Life history of *Ascaris lumbricoides* and its parasitic adaptations

**Unit 6: Phylum Annelida** **3**

General characters and classification up to classes; Metamerism in Annelida

**Unit 7: Phylum Arthropoda** **5**

General characters and classification up to classes; Vision in Arthropoda, Metamorphosis in Insects

**Unit 8: Phylum Mollusca** **3**

General characters and classification up to classes; Torsion in gastropods

**Unit 9: Phylum Echinodermata** **3**

General characters and classification up to classes; Water-vascular system in Asteroidea

**Unit 10: Introduction to cell biology** **2**

Overview of general organization of cells (Prokaryotic cells and Eukaryotic cells)

**Unit 11: Cell Environment** **05**

- Chemical bonds
- Inorganic- water, salts and ions
- Organic- proteins, carbohydrates, lipids, nucleic acids, vitamins
- Effect of radiation on cells (UV radiations, photodynamic sensitization)

**Unit 12: Cell Organelles** **15**

Structure and function of Plasma membrane, Mitochondria- Structure, and function (ETC system)

Structure and functions of Endoplasmic reticulum, Ribosomes, Golgi complex, Lysosomes (polymorphism of lysosomes), Microbodies (Peroxisomes and Glyoxysomes), Cytoskeleton (Microtubules, microfilaments and centrioles)

**Unit 13: Nucleus** **04**

Nuclear envelope, Nucleoplasm, Euchromatin and Heterochromatin, Nucleolus, Nucleosomes

#### Unit 14: Cancer Biology

04

Characteristics of cancer cell

- Carcinomas, Sarcomas, Lymphomas, Leukemia
- Carcinogenesis

#### PRACTICALS

Credits: 02

- Study of animals belonging to Protozoa, Porifera, Cnidaria, Ctenophora, Platyhelminthes, Nematelminthes, Annelida, Arthropoda, Mollusca, Echinodermata with special reference to systematic position up to class level, habit, habitat, characteristic features and economic importance (one example of each class and Local examples are to be given more emphasis) with the help of Museum specimens, models, charts, Microslides, Photographs and Digital sources.
- Identification of Protozoans and Coelenterates in pond water sample
- Digestive system of Earthworm (Museum specimen/digital sources)
- Nervous system of Earthworm (Museum specimen/digital sources)
- Parapodium of Nereis, Nephredia and setae in earthworm
- larval forms of liverfluke with the help of Permanent slides/ Microphotographs/ digital sources
- Study of Prokaryotic cells- Gram's staining technique
- Study of Eukaryotic Cell using suitable staining technique (Buccal epithelial Cells)
- Method of protozoan culture (Any one)
- Study of cytoplasmic movements in *Paramecium*
- Study of osmosis using human RBC's
- Localization of Mitochondria by Janus Green stain
- Study of Cancer cells through permanent slides
- Study of cell organelles through electron micrographs

#### SUGGESTED READINGS

- Ruppert and Barnes, R.D. (2006). *Invertebrate Zoology*, VIII Edition. Holt Saunders International Edition.
- Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002). *The Invertebrates: A New Synthesis*, III Edition, Blackwell Science
- Barrington, E.J.W. (1979). *Invertebrate Structure and Functions*. II Edition, E.L.B.S. and Nelson
- Jordan E.L., Verma P.S. (2001), *Invertebrates Zoology*, S. Chand and company, New Delhi
- Barnes, R.D. *Invertebrate Zoology* (1982) VI Edition. Holt Saunders International Edition.
- D.W. and J.I., Spicer (2002) *The Invertebrates: A New Synthesis*. III Edition. Blackwell Science.

- Boradale, L.A. and Potts, E.A. (1961) *Invertebrates: A Manual for the use of Students*. Asia Publishing Home.
- Bushbaum, R. (1964) *Animals without Backbones*. University of Chicago Press.
- Karp, G. (2010). *Cell and Molecular Biology: Concepts and Experiments*. VI Edition. John Wiley and Sons. Inc.
- De Robertis, E.D.P. and De Robertis, E.M.F. (2006). *Cell and Molecular Biology*. VIII Edition. Lippincott Williams and Wilkins, Philadelphia.
- Cooper, G.M. and Hausman, R.E. (2009). *The Cell: A Molecular Approach*. V Edition. ASM Press and Sunderland, Washington, D.C.; Sinauer Associates, MA.
- Becker, W.M., Kleinsmith, L.J., Hardin. J. and Bertoni, G. P. (2009). *The World of the Cell*. VII Edition. Pearson Benjamin Cummings Publishing, San Francisco.
- Bruce Albert, Bray Dennis, Levis Julian, Raff Martin, Roberts Keith and Watson James (2008). *Molecular Biology of the Cell*, V Edition, Garland publishing Inc., New York and London.

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**PAPER CODE: ZOG 1****TITLE: FOOD, NUTRITION AND HEALTH****THEORY****(Credits 4)**

**Learning Objective:** To know the basic concepts of food, nutrients and its impact on health.

**Learning Outcome:** On completion of the course the student should be able to know the concept of balanced diet, special nutritional requirements in various age groups and the diet related disorders in humans.

<b>Topics</b>	<b>Duration - 60</b> (Clock hours)
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**Unit 1: Basic concept of food and nutrition****10**

Food Components and food-nutrients

Concept of a balanced diet, nutrient needs and dietary pattern for various groups adults, pregnant and nursing mothers, infants, school children, adolescents and elderly

**Unit 2: Nutrients****20**

Dietary source and role of Carbohydrates, Lipids, Proteins

Vitamins- Fat-soluble and Water-soluble vitamins- their dietary source and importance

Minerals- Iron, calcium, phosphorus, iodine, selenium and zinc: their biological functions

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**Unit 3: Health**

**15**

Introduction to health- Definition and concept of health Major nutritional Deficiency diseases- Protein Energy Malnutrition (kwashiorkor and marasmus), Vitamin A deficiency disorders, Iron deficiency disorders, Iodine deficiency disorders- their causes, symptoms, treatment, prevention and Government programmes, if any.

Life style related diseases- hypertension, diabetes mellitus, and obesity- their causes and prevention through dietary and lifestyle modifications Social health problems- smoking, alcoholism, drug dependence and Acquired Immuno Deficiency Syndrome (AIDS) - their causes, treatment and prevention. Common ailments- cold, cough, and fevers, their causes and treatment

**Unit 4: Food hygiene:**

**15**

Potable water- sources and methods of purification at domestic level.

Food and Water borne infections: **Bacterial infection:** Cholera, typhoid fever, dysentery; **Viral infection:** Hepatitis, Poliomyelitis, **Protozoan infection:** amoebiasis, giardiasis; **Parasitic infection:** taeniasis and ascariasis their transmission, causative agent, sources of infection, symptoms and prevention Brief account of food spoilage: Causes of food spoilage and their preventive measures.

**Suggested Readings**

- Mudambi, SR and Rajagopal, MV. Fundamentals of Foods, Nutrition and Diet Therapy; Fifth Ed; 2007; New Age International Publishers
- Srilakshmi B. Nutrition Science; 2002; New Age International (P) Ltd.
- Srilakshmi B. Food Science; Fourth Ed; 2007; New Age International (P) Ltd.
- Swaminathan M. Handbook of Foods and Nutrition; Fifth Ed; 1986; BAPPCO.
- Bamji MS, Rao NP, and Reddy V. Text Book of Human Nutrition; 2009; Oxford & IBH Publishing Co. Pvt Ltd.
- Wardlaw GM, Hampl JS. Perspectives in Nutrition; Seventh Ed; 2007; McGraw Hill.
- Lakra P, Singh MD. Textbook of Nutrition and Health; First Ed; 2008; Academic Excellence.
- Manay MS, Shadaksharaswamy. Food-Facts and Principles; 1998; New Age International (P) Ltd.
- Gibney et al. Public Health Nutrition; 2004; Blackwell Publishing

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**SEMESTER II (ZOCG 2, ZOG 2)**

**PAPER CODE: ZOCG 2**

**TITLE: DIVERSITY OF CHORDATES & GENETICS**

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**Theory****Credits: 04**

**Learning Objective:** To know the general characters and classification of Chordates and understand the fundamentals of genetics.

**Learning Outcome:** On completion of the course the student should be able to identify and classify the Chordates and also know about the abnormalities of the chromosomes and the pattern of inheritance of genetic traits

Topics	Duration- 60 (Clock hours)
<b>Unit 1: Introduction to Chordates</b> General features and Phylogeny of Protochordata	<b>2</b>
<b>Unit 2: Agnatha</b> General features of Agnatha and classification of cyclostomes up to classes	<b>3</b>
<b>Unit 3: Pisces</b> General features and Classification up to orders; Migration and parental care in Fishes	<b>5</b>
<b>Unit 4: Amphibia</b> General features and Classification up to orders; Parental care in Amphibia	<b>5</b>
<b>Unit 5: Reptiles</b> General features and Classification up to orders, Mesozoic Reptiles, Venomous and non-venomous snakes	<b>5</b>
<b>Unit 6: Aves</b> General features and Classification up to orders; Volant adaptations in birds, Migration in Birds.	<b>5</b>
<b>Unit 7: Mammals</b> Classification up to orders; Origin of mammals,	<b>5</b>
<b>Unit 8: Mendelian Genetics &amp; its Extension</b> Overview of Mendelian Genetics Epistasis and Hypostasis, Multiple genes and multiple alleles, Sex linked, sex limited and sex influenced inheritance	<b>10</b>
<b>Unit 9: Chromosome Structure</b> Eukaryotic Chromosome, Types of Eukaryotic Chromosome (based on centromere)	<b>06</b>

position), Eukaryotic and prokaryotic chromosomal organisation, Giant chromosomes

**Unit 10: Gene Mutation**

**05**

Natural and Induced Mutations, Types of gene mutation (base pair substitution and frame shift)  
Types of chromosomal aberration, Spontaneous and induced mutations (chemical mutagens and radiations)

**Unit 11: Inbreeding and Heterosis**

**04**

Definition of Inbreeding, Inbreeding depression, Practical applications of Inbreeding.  
Heterosis – Genetic basis; Application and Evolutionary significance.

**Unit 12: Inheritance of Human traits**

**05**

Human karyotype, Pedigree analysis  
Inheritance of human traits: Brown eyes, Polydactyly, Diabetes insipidus, Sickle cell anemia, PKU  
Eugenics and Genetic counseling

**PRACTICALS**

**Credits: 02**

- Study of following specimens:  
*Balanoglossus, Herdmania, Branchiostoma, Petromyzon, Sphyrna, Pristis, Torpedo, Labeo, Exocoetus, Anguilla, Ichthyophis/Ureotyphlus, Salamandra, Bufo, Hyla, Chelone, Hemidactylus, Chamaeleon, Draco, Vipera, Naja, Crocodylus, Gavialis*, Any six common birds from different orders, Bat, *Funambulus, Loris*
- Key for Identification of poisonous and non-poisonous snakes
- Problems on multiple alleles, multiple genes and epistasis (one on each)
- Inheritance problems based on Epistatic interactions
- ABO blood grouping and Rh factor in humans
- Study of Polytene chromosome in *Drosophila*/Chironomous larva
- Determination of genetic sex by Barr body
- Study of Human Karyotype (Normal male and female, Turner's syndrome and Down's syndrome)
- Determination of allelic frequency of following Mendelian human traits: Tongue rolling, earlobes, Widow's peak, hand clasping, folding of arms, thumb cross pattern, Hitch-hiker's thumb.

**SUGGESTED READINGS**

- Young, J. Z. (2004). *The Life of Vertebrates*. III Edition. Oxford university press.
- Pough H. *Vertebrate life*, VIII Edition, Pearson International.
- Darlington P.J. *The Geographical Distribution of Animals*, R.E. Krieger Pub Co.
- Hall B.K. and Hallgrimsson B. (2008). *Strickberger's Evolution*. IV Edition. Jones and Bartlett Publishers Inc.

- Gardner, E.J., Simmons, M.J., Snustad, D.P. (2008). *Principles of Genetics*. VIII Edition. Wiley India
- Snustad, D.P., Simmons, M.J. (2009). *Principles of Genetics*. V Edition. John Wiley and Sons Inc
- Klug, W.S., Cummings, M.R., Spencer, C.A. (2012). *Concepts of Genetics*. X Edition. Benjamin Cummings
- Russell, P. J. (2009). *Genetics- A Molecular Approach*. III Edition. Benjamin Cummings
- Griffiths, A.J.F., Wessler, S.R., Lewontin, R.C. and Carroll, S.B. *Introduction to Genetic Analysis*. IX Edition. W. H. Freeman and Co
- Fletcher H. and Hickey I. (2015). *Genetics*. IV Edition. GS, Taylor and Francis Group, New York and London.

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**PAPER CODE: ZOGE 2**  
**TITLE: ANIMAL BEHAVIOUR**

**THEORY****(Credits 4)**

**Learning Objective:** To know the theories and patterns of animal behavior.

**Learning Outcome:** On completion of the course the student should be able to understand stereotyped and social behaviors of animals and know about the biological rhythms governing the behavior of animals.

Topics	Duration- 60 (Clock hours)
<b>Unit 1: Introduction to Animal Behaviour</b> Origin and history of Ethology; Brief profiles of Karl Von Frish, Ivan Pavlov, Konrad Lorenz, Niko Tinbergen, Proximate and ultimate causes of behaviour, Methods and recording of a behaviour	<b>10</b>
<b>Unit 2: Patterns of Behaviour</b> Stereotyped Behaviours (Orientation, Reflexes); Individual Behavioural patterns; Instinct vs. Learnt Behaviour; Associative learning, classical and operant conditioning, Habituation, Imprinting.	<b>15</b>
<b>Unit 3: Social and Sexual Behaviour</b> Social Behaviour: Concept of Society; Communication and the senses; Altruism; Insects' society with Honey bee as example; Foraging in honey bee and advantages of the waggle dance.	<b>15</b>

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Sexual Behaviour: Asymmetry of sex, Sexual dimorphism, Mate choice, Intra-sexual selection (male rivalry), Inter-sexual selection (female choice), Sexual conflict in parental care.

**Unit 4: Biological Rhythm**

**15**

Types and characteristics of biological rhythms: Short- and Long- term rhythms; Circadian rhythms; Tidal rhythms and Lunar rhythms; Concept of synchronization and masking; Photic and non-photic zeitgebers; Circannual rhythms; Photoperiod and regulation seasonal reproduction of vertebrates;

Role of melatonin.

**Unit 5: Biological Clocks**

**05**

Relevance of biological clocks; Chronopharmacology, Chronomedicine, Chronotherapy.

**Suggested Readings**

- David McFarland, Animal Behaviour, Pitman Publishing Limited, London, UK.
- Manning, A. and Dawkins, M. S, An Introduction to Animal Behaviour, Cambridge, University Press, UK.
- John Alcock, Animal Behaviour, Sinauer Associate Inc., USA.
- Paul W. Sherman and John Alcock, Exploring Animal Behaviour, Sinauer Associate Inc., Massachusetts, USA.
- Chronobiology Biological Timekeeping: Jay. C. Dunlap, Jennifer. J. Loros, Patricia J. DeCoursey (ed). 2004, Sinauer Associates, Inc. Publishers, Sunderland, MA, USA
- Insect Clocks D.S. Saunders, C.G.H. Steel, X., Afopoulou (ed.)R.D. Lewis. (3rdEd) 2002 Baren and Noble Inc. New York, USA
- Biological Rhythms: Vinod Kumar (2002) Narosa Publishing House, Delhi/ Springer-Verlag, Germany.

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**SEMESTER III (ZOCG 3, ZOSE 1)**

**PAPER CODE: ZOCG 3**

**TITLE: ANATOMY OF ANIMAL BODY SYSTEMS**

**THEORY**

**(CREDITS 4)**

**Learning Objective:** To know structure and functions of the different systems in the vertebrates.

**Learning Outcome:** On completion of the course the student should be able to know the general plan and functioning of different components of the systems in the body.

Topics	Duration- 60 (Clock hours)
<p><b>Unit 1: Integumentary System</b> Structure, functions and derivatives of integument</p>	8
<p><b>Unit 2: Skeletal System</b> Overview of axial and appendicular skeleton, Jaw suspensorium, Visceral arches</p>	8
<p><b>Unit 3: Digestive System</b> Alimentary canal and associated glands, dentition</p>	8
<p><b>Unit 4: Respiratory System</b> Skin, gills, lungs and air sacs; Accessory respiratory organs</p>	8
<p><b>Unit 5: Circulatory System</b> General plan of circulation, evolution of heart and aortic arches</p>	8
<p><b>Unit 6: Urinogenital System</b> Succession of kidney, Evolution of urinogenital ducts, Types of mammalian uteri</p>	6
<p><b>Unit 7: Nervous System</b> Comparative account of brain, Autonomic nervous system, Spinal cord, Cranial nerves in mammals</p>	8
<p><b>Unit 8: Sense Organs</b> Classification of receptors Brief account of visual and auditory receptors in man</p>	6

<b>PRACTICALS</b>	<b>(CREDITS 2)</b>
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- Study of placoid, cycloid and ctenoid scales through permanent slides/photographs
- Disarticulated skeleton of Frog, *Varanus*, Fowl, Rabbit
- Carapace and plastron of turtle /tortoise
- Mammalian skulls: One herbivorous and one carnivorous animal
- Dissection of rat to study arterial and urinogenital system (subject to permission)

- Study of structure of any two organs (heart, lung, kidney, eye and ear) from video recording/models/charts (may be included if dissection not permitted)
- Project on skeletal modifications in vertebrates (may be included if dissection not permitted)

**Suggested Readings**

- Kardong, K.V. (2005) *Vertebrates' Comparative Anatomy, Function and Evolution*. IV Edition. McGraw-Hill Higher Education
- Kent, G.C. and Carr R.K. (2000). *Comparative Anatomy of the Vertebrates*. IX Edition. The McGraw-Hill Companies
- Hilderbrand, M and Gaslow G.E. *Analysis of Vertebrate Structure*, John Wiley and Sons
- Walter, H.E. and Sayles, L.P; *Biology of Vertebrates*, Khosla Publishing House



**PAPER CODE: ZOSE 1**  
**TITLE: AQUARIUM FISH KEEPING**

**THEORY**

**(CREDITS 3)**

**Learning Objective:** To know the technique of rearing /maintaining fishes in an aquarium.

**Learning Outcome:** On completion of the course the student should be able to know the biology of aquarium fishes, their nutritional requirements and care. The student should be able to know the requirements for setting up an aquarium.

Topics	Duration- 45 (Clock hours)
<b>Unit 1: Introduction to Aquarium Fish Keeping</b> The potential scope of Aquarium Fish Industry as a Cottage Industry, Exotic and Endemic species of Aquarium Fishes	<b>5</b>
<b>Unit 2: Biology of Aquarium Fishes</b> Common characters and sexual dimorphism of Fresh water and Marine Aquarium fishes such as Guppy, Molly, Sword tail, Gold fish, Angel fish, Blue morph, Anemone fish and Butterfly fish	<b>7</b>
<b>Unit 3: Food and feeding of Aquarium fishes</b> Use of live fish feed organisms. Preparation and composition of formulated fish feeds	<b>6</b>

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**Unit 4: Fish Transportation****6**

Live fish transport - Fish handling, packing and forwarding techniques.

**Unit 5. Common Aquarium Fish diseases****6**

Fin rot, swim bladder disorders, body flukes and dropsy, Ich

**Unit 6: Maintenance of Aquarium****7**

General Aquarium maintenance – budget for setting up an Aquarium Fish Farm as a Cottage Industry

**Unit 7: Introduction to Aquarium plants****8**

Introduction to aquarium plants and their export potential, profiles of some selected aquarium plants, Indigenous ornamental plants of Western Ghats, management of ornamental aquatic plants and its trading.

**Practicals****(CREDITS 1)**

- Identification of common Aquarium fishes
- Identification of live feed organisms
- Study of different types of formulated feeds
- Preparation of formulated feed
- Study of slides of parasites and diseases
- Setting up of an aquarium
- Study of ornamental plants

**Suggested Readings**

- Rath, R.K. (2000) Freshwater Aquaculture. Scientific Publishers (India). PO Box:91, Jodhpur.
- Jhingran, AVG (1991) Fish and Fisheries of India. Hindustan Publishing Co.
- Baradach, JE, JH Ryther and WO Mc Larney (1972). Aquaculture. The Farming and Husbandry of Freshwater and Marine Organisms. Wiley Interscience, New York.
- Jameson, J.D. and R.Santhanam (1996). Manual of ornamental fisheries and farming technology. Fisheries College and Research Institute, Thoothukudi.
- Mitchell Beazley, 1998. The complete guide to tropical aquarium fish care. Read and Consumes Book Ltd., London.
- Everything for the aquarist. Tetra Werke Publication, West Germany.
- Jameson, J.D. Alangara Meen Valarpu (in Tamil). National Book House, New Delhi.

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**SEMESTER IV (ZOCG 4, ZOSE 2)**

**PAPER CODE: ZOCG 4**  
**TITLE: ANIMAL PHYSIOLOGY & BIOCHEMISTRY**

**THEORY****(Credits 4)**

**Learning Objective:** To understand the physiology of the different processes of the body systems and the micromolecules and macromolecules of the cells.

**Learning Outcome:** On completion of the course the student should be able to know mechanism of body functions and the basic knowledge of chemistry of biomolecules.

<b>Topics</b>	<b>Duration- 60</b> <i>(Clock hours)</i>
<b>Unit 1: Physiology of Digestion</b> Structural organization and functions of gastrointestinal tract and associated glands; Mechanical and chemical digestion of food; Hormonal control of secretion of enzymes in Gastrointestinal tract.	<b>6</b>
<b>Unit 2: Physiology of Respiration</b> Mechanism of respiration, Pulmonary ventilation; Respiratory volumes and capacities; Transport of oxygen and carbon dioxide in blood; Respiratory pigments, Dissociation curves and the factors influencing it; Control of respiration	<b>7</b>
<b>Unit 3: Renal Physiology</b> Structure of kidney and its functional unit; Mechanism of urine formation; Regulation of water balance; Regulation of acid-base balance	<b>5</b>
<b>Unit 4: Cardiovascular Physiology</b> Composition of blood, blood volume, Origin and conduction of the cardiac impulse, Cardiac cycle, Regulation of blood pressure and heart rate.	<b>6</b>
<b>Unit 5: Muscle Physiology</b> Types of muscles, Ultrastructure of skeletal muscles, properties of skeletal muscles, theories of muscle contraction,	<b>6</b>
<b>Unit 6: pH and buffer</b> Definition of pH, buffer, types of buffer.	<b>1</b>

**Unit 7: Carbohydrates**

7

Structure and Biological importance: Monosaccharides, Disaccharides, Polysaccharides and Glycoconjugates

**Unit 8: Lipids**

7

Structure and Significance: Physiologically important saturated and unsaturated fatty acids, Triacylglycerols, Phospholipids, Glycolipids, Steroids

**Unit 9: Proteins**

8

**Amino acids:** Structure, Classification and General properties of  $\alpha$ -amino acids; Physiological importance of essential and non-essential  $\alpha$ -amino acids **Proteins:** Bonds stabilizing protein structure; Levels of organization in proteins; Denaturation; Introduction to simple and conjugate proteins

**Unit 10: Enzymes**

7

Nomenclature and classification; Cofactors; Specificity of enzyme action; Isozymes; Mechanism of enzyme action; Enzyme kinetics; Factors affecting rate of enzyme-catalyzed reactions, Concept of Michaelis-Menten equation, Lineweaver-Burk plot, Enzyme inhibition.

**PRACTICALS****(Credits 2)**

- Measurement of blood pressure
- Hemoglobin estimation\
- Preparation of Haemin crystals
- Observation of Pulse rate under normal and stressed condition
- Respiratory rate of cockroach/any insect
- Qualitative tests to identify functional groups of carbohydrates in given solutions (Glucose, Fructose, Sucrose, Lactose)
- Estimation of total protein.
- Study of activity of salivary amylase under optimum conditions (pH, temperature)
- Study of normal and abnormal constituents in Urine
- Study of different types of muscle cells.

**Suggested Readings**

- Tortora, G.J. and Derrickson, B.H. (2009). *Principles of Anatomy and Physiology*, XII Edition, John Wiley & Sons, Inc.
- Widmaier, E.P., Raff, H. and Strang, K.T. (2008) *Vander's Human Physiology*, XI Edition., McGraw Hill
- Guyton, A.C. and Hall, J.E. (2011). *Textbook of Medical Physiology*, XII Edition, Harcourt Asia Pvt. Ltd/ W.B. Saunders Company

- Berg, J. M., Tymoczko, J. L. and Stryer, L. (2006). *Biochemistry*. VI Edition. W.H Freeman and Co.
- Nelson, D. L., Cox, M. M. and Lehninger, A.L. (2009). *Principles of Biochemistry*. IV Edition. W.H. Freeman and Co.
- Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. (2009). *Harper's Illustrated Biochemistry*. XXVIII Edition. Lange Medical Books/Mc Graw3Hill.

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**PAPER CODE: ZOSE 2**

**PAPER TITLE: WILDLIFE AND ECOTOURISM**

**THEORY**

**Credits: 03**

**Learning Objective:** To learn the objectives and strategies of wildlife conservation and monitoring.

**Learning Outcome:** On completion of the course the student should be able to know the current status and conservation strategies for wildlife conservation and management.

Topics	Duration- 45 (Clock hours)
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**Unit1: Introduction to Wildlife, Current Scenario & Conservation categories 04**

Meaning, Values, Global & Indian scenario  
 Biogeographic zonation and wildlife endowments of India, Wildlife as a sustainable tourism resource.  
 Contemporary status of Indian Wildlife and Impediments to conservation of wildlife in India

**Unit2: Causes of depletion, extinction of wildlife & Conservation Categories 10**

Causes of Wild Depletion -Proximate & Root causes.  
 Extinct Species, Drivers of Extinction & Extinction Threshold  
 North East and Western Ghats; as 'Centers of Endemicity'  
 Conservation categories with relevant examples (Endangered, Vulnerable, Rare, Threatened, Out of Danger, Indeterminate, Insufficiently Known, Extinct, Extinct in Wild ,Critically Endangered, Lower Risk, Conservation Dependent, Near Threatened, Least Concern, Data Deficient, Not Evaluated)  
 IWPA 1972, Schedule I species ( Mammals, Birds and Reptiles).

**Unit 3: Wildlife Conservation-Objectives & Methods 06**

Meaning of conservation,  
 Objectives of wildlife conservation  
 Conservation strategies, *Ex situ* & *In situ* methods of wildlife Conservation (**PAN, CCA, Zoos, Aquaria, Captive Breeding & Ranching etc**)

Centrally Sponsored Schemes for Wildlife Conservation (**Integrated Development of Wildlife Habitats, Project Tiger, Project Elephant**)

**Unit 4: Wildlife Tourism in India: Prospects & Challenges** **10**

Difference between Tourism, leisure and recreation

Ecotourism versus Conventional Mass tourism, a SWOT analysis.

Natural area Tourism (Adventure tourism, Wildlife tourism and Ecotourism)

Wildlife Tourism: **Advantages** (Sustainability of enterprise, Assured backflow of profits to local communities, Upholding conservation ethos)

Wildlife Tourism: **Impacts** (Altered landscape, Impact of roads on wildlife habitats, , Tourism generated litter, Introduction of Invasive species, Zoonotic disease transmissions, Violation of 'Visitors carrying Capacity' & visitor induced stress and disturbance Tour to wildlife)

**Unit 5: Planning, Management & Monitoring of Wildlife Tourism** **15**

Wildlife as a specific component of ecosystem and major wildlife destinations in India.(Wildlife of Indian Himalayas, Indian Deserts, Indian Coral Reefs, Western Ghats)

Rationale for Visitor Planning and stakeholder involvement

Carrying Capacity & 'Acceptable' Change

Visitor Management: Zoning, Roads & Trails, Regulating Visitor numbers, Visitor Communication & Education.

Interpretation: Fundamental Principles & major interpretation techniques (Publication & Websites, Visitor Centres, Self-guided Trails, Guided Tours

Visitor Monitoring: Reasons for Monitoring, Monitoring Techniques (Counting visitors, Questionnaires & Interviews, Observing visitors, Focus Groups)

**Reference Books**

- S K Singh (2010) *Text Book of wildlife Management* International Book Distributing Company, Lucknow
- Vivek Menon (2014) *Indian Mammals :A Field Guide* Hachette Book Publishing India Pvt Ltd, Gurgaon
- S S Negi (1992) *Himalayan Wildlife*. Indus Publishing Company, New Delhi
- Mohan Pai (2005) *The Western Ghats*. M/S Narcinva damodar Naik Margao ,Goa
- Richard Carmichael (2007). *Indian Wildlife*. Apa Publications GmbH Co. Vertag KG (Singapore )
- Ravee Chauhan (2006) *Ecotourism Trends & Challenges*. Vista International Publishing House Delhi
- David Newsome, Susan Moore and Ross K Dowling (2006) *Natural Area Tourism Ecology, Impacts and Management*. Viva Books Pvt Ltd Ac Delhi
- C.Michael Hall and Stephen Boyd (2006) *Nature based tourism in peripheral areas - Development or disaster ?* Viva Books Pvt Ltd New Delhi

- Ministry of Environment & Forests GoI, (2002), *National Biodiversity Strategy & Action Plan*

### Practicals

**Credits: 01**

- Use of Maps and other GIS resources to understand the biogeographic zones of India and understand the location of our State in this scheme.
- Prepare an Inventory of state's Wildlife Resources (Forest Types, Carnivores, Wild Ungulates, Birds, Reptiles) from secondary sources and classify them under them under various PAN, IUCN conservation categories & IWPA Schedules
- Visit to a state WPA and CCA to understand and prepare Report on the management and conservation action.
- To prepare an inventory of your Taluk's existing and potential Ecotourism sites with special reference to Birdlife. Evaluate any one extant ecotourism site with reference to
  - Visitor's Carrying Capacity
  - Visitor Education & Interpretation
  - Visitor Facility
- Observing the effect Habitat improvement on diversity of butterflies (Diversity estimation pre and post food plants introduction).
- Understanding Carnivore Pug Biometry by analysis of Pug Marks/Whisker Spot study in Asiatic Lion (Printed Lion Pug Imprints / Lion Head sketches with Reference Rows & Identification Rows of Whisker Spots to be provided)
- Population enumeration by Lincoln & Peterson's Index Method (Coloured Beads to represent marked to unmarked individuals)

### References

1. William J. Sutherland, Lynn V. Dicks, Nancy Ockendon & Rebecca K. Smith(2015) *What works in conservation*. Open Book Publishers, UK
2. S K Singh (2010) *Text Book of wildlife Management* International Book Distributing Company, Lucknow
3. Paresh Porb, Raman Kulkarni and Varad Giri (2014) *Biodiversity of Goa*. Pug Marks Art Gallery, Kolhapur
4. Goa State Biodiversity Board (2014) *Island Biodiversity , Goa:Biological Treasure of Chorao, Divar and St Jacinto Island*. National Biodiversity Authority.

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5. Richard Grimmet, Tim Inskipp (2005) *Birds of Southern India*. Om Books International
6. Issac Kehimkar (2011) *The Book of Indian Butterflies*. Oxford.
7. Luigi Boitani & Roger Powell (2012) *Carnivore Ecology and Conservation*. Oxford University Press
8. Romulus Whitaker & Ashok captain (2008) *Snakes of India*. Draco Books Tamil Nadu
9. Asad R Rehmani (2012) *Threatened Birds of India*. Oxford University Press
10. Ravee Chauhan (2006) *Ecotourism Trends & Challenges*. Vista International Publishing House Delhi
11. David Newsome, Susan Moore and Ross K Dowling (2006) *Natural Area Tourism Ecology, Impacts and Management*. Viva Books Pvt Ltd Ac Delhi
12. *The Wildlife (Protection ) Act*, (1972) Natraj Publishers

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**D 3.10 Minutes of the meeting of Board of Studies in Earth Science held on 02/08/2017**

**Annexure I**

**Annexure – IA**

**List of Recommended SEC courses for BSc (Geology) under CBCS**

**SES (Optional Papers)**

1. Geological Mapping
2. Mineral Exploration Techniques
3. Geoscience Software
4. Environmental Impact Assessment
5. Landscape/geological Photography
6. GIS Fundamentals
7. Introductory Remote Sensing
8. Surveying
9. Mud logging
10. Statistical Methods

**Annexure - IB**

**Introduction of New Optional Course in MSc (Applied Geology)**

<b>GLO-276</b>	<b>Long-term Internship Training in Geospatial Technologies</b>	<b>4 Credits</b>
<p>This course will involve hands-on training at NRSC (ISRO) wherein the students are expected work under the guidance of a Designated Scientist(s) assigned to gain the professional experience in working with satellite data and GIS applications involving data preparation, data analysis, modeling and &amp; Interpretation.</p> <p>On completion of the training, the students is required to submit a detailed report based of the work done during the training, which will be evaluated by the Departmental Council.</p>		

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**Annexure-IIa**

Specimen question paper for Semester End Examination  
(CC/DSE) (Credits: 4\*)

Name of Examination:

Paper No. & Title

Duration:-2 Hours.

Max. Marks: 80

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Instruction:-

Q.1) Answer any 4 out of 6 (4 x 4 = 16)

Q.2) Answer any 4 out of 6 (4 x 4 = 16)

Q.3A) (6)

OR

Q.3B) (6)

Q.3C) (6)

Q.4A) (6)

OR

Q.4B) (6)

Q.4C) (6)

Q.5A) (6)

OR

Q.5B) (6)

Q.5C) (6)

Q.6A) (6)

OR

Q.6B) (6)

Q.6C) (6)

END

Note: \*Total 6 credits for each Core Course and DSE (Theory= 4 credits and Practical= 2 credits)  
Out of the total 4 credits of Theory, 20 marks for ISA and 80 marks for SEE

**Annexure-IIb**

Specimen question paper for Semester End Examination  
(GE/SEC)(Credits: 3\*)

Name of Examination:

Paper No. & Title.

Duration:-2 Hours.

Max.Marks:-60



Instruction:-

Q.1) Answer any 5 out of 7

(5 x 2 = 10)

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Q.2) Answer any 5 out of 7

(5 x 2 = 10)

Q.3A)

(5)

OR

Q.3B)

(5)

Q.3C)

(5)

Q.4A)

(5)

OR

Q.4B)

(5)

Q.4C)

(5)

Q.5A)

(5)

OR

Q.5B)

(5)

Q.5C)

(5)

Q.6A)

(5)

OR

Q.6B)

(5)

Q.6C)

(5)

END

Note: \* Total 4 credits for each Generic Elective and SEC (Theory= 3 credits and Practical= 1 credits), Out of the total 3 credits for theory, 15 marks for ISA and 60 marks for SEE

**Annexure-IIc**

Specimen question paper for Semester End Examination  
(SEC) (Credits: 2\*)

Name of Examination:

Paper No. & Title.

Duration:-1.30 Hours.

Max.Marks:-40

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Instruction:-

Q.1) Answer any 5 out of 7

(5 x 2 = 10)

Q.2A)

(5)

OR

Q.2B)

(5)

Q.2C)		(5)
Q.3A)		(5)
	OR	
Q.3B)		(5)
Q.3C)		(5)
Q.4A)		(5)
	OR	
Q.4B)		(5)
Q.4C)		(5)
Q.5A)		(5)
	OR	
Q.5B)		(5)
Q.5C)		(5)

END

Note: \*Total 4 credits for SEC (if Theory = 2 credits and Practical = 2 credits),  
Out of the total 2 credits, 10 marks for ISA and 40 marks for SEE

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## D 3.11 Minutes of the meeting of Board of Studies in Electronics held on 21/08/2017

## Annexure I

## Programme structure for Bachelor of Science (General)

Table I: Core Papers

Sr.No	Semester	Course Code	Subject Title	Credits (T+P)
1.	I	DSC 1A	Network Analysis and Analog Electronics	4+2
2.	II	DSC 1B	Linear and Digital Integrated Circuits	4+2
3.	III	DSC 1C	Communication Electronics	4+2
4.	IV	DSC 1D	Microprocessor and Microcontrollers	4+2

Table II: Discipline specific courses (DSE)

Sr.No	Semester	Course Code	Subject Title	Credits (T+P)
1	V	DSE1A	Photonics	3+1
2	VI	DSE1B	Electronics Project/Electronic instrumentation	3+1

Table III: Skill Enhancement Courses (SEC)

Sr. No.		Course Code	Subject Title	Credits (T+P)
1	III	SEC 1	Programming in C++( <b>Flipped Class room</b> )	3+1
2	IV	SEC 2	Smart Phone Apps Development( <b>Flipped Class room</b> )	3+1
	V	SEC 3	Basics of Robotics	3+1
	V	SEC 4	Programming in python	3+1
	VI	SEC 5	Renewable energy Resources	3+1

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**Table IV: General Elective Papers (GE)**

Sr. No.		Course Code	Subject Title	Credits (T)
1.	I	GE 1	Electronics circuits and PCB designing/ Consumer Electronics	3+1
2.	II	GE 2	Repair and Maintenance of Electrical and Electronic Appliances/ Medical Home Instruments	3+1 3+1

**CBSC SYLLABUS FOR B.Sc. GENERAL PROGRAM**

( Numbers on right indicate number of lectures of 1 hour duration)

**First Year B. Sc.**-----  
**Semester I**  
-----**ELECTRONICS-DSC 1A: NETWORK ANALYSIS AND ANALOG ELECTRONICS****(Credits: Theory-04, Practicals-02)****Theory: 60 Lectures****Circuit Analysis: .****(14 Lectures)**

Concept of Voltage and Current Sources. Kirchhoff's Current Law, Kirchhoff's Voltage Law. Mesh Analysis. Node Analysis. Star and Delta networks, Star-Delta Conversion. Principal of Duality. Superposition Theorem. Thevenin's Theorem. Norton's Theorem. Reciprocity Theorem. Maximum Power Transfer Theorem. Two Port Networks: h, y and z parameters and their conversion

**Junction Diode and its applications:****(18 Lectures)**

PN junction diode (Ideal and practical)-constructions, Formation of Depletion Layer, Diode Equation and I-V characteristics. Idea of static and dynamic resistance, dc load line analysis, Quiescent (Q) point. Zener diode, Reverse saturation current, Zener and avalanche breakdown. Qualitative idea of Schottky diode. Rectifiers- Half wave rectifier, Full wave rectifiers (center tapped and bridge), circuit diagrams, working and waveforms, ripple factor and efficiency. Filter- Shunt capacitor filter, its role in power supply, output waveform, and working. Regulation- Line and load regulation, Zener diode as voltage regulator, and explanation for load and line regulation.

**Bipolar Junction Transistor: .****(5 Lectures)**

Review of the characteristics of transistor in CE and CB configurations, Regions of operation (active, cut off and saturation), Current gains  $\alpha$  and  $\beta$ . Relations between  $\alpha$  and  $\beta$ . dc load line and Q point.

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**Amplifiers:****(10 Lectures)**

Transistor biasing and Stabilization circuits- Fixed Bias and Voltage Divider Bias. Thermal runaway, stability and stability factor S. Transistor as a two port network, h-parameter equivalent circuit. Small signal analysis of single stage CE amplifier. Input and Output impedance, Current and Voltage gains. Class A, B and C Amplifiers.

**Cascaded Amplifiers:****(2 Lectures)**

Two stage RC Coupled Amplifier and its Frequency Response.

**Feedback in Amplifiers:****(2 Lectures)**

Concept of feedback, negative and positive feedback, advantages of negative feedback (Qualitative only).

**Sinusoidal Oscillators:****(5 Lectures)**

Barkhausen criterion for sustained oscillations. Phase shift and Colpitt's oscillator. Determination of Frequency and Condition of oscillation.

**Unipolar Devices:****(4 Lectures)**

JFET. Construction, working and I-V characteristics (output and transfer), Pinchoff voltage. UJT, basic construction, working, equivalent circuit and I-V characteristics.

**Reference Books:**

1. Electric Circuits, S. A. Nasar, Schaum's outline series, Tata McGraw Hill (2004)
2. Electrical Circuits, M. Nahvi & J. Edminister, Schaum's Outline Series, Tata McGraw-Hill (2005)
3. Electrical Circuits, K.A. Smith and R.E. Alley, 2014, Cambridge University Press
4. Network, Lines and Fields, J.D.Ryder, Prentice Hall of India.
5. Electronic Devices and Circuits, David A. Bell, 5th Edition 2015, Oxford University Press.
6. Electronic Circuits: Discrete and Integrated, D.L. Schilling and C. Belove, Tata McGraw Hill
7. Electrical Circuit Analysis, Mahadevan and Chitra, PHI Learning
8. Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, 2014, 6th Edn., Oxford University Press.
9. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
10. J. J. Cathey, 2000 Solved Problems in Electronics, Schaum's outline Series, Tata McGraw Hill (1991)

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**Laboratory experiments under DSC 1A**

*At Least 15 Experiments From The Following*

1. To familiarize with basic electronic components (R, C, L, diodes, transistors),
  1. digital Multimeter, Function Generator and Oscilloscope.
  2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope.
  3. Verification of (a) Thevenin's theorem and (b) Norton's theorem.
  4. Verification of (a) Superposition Theorem and (b) Reciprocity Theorem.
  5. Verification of the Maximum Power Transfer Theorem.

6. Study of the I-V Characteristics of (a) p-n junction Diode, and (b) Zener diode.
7. Study of (a) Half wave rectifier and (b) Full wave rectifier (FWR).
8. Study the effect of (a) C- filter and (b) Zener regulator on the output of FWR.
9. Study of the I-V Characteristics of UJT and design relaxation oscillator..
10. Study of the output and transfer I-V characteristics of common source JFET.
11. Study of Fixed Bias and Voltage divider bias configuration for CE transistor.
12. Design of a Single Stage CE amplifier of given gain.
13. Study of the RC Phase Shift Oscillator.
14. Study the Colpitt's oscillator.
15. Construction of class A amplifier.
16. Construction of class B amplifier.
17. Construction of class C amplifier.
18. Study of Bridge rectifier.
19. Input and output characteristics of transistor in CE mode.
20. Use of diode as clipper.
- 21.

**Reference Books:**

1. Electrical Circuits, M. Nahvi and J. Edminister, Schaum's Outline Series, Tata McGraw-Hill (2005)
2. Networks, Lines and Fields, J.D.Ryder, Prentice Hall of India.
3. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
4. Allen Mottershead, Electronic Devices and Circuits, Goodyear Publishing Corporation.

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**Semester II**

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**ELECTRONICS-DSC 1B: LINEAR AND DIGITAL INTEGRATED CIRCUITS  
(Credits: Theory-04, Practicals-02)  
Theory: 60 Lectures**

**Operational Amplifiers (Black box approach): (5 Lectures)**

Characteristics of an Ideal and Practical Operational Amplifier (IC 741), Open and closed loop configuration, Frequency Response. CMRR. Slew Rate and concept of Virtual Ground.

**Applications of Op-Amps: (12 Lectures)**

(1) Inverting and non-inverting amplifiers, (2) Summing and Difference Amplifier, (3) Differentiator, (4) Integrator, (5) Wein bridge oscillator, (6) Comparator and Zero-crossing detector, and (7) Active low pass and high pass Butterworth filter (1st order only).

**Number System and Codes: (9 Lectures)**

Decimal, Binary, Octal and Hexadecimal number systems, base conversions. Representation of signed and unsigned numbers, BCD code. Binary, octal and hexadecimal arithmetic; addition, subtraction by 2's complement method, multiplication.

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**Logic Gates and Boolean algebra:****(4 Lectures)**

Truth Tables of OR, AND, NOT, NOR, NAND, XOR, XNOR, Universal Gates, Basic postulates and fundamental theorems of Boolean algebra.

**Combinational Logic Analysis and Design:****(5 Lectures)**

Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh map minimization up to 4 variables for SOP).

**Arithmetic Circuits:****(3 Lectures)**

Binary Addition. Half and Full Adder. Half and Full Subtractor, 4-bit binary Adder/Subtractor.

**Data processing circuits:****(3 Lectures)**

Multiplexers, De-multiplexers, Decoders, Encoders.

**Clock and Timer (IC 555):****(3 Lectures)**

Introduction, Block diagram of IC 555, Astable and Monostable multivibrator circuits.

**Sequential Circuits:****(6 Lectures)**

SR, D, and JK Flip-Flops. Clocked (Level and Edge Triggered), Flip-Flops. Preset and Clear operations. Race-around conditions in JK Flip-Flop., Master-slave JK Flip-Flop.

**Shift registers:****(2 Lectures)**

Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits).

**Counters (4 bits):****(4 Lectures)**

Ring Counter. Asynchronous counters, Decade Counter. Synchronous Counter.

**D-A and A-D Conversion:****(4 Lectures)**

4 bit binary weighted and R-2R D-A converters, circuit and working. Accuracy and Resolution. A-D conversion characteristics, successive approximation ADC. (Mention of relevant ICs for all).

**Reference Books:**

1. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall
2. Operational Amplifiers and Linear ICs, David A. Bell, 3rd Edition, 2011, Oxford University Press.
3. Digital Principles and Applications, A.P. Malvino, D.P. Leach and Saha, 7th Ed., 2011, Tata McGraw
4. Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.
5. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
6. Digital Systems: Principles & Applications, R.J. Tocci, N.S. Widmer, 2001, PHI Learning.
7. Thomas L. Floyd, Digital Fundamentals, Pearson Education Asia (1994)
8. R. L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw- Hill (1994)

### **Laboratory experiments under DSC 1B**

*At least 05 experiments each from section A, B and C*

#### **Section-A: Op-Amp. Circuits (Hardware)**

1. To design an inverting amplifier using Op-amp (741,351) for dc voltage of given gain
2. (a) To design inverting amplifier using Op-amp (741,351) & study its frequency response  
(b) To design non-inverting amplifier using Op-amp (741,351) & study frequency response
3. (a) To add two dc voltages using Op-amp in inverting and non-inverting mode  
(b) To study the zero-crossing detector and comparator.
4. To design a precision Differential amplifier of given I/O specification using Op-amp.
5. To investigate the use of an op-amp as an Integrator.
6. To investigate the use of an op-amp as a Differentiator.
7. To design a Wien bridge oscillator for given frequency using an op-amp.
8. To design a circuit to simulate the solution of simultaneous equation and 1st/2nd order differential equation.
9. Design a Butterworth Low Pass active Filter (1st order) & study Frequency Response
10. Design a Butterworth High Pass active Filter (1st order) & study Frequency Response
11. Design a digital to analog converter (DAC) of given specifications.

#### **Section-B: Digital circuits (Hardware)**

1. (a) To design a combinational logic system for a specified Truth Table.  
(b) To convert Boolean expression into logic circuit & design it using logic gate ICs.  
(c) To minimize a given logic circuit.
2. Half Adder and Full Adder.
3. Half Subtractor and Full Subtractor.
4. 4 bit binary adder and adder-subtractor using Full adder IC.
5. To design a seven segment decoder.
6. To design an Astable Multivibrator of given specification using IC 555 Timer.
7. To design a Monostable Multivibrator of given specification using IC 555 Timer.
8. To build Flip-Flop (RS, Clocked RS, D-type and JK) circuits using NAND gates.
9. To build JK Master-slave flip-flop using Flip-Flop ICs
10. To build a Counter using D-type/JK Flip-Flop ICs and study timing diagram.
11. To make a Shift Register (serial-in and serial-out) using D-type/JK Flip-Flop ICs.

#### **Section-C: SPICE/MULTISIM simulations for electronic circuits and devices**

1. To verify the Thevenin and Norton Theorems.
2. Design and analyze the series and parallel LCR circuits
3. Design the inverting and non-inverting amplifier using an Op-Amp of given gain
4. Design and Verification of op-amp as integrator and differentiator
5. Design the 1st order active low pass and high pass filters of given cutoff frequency
6. Design a Wein's Bridge oscillator of given frequency.
7. Design clocked SR and JK Flip-Flop's using NAND Gates
8. Design 4-bit asynchronous counter using Flip-Flop ICs
9. Design the CE amplifier of a given gain and its frequency response.

#### **Reference Books**

1. Digital Principles and Applications, A.P. Malvino, D.P. Leach and Saha, 7th Ed., 2011, Tata McGraw



2. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edn., 2000, Prentice Hall
3. R. L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw- Hill (1994)
4. Digital Electronics, S.K. Mandal, 2010, 1st edition, McGraw Hill

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### Semester III

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#### ELECTRONICS- DSC 1C: COMMUNICATION ELECTRONICS

(Credits: Theory-04, Practicals-02)

Theory: 60 Lectures

**Electronic communication: (8 Lectures)**

Introduction to communication – means and modes. Need for modulation. Block diagram of an electronic communication system. Brief idea of frequency allocation for radio communication system in India (TRAI). Electromagnetic communication spectrum, band designations and usage. Channels and base-band signals. Concept of Noise, signal-to-noise (S/N) ratio.

**Analog Modulation: (12 Lectures)**

Amplitude Modulation, modulation index and frequency spectrum. Generation of AM (Emitter Modulation), Amplitude Demodulation (diode detector), Concept of Single side band generation and detection. Frequency Modulation (FM) and Phase Modulation (PM), modulation index and frequency spectrum, equivalence between FM and PM, Generation of FM using VCO, FM detector (slope detector), Qualitative idea of Super heterodyne receiver

**Analog Pulse Modulation: (9 Lectures)**

Channel capacity, Sampling theorem, Basic Principles-PAM, PWM, PPM, modulation and detection technique for PAM only, Multiplexing.

**Digital Pulse Modulation: (10 Lectures)**

Need for digital transmission, Pulse Code Modulation, Digital Carrier Modulation Techniques, Sampling, Quantization and Encoding. Concept of Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), and Binary Phase Shift Keying (BPSK).

**Introduction to Communication and Navigation systems: (10 Lectures)**

**Satellite Communication**– Introduction, need, Geosynchronous satellite orbits, geostationary satellite advantages of geostationary satellites. Satellite visibility, transponders (C - Band), path loss, ground station, simplified block diagram of earth station. Uplink and downlink.

**Mobile Telephony System – (10 Lectures)**

Basic concept of mobile communication, frequency bands used in mobile communication, concept of cell sectoring and cell splitting, SIM number, IMEI number, need for data encryption, architecture (block diagram) of mobile communication network, idea of GSM, CDMA, TDMA and FDMA technologies, simplified block diagram of mobile phone handset, 2G, 3G and 4G concepts (qualitative only).

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GPS navigation system (qualitative idea only)

**(1 Lecture)**

**Reference Books:**

1. Electronic Communications, D. Roddy and J. Coolen, Pearson Education India.
2. Advanced Electronics Communication Systems- Tomasi, 6th edition, Prentice Hall.
3. Modern Digital and Analog Communication Systems, B.P. Lathi, 4th Edition, 2011, Oxford University Press.
4. Electronic Communication systems, G. Kennedy, 3rd Edn., 1999, Tata McGraw Hill.
5. Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill
6. Communication Systems, S. Haykin, 2006, Wiley India
7. Electronic Communication system, Blake, Cengage, 5th edition.
8. Wireless communications, Andrea Goldsmith, 2015, Cambridge University Press

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**Laboratory experiments under -DSC 1C**

**AT LEAST 15 experiments**

1. Amplitude modulation and demodulation.
2. Frequency modulation and demodulation .
3. Analog multiplexer
4. Sample and Hold Circuit.
5. Study of super heterodyne radio receiver.
6. DSB generation using IC 1596
7. V-F and F –V using IC 331
8. Study of Antennas
9. Study of Varactor diode modulator
10. Study of PLL.
11. Characteristic impedance of Transmission lines.
12. Pre-emphasis and De-emphasis
13. Generation of PWM using 555 timer
14. Generation of PPM using 555 timer
15. Generation of PAM
16. Study of PCM generation and detection.
17. Study of TDM
18. Study of FDM
19. Generation of ASK
20. Generation of FSK
21. Generation of PSK
22. Study of DPCM modulation.
23. Study of Delta Modulation
24. Study of Modem interfacing and configuration for data communication.

**Reference Books:**

1. Electronic Communication systems, G. Kennedy, 1999, Tata McGraw Hill.
2. Electronic Communication system, Blake, Cengage, 5th edition.
3. Electronic Communication: By Dennis Roddy and John Coolen, Prentice Hall of India, New Delhi, 4th Edition, 1998.
4. Electronic Communications Systems, Wayne Tomasi, 5<sup>th</sup> Edition Pearson Education
5. Digital Communications, Simon Haykins, John Wiley, 1988

6. Digital Communication, John.G .Proakis, Mc Graw Hill Inc., Third edition, Malaysia,
7. Digital Communication Techniques, Signal Design & Detection, M.K.Simen, Prentice Hall of India, 1999

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**Semester IV**

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**ELECTRONICS-DSC 1D: MICROPROCESSOR AND MICROCONTROLLER**

**(Credits: Theory-04, Practicals-02)**

**Theory: 60 Lectures**

**Microcomputer Organization: (5 Lectures)**

Input/Output Devices. Data storage (idea of RAM and ROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map.

**8085 Microprocessor Architecture: (8 Lectures)**

Main features of 8085. Block diagram. Pin-out diagram of 8085. Data and address buses. Registers. ALU. Stack memory. Program counter.

**8085 Programming : (10 Lectures)**

Instruction classification, Instructions set (Data transfer including stacks. Arithmetic, logical, branch, and control instructions). Subroutines, delay loops.

Timing & Control circuitry. Timing states. Instruction cycle, Timing diagram of MOV and MVI. Hardware and software interrupts.

**8051 microcontroller: (12 Lectures)**

Introduction and block diagram of 8051 microcontroller, architecture of 8051, overview of 8051 family, 8051 assembly language programming, Program Counter and ROM memory map, Data types and directives, Flag bits and Program Status Word (PSW) register, Jump, loop and call instructions.

**8051 I/O port programming: (5 Lectures)**

Introduction of I/O port programming, pin out diagram of 8051 microcontroller, I/O port pins description & their functions, I/O port programming in 8051 (using assembly language), I/O programming: Bit manipulation.

**8051 Programming: (15 Lectures)**

8051 addressing modes and accessing memory locations using various addressing modes, assembly language instructions using each addressing mode, arithmetic and logic instructions, 8051 programming in C: for time delay & I/O operations and manipulation, for arithmetic and logic operations, for ASCII and BCD conversions.

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**Introduction to embedded system:****(5 Lectures)**

Embedded systems and general purpose computer systems. Architecture of embedded system. Classifications, applications and purpose of embedded systems.

**Reference Books:**

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
2. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
4. Microprocessor and Microcontrollers, N. Senthil Kumar, 2010, Oxford University Press
5. 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.
6. Embedded Systems: Design & applications, S.F. Barrett, 2008, Pearson Education India
7. Introduction to embedded system, K.V. Shibu, 1st edition, 2009, McGraw Hill
8. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning
9. Exploring C for Microcontroller ,J.S.Parab etal....Springer

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**Laboratory experiments under -DSC 1D****At least 7 experiments from Section-A and 8 from Section-B****Section-A: Programs using 8085 Microprocessor**

1. Addition and subtraction of numbers using direct addressing mode
2. Addition and subtraction of numbers using indirect addressing mode
3. Multiplication by repeated addition.
4. Division by repeated subtraction.
5. Handling of 16-bit Numbers.
6. Use of CALL and RETURN Instruction.
7. Block data handling.
8. Other programs (e.g. Parity Check, using interrupts, etc.).
9. Sorting
10. Motor control

**Section-B: Experiments using 8051 microcontroller:**

1. To find that the given numbers is prime or not.
2. To find the factorial of a number.
3. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.
4. Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's .
5. Program to glow the first four LEDs then next four using TIMER application.
6. Program to rotate the contents of the accumulator first right and then left.
7. Program to run a countdown from 9-0 in the seven segment LED display.
8. To interface seven segment LED display with 8051 microcontroller and display 'HELP' in the seven segment LED display.
9. To toggle '1234' as '1324' in the seven segment LED display.
10. Interface stepper motor with 8051 and write a program to move the motor

through a given angle in clock wise or counter clockwise direction.

11. Application of embedded systems: Temperature measurement & display on LCD

**Reference Books:**

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.

2. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill

3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.

4. 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.

5. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning

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## SEMESTER V

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DSE 1A: Photonics

**ELECTRONICS-DSE 1: PHOTONICS**

**(Credits: Theory-03, Practicals-01)**

**Theory Lectures 45**

**Unit-1**

(20 Lectures)

**Light as an Electromagnetic Wave:** Plane waves in homogeneous media, concept of spherical waves. Reflection and transmission at an interface, total internal reflection, Brewster's Law. Interaction of electromagnetic waves with dielectrics: origin of refractive index, dispersion.

**Interference :** Superposition of waves of same frequency, Concept of coherence, Interference by division of wavefront, Young's double slit, Division of Amplitude, thin film interference, Newton's rings; Michelson interferometer.

**Diffraction:** Huygen Fresnel Principle, Diffraction Integral, Fresnel and Fraunhofer approximations. Fraunhofer Diffraction by a single slit, rectangular aperture, double slit, Resolving power of microscopes and telescopes; Diffraction grating: Resolving power and Dispersive power

**Unit-2**

(12 Lectures)

**Polarization:** Linear, circular and elliptical polarization, polarizer-analyzer and Malus' law; Double refraction by crystals, Interference of polarized light, Wave propagation in uniaxial media. Half wave and quarter wave plates.

**Unit-3**

(13 Lectures)

**Light Emitting Diodes:** Construction, materials and operation.

**Lasers:** Interaction of radiation and matter, Einstein coefficients, Condition for amplification, laser cavity, threshold for laser oscillation, line shape function. Examples of common lasers. The semiconductor injection laser diode.

**Photodetectors:** Bolometer, Photomultiplier tube, Charge Coupled Device. Photo transistors

and Photodiodes (p-i-n, avalanche), quantum efficiency and responsivity.

**LCD Displays:** Types of liquid crystals, Principle of Liquid Crystal Displays, applications, advantages over LED displays.

**Reference Books:**

1. Ajoy Ghatak, Optics, Tata McGraw Hill, New Delhi (2005)
2. E. Hecht, Optics, Pearson Education Ltd. (2002)
3. J. Wilson and J. F. B. Hawkes, Optoelectronics: An Introduction, Prentice Hall India (1996)
4. S. O. Kasap, Optoelectronics and Photonics: Principles and Practices, Pearson Education (2009)
5. Ghatak A.K. and Thyagarajan K., "Introduction to fiber optics," Cambridge Univ. Press. (1998)

**Laboratory experiments under: DSE 1: PHOTONICS**

**At least 8 experiments from following list**

1. To verify the law of Malus for plane polarized light.
2. To determine wavelength of sodium light using Michelson's Interferometer.
3. To determine wavelength of sodium light using Newton's Rings.
4. To determine the resolving power and Dispersive power of Diffraction Grating.
5. Diffraction experiments using a laser.
6. Study of Faraday rotation.
7. To determine the specific rotation of scan sugar using polarimeter.
8. To determine characteristics of LEDs (Radiation pattern, Power Vs. Current)
9. To measure the numerical aperture of an optical fiber.
10. Design of Photo detector circuit using OP-amp
11. Design of digital optical receiver using comparator
12. To determine characteristics Photo- detector (rise time, radiation pattern, Power Vs. Current)
13. Light coupling in optical fiber, Numerical aperture of Fiber

**Reference Books:**

3. J. Wilson and J. F. B. Hawkes, Optoelectronics: An Introduction, Prentice Hall India (1996)
4. S. O. Kasap, Optoelectronics and Photonics: Principles and Practices, Pearson Education (2009)
5. Ghatak A.K. and Thyagarajan K., "Introduction to fiber optics," Cambridge Univ. Press. (1998)

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**SEMESTER VI**

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DSE 1B: Electronics Project/ Electronics Instrumentation

**ELECTRONICS-DSE 1B: ELECTRONICS INSTRUMENTATION**

**(Credits: Theory-03, Practicals-01)**

**Theory: 45 Lectures**

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**QUALITIES OF MEASUREMENTS:****06**

Introduction, Performance Characteristics, Static characteristics, Error in measurement, Types of Error, Sources of Error, Dynamic characteristics, Statistical analysis, Standard, Atomic frequency and time standards.

**TRANSDUCERS:****15**

**Electrical transducer:** Characteristics, advantages, Selecting a Transducer, **Resistive Transducer:** Potentiometer, Resistance pressure transducer, Resistive Position Transducer, Resistance thermometer. **Strain Gauges:** Resistance wire Gauge (Unbounded and Bonded), Foil strain Gauge, semiconductor strain Gauge. **Inductive transducer:** Change in self inductance with number of turns and with change in permeability, Variable reluctance type transducer, Differential output Transducer, LVDT, Pressure inductive transducer, Capacitive Transducer (pressure), Load cell (Pressure Cell), Piezo Electric Transducer, **Photoelectric transducer:** Photomultiplier tube, Photocells, Photo-Voltaic cell, Semiconductor Photodiode, Phototransistor. **Temperature Transducer:** Thermocouple, Thermistor, RTD. Magnetic flow meters.

**SIGNAL CONDITIONING:****03**

Introduction, **Basic Instrumentation amplifier:** Instrumentation amplifier, Instrumentation system, Instrumentation amplifier using Transducer Bridge. Chopped and Modulated DC Amplifier.

**BRIDGES:****05**

DC Bridges and applications: Wheatstone, Kelvin, AC Bridges: General form of AC bridge balance, comparison bridges, Maxwell, Hay, Schering, Wien, LCR Bridge.

**SIGNAL GENERATOR:****03**

A.F Sine & Square Wave Generator, Function generator, Pulse Generator, Sweep Frequency generator.

**WAVE ANALYZERS:****05**

Basic wave analyzer, Frequency Selective Wave Analyzer, Heterodyne Wave Analyzers. Harmonic Distortion Analyzers, Spectrum Analyzers.

**DIGITAL INSTRUMENTS:****08**

Digital Voltmeters: Ramp type DVM, Dual Slope integrating type DVM, Staircase Ramp Type, Successive Approximation DVM, 3 $\frac{1}{2}$  Digit, Resolution & Sensitivity of Digital Meters, Digital Multimeters, Digital Frequency meter.

**Reference Books:**

1. Electronics Instrumentation by H. S. Kalsi , 2nd Edition, Tata Mc Graw Hill, 2nd Edition
1. Industrial Instrumentation by K. Krishnaswami and S. Vijayachitra, New Age Int. Pub.
2. Measurement, Instrumentation and Experiment Design in Physics and Engineering by Michael Sayer and Abhai Mansingh, PHI Ltd, 2008

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**Laboratory experiments under -DSE 1B ELECTRONICS INSTRUMENTATION**

Atleast 8 experiments

1. Instrumentation amplifiers.
2. Temperature control using thermistor.
3. LVDT displacement sensor.
4. Ultrasonic sensor for ranging.
5. Characteristics of a Phototransistor.
6. Characteristics of Photocell and its application.
7. Interfacing of solar panel for lighting application.

8. Generation of sine and triangle using XR-2206.
9. Generation of waveforms using 8038.
10. Intruder alarm using photodiode and opamp.
11. Fluid level sensor using opamp.
12. Characteristics of thermocouple.
13. Design of Bessel/Chebyshev Filter.
14. Signal conditioning circuit.
15. Frequency measurement using Wein Bridge.
16. Frequency measurement using Maxwell's Bridge.
17. Frequency measurement using Wheatstone Bridge,
18. Frequency measurement using Kelvin's Bridge.
19. Frequency measurement using Hay's Bridge.
20. Frequency measurement using Schering Bridge.
21. Frequency measurement using LCR Bridge.

#### Reference Books:

1. Industrial Instrumentation by K. Krishnaswami and S. Vijayachitra, New Age Int. Pub.
2. Measurement, Instrumentation and Experiment Design in Physics and Engineering by Michael Sayer and Abhai Mansingh, PHI Ltd, 2008

#### SEC Courses

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#### ELECTRONICS SEC 1: PROGRAMMING in C++

(Credits: Theory-03, Practicals-01)

Theory Lectures: 45 lectures

<b>Chapter 1 : Flowcharts and Algorithms</b>	<b>1</b>
<b>Chapter 2: Data types, Operators and expressions</b>	<b>3</b>
Identifiers, keywords, constants, C++ operators, Type conversion	
<b>Chapter 3: Writing a program in C++</b>	<b>3</b>
Declaration of variables, statements, control statements – if statement and if –else statements, switch statements, loop statements: for loop, while loop and do-while loop, breaking control statements: break and continue statements, goto statement.	
<b>Chapter 4: Functions and Program Structures</b>	<b>4</b>
Defining a function, return statement, types of functions, Actual and formal arguments, Local and Global arguments, Default arguments, Multifunction program, Storage class specifiers, Recursive functions, Preprocessors, Macro, header files and standard files.	
<b>Chapter 5: Arrays</b>	<b>3</b>
Array notation, array declaration, array initialization, processing with an array, arrays and functions, Multidimensional arrays, Character arrays.	
<b>Chapter 6: Pointers</b>	<b>3</b>
Pointer declaration, address operator, pointer variable, pointer expressions, pointer arithmetic, pointer and functions, pointers and arrays, pointers and strings, array of pointers and pointer to pointer.	
<b>Chapter 7: Structures</b>	<b>3</b>
Structure declaration, structure definition, structure initialization, accessing structure members, nesting of structures, array of structures, structures and functions	
<b>Chapter 8: Classes and Objects</b>	<b>5</b>



Declaration of a class, member functions, defining the object of a class, accessing a member of a class, Array of class objects, Pointers and classes, classes within classes.

**Chapter 9: Constructors and destructors** **5**

Constructors, Copy constructors, Parameterized constructors, multiple constructors, default constructors, destructors, inline member functions, Static class members(Static data members and static member functions), friend function, new and delete operators, this operators.

**Chapter 10: Inheritance** **5**

Types of Inheritances, Types of base classes, derived class, types of inheritance.

**Chapter 11: Operator overloading** **5**

Defining operator overloading, overloading unary operators, overloading binary operators.

**Chapter 12: Polymorphism** **5**

Function overloading, Early binding, Late binding, virtual functions, Pure virtual functions and Abstract base classes.

**Text Book:**

1. Object oriented programming with C++ E. Balaguruswamy TMHv

**REFERENCE BOOKS:**

1. Mastering C++ K. R. Venugopal, Rajkumar, T. Ravishankar TMH
2. Programming with C++ D. Ravichandran TMH

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**Laboratory experiments under SEC1: Programming in C++**

**AT LEAST 8 EXPERIMENTS FROM FOLLOWING.**

**Practical List**

1. To find the largest of three numbers.
2. Sum and average of n numbers.
3. Sum of the digits of a number using mod function.
4. Generation of Fibonacci series using functions and classes
5. Prime numbers
  - a) To identify whether a number is prime or composite.
  - b) To print prime numbers for a given range of numbers.
6. Sine series evaluation.
7. Sorting of n numbers using arrays
8. Programming using overloading
9. Programming using polymorphism
10. Programming using inheritance
11. Matrix multiplication
12. Addition of a number using Storage class specifiers
13. Factorial of a number using recursive functions
14. Swapping of a number using:
  - a) Call by value
  - b) Call by reference
15. Programming using class constructors and destructors
16. Programming to generate student identity cards using structures
17. Copy contents of two strings A and B into string C and count the number of characters present in string C.

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**Reference Books:**

1. Yeshvant Kanetkar, Let Us C , BPB Publications
2. Numerical methods for Engineers, Steven C. Chapra and Raymond P. Canale, 6<sup>th</sup> Edition, TMH.
3. Programming in ANSI C, Balagurusamy, 2nd edition, TMH.

**ELECTRONICS-SEC2: SMART PHONE APPS DEVELOPMENT**  
**(Credits: 03, Practicals-01)**  
**Theory Lectures: 45 lectures**

**Introduction:**

What is mobile Application Programming, Different Platforms, Architecture and working of Android, iOS and Windows phone 8 operating system, Comparison of Android, iOS and Windows phone 8.

**Android Development Environment:**

What is Android, Advantages and Future of Android, Tools and about Android SDK, Installing Java, Eclipse, and Android, Android Software Development Kit for Eclipse, Android Development Tool: Android Tools for Eclipse, AVDs: Smartphone Emulators, Image Editing,

**Android Software Development Platform:**

Understanding Java SE and the Dalvik Virtual Machine, Directory Structure of an Android Project, Common Default Resources Folders, The Values Folder, Leveraging Android XML, Screen Sizes, Launching Your Application: The AndroidManifest.xml File, Creating Your First Android Application.

**Android Framework Overview:**

The Foundation of OOP, The APK File, Android Application Components, Android Activities: Defining the User Interface, Android Services: Processing in the Background, Broadcast Receivers: Announcements and Notifications, Content Providers: Data Management, Android Intent Objects: Messaging for Components, Android Manifest XML: Declaring Your Components.

**Views and Layouts, Buttons, Menus, and Dialogs, Graphics Resources in Android:**

Introducing the Drawables, Implementing Images, Core Drawable Subclasses, Using Bitmap, PNG, JPEG and GIF Images in Android, Creating Animation in Android

**Handling User Interface(UI) Events:** An Overview of UI Events in Android, Listening for and Handling Events , Handling UI Events via the View Class, Event Callback Methods, Handling Click Events, Touchscreen Events, Keyboard Events, Context Menus, Controlling the Focus.

**Content Providers:** An Overview of Android Content Providers, Defining a Content Provider, Working with a Database.

**Intents and Intent Filters:** Intent, Implicit Intents and Explicit Intents, Intents with Activities, Intents with Broadcast Receivers

**Advanced Android: New Features in Android 4.4.**

**iOS Development Environment:** Overview of iOS, iOS Layers, Introduction to iOS application development.

**Windows phone Environment:** Overview of windows phone and its platform, Building

windows phone application.

**Suggested Books:**

1. Beginning Android 4, Onur Cinar , Apress Publication
2. Professional Android 4 Application Development, Reto Meier, Wrox

**Electronics Lab SEC2: SMART PHONE APPS DEVELOPMENT**

**PRACTICALS: (ANY 8)**

1. Create —Hello World application. That will display —Hello World in the middle of the screen in the emulator. Also display —Hello World in the middle of the screen in the Android Phone.
2. Create- HELLO INDIA, when the button is clicked.
3. Create 4 buttons which displays four values.
4. Create an application with login module. (Check username and password).
5. Create spinner with strings taken from resource folder (res >> value folder) and on changing the spinner value, Image will change.
6. Create a menu with 5 options and selected option should appear in text box.
7. Create a list of all courses in your college and on selecting a particular course teacher-in-charge of that course should appear at the bottom of the screen.
8. Create an application with three option buttons, on selecting a button colour of the screen will change.
9. Create and Login application as above. On successful login, pop up the message.

**ELECTRONICS-SEC3:BASICS OF ROBOTICS**

**(Credits: Theory-03, Practicals-01)**

**Theory Lectures: 45 lectures**

**Introduction to Robotics:**

**5**

Introduction to Extensive Field of ROBOTICS, Application of Robotics: Industrial, Medical, Entertainment. Introduction to Embedded System, Embedded systems and Robotics, Basics of hardware and software.

**Fundamentals of Electronics for Robotics:**

**4**

Voltage, Current, Analog and Digital electronics, Resistance, Capacitance, Inductance, Diode, Transistor, Use of Digital Multimeter for measurement of voltage, current, resistance.

**Sensors and Actuators:**

**14**

Sensors: White line sensors , IR range sensor, Analog IR proximity sensors , Analog directional light intensity sensors , Position encoders , Servo mounted sensor pod/ Camera Pod, Wireless colour camera , Ultrasound scanner , Gyroscope and Accelerometer , Magnetometer, GPS receiver, Battery voltage sensing, Current Sensing.

Actuators: DC Motors, Gearing and Efficiency, Servo Motors, Stepper motors, Relays, Motor driver IC L293D vis-s-vis H- BRIDGE concept .

**Microcontroller Programming for Robotics:**

**10**

Microcontroller ATMEGA 328, Introduction to Arduino, Arduino IDE and Overview, Introduction to different Arduino boards and shields, Working on digital and analog signal,

Future Technology Devices International Ltd.(FTDI), PROGRAMMING the Arduino, Driver and software installation,Creating Simple Sketches

**Interfacing** **5**

Interfacing with Arduino: Switches, LED's, Buzzer, DC motor, 16x2 LCD Display, potentiometer

**LINE FOLLOWER CONCEPT.** **5**

Interface Motor Driver with white light sensors, IR sensor, Calibration of IR sensors. Line follower robot, obstacle detector, edge avoider, Intelligent Line follower Robot.

**NEW AND UPCOMING TECHNOLOGIES:** **2**

3D printers, humanoid robots.

**Reference Books:**

1. Saha, S.K., Introduction to Robotics, 2nd Edition, McGraw-Hill Education, New Delhi, 2014
  2. R.K. Mittal, I.J. Nagrath, "Robotics & Control", Tata McGraw & Hills, 2005.
- Website: [www.arduino.org](http://www.arduino.org)

**Electronics Lab SEC 3 : Basics of Robotics**

**PRACTICALS: (ANY 8)**

Expt 1: Program to read and display on the serial Port analog and digital values  
Analog Read Serial: Read a potentiometer, print its state out to the Arduino Serial Monitor.  
Digital Read Serial: Read a switch, print the state out to the Arduino Serial Monitor.

Expt 2: Digital-1

Blink: Turn an LED on and off.

Button: Use a pushbutton to control an LED.

Glowing LEDs in pattern of your own choice.

Designing of RGB color pattern

Expt 3: Digital-2

Debounce: Read a pushbutton, filtering noise.

Digital Input Pullup: Demonstrates the use of INPUT\_PULLUP with pinMode().

State Change Detection: Count the number of button pushes.

Expt 4: Digital-3

Tone Keyboard: A three-key musical keyboard using force sensors and a piezo speaker.

Tone Melody: Play a melody with a Piezo speaker.

Expt 5: Digital-4

Tone Multiple: Play tones on multiple speakers sequentially using the tone() command.

Tone Pitch Follower: Play a pitch on a piezo speaker depending on an analog input.

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Expt 6: Analog-1

Analog In Out Serial: Read an analog input pin, map the result, and then use that data to dim or brighten an LED.

Analog Input: Use a potentiometer to control the blinking of an LED.

Expt 7: Analog-3

Fading: Use an analog output (PWM pin) to fade an LED.

Smoothing: Smooth multiple readings of an analog input.

Expt 8: Control Structures-1

Arrays: A variation on the For Loop example that demonstrates how to use an array.

For Loop Iteration: Control multiple LEDs with a for loop and.

If Statement Conditional: Use an 'if statement' to change the output conditions based on changing the input conditions.

Expt 9: Control Structures-2

Switch Case: How to choose between a discrete number of values.

Switch Case 2: A second switch-case example, showing how to take different actions based on the characters received in the serial port.

While Statement Conditional: How to use a while loop to calibrate a sensor while a button is being read.

Expt 10. Sensors-1

Accelerometer: Read an accelerometer.

Expt 11. Sensors-2

Knock: Detect knocks with a piezo element.

Expt 12. Sensors-3

Interfacing of Temperature Sensor

Expt 13. Sensors-4

Detect objects with an ultrasonic range finder.

Expt 14. Display-1

Interfacing 2x16 LCD

Expt 15. Display-2

Bar Graph: Make an LED bar graph.

Expt 16. Display-3

RowColumnScanning: Control an 8x8 matrix of LEDs.

Expt. 17. Interfacing DC motor using Motor driver with Arduino:

Dc motor speed control using PWM

Expt. 18. Interfacing Stepper motor

Expt 19: Interfacing Potentiometer and LDR with ARDUINO.

- ☐ xpt 20:☐ Testing of IR sensors.
- ☐ Detecting white and black surface with digital IR sensors.
- ☐ IR range detection.

☐ xpt 21: Programming Line follower Robot

#### SEC 4: PROGRAMMING IN PYTHON

(Credits: Theory-03, Practicals-01)

Theory Lectures: 45

**Chapter 1: Python — Overview (1L)**

History of Python, Python Features

**Chapter 2: Python — Environment Setup (5L)**

Local Environment Setup, Getting Python, Setting up, Setting Path at Unix/Linux, Setting Path at Windows, Python Environment Variables

**Chapter 3: Running Python (9L)**

Python — Basic Syntax, First Python Program, Python identifiers, Reserved Words, Lines and indentation, Multi-Line Statements, Quotation in Python, Comments in Python, Using Blank, Waiting for the Multiple Statements on a Single Line, Multiple Statement Groups as Suites, Command Line Arguments, Parsing Command-Line Arguments

**Chapter 4: Python — Variable Types (7L)**

Assigning Values to Variables, Multiple Assignment, Standard Data Types, Python Numbers, Python Strings, Python Lists, Python Tuples, Python Dictionary, Data Type Conversion

**Chapter 5: Python — Basic Operators (8L)**

Types of Operator, Python Arithmetic Operators, Python Comparison Operators, Python Assignment Operators, Python Bitwise Operators, Python Logical Operators, Python Membership Operators, Python Identity Operators, Python Operators Precedence

**Chapter 6: Python Decision Making (7L)**

IF Statement, IF...ELIF...ELSE Statements, Nested IF Statements, Single Statement Suites

**Chapter 7: Python - Loops (8L)**

While Loop Statements, for Loop Statements, Nested loops, Loop Control Statements, break statement, continue Statement, pass Statement.

#### Reference Books

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. <http://www.tutorialpoints.com> (simpleeasylearning)
3. Allen Downey, Jeffrey Elkner, Chris Meyers, How to think like a computer scientist : learning with Python, Freely available online.2012

#### Laboratory experiments under SEC 4

At Least 8 Experiments From The Following

[\(Back to Index\)](#)[\(Back to Agenda\)](#)

1. Write a menu driven program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon users choice.
2. Write a program to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria :  
Grade A: Percentage  $\geq 80$   
Grade B: Percentage  $\geq 70$  and  $< 80$   
Grade C: Percentage  $\geq 60$  and  $< 70$   
Grade D: Percentage  $\geq 40$  and  $< 60$   
Grade E: Percentage  $< 40$
3. Write a program using for loop, print a table of Celsius/Fahrenheit equivalences. Let c be the Celsius temperatures ranging from 0 to 100, for each value of c, print the corresponding Fahrenheit temperature.
4. Write a program using while loop, produce a table of sines, cosines and tangents. Make a variable x in range from 0 to 10 in steps of 0.2. For each value of x, print the value of  $\sin(x)$ ,  $\cos(x)$  and  $\tan(x)$ .
5. Write a program that takes a positive integer n and then produces n lines of output shown as follows  
For example enter a size: 5  
\*  
\*\*  
\*\*\*  
\*\*\*\*  
\*\*\*\*\*
6. Write a program to check whether the input number is even or odd.
7. Write a program to compare three numbers and print the largest one.
8. Write a program to print factors of a given number.
9. Write a method to calculate GCD of two numbers.
10. Write a program to display the first n terms of Fibonacci series.
11. Write a program to find factorial of the given number.
12. Write a program to find sum of the following series for n terms:  $1 - 2/2! + 3/3! - \dots - n/n!$
13. Write a program to perform different arithmetic operators on two variables.
14. Write a program to perform different comparator operators on two variables.
15. Write a program to perform different assignment operators on two variables.
16. Write a program to perform different bitwise operators on two variables.
17. Write a program to perform different logical operators on two variables.
18. Write a program to find the prime numbers from 2 to 100 using a nested for loop
19. Write a program to calculate the sum and difference of two compatible matrices.

**ELECTRONICS-SEC5:Renewable Energy Resources**  
**(Credits: Theory-03, Practicals-01)**  
**Theory Lectures: 45 lectures**

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**UNIT I INTRODUCTION**

(9)

World Energy Use – Reserves of Energy Resources – Environmental Aspects of Energy Utilisation – Renewable Energy Scenario in India and around the World – Potentials – Achievements / Applications – Economics of renewable energy systems.

**UNIT II SOLAR ENERGY**

(9)

Solar Radiation – Measurements of Solar Radiation – Flat Plate and Concentrating Collectors – Solar direct Thermal Applications – Solar thermal Power Generation – Fundamentals of Solar Photo Voltaic Conversion – Solar Cells – Solar PV Power Generation – Solar PV Applications.

**UNIT III WIND ENERGY**

(9)

Wind Data and Energy Estimation – Types of Wind Energy Systems – Performance – Site Selection – Details of Wind Turbine Generator – Safety and Environmental Aspects

**UNIT IV BIO – ENERGY**

(9)

Biomass direct combustion – Biomass gasifiers – Biogas plants – Digesters – Ethanol production – Bio diesel – Cogeneration – Biomass Applications

**UNIT V OTHER RENEWABLE ENERGY SOURCES**

(9)

Tidal energy – Wave Energy – Open and Closed OTEC Cycles – Small Hydro-Geothermal Energy – Hydrogen and Storage – Fuel Cell Systems – Hybrid Systems.

**Reference Books:**

1. Rai. G.D., "Non Conventional Energy Sources", Khanna Publishers, New Delhi, 2011.
2. Twidell, J.W. & Weir, A., "Renewable Energy Sources", EFN Spon Ltd., UK, 2006.
3. Sukhatme. S.P., "Solar Energy", Tata McGraw Hill Publishing Company Ltd., New Delhi, 1997.
3. Godfrey Boyle, "Renewable Energy, Power for a Sustainable Future", Oxford University Press, U.K., 1996.
4. Tiwari. G.N., Solar Energy – "Fundamentals Design, Modelling & Applications", Narosa Publishing House, New Delhi, 2002.
5. Freris. L.L., "Wind Energy Conversion Systems", Prentice Hall, UK, 1990.
6. Johnson Gary, L. "Wind Energy Systems", Prentice Hall, New York, 1985
7. David M. Mousdale – "Introduction to Biofuels", CRC Press, Taylor & Francis Group, USA 2010
8. Chetan Singh Solanki, Solar Photovoltaics, "Fundamentals, Technologies and Applications", PHI Learning Private Limited, New Delhi, 2009.
9. Renewable Energy Technologies /Ramesh & Kumar /Narosa
10. Non-Conventional Energy Sources /G.D. Rai, Khanna Publishers
11. Renewable Energy Resources – Twidell&Wier, CRC Press( Taylor & Francis)
12. Renewable energy resources/ Tiwari and Ghosal/ Narosa.
13. Renewable energy sources and emerging technologies by D.P.Kothari, K.C.Singhal, P.H.I.
14. Non-Conventional Energy Systems / K Mittal /Wheeler

**LAB SEC 5: RENEWABLE ENERGYS RESOURCES****Practicals: (Minimum 8)****Series and Parallel PV cell Connection****(3 expts)**

- a) One cell-Measuring Short circuit current, open circuit voltage
- b) Two Cells-Connected in Parallel - Measuring Short Circuit Current and Open Circuit Voltage
- c) Cells Connected in Series

**Current Output vs. Shading****(3 expts)**

- a) Shading PV cells connected in series and parallel combinations
- b) Determining the Short Circuit Current and Voltage and Open Circuit Voltage
- c) Effect of Shading on Short Circuit Current for Solar Cells in Parallel



d) Effect of Shading on Short Circuit Current for Solar Cells in Series

**PV Loads**

**(9 expts)**

- a) Measuring Voltage, Current, and Power under load
- b) Loading the PV Cell
- c) Voltage, Current, and Power for One Cell
- d) Voltage, Current, and Power for Two Cells in Parallel
- e) Power, Two Cells in Series
- f) Rated Voltage and Power
- g) Testing the Current, Voltage, and Power with a Light Bulb as a Load – One Cell
- h) Testing the Current, Voltage, and Power with a Light Bulb as a Load – Two Cells
- i) A Power Curve

**Solar Cells, IV Curve, and Power**

**(1 expt)**

**Output vs. Light Wavelength (Color)**

**(2 expts)**

- a- Affects of wavelength (“color”) on PV cell current output
- b- Effect of sunlight on PV cell output current

**Photocell Output vs. Lamp Distance**

**(1 expt)**

**Output vs Sun angle**

**(2 expts)**

- a- Measuring the Effect of Sun Angle on Current Output
- b- Output vs. PV Cell Temperature

**Build a Simple Sun Tracker**

**(1 expt)**

**Study of PV cell (Solar cell) basic Installation setup for generating electricity for domestic purpose(Home Rooftop)**

**(2 expts)**

**Study of Solar Cooker**

**(1 expt)**

**Study of a Biogas Plant**

**(1 expt)**

**Study of Wind Turbine**

**(1 expt)**

**Biofuels with Plants**

**(1 expt)**

**GE Courses**

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**GE 1: ELECTRONICS CIRCUITS AND PCB DESIGNING/ Consumer Electronics**

**(Credits: Theory-03,Practical:01)**

**Theory: 45 Lectures**

**Unit-1**

**(9 Lectures)**

**Network theorems (DC analysis only):** Review of Ohms law, Kirchhoff’s laws, voltage divider and current divider theorems, open and short circuits.

Thevenin’s theorem, Norton’s theorem and interconversion, superposition theorem, maximum power transfer theorem.

**Unit 2**

**(11 Lectures)**

**Semiconductor Diode and its applications:** PN junction diode and characteristics, ideal diode and diode approximations. Block diagram of a Regulated Power Supply, Rectifiers: HWR, FWR- center tapped and bridge FWRs. Circuit diagrams, working and waveforms, ripple factor & efficiency(no derivations).Filters: circuit diagram and explanation of shunt capacitor filter with waveforms.

**Zener diode regulator:** circuit diagram and explanation for load and line regulation, disadvantages of Zener diode regulator.

**Unit-3**

(13 Lectures)

**BJT and Small Signal amplifier:** Bipolar Junction Transistor: Construction, principle & working of NPN transistor, terminology. Configuration: CE, CB, CC. Definition of  $\alpha$ ,  $\beta$  and  $\gamma$  and their interrelations, leakage currents. Study of CE Characteristics, Hybrid parameters. Transistor biasing: need for biasing, DC load line, operating point, thermal runaway, stability and stability factor.

Voltage divider bias: circuit diagrams and their working, Q point expressions for voltage divider biasing.

Small signal CE amplifier: circuit, working, frequency response, re model for CE configuration, derivation for  $A_v$ ,  $Z_{in}$  and  $Z_{out}$ .

**Unit-4**

(12 Lectures)

**Types of PCB:** Single sided board, double sided, Multilayer boards, Plated through holes technology, Benefits of Surface Mount Technology (SMT), Limitation of SMT, Surface mount components: Resistors, Capacitor, Inductor, Diode and IC's.

**Layout and Artwork:** Layout Planning: General rules of Layout, Resistance, Capacitance and Inductance, Conductor Spacing, Supply and Ground Conductors, Component Placing and mounting, Cooling requirement and package density, Layout check.

Basic artwork approaches, Artwork taping guidelines, General artwork rules: Artwork check and Inspection.

**Laminates and Photoprinting:** Properties of laminates, Types of Laminates, Manual cleaning process, Basic printing process for double sided PCB's, Photo resists, wet film resists, Coating process for wet film resists, Exposure and further process for wet film resists, Dry film resists

**Etching and Soldering:** Introduction, Etching machine, Etchant system. Principles of Solder connection, Solder joints, Solder alloys, Soldering fluxes. Soldering, Desoldering tools and Techniques.

**Reference Books:**

1. Electronic Devices and circuit theory, Robert Boylestaid and Louis Nashelsky, 9th Edition, 2013, PHI
2. Electronics text lab manual, Paul B. Zbar.
3. Electric circuits, Joeseeph Edminister, Schaum series.
4. Basic Electronics and Linear circuits, N.N. Bhargava, D.C. Kulshresta and D.C Gupta -TMH.
5. Electronic devices, David A Bell, Reston Publishing Company/DB Tarapurwala Publ.
6. Walter C.Bosshart "PCB DESIGN AND TECHNOLOGY" Tata McGraw Hill Publications, Delhi. 1983
7. Clyde F.Coombs "Printed circuits Handbook" III Edition, McGraw Hill.

**LAB GE1: Electronics circuits and PCB designing**

**Practicals: (Any 8)**

1. Familiarization with various controls and use of CRO, Power Supply, Function Generator and Multimeter.
2. Verification of Ohm's Law and Kirchhoff's Laws.
3. Verification of voltage division and current division Laws.

4. Familiarization of various Electronics components & Introduction to Bread board, Resistors (Colour codes) and values, Capacitors (various types), Inductors (various types), Diodes – Rectifier, Zener, LED, BJT
5. Verification of Thevenins Theorem.
6. Verification of Norton's Theorem.
7. Verification of Superposition Theorem.
8. Verification of Maximum Power transfer Theorem.
9. Characteristics of P-N junction diode.
10. Study of H.W. and F.W. Rectifiers (Ripple factor and wave forms).
11. Study of Bridge Rectifiers (Ripple factor and wave forms).
12. Study of the effect of adding capacitor filter to F.W.R. (Waveforms and Ripple factor calculations).
13. Zener diode Regulator circuit.
14. Input characteristics of BJT (CE configuration)
15. Output characteristics of BJT (CE configuration)
16. Verification of Transistor current gains ( $\alpha$  &  $\beta$ ).
17. Load line and Q-point of CE Amplifier.
18. Study of frequency response of CE amplifier- with and without CE (Emitter bypass cap.)
19. PCB designing for given circuit using manual method.
20. Circuit construction on the PCB of a given circuit (drilling, components mounting & soldering, etc.)
21. PCB designing for a given circuit using CAD tools.

### **GE - 1 Consumer Electronics**

**(Credits: Theory-03, Practicals-01)**

**Theory Lectures: 45**

#### **Unit -1**

**(10 Lectures)**

#### **Audio systems:**

PA system, Microphone, Amplifier, Loudspeakers. Radio receivers, AM/FM. Audio recording and reproduction, CD and MP3.

#### **Unit-2**

**(10 Lectures)**

#### **TV and display systems:**

Television standards, MP4 players, Set Top box, CATV and Dish TV, LCD, Plasma & LED TV. Projectors: DLP, Home Theatres, Remote Controls

**Unit-3****(15 Lectures)****Landline, Mobile telephony and Cabling:**

Basic landline equipment, Cordless. Intercom/ EPABX system. Mobile phones: GPRS & Bluetooth and Wi-Fi. Analysis and Comparison of 1G, 2G, 3G, 4G, 5G and 6G Telecom services, GPS Navigation system. Smart Phones Office Equipment: Scanners, Barcode / Flat bed, Printers, Xerox, Different types of Cables, Punching and crimping of cables.

**Unit-4****(10 Lectures)****Electronic Gadgets and Domestic Appliances:**

Digital clock, Digital camera, Handicam, Home security system, CCTV. Air conditioners, Refrigerators, Washing Machine/Dish Washer, Microwave oven, Vacuum cleaners

**Suggested Books:**

1. R. P. Bali Consumer Electronics Pearson Education (2008)
2. R. G. Gupta Audio and Video systems Tata McGraw Hill (2004)

**Laboratory experiments under: GE1:Consumer Electronics****At least 8 experiments from following list****Practical List**

1. Punching and crimping of cables
2. Study of Microphone
3. Study of Amplifier
4. Study of Loud speaker
5. Study of AM Radio receivers
6. Study of FM Radio receivers
7. Study of a PA system
8. Audio recording, reproduction and rendering of sound signals
9. Study of Set top box
10. Study of Home theatre system
11. Study of a Projector
12. Study of a Landline equipment
13. Study of a Mobile equipment
14. Study of a Digital clock
15. Study of a Digital camera
16. Study of a Handicam system
17. CCTV installations and cabling
18. Study of an Air conditioner system
19. Study of a Washing machine system
20. Study of a Dish washer system
21. Study of a Microwave oven system
22. Study of a Vacuum cleaner system

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**GE 2:REPAIR AND MAINTENANCE OF ELECTRICAL AND ELECTRONIC APPLIANCES/Medical****Home Instruments****(Credits: 03, Practical :01)****Total Lectures 45****UNIT I****12****INTRODUCTION TO ELECTRICITY**

1. Line Voltage: -Distribution, Mains supply standards, Meaning of Single phase and three phase supply, conventions followed.
2. IMPORTANCE OF EARTHING AND FUSE: Introduction of Earthing, Need of earthing, Hazard, Types of earthing, Advantage of earthing, working of earthing, Importance of fuse, types of fuse
3. HOUSE WIRING: Introduction of Wiring, types of wiring, advantage of wiring, wiring methods, electrical panel, House wiring diagram.

**UNIT II****5****Energy Consumption and Preventive Maintenance**

General Precautions, handling and maintenance for all types of electrical and electronic domestic Appliances, Energy consumption.

1. Energy meter: Introduction, working, Connection and Energy meter reading:
2. Power Calculation of Load
3. Electricity Bill calculation

**UNIT III****7****HEATING APPLIANCES:**

Electrical iron, Electric stove, Electric Toaster, Immersion heater, Electric geyser, Electric Oven, Induction Cooktop, Electric Roti Maker, Electric Kettle, Ordinary and automatic iron:- Introduction, working principle, construction, operation, Installation, Maintenance and Repair (faultfinding and removal of faulty component)

**UNIT IV****7****MOTORIZED APPLIANCES:**

Electric fan (Ceiling Fan and Table Fan), Electric Mixer grinder, juicer, Electric washing machine, Hair dryer, Vacuum cleaner:- Introduction, working principle, construction, operation, Installation, Maintenance and Repair (faultfinding and removal of faulty component)

**UNIT V****7****Electrical and electronic appliances**

Electric gas lighter, Electric bell and buzzer, Emergency light, Voltage Stabilizer (Relay based), Linear Regulated Power Supply, Battery Charger, Solar Voltaic cell, Tube light: Introduction, working principle, construction, operation, Installation, Maintenance and Repair (faultfinding and removal of faulty component)

**UNIT VI****7****Visual electronic appliances**

Introduction, block diagram, working principal and different sections of

1. Public address system:
2. CD/DVD player

### 3. LCD/LED Television

#### **LAB GE2: Repair and Maintenance of Electrical and Electronic**

##### **Appliances:(any 8)**

1. Use of tong tester, tester, Multimeter for measurement of Voltage, Current, Resistance and Continuity test.
2. Dismantling and reassembling of ordinary/automatic iron, Testing and repair of ordinary/automatic iron
3. Dismantling and reassembling of electric stove and hot plate, Testing and repair of electric stove and hot plate
4. Dismantling and reassembling of Induction cooktop, Testing and repair of Induction cooktop
5. Dismantling and reassembling of Electric Kettle, Testing and repair of Electric Kettle
6. Construction of Electric Extension board, Testing and repair of extension board
7. Dismantling and reassembling of electric oven, Testing and repair of electric oven
8. Dismantling and reassembling of electric toaster, Testing and repair of electric toaster.
9. Dismantling, assembling and testing of immersion heater and installation of geyser.
10. Testing, faultfinding, repair and overhauling of electric fan
11. Testing, faultfinding, repair and overhauling of electric mixer
12. Testing, faultfinding, repair and overhauling of non automatic agitator type washing machine
13. Testing, faultfinding, repair and overhauling of hair dryer
14. Testing, faultfinding, repair and overhauling of vacuum cleaner
15. Testing, faultfinding, repair and overhauling of grain grinder
16. Dismantling, assembling, testing and repair of electric gas lighter
17. Testing, faultfinding and repairs of electric bell.
18. Testing, faultfinding and repair of emergency light.
19. Testing, faultfinding and repair of stabilizer.
20. Dismantling, assembling and study of various sections of LCD/LED TV
21. Dismantling, assembling and repair of battery charger / adaptor
22. To measure voltages/signals at various test points of public address system.
23. To study installation of DTH.
24. Tube light wiring
25. Installation and Testing of Earthing.
26. Installation of Basic Single phase wiring as per the given wiring diagram.

##### **Reference Books**

1. The Repair & Maintenance Of Electrical Equipment: A Complete Guide To Troubleshooting Portable electric Tools And Generators. Front Cover. Fred Sotcher.
2. Troubleshooting Electronic Equipment: Includes Repair And Maintenance, R.S. Khandpur, Second Edition

#### **GE2 : Medical Home instrumentation**

**(Credits: 03, Practical :01)**

**Total Lectures 45**

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**Fundamentals of Medical Instrumentation:****7L**

Anatomy and Physiology, Physiology system of body: Cardiovascular System, Respiratory System, Nervous system, Sources of biomedical signals, Basic medical Instrumentation system, General constraints in design of medical instrumentation system.

**Bioelectric Signals and electrodes:****12L**

Origin of Bio electric Signals: Electrocardiogram, Electroencephalogram, and electromyogram, Recording Electrodes: Electrode tissue interface, Skin contact impedance, Silver – Silver Chloride electrodes, Electrodes for ECG, Electrodes for EEG, Electrodes for EMG, Electrical conductivity of electrodes jellies and creams, Microelectrodes: Glass micro capillary electrodes, Metal Microelectrodes.

**Physiological transducers:****8L**

Introduction, Classification of Transducers, performance characteristics of Transducers: static and dynamic characteristics, signals from cardiovascular system, signals from respiratory system and the various types of transducers required to measure a given parameter, Optical fibre sensors: types of optical fibre sensors, Biosensors, Smart sensors

**Recording Systems:****2L**

Basic recording system, General considerations for signal conditioners, Writing systems.

**Biomedical Recorders:****5L**

Working principles of Electrocardiograph( ECG), ECG leads Electroencephalograph (EEG) and Electromyograph( EMG) ( qualitative study only). **Phonocardiograph**: origin of heart sounds, Microphones for Phonocardiography.

**Patient Monitoring Systems:****6L**

Measurement of heart rate, Measurement of pulse rate, Blood pressure measurement: In-direct Methods of blood Pressure measurement: automatic blood pressure measuring using Korotkoff's method. Measurement of respiration rate: thermistor method, Pulse oximeter, Working principle of cardiac pacemaker.

**Non- Invasive Diagnostic Imaging:****5L**

Working principles of X-rays, CT Scan, Magnetic Resonance Imaging and Ultra-sound Imaging.

1. Handbook of Biomedical Instrumentation By R.S.Khandpur ,TMH,2nd Edn
2. Medical Instrumentation- Application & Design, By John Webster , 3rd Edition, Wiley India Edi.
3. Biomedical Instrumentation and Measurements By Leslie Cromwell, Fred J. Weibell, Erich A. Pfeiffer PHI( 2nd Edition)
4. Principles of applied biomedical instrumentation by Goddes & Baker, Jonh Wiley
5. Medical Electronics and Instrumentation by Sanjay Guha, University publication.
6. Textbook of Medical Instruments, By S. Ananthi New Age International.

Practicals: (At least 8 Experiments)

1. Study of Bio-Medical ECG.
2. Study of Bio-Medical EEG.

3. Study of Bio-Medical EMG.
4. Study of Bio-Medical Electronics Pressure meter.
5. Study of Bio-Medical Glucometer.
6. Study of Bio-Medical transducers for bio-medical applications.
7. Study of Oximeter.
8. Bio-Medical application using transducer I.
9. Bio-Medical application using transducer II.
10. Study of Bio- Medical transducers
11. Study of Bio- Medical transducers
12. Study of electrical conductivity of electrodes and jellies / creams
13. study of Pulse Rate
14. study of Heart beat Meter.
15. Study of cardiac pacemaker
16. Study of ultrasonography
17. Study of oximeter
18. Measurement of Body temperature

### Bachelor of Science (HONOURS)

**Table V:Core Papers**

Sr.No	Semester	Course Code	Subject Title	Credits (T+P)
1.	I	DSC 1A	Network Analysis and Analog Electronics	4+2
2.	II	DSC 1B	Linear and Digital Integrated Circuits	4+2
3.	III	DSC 1C	Communication Electronics	4+2
4.	IV	DSC 1D	Microprocessor and Microcontrollers	4+2
5.	V	DSC5	Operating system	4+2
6.		DSC 6	Power Electronics	4+2
7.		DSC7	Transducers and Instrumentation	4+2
8.	VI	DSC8	Computer Networks and Administration	4+2
9.		DSC 9	Biomedical and Pharmaceutical Instrumentation	4+2
10.		DSC10	Embedded Systems	4+2

**Table VI: Discipline specific courses (DSE)**

Sr.No	Semester	Course Code	Subject Title	Credits (T+P)
<b>1</b>	<b>V(DSE1 &amp;DSE2) Any 2 courses has to be offered</b>		<b>Photonics</b>	<b>3+1</b>
			Programming with Matlab	<b>3+1</b>
			Programming with Scilab	<b>3+1</b>
<b>2</b>	<b>VI</b>	<b>DSE 3</b>	Industrial Automation	<b>3+1</b>



	VI	DSE 3(SWAYAM)	Satellite Communication by Kalyankumar Bandyopadhyay IIT - Kaharagpur	2
			Hardware modeling using Verilog by Indranil Sengupta IIT - Kaharagpur	2
			Basics of Photography by Dr. Lalit Engle DAV - Indore	2
			Error control coding : An (Introduction to Linear Block code+ convolution Coding) by Adrish Banerjee IIT Madras	4
	VI	DSE4	Electronics Project	4

Table VII: Skill Enhancement Courses (SEC)

Sr. No.		Course Code	Subject Title	Credits (T+P)
1	III	SEC 1	Programming in C++ (Flipped Classroom)	3+1
2	IV	SEC 2	Smart Phone Apps Development (Flipped Classroom)	3+1

Table VIII: General Elective papers(GE)

Sr. No.		Course Code	Subject Title	Credits (T)
3.	I	GE 1	Electronics circuits and PCB designing/ consumer Electronics	3+1
4.	II	GE 2	Repair and Maintenance of Electrical and Electronic Appliances/ Medical Home Instruments	3+1

**CBSC SYLLABUS FOR B.Sc. HONOURS PROGRAM**

( Numbers on right indicate number of lectures of 1 hour duration)

**First Year B. Sc.**[\(Back to Index\)\(Back to Agenda\)](#)

**Semester I**

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**ELECTRONICS-DSC 1A: NETWORK ANALYSIS AND ANALOG ELECTRONICS**  
**(Credits: Theory-04, Practicals-02)**  
**Theory: 60 Lectures**

**Circuit Analysis: . (14 Lectures)**

Concept of Voltage and Current Sources. Kirchhoff's Current Law, Kirchhoff's Voltage Law. Mesh Analysis. Node Analysis. Star and Delta networks, Star-Delta Conversion. Principle of Duality. Superposition Theorem. Thevenin's Theorem. Norton's Theorem. Reciprocity Theorem. Maximum Power Transfer Theorem. Two Port Networks: h, y and z parameters and their conversion

**Junction Diode and its applications: (18 Lectures)**

PN junction diode (Ideal and practical)-constructions, Formation of Depletion Layer, Diode Equation and I-V characteristics. Idea of static and dynamic resistance, dc load line analysis, Quiescent (Q) point. Zener diode, Reverse saturation current, Zener and avalanche breakdown. Qualitative idea of Schottky diode. Rectifiers- Half wave rectifier, Full wave rectifiers (center tapped and bridge), circuit diagrams, working and waveforms, ripple factor and efficiency. Filter- Shunt capacitor filter, its role in power supply, output waveform, and working. Regulation- Line and load regulation, Zener diode as voltage regulator, and explanation for load and line regulation.

**Bipolar Junction Transistor: . (5 Lectures)**

Review of the characteristics of transistor in CE and CB configurations, Regions of operation (active, cut off and saturation), Current gains  $\alpha$  and  $\beta$ . Relations between  $\alpha$  and  $\beta$ . dc load line and Q point.

**Amplifiers: (10 Lectures)**

Transistor biasing and Stabilization circuits- Fixed Bias and Voltage Divider Bias. Thermal runaway, stability and stability factor S. Transistor as a two port network, h-parameter equivalent circuit. Small signal analysis of single stage CE amplifier. Input and Output impedance, Current and Voltage gains. Class A, B and C Amplifiers.

**Cascaded Amplifiers: (2 Lectures)**

Two stage RC Coupled Amplifier and its Frequency Response.

**Feedback in Amplifiers: (2 Lectures)**

Concept of feedback, negative and positive feedback, advantages of negative feedback (Qualitative only).

**Sinusoidal Oscillators: (5 Lectures)**

Barkhausen criterion for sustained oscillations. Phase shift and Colpitt's oscillator. Determination of Frequency and Condition of oscillation.

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**Unipolar Devices:****(4 Lectures)**

JFET. Construction, working and I-V characteristics (output and transfer), Pinchoff voltage. UJT, basic construction, working, equivalent circuit and I-V characteristics.

**Reference Books:**

11. Electric Circuits, S. A. Nasar, Schaum's outline series, Tata McGraw Hill (2004)
12. Electrical Circuits, M. Nahvi & J. Edminister, Schaum's Outline Series, Tata McGraw-Hill (2005)
13. Electrical Circuits, K.A. Smith and R.E. Alley, 2014, Cambridge University Press
14. Network, Lines and Fields, J.D.Ryder, Prentice Hall of India.
15. Electronic Devices and Circuits, David A. Bell, 5th Edition 2015, Oxford University Press.
16. Electronic Circuits: Discrete and Integrated, D.L. Schilling and C. Belove, Tata McGraw Hill
17. Electrical Circuit Analysis, Mahadevan and Chitra, PHI Learning
18. Microelectronic circuits, A.S. Sedra, K.C. Smith, A.N. Chandorkar, 2014, 6th Edn., Oxford University Press.
19. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
20. J. J. Cathey, 2000 Solved Problems in Electronics, Schaum's outline Series, Tata McGraw Hill (1991)

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**Laboratory experiments under DSC 1A**

*At Least 15 Experiments From The Following*

2. To familiarize with basic electronic components (R, C, L, diodes, transistors),
22. digital Multimeter, Function Generator and Oscilloscope.
23. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope.
24. Verification of (a) Thevenin's theorem and (b) Norton's theorem.
25. Verification of (a) Superposition Theorem and (b) Reciprocity Theorem.
26. Verification of the Maximum Power Transfer Theorem.
27. Study of the I-V Characteristics of (a) p-n junction Diode, and (b) Zener diode.
28. Study of (a) Half wave rectifier and (b) Full wave rectifier (FWR).
29. Study the effect of (a) C- filter and (b) Zener regulator on the output of FWR.
30. Study of the I-V Characteristics of UJT and design relaxation oscillator..
31. Study of the output and transfer I-V characteristics of common source JFET.
32. Study of Fixed Bias and Voltage divider bias configuration for CE transistor.
33. Design of a Single Stage CE amplifier of given gain.
34. Study of the RC Phase Shift Oscillator.
35. Study the Colpitt's oscillator.
36. Construction of class A amplifier.
37. Construction of class B amplifier.
38. Construction of class C amplifier.
39. Study of Bridge rectifier.
40. Input and output characteristics of transistor in CE mode.
41. Use of diode as clipper.

**Reference Books:**

5. Electrical Circuits, M. Nahvi and J. Edminister, Schaum's Outline Series, Tata McGraw-Hill (2005)
6. Networks, Lines and Fields, J.D.Ryder, Prentice Hall of India.
7. J. Millman and C. C. Halkias, Integrated Electronics, Tata McGraw Hill (2001)
8. Allen Mottershead, Electronic Devices and Circuits, Goodyear Publishing Corporation.

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**Semester II**

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**ELECTRONICS-DSC 1B: LINEAR AND DIGITAL INTEGRATED CIRCUITS****(Credits: Theory-04, Practicals-02)****Theory: 60 Lectures****Operational Amplifiers (Black box approach): (5 Lectures)**

Characteristics of an Ideal and Practical Operational Amplifier (IC 741), Open and closed loop configuration, Frequency Response. CMRR. Slew Rate and concept of Virtual Ground.

**Applications of Op-Amps: (12 Lectures)**

(1) Inverting and non-inverting amplifiers, (2) Summing and Difference Amplifier, (3) Differentiator, (4) Integrator, (5) Wein bridge oscillator, (6) Comparator and Zero-crossing detector, and (7) Active low pass and high pass Butterworth filter (1st order only).

**Number System and Codes: (9 Lectures)**

Decimal, Binary, Octal and Hexadecimal number systems, base conversions. Representation of signed and unsigned numbers, BCD code. Binary, octal and hexadecimal arithmetic; addition, subtraction by 2's complement method, multiplication.

**Logic Gates and Boolean algebra: (4 Lectures)**

Truth Tables of OR, AND, NOT, NOR, NAND, XOR, XNOR, Universal Gates, Basic postulates and fundamental theorems of Boolean algebra.

**Combinational Logic Analysis and Design: (5 Lectures)**

Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh map minimization up to 4 variables for SOP).

**Arithmetic Circuits: (3 Lectures)**

Binary Addition. Half and Full Adder. Half and Full Subtractor, 4-bit binary Adder/Subtractor.

**Data processing circuits: (3 Lectures)**

Multiplexers, De-multiplexers, Decoders, Encoders.

**Clock and Timer (IC 555): (3 Lectures)**

Introduction, Block diagram of IC 555, Astable and Monostable multivibrator circuits.

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**Sequential Circuits:****(6 Lectures)**

SR, D, and JK Flip-Flops. Clocked (Level and Edge Triggered), Flip-Flops. Preset and Clear operations. Race-around conditions in JK Flip-Flop., Master-slave JK Flip-Flop.

**Shift registers:****(2 Lectures)**

Serial-in-Serial-out, Serial-in-Parallel-out, Parallel-in-Serial-out and Parallel-in-Parallel-out Shift Registers (only up to 4 bits).

**Counters (4 bits):****(4 Lectures)**

Ring Counter. Asynchronous counters, Decade Counter.Synchronous Counter.

**D-A and A-D Conversion:****(4 Lectures)**

4 bit binary weighted and R-2R D-A converters, circuit and working. Accuracy and Resolution. A-D conversion characteristics, successive approximation ADC. (Mention of relevant ICs for all).

**Reference Books:**

9. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edition, 2000, Prentice Hall
  10. Operational Amplifiers and Linear ICs, David A. Bell, 3rd Edition, 2011, Oxford University Press.
  11. Digital Principles and Applications, A.P. Malvino, D.P.Leach and Saha, 7th Ed., 2011, Tata McGraw
  12. Fundamentals of Digital Circuits, Anand Kumar, 2nd Edn, 2009, PHI Learning Pvt. Ltd.
  13. Digital Circuits and systems, Venugopal, 2011, Tata McGraw Hill.
  14. Digital Systems: Principles & Applications, R.J.Tocci, N.S.Widmer, 2001, PHI Learning.
  15. Thomas L. Flyod, Digital Fundamentals, Pearson Education Asia (1994)
  16. R. L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw- Hill (1994)
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**Laboratory experiments under DSC 1B**

*At least 05 experiments each from section A, B and C*

**Section-A: Op-Amp. Circuits (Hardware)**

1. To design an inverting amplifier using Op-amp (741,351)for dc voltage of given gain
2. (a) To design inverting amplifier using Op-amp (741,351) & study its frequency response  
(b) To design non-inverting amplifier using Op-amp (741,351) & study frequency response
3. (a) To add two dc voltages using Op-amp in inverting and non-inverting mode  
(b) To study the zero-crossing detector and comparator.
4. To design a precision Differential amplifier of given I/O specification using Op-amp.
5. To investigate the use of an op-amp as an Integrator.
6. To investigate the use of an op-amp as a Differentiator.
7. To design a Wien bridge oscillator for given frequency using an op-amp.
8. To design a circuit to simulate the solution of simultaneous equation and 1st/2ndorder differential equation.
9. Design a Butterworth Low Pass active Filter (1st order) & study Frequency Response
10. Design a Butterworth High Pass active Filter (1st order) & study Frequency Response
11. Design a digital to analog converter (DAC) of given specifications.

**Section-B: Digital circuits (Hardware)**

1. (a) To design a combinational logic system for a specified Truth Table.  
(b) To convert Boolean expression into logic circuit & design it using logic gate ICs.  
(c) To minimize a given logic circuit.
2. Half Adder and Full Adder.
3. Half Subtractor and Full Subtractor.
4. 4 bit binary adder and adder-subtractor using Full adder IC.
5. To design a seven segment decoder.
6. To design an Astable Multivibrator of given specification using IC 555 Timer.
7. To design a Monostable Multivibrator of given specification using IC 555 Timer.
8. To build Flip-Flop (RS, Clocked RS, D-type and JK) circuits using NAND gates.
9. To build JK Master-slave flip-flop using Flip-Flop ICs
10. To build a Counter using D-type/JK Flip-Flop ICs and study timing diagram.
11. To make a Shift Register (serial-in and serial-out) using D-type/JK Flip-Flop ICs.

**Section-C: SPICE/MULTISIM simulations for electronic circuits and devices**

1. To verify the Thevenin and Norton Theorems.
2. Design and analyze the series and parallel LCR circuits
3. Design the inverting and non-inverting amplifier using an Op-Amp of given gain
4. Design and Verification of op-amp as integrator and differentiator
5. Design the 1st order active low pass and high pass filters of given cutoff frequency
6. Design a Wein's Bridge oscillator of given frequency.
7. Design clocked SR and JK Flip-Flop's using NAND Gates
8. Design 4-bit asynchronous counter using Flip-Flop ICs
9. Design the CE amplifier of a given gain and its frequency response.

**Reference Books**

5. Digital Principles and Applications, A.P. Malvino, D.P. Leach and Saha, 7th Ed., 2011, Tata McGraw
6. OP-Amps and Linear Integrated Circuit, R. A. Gayakwad, 4th edn., 2000, Prentice Hall
7. R. L. Tokheim, Digital Principles, Schaum's Outline Series, Tata McGraw- Hill (1994)
8. Digital Electronics, S.K. Mandal, 2010, 1st edition, McGraw Hill

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**Semester III**

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**ELECTRONICS- DSC 1C: COMMUNICATION ELECTRONICS  
(Credits: Theory-04, Practicals-02)  
Theory: 60 Lectures****Electronic communication:****(8 Lectures)**

Introduction to communication – means and modes. Need for modulation. Block diagram of an electronic communication system. Brief idea of frequency allocation for radio communication system in India (TRAI). Electromagnetic communication spectrum, band designations and usage. Channels and base-band signals. Concept of Noise, signal-to-noise (S/N) ratio.

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**Analog Modulation: (12 Lectures)**

Amplitude Modulation, modulation index and frequency spectrum. Generation of AM (Emitter Modulation), Amplitude Demodulation (diode detector), Concept of Single side band generation and detection. Frequency Modulation (FM) and Phase Modulation (PM), modulation index and frequency spectrum, equivalence between FM and PM, Generation of FM using VCO, FM detector (slope detector), Qualitative idea of Super heterodyne receiver

**Analog Pulse Modulation: (9 Lectures)**

Channel capacity, Sampling theorem, Basic Principles-PAM, PWM, PPM, modulation and detection technique for PAM only, Multiplexing.

**Digital Pulse Modulation: (10 Lectures)**

Need for digital transmission, Pulse Code Modulation, Digital Carrier Modulation Techniques, Sampling, Quantization and Encoding. Concept of Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), and Binary Phase Shift Keying (BPSK).

**Introduction to Communication and Navigation systems: (10 Lectures)**

**Satellite Communication**– Introduction, need, Geosynchronous satellite orbits, geostationary satellite advantages of geostationary satellites. Satellite visibility, transponders (C - Band), path loss, ground station, simplified block diagram of earth station. Uplink and downlink.

**Mobile Telephony System – (10 Lectures)**

Basic concept of mobile communication, frequency bands used in mobile communication, concept of cell sectoring and cell splitting, SIM number, IMEI number, need for data encryption, architecture (block diagram) of mobile communication network, idea of GSM, CDMA, TDMA and FDMA technologies, simplified block diagram of mobile phone handset, 2G, 3G and 4G concepts (qualitative only).

**GPS navigation system (qualitative idea only) (1 Lecture)**

**Reference Books:**

9. Electronic Communications, D. Roddy and J. Coolen, Pearson Education India.
10. Advanced Electronics Communication Systems- Tomasi, 6th edition, Prentice Hall.
11. Modern Digital and Analog Communication Systems, B.P. Lathi, 4th Edition, 2011, Oxford University Press.
12. Electronic Communication systems, G. Kennedy, 3rd Edn., 1999, Tata McGraw Hill.
13. Principles of Electronic communication systems – Frenzel, 3rd edition, McGraw Hill
14. Communication Systems, S. Haykin, 2006, Wiley India
15. Electronic Communication system, Blake, Cengage, 5th edition.
16. Wireless communications, Andrea Goldsmith, 2015, Cambridge University Press

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**Laboratory experiments under -DSC 1C**

**AT LEAST 15 experiments**

1. Amplitude modulation and demodulation.
2. Frequency modulation and demodulation .
3. Analog multiplexer

4. Sample and Hold Circuit.
5. Study of super heterodyne radio receiver.
6. DSB generation using IC 1596
7. V-F and F –V using IC 331
8. Study of Antennas
9. Study of Varactor diode modulator
10. Study of PLL.
11. Characteristic impedance of Transmission lines.
12. Pre-emphasis and De-emphasis
13. Generation of PWM using **555** timer
14. Generation of PPM using **555** timer
15. Generation of PAM
16. Study of PCM generation and detection.
17. Study of TDM
18. Study of FDM
19. Generation of ASK
20. Generation of FSK
21. Generation of PSK
22. Study of DPCM modulation.
23. Study of Delta Modulation
24. Study of Modem interfacing and configuration for data communication.

**Reference Books:**

8. Electronic Communication systems, G. Kennedy, 1999, Tata McGraw Hill.
9. Electronic Communication system, Blake, Cengage, 5th edition.
10. Electronic Communication: By Dennis Roddy and John Coolen, Prentice Hall of India, New Delhi, 4th Edition, 1998.
11. Electronic Communications Systems, Wayne Tomasi, 5<sup>th</sup> Edition Pearson Education
12. Digital Communications, Simon Haykins, John Wiley, 1988
13. Digital Communication, John.G .Proakis, Mc Graw Hill Inc., Third edition, Malaysia,
14. Digital Communication Techniques, Signal Design & Detection, M.K.Simen, Prentice Hall of India, 1999

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**Semester IV**

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**ELECTRONICS-DSC 1D: MICROPROCESSOR AND MICROCONTROLLER**  
**(Credits: Theory-04, Practicals-02)**  
**Theory: 60 Lectures**

**Microcomputer Organization:**

**(5 Lectures)**

Input/Output Devices. Data storage (idea of RAM and ROM). Computer memory. Memory organization & addressing. Memory Interfacing. Memory Map.

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**8085 Microprocessor Architecture:****(8 Lectures)**

Main features of 8085. Block diagram. Pin-out diagram of 8085. Data and address buses. Registers. ALU. Stack memory. Program counter.

**8085 Programming :****(10 Lectures)**

Instruction classification, Instructions set (Data transfer including stacks. Arithmetic, logical, branch, and control instructions). Subroutines, delay loops.

Timing & Control circuitry. Timing states. Instruction cycle, Timing diagram of MOV and MVI. Hardware and software interrupts.

**8051 microcontroller:****(12 Lectures)**

Introduction and block diagram of 8051 microcontroller, architecture of 8051, overview of 8051 family, 8051 assembly language programming, Program Counter and ROM memory map, Data types and directives, Flag bits and Program Status Word (PSW) register, Jump, loop and call instructions.

**8051 I/O port programming:****(5 Lectures)**

Introduction of I/O port programming, pin out diagram of 8051 microcontroller, I/O port pins description & their functions, I/O port programming in 8051 (using assembly language), I/O programming: Bit manipulation.

**8051 Programming:****(15 Lectures)**

8051 addressing modes and accessing memory locations using various addressing modes, assembly language instructions using each addressing mode, arithmetic and logic instructions, 8051 programming in C: for time delay & I/O operations and manipulation, for arithmetic and logic operations, for ASCII and BCD conversions.

**Introduction to embedded system:****(5 Lectures)**

Embedded systems and general purpose computer systems. Architecture of embedded system. Classifications, applications and purpose of embedded systems.

**Reference Books:**

10. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
11. Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
12. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
13. Microprocessor and Microcontrollers, N. Senthil Kumar, 2010, Oxford University Press
14. 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.
15. Embedded Systems: Design & applications, S.F. Barrett, 2008, Pearson Education India
16. Introduction to embedded system, K.V. Shibu, 1st edition, 2009, McGraw Hill
17. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning
18. Exploring C for Microcontroller ,J.S.Parab etal....Springer

**Laboratory experiments under -DSC 1D**

**At least 7 experiments from Section-A and 8 from Section-B**

**Section-A: Programs using 8085 Microprocessor**

1. Addition and subtraction of numbers using direct addressing mode
2. Addition and subtraction of numbers using indirect addressing mode
3. Multiplication by repeated addition.
4. Division by repeated subtraction.
5. Handling of 16-bit Numbers.
6. Use of CALL and RETURN Instruction.
7. Block data handling.
8. Other programs (e.g. Parity Check, using interrupts, etc.).
9. Sorting
10. Motor control

**Section-B: Experiments using 8051 microcontroller:**

1. To find that the given numbers is prime or not.
2. To find the factorial of a number.
3. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.
4. Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's .
5. Program to glow the first four LEDs then next four using TIMER application.
6. Program to rotate the contents of the accumulator first right and then left.
7. Program to run a countdown from 9-0 in the seven segment LED display.
8. To interface seven segment LED display with 8051 microcontroller and display 'HELP' in the seven segment LED display.
9. To toggle '1234' as '1324' in the seven segment LED display.
10. Interface stepper motor with 8051 and write a program to move the motor through a given angle in clock wise or counter clockwise direction.
11. Application of embedded systems: Temperature measurement & display on LCD

**Reference Books:**

1. Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
2. Embedded Systems: Architecture, Programing & Design, Raj Kamal, 2008, Tata McGraw Hill
3. The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
4. 8051 microcontrollers, Satish Shah, 2010, OxfordUniversity Press.
5. Embedded Microcomputer systems: Real time interfacing, J.W. Valvano 2011, Cengage Learning

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**Semester V**

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**ELECTRONICS-DSC5: OPERATING SYSTEM  
(Credits: Theory-04, Practicals-02)**

**Theory: 60 Lectures**

<b>Operating Systems Overview:</b>	<b>9</b>
Operating System Objectives and Functions, Evolution of operating systems, Major Achievements, characteristics of Modern Operating Systems, Introduction to Embedded & RTOS.	
<b>Processes: Process Description and Control:</b>	<b>9</b>
Process states, Process description, Process control. <b>Threads, SMP and Microkernels:</b> Processes and Threads, Symmetric Multiprocessing, Microkernels.	
<b>Concurrency : Mutual Exclusion and Synchronization:</b>	<b>13</b>
Principles of Concurrency, Mutual Exclusion: Software approaches, Mutual Exclusion: Hardware support, Semaphores, message passing. Concurrency : Deadlock and Starvation: Principles of Deadlock, Deadlock Prevention, Deadlock avoidance, Deadlock detection, An integrated deadlock strategy, dining philosophers problem	
<b>Scheduling: Uniprocessor Scheduling:</b>	<b>12</b>
Types of Processor Scheduling, Scheduling Algorithms. <b>Multiprocessor and Real Time Scheduling:</b> Multiprocessor Scheduling, Real Time Scheduling.	
<b>Embedded/ Real Time Operating systems:</b>	<b>8</b>
Categories of Embedded Operating systems, Overview of Embedded/ Real Time Operating systems, Embedded/Real Time Operating System Concepts.	
<b>MicroC/OS – II, The Real Time Kernel:</b>	<b>9</b>
Kernel Structure , Task Management	
<b>Textbook:</b>	
1. Operating Systems – William Stallings – Fourth Edition, Pearson Education( Chap 1 to 4)	
2. Embedded / Real Time System – Dr. K.V.K.K Prasad , DreamTech Pub (Chp 5)	
3. MicroC/OS – II, The Real Time kernel – Jean J. Labrosse ,Second Edition, CMP Books	
<b>Reference</b>	
<b>1.Operating Systems Principles : Silberchatz, Galvin-</b> Fifth Edition, Addison Wesley	

**Electronics Lab DSC 5: Operating System****PRACTICAL (minimum 15 practicals )**

1. Introduction to shell commands
2. Shell Programming to find the largest of three numbers.
3. Shell Programming to sort numbers.
4. Shell Programming to find the factorial of a number.
5. Shell Programming to find the sum of the digits of a number.
6. Shell Programming to identify if a number is prime or composite.
7. Shell Programming to generate the prime numbers specified for a particular range.
8. Shell Programming to generate the Fibonacci series.
9. Shell Programming to calculate the sum and average of a given numbers using for loop and while loop.
10. Shell Programming to find the sum of odd natural numbers.
11. Shell Programming to find the sum of even natural numbers.
12. Shell Programming demonstrating Swapping of two numbers.
13. Shell Programming Display of Multiplication Tables for a given range.
14. Shell script using grep command.

15. Shell script using case construct.
16. Shell script using to find sum of a series.
17. Socket Programming 13- To transmit and receive a file.
18. Socket Programming 14- To Transmit a message, manipulate the data by counting the number of characters in the message
19. RTOS-1
20. RTOS-2

**ELECTRONICS-DSC6: POWER ELECTRONICS**  
**(Credits: Theory-04, Practicals-02)**  
**Theory: 60 Lectures**

**Power Devices:** (3L)

Need for Semiconductor Power Devices, Power Diodes, Introduction to Power semiconductor devices, Types of Power electronic converters.

**Silicon Controlled Rectifier (SCR):** (8L)

Structure, Principle of operation, V-I characteristics, Two- transistor model of SCR, turn-on and turn-off time,  $di/dt$  and  $dv/dt$  ratings, factors affecting characteristics/ratings of SCR, Turn-on Methods of SCR, Gate firing circuits: Resistive, Resistive- Capacitive, UJT firing circuit, PUT firing circuit, Synchronized UJT firing circuit, Pulse transformer firing circuit and Light Activated firing circuit, SCR as a static switch.

**Triac:** (2L)

Structure, Principle of operation, V-I characteristics, Comparison between SCR and Triac. Application of Diac and SBS as a triggering device for a Traic

**Protection of Power Semiconductor Devices:** (2L)

Overvoltage protection, overcurrent protection, Over temperature protection, Gate protection using shielding and RF filters, Snubber circuit.

**Converters:** (7L)

Single Phase Half wave controlled rectifier with resistive load and inductive load ( qualitative study only), Effect of freewheeling diode, Single Phase Full wave controlled rectifier: Mid-point configuration and Bridge configuration with resistive load and inductive load, Single Phase Half controlled rectifier Bridge rectifier with resistive load and inductive load, DC link variable converter , Dual Converter without circulating current, Cycloconverter, AC voltage Stabilizer.

**Power Transistor:** (5L)

Power BJT: Circuit diagram, Switching Characteristics and limitations Power MOSFET: Circuit diagram, Output transfer characteristics, switching characteristics and limitations, IGBT: structure with equivalent circuit, State and dynamic characteristics, Comparison between Power BJT, Power MOSFET and IGBT.

**Power Inverter:** (10L)

Thyristor Turn- off Methods, Commutating circuits (working principle only), Introduction to Inverter, Basic circuit diagram of Voltage driven inverter, current driven inverter, sine wave inverter and square wave inverter, Thyristor Inverters: Centre- tapped load inverter, centre-tapped supply inverter, Bridge inverter, Current commutated bridge inverter, voltage commutated bridge inverter, McMurray inverter, McMurray- Bedford Inverter, Single Phase Pulse width Modulated inverter, Control of inverter output voltage, Current driven inverter, Series inverter: Basic series inverter (working principle only) and its drawbacks, Modified Series

inverter, Uninterruptible Power Supply ( UPS) : Types and Working principle( Blocks only).

**Batteries:** (2L)

Types of batteries used for Inverters, specification of batteries, Load calculation for batteries, connection of batteries and their Maintenance. Battery charger circuit.

**Choppers:** (6L)

Principle of a chopper, Step-down chopper, step-up chopper, step Up-Down chopper, Chopper classification ( Type A-D), Thyristor chopper: Voltage and current commutated, Morgan Chopper, Jones Chopper.( qualitative study only)

**PolyPhase and Coupled Circuits:** (4L)

Poly phase system, advantages of Three Phase system, interconnection of Three Phase sources and loads, voltage Current and power in a Star and Delta connected system, Mutual inductance, characteristics of an ideal transformer and transformer losses.

**DC Motors:** (6L)

Basic understanding of field and armature, motor principle and motor action , Significance of the back e.m.f., torque and speed relation of a DC motor, Characteristics of DC series and DC shunt motors, Electric Braking of DC motors. Thyristor based DC motor speed control.

**AC Motors:** (5L)

Classification of AC motors, Induction Motor: General Principle, Construction, Production of rotating field: two phase supply, Why does the rotor rotate?, slip, frequency of rotor current, speed / torque characteristics of a AC motor, Thyristor based speed control of AC motor.

**Reference Books:**

1. Power Electronics and its applications by Alok Jain, Penram Intl. Pub. 2<sup>nd</sup> E
1. Power Electronics by MD Singh, KB Khanchandani. Tata McGraw 2<sup>nd</sup> Ed.
2. Circuits and Networks analysis and synthesis by Shudakar & ShyamMohan
3. A Text Book of electrical Technology Vol II by Theraja and Theraja

**Laboratory experiments under –DSC6 : POWER ELECTRONICS**

*At Least 15 Experiments From The Following*

1. Study of I-V characteristics of a SCR
2. Study of I-V characteristics of a Triac
3. Study of I-V characteristics of a Power BJT
4. Study of I-V characteristics of a Power MOSFET
5. Study of I-V characteristics of a IGBT
6. Study of I-V characteristics of a Diac and SBS.
7. Study of Half wave controlled rectifier with resistive and inductive loads.
8. Study of Full wave controlled rectifier with resistive and inductive loads
9. Study of importance of free wheeling diode.
10. SCR based Power Controller using Resistive and Resistive Capacitive firing circuit.
11. SCR based Power Controller using UJT firing circuit.

12. SCR based Power Controller using PUT firing circuit
13. SCR based Power Controller using LASCR firing circuit
14. Application of thyristor as a Static switch
15. DC Motor control using SCR
16. AC motor control using SBS and Triac
17. Illumination control using Diac and Triac
18. AC voltage controller using Triac with synchronized UJT triggering.
19. Study of Snubber circuit
20. Study of forced Voltage Commutating Circuits
21. Study of forced Current Commutating Circuits
22. Study of Bridge inverter
23. Study of chopper circuit
24. Study of load calculation and connection of UPS for a given setup
25. Study of Stabilizer.
26. Study of UPS , assembling and disassembling
27. Construction of Transformer
28. Study of constructional features of DC and AC motors
29. Load characteristics of DC motor
30. Break test of induction motor.

#### Reference Books:

1. Power Electronics and its applications by Alok Jain, Penram Intl. Pub. 2<sup>nd</sup> E
  2. Power Electronics by MD Singh, KB Khanchandani. Tata McGraw 2<sup>nd</sup> Ed
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#### ELECTRONICS-DSC7: TRANSDUCER AND INSTRUMENTATION

(Credits: Theory-04, Practicals-02)

Theory: 60 Lectures

##### QUALITIES OF MEASUREMENTS:

06

Introduction, Performance Characteristics, Static characteristics, Error in measurement, Types of Error, Sources of Error, Dynamic characteristics, Statistical analysis, Standard, Atomic frequency and time standards.

##### TRANSDUCERS:

15

**Electrical transducer:** Characteristics, advantages, Selecting a Transducer, **Resistive Transducer:** Potentiometer, Resistance pressure transducer, Resistive Position Transducer, Resistance thermometer. **Strain Gauges:** Resistance wire Gauge (Unbounded and Bonded), Foil strain Gauge, semiconductor strain Gauge. **Inductive transducer:** Change in self inductance with number of turns and with change in permeability, Variable reluctance type transducer, Differential output Transducer, LVDT, Pressure inductive transducer, Capacitive Transducer (pressure), Load cell (Pressure Cell), Piezo Electric Transducer, **Photoelectric transducer:** Photomultiplier tube, Photocells, Photo-Voltaic cell, Semiconductor Photodiode, Phototransistor. **Temperature Transducer:** Thermocouple, Thermistor, RTD. Magnetic flow meters.

##### SIGNAL CONDITIONING:

08

Introduction, **Basic Instrumentation amplifier:** Instrumentation amplifier, Instrumentation system, Instrumentation amplifier using Transducer Bridge. Chopped and Modulated DC

Amplifier. **Modulators:** Synchronous Modulator and Demodulator, Solid state Modulator/Demodulator Circuit. **Types of Active filters:** Butterworth, Chebyshev, Bessel & Elliptic.

**OSCILLOSCOPE:** **10**

Basic principle, Block diagram of oscilloscope, **Types of CRO:** Principles of Dual beam and Dual trace Oscilloscope, Analog storage Oscilloscope, DSO, Powerscope: Block diagram, principle and working, Advantages and applications, CRO specifications (bandwidth, sensitivity, rise time).

**BRIDGES:** **05**

DC Bridges and applications: Wheatstone, Kelvin, AC Bridges: General form of AC bridge balance, comparison bridges, Maxwell, Hay, Schering, Wien, LCR Bridge.

**SIGNAL GENERATOR:** **03**

A.F Sine & Square Wave Generator, Function generator, Pulse Generator, Sweep Frequency generator.

**WAVE ANALYZERS:** **05**

Basic wave analyzer, Frequency Selective Wave Analyzer, Heterodyne Wave Analyzers. Harmonic Distortion Analyzers, Spectrum Analyzers.

**DIGITAL INSTRUMENTS:** **08**

Digital Voltmeters: Ramp type DVM, Dual Slope integrating type DVM, Staircase Ramp Type, Successive Approximation DVM, 3 $\frac{1}{2}$  Digit, Resolution & Sensitivity of Digital Meters, Digital Multimeters, Digital Frequency meter.

**Reference Books:**

1. Electronics Instrumentation by H. S. Kalsi , 2nd Edition, Tata Mc Graw Hill, 2nd Edition
1. Industrial Instrumentation by K. Krishnaswami and S. Vijayachitra, New Age Int. Pub.
2. Measurement, Instrumentation and Experiment Design in Physics and Engineering by Michael Sayer and Abhai Mansingh, PHI Ltd, 2008

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**Laboratory experiments under –DSC7:TRANSDUCER AND INSTRUMENTATION**

Atleast 15 experiments

1. Instrumentation amplifiers.
2. Temperature control using thermistor.
3. LVDT displacement sensor.
4. Ultrasonic sensor for ranging.
5. Characteristics of a Phototransistor.
6. Characteristics of Photocell and its application.
7. Interfacing of solar panel for lighting application.
8. Generation of sine and triangle using XR-2206.
9. Generation of waveforms using 8038.
10. Intruder alarm using photodiode and opamp.
11. Fluid level sensor using opamp.
12. Characteristics of thermocouple.
13. Design of Bessel/Chebyshev Filter.
14. Signal conditioning circuit.
15. Frequency measurement using Wein Bridge.
16. Frequency measurement using Maxwell's Bridge.
17. Frequency measurement using Wheatstone Bridge,
18. Frequency measurement using Kelvin's Bridge.

19. Frequency measurement using Hay's Bridge.
20. Frequency measurement using Schering Bridge.
21. Frequency measurement using LCR Bridge.

**Reference Books:**

1. Industrial Instrumentation by K. Krishnaswami and S. Vijayachitra, New Age Int. Pub.
2. Measurement, Instrumentation and Experiment Design in Physics and Engineering by Michael Sayer and Abhai Mansingh, PHI Ltd, 2008

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**Semester VI**

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**ELECTRONICS-DSC8: COMPUTER NETWORKS AND ADMINISTRATION  
(Credits: Theory-04, Practicals-02)****Theory: 60 Lectures****Computer hardware:****3**

Introduction to Computer components and peripherals, BIOS, PC Assembling, Formatting and Installation of Operating System. Installing Drivers, Installing Application Software, Troubleshooting.

**PHYSICAL LAYER****4**

Data Communications, Networks, Network types, Protocol, layering, OSI model, Layers in OSI model, TCP / IP protocol suite, Addressing, Guided and Unguided Transmission media. Switching: Centralized switching, store and forward, circuit switching, packet switching, network protocols-protocol phases, polling protocols, contention protocols,

**DATA LINK LAYER****4**

Introduction to Data link Layer, DLC Services, DLL protocols, HDLC, PPP, Media Access Control: Random Access, Controlled Access, Channelization. Wired LAN: Ethernet Protocol, Standard Ethernet, Fast Ethernet, Gigabit Ethernet, 10 Gigabit Ethernet.

**Wireless LANS & Virtual Circuit Networks****4**

Introduction, Wireless LANS: IEEE 802.11 project, Bluetooth, Zigbee, Connecting devices and Virtual LANS: Connecting devices, Virtual LANS.

**Network Layer****4**

Network Layer Services, Packet Switching, Network layer performance, IPv4, addresses, Forwarding of IP packets, Network layer protocols: IP, ICMPv4, Mobile IP, Unicast Routing: Introduction, Routing Algorithms, Unicast Routing protocols, Multicast Routing Introduction, Next Generation IP:IPv6 Addressing, The IPv6 protocol, ICMPv6, Transition from IPv4 to IPv6.

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<b>Transport Layer</b>	<b>3</b>
Introduction, Transport layer protocols and services, Port numbers User Datagram Protocol (UDP), Transmission Control protocol (TCP), SCTP, Quality of services: Dataflow characteristics, Flow Control.	
<b>Application Layer</b>	<b>4</b>
Introduction, World Wide Web and HTTP, FTP, Electronic mail, Telnet, Name System (DNS), Cryptography and Network Security: Introduction, Symmetric key ciphers and Asymmetric key Ciphers, Introduction to network security.	
<b>Basics terms of server</b>	<b>3</b>
Introduction to the concepts of Users, Groups and Computer management, Group policy Infrastructures and Group Policy Settings, Authentication, Domain Controllers, Sites and Replication, Domains and Forests	
<b>MS WINDOWS SERVER 2012 R2</b>	
<b>Introduction</b>	<b>3</b>
Windows server editions, Desktop changes, active directory changes, Virtualization, network changes, management tools, file and print sharing , web based services	
<b>Installation and upgrading to Windows 2012 R2 server</b>	<b>2</b>
Installing the operating system using server manager to configure services, installing a sample server network.	
<b>Introduction to server core:</b>	<b>5</b>
Installing server core, configurations of server core, configuring roles and features	
<b>Windows server 2012 R2 Networking Enhancements</b>	<b>3</b>
Benefits of IPv6, networking manageability with powershell, microsoft NIC teaming, Enhanced QoS.	
<b>IP address management</b>	<b>5</b>
IPAM: IPAM REQUIREMENTS, IPAM components, IPAM installation: installing the IPAM server feature, installing the IPAM client feature, configuring IPAM Provisioning and server Discovery, Run Server Discoveries, Choosing Servers for management and retrieving data,	
<b>DNS &amp; Name resolution in windows server 2012 R2</b>	<b>5</b>
Installing DNS, Configuring standalone DNS server, integrating with other DNS servers, implementing zones to manage namespaces, understanding record types, Managing DNS clients and name resolutions, understanding active directory's DNS,configuring DNS automatically,	
<b>Creating &amp; managing user accounts</b>	<b>2</b>
Creating local user accounts, creating domain user accounts, setting local user account properties, setting domain based user account properties.	
<b>Group policy</b>	<b>2</b>

Group policy concepts, Group policy basics, local policies and group policy objects.

**Files ,folders and basic shares** **2**  
 Understanding the file and storage server roles, creating shares,managing permissions

**Creating & managing shared folders:** **1**  
 Creating shared folders , managing permissions

**Sharing printers on windows server 2012 R2 networks** **1**  
 Print services overview, installing the print and docum,ent services role

**Reference Books**

- 1.Computer Networks By A. Tennaunbaum.
2. Mastering Windows Server® 2012R2 By: Mark Minasi; Darril Gibson; Aidan Finn; Wendy Henry; Byron Hynes Publisher: Sybex

**Laboratory experiments under:DSC8**

*At Least 15 Experiments From The Following*

1. Assembling the pc
2. Formatting and installation of OS
3. Troubleshooting general system problems
4. study of network devices:repeater, hub, router,bridge, switch,gateway,etc.
5. study of IP networking and subnetting
6. Crimping and punching of network cables(straight and crossed)
7. Setting up of a network in a lab
8. Configuring Domain Controller
9. Managing users, computers and groups on a domain controller
10. Implementation of group policies
11. Configuring DNS and DHCP roles
12. WSUS implementation
13. Windows deployment
14. Configuring Wireless Network
- 15.simple Chat Program using TCP Sockets
16. Simulation of HTTP Protocol using TCP Sockets
17. Simulation of DNS using UDP Sockets
18. Learn to use commands like TCP Dump, Netstat, Trace Route
19. Simulation of Ping using Raw Sockets 64
20. Simulation of Distance Vector/ Link State Routing algorithm
21. Study and configure functionalities of a router and switches (or by simulation)
22. Study of TCP/UDP performance using Simulation tool
23. Performance comparison of Routing protocols using Simulation tool
24. Simulation of error correction code (like CRC)

**Reference Books**

- 1.Computer Networks By A. Tennaunbaum.
2. Mastering Windows Server® 2012R2 By: Mark Minasi; Darril Gibson; Aidan Finn; Wendy Henry; Byron Hynes Publisher: Sybex

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**ELECTRONICS-DSC9: BIOMEDICAL AND PHARMACEUTICAL INSTRUMENTATION**

(Credits: Theory-04, Practicals-02)

Theory: 60 Lectures

<b>Pharmaceutical Instrumentation:</b>	<b>06</b>
<b>Ph-meter:</b> Analog & Digital Ph-meter, <b>Chromatograph:</b> Gas Chromatography, Liquid Chromatography, IR Spectrophotometers, Mass Spectrophotometer.	
<b>Chemical Sensors:</b>	<b>05</b>
Field Effect Transducer (ISFET, IMFET), <b>Blood Glucose Sensor:</b> Glucose oxidase Enzyme, Optical Approach, <b>Oximeter:</b> Oximetry, <b>In-Vitro Oximetry:</b> Transmission Oximetry, Reflection Oximetry & In-Vivo oximetry.	
<b>Fundamentals of Medical Instrumentation:</b>	<b>06</b>
<b>Physiology system of body:</b> Cardiovascular System, Respiratory System, Nervous system, Sources of Biomedical Signals, Basic Medical Instrumentation system, General constraints in design of medical instrumentation system.	
<b>Bioelectric Signals And Electrodes:</b>	<b>09</b>
<b>Origin of bioelectric potentials:</b> Electrocardiogram, Electroencephalogram & Electromyogram, <b>Recording Electrodes:</b> Electrode Tissue Interface, <b>Skin contact impedance, Electrodes for ECG, Electrodes for EEG, Electrodes for EMG, Electrical conductivity of electrodes jellies and creams, Microelectrodes:</b> Glass micro capillary Electrode, Metal Micropipette.	
<b>Physiological Transducers:</b>	<b>06</b>
Classification of Transducers, Performance Characteristics of Transducers: Static Characteristics and Dynamic Characteristics, Signals from Cardiovascular system, Signals from Respiratory system, Optical Fibre Sensors, Types of Optical Fibre Sensors, Various types of Transducers for biomedical Applications.	
<b>Biomedical Instruments:</b>	<b>14</b>
<b>Bio-medical recorders: Electrocardiography:</b> Block diagram of Electrocardiography, ECG Leads, <b>Electroencephalography:</b> Block diagram of Electroencephalography, <b>Electromyography:</b> Block diagram of Electromyography, Measurement of Heart rate, Measurement of Pulse rate, <b>Blood Pressure Measurement: In-direct Blood Pressure measurement:</b> Automatic Blood Pressure Measuring using Korotkoffs Method, Oscillometric Method, <b>Measurement of Respiration rate:</b> Thermistor Method, Pulse Oximeter, <b>Blood Flow meters:</b> Electromagnetic blood flow meter, Chamber plethysmography, <b>Cardiac Pacemaker:</b> Asynchronous cardiac pacemaker, demand type synchronous pacemaker, An atrial- synchronous cardiac pacemaker.	
<b>Biotelemetry:</b>	<b>04</b>
Introduction to Biotelemetry, Physiological parameters, Adaptable to Biotelemetry, The components of Biotelemetry System, Implantable Units, Applications of telemetry in-Patient care.	
<b>The Laser Application In Biomedical Field:</b>	<b>04</b>
<b>Laser:</b> Pulse Ruby, ND-YAG, Helium-Neon, Argon, CO <sub>2</sub> LASER.	
<b>Non-Invasive Diagnostic Imaging:</b>	<b>06</b>
Study of block diagrams of X-Ray, Study of block diagrams of CT, Study of block diagrams of Nuclear Medical Imaging, Study of block diagrams of Magnetic Resonance Imaging, Study of block diagrams of Ultrasonic Imaging.	

**Reference Books:**

1. Handbook of Analytical Instrumentation By R.S.Khandpur , TMH,2nd Edn
2. Handbook of Biomedical Instrumentation By R.S.Khandpur ,TMH,2nd Edn

3. Medical Instrumentation- Application & Design, By John Webster , 3rd Edition, Wiley India Edi.
4. Electronics Instrumentation by H. S. Kalsi , Tata Mc Graw Hill.
5. Instrumental methods of Chemical Analysis, E.W.Ewing
6. Biomedical Instrumentation and Measurements By Leslie Cromwell, Fred J. Weibell, Erich A. Pfeiffer PHI( 2nd Edition)

**Laboratory experiments under DSC9 LAB: BIOMEDICAL & PHARMACEUTICAL INSTRUMENTATION**

**AT LEAST 15 EXPERIMENTS FROM FOLLOWING.**

1. Study of Bio-Medical ECG.
2. Study of Bio-Medical EEG.
3. Study of Bio-Medical EMG.
4. Study of Bio-Medical Electronics Pressure meter.
5. Study of Bio-Medical Glucometer.
6. Study of Cardiac Pacemaker.
7. Study of Ultrasonography.
8. Study of Oximeter
9. Measurement of respiration rate using thermister.
10. Study of Bio-Medical transducers for bio-medical applications.
11. Bio-Medical application using transducer I.
12. Bio-Medical application using transducer II.
13. Study of electrical conductivity of electrodes and jellies / creams.
14. Construction of Analog Ph Meter using Opamp.
15. Construction of Pulse Rate Meter.
16. Construction of Heart beat Meter.
17. Measurement of Body Temperature using thermister.
18. Study of Gas Chromatography.
19. Study of Liquid Chromatography.
20. Study of VIS-IR Spectrometer.

**Reference Books:**

1. Handbook of Analytical Instrumentation By R.S.Khandpur , TMH,2nd Edn
2. Handbook of Biomedical Instrumentation By R.S.Khandpur ,TMH,2nd Edn
3. Medical Instrumentation- Application & Design, By John Webster , 3rd Edition, Wiley India Edi.
4. Electronics Instrumentation by H. S. Kalsi , Tata Mc Graw Hill.

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**ELECTRONICS-DSC10: EMBEDDED SYSTEMS**

**(Credits: Theory-04, Practicals-02)**

**Theory: 60 Lectures**

**UNIT 1:** **10**  
Introduction of Microcontroller / Microprocessor architectures, The Texas Instrument's MSP430 Microcontrollers, Architecture: CPU, Memory Structure, RAM and Information memory, Variants and their hardware enhancements.

**UNIT 2:** **10**  
Resets and Interrupts: Resets, Interrupts and its uses, Interrupt v/s Polling  
Clocks and Timers: Sources, Controls  
Low power design: Power Consumption characteristics, Low Power modes  
Addressing modes: Register mode, Immediate mode, Symbolic mode, Absolute mode, Indexed mode, Indirect mode/ Indirect Auto-increment mode.

**UNIT 3:** **15**  
Instruction set of MSP430: Basic Instruction set, Instruction format, I/O Port programming, Arithmetic & Logical Instructions.

**UNIT 4:** **25**  
Real time interfacing I: 16x2 Alphanumeric LCD, 4 x 1 / 4x4 keypad, 7segment LED, RTC  
Real time Interfacing II (Mixed signal interfaces): 10bit /12 bit SAR A/D converter, 12 bit D/A Converter  
Real time interfaces III (Communication of data): UART, I2C, SPI

**Reference Books:**

1. Embedded Systems Design using the TI MSP430 Series Author: Chris Nagy Imprint Newnes
2. MSP430 Microcontroller Basics Author: John Davies Imprint: Newnes
3. User data manuals and Handbooks of TI MSP430

**Laboratory experiments under –DSC10: EMBEDDED SYSTEMS**

*At Least 15 Experiments From The Following*

Examples in Assembly & C in workable on IAR WORKBENCH

**EMBEDDED SYSTEMS- LAB**

1. Lab-1 (4 – experiments)  
Basic Instruction set
  - i. I/O Port programming
  - ii. Addressing modes
  - iii. Arithmetic & Logical Instructions
  - iv. RAM and Information memory
2. Lab-2 (2 – experiments)  
Timers of MSP430
3. Lab-3 (2 – experiments)  
Interrupts
4. Lab-4 (7 – experiments)  
Real time interfacing (I)

- i. 16x2 Alphanumeric LCD
- ii. 4 x 1 keypad
- iii. 4 x 4 keypad
- iv. 7segment LED
- v. RTC
- vi. Interfacing DC motor
- vii. Interfacing STEPPER motor

5. Lab-5 (3 – experiments)

Real time Interfacing – (II) Mixed signal interfaces

- i. 12bit A/D converter
- ii. 16bit Sigma Delta A/D converter
- iii. 12 bit D/A Converter

6. Lab-6 (3 – experiments)

Real time Interfacing – (III) Serial communication interfaces

- i. UART
- ii. I2C
- iii. SPI

Practicals in Assembly/C workable on IAR WORKBENCH

**ELECTRONICS-DSE 1 or 2: PHOTONICS**

**(Credits: Theory-03, Practicals-01)**

**Theory Lectures 45**

**Unit-1** (20 Lectures)

**Light as an Electromagnetic Wave:** Plane waves in homogeneous media, concept of spherical waves. Reflection and transmission at an interface, total internal reflection, Brewster's Law. Interaction of electromagnetic waves with dielectrics: origin of refractive index, dispersion.

**Interference :** Superposition of waves of same frequency, Concept of coherence, Interference by division of wavefront, Young's double slit, Division of Amplitude, thin film interference, Newton's rings; Michelson interferometer.

**Diffraction:** Huygen Fresnel Principle, Diffraction Integral, Fresnel and Fraunhofer approximations. Fraunhofer Diffraction by a single slit, rectangular aperture, double slit, Resolving power of microscopes and telescopes; Diffraction grating: Resolving power and Dispersive power

**Unit-2** (12 Lectures)

**Polarization:** Linear, circular and elliptical polarization, polarizer-analyzer and Malus' law; Double refraction by crystals, Interference of polarized light, Wave propagation in uniaxial media. Half wave and quarter wave plates.

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**Unit-3**

(13 Lectures)

**Light Emitting Diodes:** Construction, materials and operation.**Lasers:** Interaction of radiation and matter, Einstein coefficients, Condition for amplification, laser cavity, threshold for laser oscillation, line shape function. Examples of common lasers. The semiconductor injection laser diode.**Photodetectors:** Bolometer, Photomultiplier tube, Charge Coupled Device. Photo transistors and Photodiodes (p-i-n, avalanche), quantum efficiency and responsivity.**LCD Displays:** Types of liquid crystals, Principle of Liquid Crystal Displays, applications, advantages over LED displays.**Reference Books:**

1. Ajoy Ghatak, Optics, Tata McGraw Hill, New Delhi (2005)
2. E. Hecht, Optics, Pearson Education Ltd. (2002)
3. J. Wilson and J. F. B. Hawkes, Optoelectronics: An Introduction, Prentice Hall India (1996)
4. S. O. Kasap, Optoelectronics and Photonics: Principles and Practices, Pearson Education (2009)
5. Ghatak A.K. and Thyagarajan K., "Introduction to fiber optics," Cambridge Univ. Press. (1998)

**Laboratory experiments under: DSE 1 or 2: PHOTONICS****At least 8 experiments from following list**

1. To verify the law of Malus for plane polarized light.
2. To determine wavelength of sodium light using Michelson's Interferometer.
3. To determine wavelength of sodium light using Newton's Rings.
4. To determine the resolving power and Dispersive power of Diffraction Grating.
5. Diffraction experiments using a laser.
6. Study of Faraday rotation.
7. To determine the specific rotation of scan sugar using polarimeter.
8. To determine characteristics of LEDs (Radiation pattern, Power Vs. Current)
9. To measure the numerical aperture of an optical fiber.
10. Design of Photo detector circuit using OP-amp
11. Design of digital optical receiver using comparator
12. To determine characteristics Photo- detector (rise time, radiation pattern, Power Vs. Current)
13. Light coupling in optical fiber, Numerical aperture of Fiber

**Reference Books:**

3. J. Wilson and J. F. B. Hawkes, Optoelectronics: An Introduction, Prentice Hall India (1996)
4. S. O. Kasap, Optoelectronics and Photonics: Principles and Practices, Pearson Education (2009)
5. Ghatak A.K. and Thyagarajan K., "Introduction to fiber optics," Cambridge Univ. Press. (1998)

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**DSE 1 or 2: PROGRAMMING WITH MATLAB****(Credits: Theory-03, Practicals-01)****Total Lectures: 45****CHAPTER 1: STARTING WITH MATLAB****(6L)**

Starting MATLAB, MATLAB Windows, Working in the Command Window, Arithmetic Operations With Scalars: Order of Precedence & Using MATLAB as a Calculator, Display Formats, Elementary Math Built-In Functions, Defining Scalar Variables: The Assignment Operator, Rules About Variable Names, Predefined Variables.

**CHAPTER 2: CREATING ARRAYS (8L)**

Creating a one-dimensional array (vector), Creating a two-dimensional array (matrix): The zeros, ones and eye Commands, Notes about variables in MATLAB, The transpose operator, **Array addressing**: vector & matrix, Using a colon: inaddressing arrays, Adding elements to existing variables

Deleting elements, Built-in functions for handling arrays, Strings and strings as variables

**CHAPTER 3: MATHEMATICAL OPERATIONS WITH ARRAYS (7L)**

Addition and subtraction, Array multiplication, Array division, Element-by-element operations, Using arrays in MATLAB built-in math functions, Built-in functions for analyzing arrays, Generation Of Random Numbers

**CHAPTER 4: SCRIPT FILES (5L)**

Notes about Script Files, Creating and Saving a Script File, Running a script file: Current directory & Search path, Global variables, Input to a script file, **Output commands**: The disp Command & The fprintf command.

**CHAPTER 5: TWO-DIMENSIONAL PLOTS (6L)**

**The Plot Command**: Plot of Given Data & Plot of a Function, the fplot command, Plotting Multiple Graphs In The Same Plot: Using the plot Command & Using the hold on, hold off Commands Using the line Command, **Formatting A Plot**: Formatting a Plot Using Commands & Formatting a Plot Using the Plot Editor, Histograms.

**CHAPTER 6: FUNCTIONS AND FUNCTION FILES (5L)**

Creating a function file, **Structure of a function file**: Function Definition Line, Input and Output Arguments, The H1 Line and Help Text Lines ,Function Body, Local and global variables, Saving a function file, Using a function file, Examples of simple function files, Comparison between script files and function files

**CHAPTER 7: PROGRAMMING IN MATLAB (8L)**

Relational and logical operators, **conditional statements**: The if-end Structure, The if-else-end Structure, The if-elseif-else-end Structure, The switch-case statement, loops: for-end loops, while-end loops, Nested loops and nested conditional statements, The break and continue commands.

**Reference Books:**

1. MATLAB: An Introduction with Applications, by Amos Gilat, 2nd edition, Wiley, 2004,
2. C.B. Moler, Numerical Computing with MATLAB, SIAM, 2004.

**Laboratory experiments under DSE 1 OR 2:**

**AT LEAST 8 EXPERIMENTS FROM FOLLOWING.**

1. Write a program to perform simple Calculations using MATLAB.
2. Write a program to perform Elementary math functions and Trigonometric math functions using MATLAB.



3. Write a program to assign the following expressions to a variable A and then to print out the value of A.
  - a.  $(3+4)/(5+6)$
  - b.  $2\pi^2$
  - c.  $\sqrt{2}$
  - d.  $(0.0000123 + 5.67 \times 10^{-3}) \times 0.4567 \times 10^{-4}$
4. Write a program to convert Celsius temperatures to Fahrenheit by multiplying by 9, dividing by 5, and adding 32. Assign a variable called C the value 37, and implement this formula to assign a variable F the Fahrenheit equivalent of 37 Celsius.
5. Write a program to perform Matrix addition, subtraction and Multiplication for [3x 3]matrix.
6. Write a program to use the built in functions for analyzing array.
7. Write a program to plot a graph for the given data.
8. Write a program to plot a graph using flpot command.
9. Write a program to plot a multiple graph using plot command.
10. Write a program to check whether the input number is even or odd.
11. Write a program to compare three numbers and print the largest one.
12. Write a program to print factors of a given number.
13. Write a program to display the first n terms of Fibonacci series.
14. Write a program to find factorial of the given number.
15. Write a function called FtoC (ftoc.m) to convert Fahrenheit temperatures into Celsius. Make sure the program has a title comment and a help page. Test from the command window with:
  - i. FtoC(96)
  - ii. lookfor Fahrenheit
  - iii. help FtoC
16. Write a program using if-end Structure, if-else-end Structure, if-elseif-else-end Structure.
17. Write a program using switch-case statement.
18. Write a program using for-end loops and while-end loops
19. Write a program using Nested loops and nested conditional statements.

## **DSE 1 or 2: PROGRAMMING WITH SCILAB**

**(Credits: Theory-03, Practicals-01)**

**Theory: 45 Lectures**

**Unit I- Introduction to Scilab:** (10 L)

Why Scilab, Installing Scilab, Getting Started with Scilab: SCILAB Environment, Workspace, Working Directory, Expressions, Constants, Variables and assignment statement, Arrays.

**Unit II- Graph Plots:** (8L)

Basic plotting, Built in functions, Generating waveforms, Sound replay, load and save.

**Unit III: Matrix Operation** (6L)

Matrices and Some Simple Matrix Operations, Sub- Matrices.

**Unit IV-** (6L)

**Procedures and Functions:** Arguments and return values.

**Unit V-Control Statements:**

(10L)

Conditional statements: If, Else, Else-if, Repetition statements:While, for loop.

**Unit VI**

(5L)

Introduction to xcos, Calling User Defined Functions in XCOS

**Reference Books:**

1. M.Affouf, SCILAB by Example , CreateSpace Independent Publishing Platform,2012
2. 2. H. Ramchandran, A.S. Nair, SCILAB , S.Chand, 2011

**Laboratory experiments under DSE 1 OR 2:****AT LEAST 8 EXPERIMENTS FROM FOLLOWING.**

1. Write a program to perform simple Calculations using Scilab.
2. Write a program to perform Elementary math functions and Trigonometric math functions using Scilab.
3. Write a program to assign the following expressions to a variable A and then to print out the value of A.
  - a.  $(3+4)/(5+6)$
  - b.  $2\pi^2$
  - c.  $\sqrt{2}$
  - d.  $(0.0000123 + 5.67 \times 10^{-3}) \times 0.4567 \times 10^{-4}$
4. Write a program to convert Celsius temperatures to Fahrenheit by multiplying by 9, dividing by 5, and adding 32. Assign a variable called C the value 37, and implement this formula to assign a variable F the Fahrenheit equivalent of 37 Celsius.
5. Write a program to perform Matrix addition, subtraction and Multiplication for [3x 3]matrix.
6. Write a program to use the built in functions for analyzing array.
7. Write a program to plot a graph for the given data.
8. Write a program to plot a graph using flplot command.
9. Write a program to plot a multiple graph using plot command.
10. Write a program to check whether the input number is even or odd.
11. Write a program to compare three numbers and print the largest one.
12. Write a program to print factors of a given number.
13. Write a program to display the first n terms of Fibonacci series.
14. Write a program to find factorial of the given number.
15. Write a function called FtoC (ftoc.m) to convert Fahrenheit temperatures into Celsius. Make sure the program has a title comment and a help page. Test from the command window with:
  - iv. FtoC(96)
  - v. lookfor Fahrenheit
  - vi. help FtoC
16. Write a program using if-end Structure, if-else-end Structure, if-elseif-else-end Structure.
17. Write a program using switch-case statement.
18. Write a program using for-end loops and while-end loops
19. Write a program using Nested loops and nested conditional statements.

## **ELECTRONICS-DSE 3: INDUSTRIAL AUTOMATION**

**(Credits: Theory-03, Practicals-01)**

**Theory: 45 Lectures**

### **Unit 1**

**(12 Lectures)**

Introduction to control systems; types of control systems, basic concept of open-loop and closed-loop control systems; Mathematical modeling and representation of mechanical (translational & rotational) and electrical systems Conversion of mechanical to analogous electrical systems (force-voltage and force current analogy); (Block diagrams, Signal flow graphs and transfer functions.

### **Unit 2**

**(13 Lectures)**

Programmable Logic Controllers (PLC): PLC Advantages & Disadvantages, Overall PLC System, CPU, PLC input & Output Modules(Interfaces), General PLC Programming Procedure : Proper Construction of PLC Ladder diagrams, Process Scanning considerations, Devices to which PLC input & output are connected: Input ON/OFF switching devices, Input analog devices, ON/OFF devices, Output analog devices,

Basic PLC Programming : (i) Programming ON-OFF inputs to produce ON-OFF outputs: PLC input instructions, Outputs Coils, Indicators, Operational Procedures, Constant Coil input & output programming examples, Fail Safe circuits, Industrial Process Example. (ii) Relation of digital gate Logic to Contact /Coil Logic: Digital logic gates & PLC equivalents, Boolean Algebra PLC programming, Conversion Examples.(iii) Creating Ladder Diagrams from Process Control Descriptions: Ladder diagrams & Sequence listing, Large Process Ladder diagram construction. (iv) PLC Timer Functions: PLC timer functions, Examples of timer and their industrial applications, Industrial process timing applications. (v) PLC Counter functions : PLC Counters, Examples of Counter Functions, Industrial applications. (vi) Selecting a PLC: PLC versus Personal Computer, Factors to consider while selecting a PLC.

### **Unit 3**

**(20 Lectures)**

Supervisory Control and Data acquisition (SCADA) Systems, Types of supervisory systems, concepts of Distributed Digital Control Systems (DCS), Direct digital control (DDC), SCADA: Components of SCADA Systems, field data interface devices, communication network and other details, System Architecture: monolithic, distributed, networked, SCADA protocols in short, application of SCADA in industry; installation of SCADA Systems; security and weakness of SCADA Systems.

### **Reference Books**

1. S. Gupta, JP Gupta, "PC interface For Data Acquiring & Process Control", 2nd Ed., Instrument Society of America.
2. John W. Web, Ronald A. Reis, "Programmable Logic Controllers" 5th Edition, PHI
3. Liptak, B. G. (E.d.), "Instrument Engineers Handbook", vol. I to III, Chilton Book Co.
4. Bhatkar, Marshal, "Distributed Computer control & Industrial Automation", Dekker Publication
5. Frank D. Petruzella, "Programmable Logic Controllers", 3rd Edition, McGraw Hill
6. Control Systems-Principles and Design - M. Gopal, Tata Mc Graw Hill
7. Control Systems Engineering,– I.J. Nagrath and M. Gopal, The New Age International (P) Ltd., New

Delhi

8. Modern Control Engineering—D. Roy Choudhry
9. Modern Control Engineering, -K.Ogala, PHI
10. Control Systems, -A.Nagoor Kani, RBA Publications, Chennai
11. Automatic Control Systems, - B.C.Kuo ,PHI
12. Programmable Logic Controllers Principles and applications by John W. Webb and Ronald A. Reis 5<sup>th</sup> edition prentice Hall of India.
13. Programmable Logic Controllers and Industrial Automation by Madhuchhanda ,SamarjitSenguptaPenram International Pub. Pvt. Ltd.
14. Programmable Logic Controllers Programming methods and applications by john r. Hackworth and Frederick D. Hackworth, Jr. Pearson education.
15. Programmable Logic Controllers by Frank Petuzella , Tata Mcgraw Hill Pub.

**Laboratory experiments under -DSE 3: INDUSTRIAL AUTOMATION  
(minimum 8 practicals, 4 from PLC and 4 from SCADA)**

**PLC PRACTICALS:**

1. INTERFACING OF FIELD DEVICES TO PLC, VIZ, SENSOR, RELAYS, PUSH BUTTONS AND UNDERSTANDING OF SOURCE AND SINK CONCEPT.
2. USE OF “NO” AND “NC” CONTACTS FOR WRITING EFFECTIVE “START” AND “STOP” CIRCUIT.
3. USE OF LADDER DIAGRAM TO UNDERSTAND NORMALLY CLOSE CONTACT AS “ FAIL SAFE CONTACT”.
4. CONCEPT OF INTERLOCKING FOR SAFE MACHINE OPERATION.
5. IMPORTANCE OF LATCH , JOG / INCHING.
6. UNDERSTANDING THREE BASIC TIMERS : ON DELAY, OFF DELAY AND RETENTIVE.  
( USING TIMER BASED APPLICATIONS)
7. UNDERSTANDING TWO COUNTERS UP AND DOWN ( USING COUNTER BASED APPLICATIONS)
8. UNDERSTANDING PWM USING PLC
9. UNDERSTANDING PID USING PLC
10. PLC ladder Program for logic functions: AND, OR ,NAND, NOR and XOR.
11. PLC ladder Program to prove De Morgan’s theorem.
12. PLC ladder program for Multipleinputs and outputs.
13. PLC ladder Program for latching and unlatching functions.
14. PLC ladder Program using timers.
15. PLC ladder Program using counters.
16. PLC ladder Program to apply timer functions to process control.
17. PLC ladder Program to apply timer functions for control of industrial control.
18. PLC ladder Program to apply counter functions to process control.
19. PLC ladder Program to apply timer and counter functions to process control
20. PLC ladder Program using Master Control Relay function
21. PLC based application program for automatic indication for water tank level.
22. PLC based application program for traffic light indication.
23. PLC based application program forward and Rev direction of Motor.
24. PLC based application program for controlling Robot.
25. PLC based application program for ON/OFF control lights.
26. Interfacing Digital input and output device/s to PLC and writing a ladder program.
27. Interfacing Analog input and output device/s to PLC and writing a ladder program.

SCADA PRACTICALS:

1. USE OF SLIDER AS TAG AND DIFFERENT TAG GENERATION.
2. CREATING SIMPLE START STOP LOGIC USING A SCRIPT.
3. CREATING MIMIC FOR BOTTLE FILLING PLANT.
4. PASSWORD SETTING AND SECURITY IN SCADA.
5. USE OF REAL TIME AND HISTORICAL TREND FOR REAL TIME APPLICATION.
6. ACQUIRING PLC DATA THROUGH COMMUNICATION.
7. CONTROLLING PLC OUTPUT THROUGH SCADA TO RUN AC INDUCTION MOTOR.
8. CREATING AND UNDERSTANDING ALARMS.

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**DSE 3(SWAYAM)**

**SEC COURSES**

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**ELECTRONICS SEC 1: PROGRAMMING in C++**

**(Credits: Theory-03, Practicals-01)**

**Theory Lectures: 45 lectures**

<b>Chapter 1 : Flowcharts and Algorithms</b>	<b>1</b>
<b>Chapter 2: Data types, Operators and expressions</b>	<b>3</b>
Identifiers, keywords, constants, C++ operators, Type conversion	
<b>Chapter 3: Writing a program in C++</b>	<b>3</b>
Declaration of variables, statements, control statements – if statement and if –else statements, switch statements, loop statements: for loop, while loop and do-while loop, breaking control statements: break and continue statements, goto statement.	
<b>Chapter 4: Functions and Program Structures</b>	<b>4</b>
Defining a function, return statement, types of functions, Actual and formal arguments, Local and Global arguments, Default arguments, Multifunction program, Storage class specifiers, Recursive functions, Preprocessors, Macro, header files and standard files.	
<b>Chapter 5: Arrays</b>	<b>3</b>
Array notation, array declaration, array initialization, processing with an array, arrays and functions, Multidimensional arrays, Character arrays.	
<b>Chapter 6: Pointers</b>	<b>3</b>
Pointer declaration, address operator, pointer variable, pointer expressions, pointer arithmetic, pointer and functions, pointers and arrays, pointers and strings, array of pointers and pointer to pointer.	
<b>Chapter 7: Structures</b>	<b>3</b>
Structure declaration, structure definition, structure initialization, accessing structure members, nesting of structures, array of structures, structures and functions	
<b>Chapter 8: Classes and Objects</b>	<b>5</b>
Declaration of a class, member functions, defining the object of a class, accessing a member of a class, Array of class objects, Pointers and classes, classes within classes.	

**Chapter 9: Constructors and destructors****5**

Constructors, Copy constructors, Parameterized constructors, multiple constructors, default constructors, destructors, inline member functions, Static class members(Static data members and static member functions), friend function, new and delete operators, this operators.

**Chapter 10: Inheritance****5**

Types of Inheritances, Types of base classes, derived class, types of inheritance.

**Chapter 11: Operator overloading****5**

Defining operator overloading, overloading unary operators, overloading binary operators.

**Chapter 12: Polymorphism****5**

Function overloading, Early binding, Late binding, virtual functions, Pure virtual functions and Abstract base classes.

**Text Book:**

1. Object oriented programming with C++ E. Balaguruswamy TMHv

**REFERENCE BOOKS:**

1. Mastering C++ K. R. Venugopal, Rajkumar, T. Ravishankar TMH
2. Programming with C++ D. Ravichandran TMH

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**Laboratory experiments under SEC1: Programming in C++****AT LEAST 8 EXPERIMENTS FROM FOLLOWING.****Practical List**

18. To find the largest of three numbers.
19. Sum and average of n numbers.
20. Sum of the digits of a number using mod function.
21. Generation of Fibonacci series using functions and classes
22. Prime numbers
  - c) To identify whether a number is prime or composite.
  - d) To print prime numbers for a given range of numbers.
23. Sine series evaluation.
24. Sorting of n numbers using arrays
25. Programming using overloading
26. Programming using polymorphism
27. Programming using inheritance
28. Matrix multiplication
29. Addition of a number using Storage class specifiers
30. Factorial of a number using recursive functions
31. Swapping of a number using:
  - c) Call by value
  - d) Call by reference
32. Programming using class constructors and destructors
33. Programming to generate student identity cards using structures
34. Copy contents of two strings A and B into string C and count the number of characters present in string C.

**Reference Books:**

1. Yeshvant Kanetkar, Let Us C , BPB Publications
2. Numerical methods for Engineers, Steven C. Chapra and Raymond P. Canale, 6<sup>th</sup> Edition, TMH.
3. Programming in ANSI C, Balagurusamy, 2nd edition, TMH.

## ELECTRONICS-SEC2: SMART PHONE APPS DEVELOPMENT

(Credits: 03, Practicals-01)

Theory Lectures: 45 lectures

### UNIT-I

(15)

#### Introduction:

What is mobile Application Programming, Different Platforms, Architecture and working of Android, iOS and Windows phone 8operating system, Comparison of Android, iOS and Windows phone 8.

#### Android Development Environment:

What is Android, Advantages and Future of Android, Tools and about Android SDK, Installing Java, Eclipse, and Android, Android Software Development Kit for Eclipse, Android Development Tool: Android Tools for Eclipse, AVDs: Smartphone Emulators, Image Editing,

#### Android Software Development Platform:

Understanding Java SE and the Dalvik Virtual Machine, Directory Structure of an Android Project, Common Default Resources Folders, The Values Folder, Leveraging Android XML, Screen Sizes, Launching Your Application: The AndroidManifest.xml File, Creating Your First Android Application.

### UNIT-II

(20)

#### Android Framework Overview:

The Foundation of OOP, The APK File, Android Application Components, Android Activities: Defining the User Interface, Android Services: Processing in the Background, Broadcast Receivers: Announcements and Notifications, Content Providers: Data Management, Android Intent Objects: Messaging for Components, Android Manifest XML: Declaring Your Components.

#### Views and Layouts, Buttons, Menus, and Dialogs, Graphics Resources in Android:

Introducing the Drawables, Implementing Images, Core Drawable Subclasses, Using Bitmap, PNG, JPEG and GIF Images in Android, Creating Animation in Android

**Handling User Interface(UI) Events:** An Overview of UI Events in Android, Listening for and Handling Events , Handling UI Events via the View Class, Event Callback Methods, Handling Click Events, Touchscreen Events, Keyboard Events, Context Menus, Controlling the Focus.

### UNIT-III

(10)

**Content Providers:** An Overview of Android Content Providers, Defining a Content Provider, Working with a Database.

**Intents and Intent Filters:** Intent, Implicit Intents and Explicit Intents, Intents with Activities, Intents with Broadcast Receivers

**Advanced Android: New** Features in Android 4.4.

**iOS Development Environment:** Overview of iOS, iOS Layers, Introduction to iOS application development.

**Windows phone Environment:** Overview of windows phone and its platform, Building windows phone application.

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**Suggested Books:**

1. Beginning Android 4, Onur Cinar , Apress Publication
2. Professional Android 4 Application Development, Reto Meier, Wrox

**Electronics Lab SEC2: SMART PHONE APPS DEVELOPMENT****PRACTICALS: (ANY 8)**

10. Create —Hello World application. That will display —Hello World in the middle of the screen in the emulator. Also display —Hello World in the middle of the screen in the Android Phone.
11. Create- HELLO INDIA, when the button is clicked.
12. Create 4 buttons which displays four values.
13. Create an application with login module. (Check username and password).
14. Create spinner with strings taken from resource folder (res >> value folder) and on changing the spinner value, Image will change.
15. Create a menu with 5 options and selected option should appear in text box.
16. Create a list of all courses in your college and on selecting a particular course teacher-in-charge of that course should appear at the bottom of the screen.
17. Create an application with three option buttons, on selecting a button colour of the screen will change.
18. Create and Login application as above. On successful login, pop up the message.

**GE Courses**

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**GE 1: ELECTRONICS CIRCUITS AND PCB DESIGNING/ Consumer Electronics****(Credits: Theory-03, Practical:01)****Theory: 45 Lectures****Unit-1****(9 Lectures)****Network theorems (DC analysis only):** Review of Ohms law, Kirchhoff's laws, voltage divider and current divider theorems, open and short circuits.

Thevenin's theorem, Norton's theorem and interconversion, superposition theorem, maximum power transfer theorem.

**Unit 2****(11 Lectures)****Semiconductor Diode and its applications:** PN junction diode and characteristics, ideal diode and diode approximations. Block diagram of a Regulated Power Supply, Rectifiers: HWR, FWR- center tapped and bridge FWRs. Circuit diagrams, working and waveforms, ripple factor & efficiency(no derivations). Filters: circuit diagram and explanation of shunt capacitor filter with waveforms.**Zener diode regulator:** circuit diagram and explanation for load and line regulation, disadvantages of Zener diode regulator.**Unit-3****(13 Lectures)****BJT and Small Signal amplifier:** Bipolar Junction Transistor: Construction, principle & working of NPN transistor, terminology. Configuration: CE, CB, CC. Definition of  $\alpha$ ,  $\beta$  and  $\gamma$  and their interrelations, leakage currents. Study of CE Characteristics, Hybrid parameters. Transistor biasing: need for biasing, DC load line, operating point, thermal runaway, stability and stability factor.

Voltage divider bias: circuit diagrams and their working, Q point expressions for voltage divider biasing.



Small signal CE amplifier: circuit, working, frequency response, re model for CE configuration, derivation for  $A_v$ ,  $Z_{in}$  and  $Z_{out}$ .

**Unit-4**

(12 Lectures)

**Types of PCB:** Single sided board, double sided, Multilayer boards, Plated through holes technology, Benefits of Surface Mount Technology (SMT), Limitation of SMT, Surface mount components: Resistors, Capacitor, Inductor, Diode and IC's.

**Layout and Artwork:** Layout Planning: General rules of Layout, Resistance, Capacitance and Inductance, Conductor Spacing, Supply and Ground Conductors, Component Placing and mounting, Cooling requirement and package density, Layout check.

Basic artwork approaches, Artwork taping guidelines, General artwork rules: Artwork check and Inspection.

**Laminates and Photoprinting:** Properties of laminates, Types of Laminates, Manual cleaning process, Basic printing process for double sided PCB's, Photo resists, wet film resists, Coating process for wet film resists, Exposure and further process for wet film resists, Dry film resists

**Etching and Soldering:** Introduction, Etching machine, Etchant system. Principles of Solder connection, Solder joints, Solder alloys, Soldering fluxes. Soldering, Desoldering tools and Techniques.

**Reference Books:**

1. Electronic Devices and circuit theory, Robert Boylestad and Louis Nashelsky, 9th Edition, 2013, PHI
2. Electronics text lab manual, Paul B. Zbar.
3. Electric circuits, Joseph Edminister, Schaum series.
4. Basic Electronics and Linear circuits, N.N. Bhargava, D.C. Kulshrestha and D.C Gupta -TMH.
5. Electronic devices, David A Bell, Reston Publishing Company/DB Tarapurwala Publ.
6. Walter C.Bosshart "PCB DESIGN AND TECHNOLOGY" Tata McGraw Hill Publications, Delhi. 1983
7. Clyde F.Coombs "Printed circuits Handbook" III Edition, McGraw Hill.

**LAB GE1: Electronics circuits and PCB designing**

**Practicals: (Any 8)**

1. Familiarization with various controls and use of CRO, Power Supply, Function Generator and Multimeter.
2. Verification of Ohm's Law and Kirchhoff's Laws.
3. Verification of voltage division and current division Laws.
4. Familiarization of various Electronics components & Introduction to Bread board, Resistors (Colour codes) and values, Capacitors (various types), Inductors (various types), Diodes – Rectifier, Zener, LED, BJT
5. Verification of Thevenins Theorem.
6. Verification of Norton's Theorem.
7. Verification of Superposition Theorem.

8. Verification of Maximum Power transfer Theorem.
9. Characteristics of P-N junction diode.
10. Study of H.W. and F.W. Rectifiers (Ripple factor and wave forms).
11. Study of Bridge Rectifiers (Ripple factor and wave forms).
12. Study of the effect of adding capacitor filter to F.W.R. (Waveforms and Ripple factor calculations).
13. Zener diode Regulator circuit.
14. Input characteristics of BJT (CE configuration)
15. Output characteristics of BJT (CE configuration)
16. Verification of Transistor current gains ( $\alpha$  &  $\beta$ ).
17. Load line and Q-point of CE Amplifier.
18. Study of frequency response of CE amplifier- with and without CE (Emitter bypass cap.)
19. PCB designing for given circuit using manual method.
20. Circuit construction on the PCB of a given circuit (drilling, components mounting & soldering, etc.)
21. PCB designing for a given circuit using CAD tools.

### **GE - 1 Consumer Electronics**

**(Credits: Theory-03, Practicals-01)**

**Theory Lectures: 45**

#### **Unit -1**

**(10 Lectures)**

##### **Audio systems:**

PA system, Microphone, Amplifier, Loudspeakers. Radio receivers, AM/FM. Audio recording and reproduction, CD and MP3.

#### **Unit-2**

**(10 Lectures)**

##### **TV and display systems:**

Television standards, MP4 players, Set Top box, CATV and Dish TV, LCD, Plasma & LED TV. Projectors: DLP, Home Theatres, Remote Controls

#### **Unit-3**

**(15 Lectures)**

##### **Landline, Mobile telephony and Cabling:**

Basic landline equipment, Cordless. Intercom/ EPABX system. Mobile phones: GPRS & Bluetooth and Wi-Fi. Analysis and Comparison of 1G, 2G, 3G, 4G, 5G and 6G Telecom services, GPS Navigation system. Smart Phones Office Equipment: Scanners, Barcode / Flat bed, Printers, Xerox, Different types of Cables, Punching and crimping of cables.

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**Unit-4****(10 Lectures)****Electronic Gadgets and Domestic Appliances:**

Digital clock, Digital camera, Handicam, Home security system, CCTV. Air conditioners, Refrigerators, Washing Machine/Dish Washer, Microwave oven, Vacuum cleaners

**Suggested Books:**

1. R. P. Bali Consumer Electronics Pearson Education (2008)
2. R. G. Gupta Audio and Video systems Tata McGraw Hill (2004)

**Laboratory experiments under: GE1:Consumer Electronics****At least 8 experiments from following list****Practical List**

1. Punching and crimping of cables
2. Study of Microphone
3. Study of Amplifier
4. Study of Loud speaker
5. Study of AM Radio receivers
6. Study of FM Radio receivers
7. Study of a PA system
8. Audio recording, reproduction and rendering of sound signals
9. Study of Set top box
10. Study of Home theatre system
11. Study of a Projector
12. Study of a Landline equipment
13. Study of a Mobile equipment
14. Study of a Digital clock
15. Study of a Digital camera
16. Study of a Handicam system
17. CCTV installations and cabling
18. Study of an Air conditioner system
19. Study of a Washing machine system
20. Study of a Dish washer system
21. Study of a Microwave oven system
22. Study of a Vacuum cleaner system

**GE 2:REPAIR AND MAINTENANCE OF ELECTRICAL AND ELECTRONIC APPLIANCES/Medical****Home Instruments****(Credits: 03, Practical :01)****Total Lectures 45**

UNIT I

**12****INTRODUCTION TO ELECTRICITY**

Line Voltage: -Distribution, Mains supply standards, Meaning of Single phase and three phase supply, conventions followed. IMPORTANCE OF EARTHING AND FUSE: Introduction of Earthing, Need of earthing, Hazard, Types of earthing, Advantage of earthing, working of earthing, Importance of fuse, types of fuse. HOUSE WIRING: Introduction of Wiring, types of wiring, advantage of wiring, wiring methods, electrical panel, House wiring diagram.

**UNIT II**

**5**

**Energy Consumption and Preventive Maintenance**

General Precautions, handling and maintenance for all types of electrical and electronic domestic Appliances, Energy consumption..Energy meter: Introduction, working, Connection and Energy meter reading:Power Calculation of Load, Electricity Bill calculation

**UNIT III**

**7**

**HEATING APPLIANCES:**

Electrical iron,Electric stove, Electric Toaster, Immersion heater, Electric geyser, Electric Oven, Induction Cooktop, Electric Roti Maker, Electric Kettle, Ordinary and automatic iron:- Introduction, working principle, construction, operation, Installation, Maintenance and Repair (faultfinding and removal of faulty component)

**UNIT IV**

**7**

**MOTORIZED APPLIANCES:**

Electric fan(Ceiling Fan and Table Fan),Electric Mixer grinder, juicer,Electric washing machine,Hair dryer,Vacuum cleaner:-Introduction, working principle, construction, operation, Installation, Maintenance and Repair (faultfinding and removal of faulty component)

**UNIT V**

**7**

**Electrical and electronic appliances**

Electric gas lighter,Electric bell and buzzer,Emergency light,Voltage Stabilizer(Relay based),Linear Regulated Power Supply,Battery Charger,Solar Voltaic cell,Tube light: Introduction, working principle, construction, operation, Installation, Maintenance and Repair (faultfinding and removal of faulty component)

**UNIT VI**

**7**

**Visual electronic appliances**

Introduction, block diagram, working principal and different sections of Public address system,CD/DVD player,LCD/LED Television

**LAB GE2: Repair and Maintenance of Electrical and Electronic**

**Appliances:(any 8)**

1. Use of tong tester, tester,Multimeter for measurement of Voltage, Current, Resistance and Continuity test.
2. Dismantling and reassembling of ordinary/automatic iron, Testing and repair of ordinary/automatic iron
3. Dismantling and reassembling of electric stove and hot plate, Testing and repair of electric stove and hot plate
4. Dismantling and reassembling of Induction cooktop, Testing and repair of Induction cooktop
5. Dismantling and reassembling of Electric Kettle, Testing and repair of Electric Kettle
6. Construction of Electric Extention board, Testing and repair of extention board
7. Dismantling and reassembling of electric oven, Testing and repair of electric oven
8. Dismantling and reassembling of electric toaster, Testing and repair of electric toaster.

9. Dismantling, assembling and testing of immersion heater and installation of geyser.
10. Testing, faultfinding, repair and overhauling of electric fan
11. Testing, faultfinding, repair and overhauling of electric mixer
12. Testing, faultfinding, repair and overhauling of non automatic agitator type washing machine
13. Testing, faultfinding, repair and overhauling of hair dryer
14. Testing, faultfinding, repair and overhauling of vacuum cleaner
15. Testing, faultfinding, repair and overhauling of grain grinder
16. Dismantling, assembling, testing and repair of electric gas lighter
17. Testing, faultfinding and repairs of electric bell.
18. Testing, faultfinding and repair of emergency light.
19. Testing, faultfinding and repair of stabilizer.
20. Dismantling, assembling and study of various sections of LCD/LED TV
21. Dismantling, assembling and repair of battery charger / adaptor
22. To measure voltages/signals at various test points of public address system.
23. To study installation of DTH.
24. Tube light wiring
25. Installation and Testing of Earthing.
26. Installation of Basic Single phase wiring as per the given wiring diagram.

#### Reference Books

1. The Repair & Maintenance Of Electrical Equipment: A Complete Guide To Troubleshooting Portableelectric Tools And Generators. Front Cover. Fred Sotcher.
2. Troubleshooting Electronic Equipment: Includes Repair And Maintenance,R.S.Khandpur , Second Edition

#### GE2 : Medical Home instrumentation (Credits: 03, Practical :01)

Total Lectures 45

##### Fundamentals of Medical Instrumentation:

7L

Anatomy and Physiology, Physiology system of body: Cardiovascular System, Respiratory System, Nervous system, Sources of biomedical signals, Basic medical Instrumentation system, General constraints in design of medical instrumentation system.

##### Bioelectric Signals and electrodes:

12L

Origin of Bio electric Signals: Electrocardiogram, Electroencephalogram, and electromyogram, Recording Electrodes: Electrode tissue interface, Skin contact impedance, Silver – Silver Chloride electrodes, Electrodes for ECG, Electrodes for EEG, Electrodes for EMG, Electrical conductivity of electrodes jellies and creams, Microelectrodes: Glass micro capillary electrodes, Metal Microelectrodes.

##### Physiological transducers:

8L

Introduction, Classification of Transducers, performance characteristics of Transducers: static and dynamic characteristics, signals from cardiovascular system, signals from respiratory system and the various types of transducers required to measure a given parameter, Optical fibre sensors: types of optical fibre sensors, Biosensors, Smart sensors

**Recording Systems:****2L**

Basic recording system, General considerations for signal conditioners, Writing systems.

**Biomedical Recorders:****5L**

Working principles of Electrocardiograph( ECG), ECG leads Electroencephalograph (EEG) and Electromyograph( EMG) ( qualitative study only). **Phonocardiograph:** origin of heart sounds, Microphones for Phonocardiography.

**Patient Monitoring Systems:****6L**

Measurement of heart rate, Measurement of pulse rate, Blood pressure measurement: In-direct Methods of blood Pressure measurement: automatic blood pressure measuring using Korotkoff's method. Measurement of respiration rate: thermistor method, Pulse oximeter, Working principle of cardiac pacemaker.

**Non- Invasive Diagnostic Imaging:****5L**

Working principles of X-rays, CT Scan, Magnetic Resonance Imaging and Ultra-sound Imaging.

1. Handbook of Biomedical Instrumentation By R.S.Khandpur ,TMH,2nd Edn
2. Medical Instrumentation- Application & Design, By John Webster , 3rd Edition, Wiley India Edi.
3. Biomedical Instrumentation and Measurements By Leslie Cromwell, Fred J. Weibell, Erich A. Pfeiffer PHI( 2nd Edition)
4. Principles of applied biomedical instrumentation by Goddes & Baker, Jonh Wiley
5. Medical Electronics and Instrumentation by Sanjay Guha, University publication.
6. Textbook of Medical Instruments, By S. Ananthi New Age International.

Practicals: (At least 8 Experiments)

1. Study of Bio-Medical ECG.
2. Study of Bio-Medical EEG.
3. Study of Bio-Medical EMG.
4. Study of Bio-Medical Electronics Pressure meter.
5. Study of Bio-Medical Glucometer.
6. Study of Bio-Medical transducers for bio-medical applications.
7. Study of Oximeter.
8. Bio-Medical application using transducer I.
9. Bio-Medical application using transducer II.
10. Study of Bio- Medical transducers
11. Study of Bio- Medical transducers
12. Study of electrical conductivity of electrodes and jellies / creams
13. study of Pulse Rate
14. study of Heart beat Meter.
15. Study of cardiac pacemaker
16. Study of ultrasonography
17. Study of oximeter
18. Measurement of Body temperature

ANNEXTURE-II

**Syllabus of M.Sc. (Electronics) Programme**

Sr. No	Course code	Title	Credits	Type
<b>Semester-I</b>				
1	ELC101	MICROELECTRONICS AND VLSI DESIGN	4	L
2	ELC102	NUMERICAL COMPUTATION AND ALGORITHMS	4	L
3	ELC103	EDA TOOLS-I ( <b>Flipped Classroom</b> )	4	L
4	ELC104	ELECTRONICS PRACTICALS – I	4	P
5	UEL101	ADVANCED DIGITAL COMMUNICATION SYSTEMS	4	L
6	UEL 106	PRINCIPLES OF MODERN CDMA/ MIMO/ OFDM WIRELESS COMMUNICATIONS BY Aditya Jagannat IIT Madras ( <b>SWAYAM</b> )	4	L
Total			20	
<b>Semester II</b>				
1	ELC201	EMBEDDED SYSTEMS DESIGNS	4	L
2	ELC105	OPERATING SYSTEM AND RTOS	4	L
3	ELC202	OPTICAL COMMUNICATION SYSTEMS ( <b>Flipped Classroom</b> )	4	L
4	ELC203	ELECTRONICS PRACTICALS- II	4	P
5	UEL102	MICROPROCESSORS ARCHITECTURES AND PROGRAMMING	4	L
6	UEL 107	An invitation to Mathematics by Sankaran Vishvanath IITM ( <b>SWAYAM</b> )	2	L
7	UEL 108	Basics of Medical Imaging	1	L
8	UEL 109	Basics of Clinical Instrumentation	1	L
Total			20	
<b>Semester III</b>				
1	ELC204	INSTRUMENTATION & CONTROL THEORY	4	L
2	ELC301	ELECTRONICS PRACTICALS - III	4	P
3	ELD201	SIGNALS AND SYSTEMS	4	L
4	ELD202	DIGITAL SIGNAL PROCESSING ( <b>Flipped Classroom</b> )	4	L
5	<b>ELD301</b>	DIGITAL SYSTEM DESIGN USING HDL	<b>4</b>	L
6	<b>ELD302</b>	EDA TOOLS-II	<b>4</b>	L
7	UEL103	INDUSTRIAL TRAINING, MINI-PROJECT AND SEMINAR	4	T
8	UEL 110	Biomems and Microfluids by Shantanu Bhattacharya IIT Madras ( <b>SWAYAM</b> )	4	L
Total			20	
<b>Semester IV</b>				
1	ELD401	ELECTRONICS PRACTICALS - IV	4	P
2	ELD203	NANOELECTRONICS & NANOSYSTEMS	4	L

3	ELD303	LASER SYSTEM ENGINEERING	4	L
4	ELD402	PROJECT	8	P
5	UEL104	PHARMACEUTICAL INSTRUMENTATION	4	L
6	UEL105	COMMUNICATION AND TECHNICAL SKILLS (Flipped Classroom)	4	T
7	UEL 111	Antennas by Girish Kumar (SWAYAM)	4	L
			Total	20

## ANNEXURE III

**Specimen Question Paper for Semester End Examination for papers with 4 Theory Credits**

Duration: 2 hours

Max Marks 80

Instructions:

Q.1) Answer any 4 out of 6

(4 x 4 = 16)

Q.2) Answer any 4 out of 6

(4 x 4 = 16)

Q.3A)

(6)

OR

Q.3B)

(6)

Q.3C)

(6)

Q.4A)

(6)

OR

Q.4B)

(6)

Q.4C)

(6)

Q.5A)

(6)

OR

Q.5B)

(6)

Q.5C)

(6)

Q.6A)

(6)

OR

Q.6B)

(6)

Q.6C)

(6)

END

**Specimen Question Paper for Semester End Examination for papers with 3 Theory Credits**

Duration: 2 hours

Max Marks 60

Instructions:

Q.1) Answer any 5 out of 7

(5 x 2 = 10)

Q.2) Answer any 5 out of 7

(5 x 2 = 10)

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Q.3A)		(5)
	OR	
Q.3B)		(5)
Q.3C)		(5)
Q.4A)		(5)
	OR	
Q.4B)		(5)
Q.4C)		(5)
Q.5A)		(5)
	OR	
Q.5B)		(5)
Q.5C)		(5)
Q.6A)		(5)
	OR	
Q.6B)		(5)
Q.6C)		(5)

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**D 4.1 Goa Institute of Management, Sanquelim-Goa.**

**Annexure I**

**Part -1**

<b>Date of visit</b>	21/07/2017
<b>Name of the College/Institution</b>	Goa Institute of Management
<b>NAAC Accreditation</b>	Not Applicable
<b>If Yes, Grade and year</b>	
<b>Research funding received by college last year</b>	
<b>Programme being reviewed by AIC</b>	PhD
<b>Programme fee per year per student</b>	As per State Fee fixation committee approval
<b>Is financial position of the programme as per SC-1?</b>	Yes

**Faculty (add more rows in the table below if needed)**

<b>Number of faculty members sanctioned for programme</b>	Seven
<b>Number of faculty positions filled</b>	Seven
<b>Faculty Member 1</b>	Divya Singhal
<b>Highest qualification</b>	PhD. MaharshiDayanandSaraswati University, Ajmer  M.A. (Eco.)- Maharshi Dayanand Saraswati University, Ajmer 1 <sup>st</sup> Division
<b>Qualified as per UGC?</b>	Yes
<b>Nature of Appointment</b>	Permanent
<b>Salary</b>	37400-67000+AGP 9000
<b>Faculty Member 2</b>	Arindam Das-Gupta
<b>Highest qualification</b>	PhD Degree Cornell University, Ithaca, USA  Graduation and Post-Graduation (Integrated MA) Birla Institute of Technology and Science, Pilani 7.98 CGPA
<b>Qualified as per UGC?</b>	Yes
<b>Nature of Appointment</b>	Permanent <a href="#">(Back to Index)</a> <a href="#">(Back to Agenda)</a>

<b>Salary</b>	37400-67000+AGP 10000 (consolidated)
<b>Faculty Member 3</b>	Krishna K Ladha
<b>Highest qualification</b>	PhD Carnegie-Mellon University  PGDM IIM-C
<b>Qualified as per UGC?</b>	Yes
<b>Nature of Appointment</b>	Permanent
<b>Salary</b>	37400-67000+AGP 10000
<b>Faculty Member 4</b>	Samveg Arvindkumar Patel
<b>Highest qualification</b>	PhD - Management (Finance) KadiSarvaVishwavidalaya, Gandhinagar, Gujarat MBA (Major Finance, Minor Marketing) Hemchandracharya North Gujrat University, Patan, Gujarat 68.2% BE (Electronics & Telecommunication) North Maharashtra University, Jalgaon, Maharashtra First Class with Distinction
<b>Qualified as per UGC?</b>	Yes
<b>Nature of Appointment</b>	Permanent
<b>Salary</b>	15600-39100+AGP 8000
<b>Faculty Member 5</b>	Manas Mayur
<b>Highest qualification</b>	PhD. - Management (Finance) Guru Gobind Singh Indraprastha University, Delhi  MSc. - Forestry (Economics & Management) Forest Research Institute, Dehradun Class : First  BSc. - Chemistry (H) Delhi University Class: Second
<b>Qualified as per UGC?</b>	Yes

<b>Nature of Appointment</b>	Permanent
<b>Salary</b>	15600-39100+AGP 8000
<b>Faculty Member 6</b>	Anamika Sinha
<b>Highest qualification</b>	PhD University of Lucknow MCM University of Lucknow 73%
<b>Qualified as per UGC?</b>	Yes
<b>Nature of Appointment</b>	Permanent
<b>Salary</b>	37400-67000+AGP 9000
<b>Faculty Member 7</b>	Abhishek Ranga
<b>Highest qualification</b>	PhD (Management) Bhavnagar University, Bhavnagar MBA, Gujarat University First Class ACMA, The Institute of Cost Accountants of India
<b>Qualified as per UGC?</b>	Yes
<b>Nature of Appointment</b>	Permanent
<b>Salary</b>	37400-67000+AGP 9000

**No. of applications received for admission to the programme during last 3 academic years**

Academic year	No. of applications	No. of seats sanctioned	No. of seats filled
2016-17	3	14	NIL

**Infrastructure**

Classrooms available to the programme and area of each classroom	2 class room, Area 123.39 Sq. m. each
Teaching aids available for the programme	E-Journals: Science direct, EBSCO, Proquest, JSTOR, J-Gate  Database: Thomson Reuters Eikon, CMIE Prowess, Capitaline  Software: SPSS, STATA, EViews, Minitab <a href="#">(Back to Index)</a> <a href="#">(Back to Agenda)</a> Projector, Computer, Audio System

Laboratories used by the programme and area of each laboratory	N.A.
Special equipment used in the programme	
Availability of staffroom to teachers	Faculty cabins available (73 nos.)
Availability of common room to students	7 common room (Boys/Girls) Area 41.25 sq.m. avg.each
Library facilities available to the programme	1 Library, Area 674.27 sq. m.
Sports facilities available to the programme	Football ground, swimming pool, volleyball, basketball, Long tennis courts
Canteen facilities	Yes
Health facilities, Counseling, etc. available to the programme	Yes
Description of facilities that have been added since the last AIC visit	Finance Lab

**Data on placements of last 3 batches: Not Applicable**

**Batch:**

Sr. No	Students Name	Placement
01		
02		
03		
04		
05		

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**D 5.1 Proposed amendment to Ordinance OB-8.8 relating to the Formation of Teaching Departments under faculties in Goa University**

**Annexure I**

**Proposed part amendment to Ordinance OB-8 relating to the Formation of Teaching Departments Under Faculties in Goa University**  
(under Section 24(1) of the Goa University Act, 1984).

Existing Provisions		Proposed Provisions		Justification
Ordinance No.	Text	Ordinance No.	Text	
<b>OB-8.8</b>	In case there is neither Professor nor a Reader in the Department, the Dean of the Faculty concerned will act, as the Head of that Department.	<b>OB-8.8</b>	In case there is neither Professor nor Associate Professor in the Department, the Vice-Chancellor shall nominate an Assistant Professor as Teacher-in-Charge of the concerned Department for a term of three years, or till such time as a Professor/Associate Professor joins the Department, whichever is earlier. The Teacher-in-Charge shall route all matters of the Department through the Dean of the faculty concerned, who will function as the Head of that Department.	The term 'Reader' is changed to 'Associate Professor'.  Provision for an Assistant Professor to act as teacher-in-charge in absence of an Professor/Associate Professor in the department, to minimize the burden on the Dean, who shall function as the Head of the Department.

*Sarita Nazareth*  
13/09/2017  
Prof. Sarita Nazareth  
Chairperson  
Drafting and Vetting Committee

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**D 5.2 Proposed part amendment to Ordinance OA-5.15 Instructions relating to the revaluation of answer books at a University Examination.**

**Annexure I**

<b>Existing Provisions</b>		<b>Proposed Provisions</b>		<b>Justification</b>
OA-5.15 (A) (i)	A candidate who desires to have revaluation of his paper/papers shall be required to apply for revaluation of his paper / papers within 15 days from the date of declaration of the results of the candidate of the concerned examination and that the revaluation shall not include verification of marks.	OA-5.15 (A) (i)	A candidate who desires to have revaluation of his paper/papers shall be required to apply for revaluation of his paper / papers within 07 days from the date of declaration of the results of the candidate of the concerned examination and that the revaluation shall not include verification of marks.	To overcome delay in declaration of revaluation results.

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**D 5.3 Provision for One Time and final Chance to appear for examination and complete the program.**

**Annexure I**

**OA-16.11 Duration for the completion of the Programme**

Ordinance No	Present	Proposed	justification
OA-16.11	<p>(effective from 6<sup>th</sup> February, 2015)  <b>(i)</b> The total duration available for students to complete the course shall be twice the actual duration prescribed for the course, unless otherwise specified. In case of courses having guidelines prescribed by regulatory bodies such as MCI, DCI, CCH, CCIM, AICTE, the duration for completion of such course shall be as prescribed. Students who do not complete the course/pass all the examinations prescribed for the course within the available duration, shall have to discontinue the course.</p>	No Change	



	<p>(effective from 22<sup>nd</sup> December, 2015)  <b>(ii)</b> Exceptional cases of candidates who are unable to complete the academic programme within the prescribed duration shall be placed before the Academic Council for appropriate decision on case to case basis. In such cases if the candidate is permitted by the Academic Council to answer the examination beyond twice the actual duration prescribed, he/she shall not be eligible for award of class.          (effective from 6<sup>th</sup> February, 2015)          However, candidates of differently-abled category shall be eligible for award of class but shall not be considered for award of medal/prize/scholarship.</p>	<p>No Change</p>	
		<p>(iii) The Academic Council may also consider, if it thinks fit, granting a one time and final opportunity to students having backlogs to appear for their examinations and complete the program. This one time opportunity would be allowed only for the existing/current Programme/Course being conducted by University in view of the availability of syllabus, paper setters and teaching faculty who are conversant with the subject.</p>	<p>This relaxation envisages a facility to clear a few backlog papers which prohibits a student from obtaining his/her final degree. This would not be a facility to overcome a block/clear lower semester, or supersede the existing detention rule.</p> <p style="text-align: right;"><a href="#">(Back to Index)</a> <a href="#">(Back to Agenda)</a></p>

**D 5.4 To examine issues pertaining to admission of foreign students to the Ph.D. programme and frame guidelines and suggest amendments needed to Ordinance OA-19A governing the Ph.D. programme.**

**Annexure I**

**GOA UNIVERSITY**  
**Minutes of the Meeting**

A meeting of the Committee constituted vide Order No. GU/41/Acad-PG/Ph.D.-Foreign Studn/074 dated 17.07.2017 to examine the issues pertaining to admission of foreign students to the Ph.D. programme and frame guidelines and suggest amendments needed to Ordinance OA-19A governing Ph.D. programme was held on 25<sup>th</sup> July at 3.30 p.m. in the Placement Cell. Prof. N. S. Bhat, Dean, Faculty of Social Sciences, chaired the meeting.

The following members attended the meeting.

1. Prof. I. B. Khan, Faculty of Languages and Literature, Goa University.
2. Prof. G. M. Naik, Faculty of Natural Science, Goa University.
3. Prof. M. K. Janarthanam, Faculty of Life Science and Environment, Goa University.
4. Prof. K. B. Subhash, Faculty of Commerce and Management Studies, Goa University.
5. Prof. Koshy Tharakan, Director, International Office, Goa University.
6. Dr. Rahul Tripathi, Foreign Student Advisor, Goa University.
7. Mrs. Maya Sawant, Asst. Registrar – Acad (PG), Member Secretary.

The Chairperson welcomed the members to the meeting and provided the background needed for the discussion. The document prepared by Dr. Rahul Tripathi, Foreign Student Advisor, regarding the admission of foreign students was placed before the Committee by the administration. The same was discussed in detail, and necessary changes were suggested. The mention of vacancies regarding M.Phil. was dropped as it has a separate Ordinance and also the applicants are very few. The Committee decided that the points/provisions mentioned in the said document be incorporated, with

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necessary changes, at the end of the Ordinance OA-19A.2 as **OA-19A.2 A: Admission Procedure for the Foreign Students.**

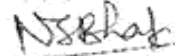
The Committee also discussed the guidelines for the admission of foreign students and finalised the following as the Guidelines.

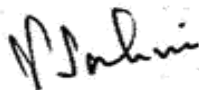
The Committee suggested that the foreign students shall apply for Ph.D. programme with the following documents:

1. An application (scanned copy) from the candidate addressed to the Registrar, Goa University with copies to the Head of the Concerned Department/Centre and the Director, International Office, Goa University giving full details of the subject/area applying for, a preliminary research proposal giving the Objectives, Scope, Hypothesis, Methodology and Tentative Chapterisation of about 1000 words.
2. Certified, scanned letter/proof relating to ICCR sponsorship if any.
3. Certified, scanned letter/ proof regarding financial support, if not sponsored by ICCR.
4. Certified, scanned copy of the relevant pages of the passport as proof of nationality and personal details.
5. Certified, scanned copy of passing certificates and statements of marks of all the semesters of the qualifying examination/s.
6. Certified, scanned copy of passing certificates and statements of marks of all the previous examination/s of School/College/Degree levels.
7. Certified, scanned copy of Reference letters supporting the research aptitude of the candidate from two senior/ eminent scholars.

The meeting ended with thanks to the chair.

Date: 27/ 07/2017

  
(Prof. N. S. Bhat)  
Chairperson



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**Part Amendment to Ordinance OA-19A  
Governing the Degree of Doctor of Philosophy (Ph.D.)**

Existing Provisions	Proposed Provisions	Justification
<p><b>OA-19A.2 Admission Procedure:</b></p> <p>(i) Admission to the Ph.D. Programme shall be through an Entrance Examination.</p> <p>(ii) A candidate desirous of seeking registration for a Ph.D. Degree of this University shall have to obtain a minimum of 50% marks (5% relaxation for SC/ST/OBC(non-creamy layer)/ Differentially-abled candidates, or other categories of candidates as specified by the State Government) to qualify in the Entrance Test conducted for admission during the period July/August. The number of seats for the Ph.D. Programme in respective subject, along with the name of the Guides and area of research shall be notified by the University.</p> <p>(iii) The Entrance Test for admission to</p>	<p><b>OA-19A.2 Admission Procedure:</b></p> <p>(i) Admission to the Ph.D. Programme shall be through an Entrance Examination.</p> <p>(ii) A candidate desirous of seeking registration for a Ph.D. Degree of this University shall have to obtain a minimum of 50% marks (5% relaxation for SC/ST/OBC(non-creamy layer)/ Differentially-abled candidates, or other categories of candidates as specified by the State Government) to qualify in the Entrance Test conducted for admission during the period July/August. The number of seats for the Ph.D. Programme in respective subject, along with the name of the Guides and area of research shall be notified by the University.</p> <p>(iii) The Entrance Test for admission to the Ph.D.</p>	

the Ph.D. Programme shall consist of two Papers: One general aptitude test (on lines with CSIR-UGC/UGC NET) and the other on the subject in which the candidate desires to take admission. The procedure for the tests and exemption shall be as provided in subsections below.

- a. Paper I shall be a Research Aptitude Test on the lines of the CSIR-UGC NET examination and shall be different for students of the Faculties of Science and for students of Faculties of Languages and Humanities, Commerce, Management Studies, and Social Sciences. The Paper shall be of two hours duration having multiple choice questions (MCQ) and carry a total of 100 marks.
- b. Paper II shall be subject specific, of two hours duration and shall carry a total of 100 marks. The Paper shall consist of multiple choice/ objective type questions for 50 marks and theoretical/ descriptive questions for 50 marks. However, in

Programme shall consist of two Papers: One general aptitude test (on lines with CSIR-UGC/UGC NET) and the other on the subject in which the candidate desires to take admission. The procedure for the tests and exemption shall be as provided in subsections below.

- a. Paper I shall be a Research Aptitude Test on the lines of the CSIR-UGC NET examination and shall be different for students of the Faculties of Science and for students of Faculties of Languages and Humanities, Commerce, Management Studies, and Social Sciences. The Paper shall be of two hours duration having multiple choice questions (MCQ) and carry a total of 100 marks.
- b. Paper II shall be subject specific, of two hours duration and shall carry a total of 100 marks. The Paper shall consist of multiple choice/ objective type questions for 50 marks and theoretical/ descriptive questions for 50 marks. However, in interdisciplinary Programmes such as Marine Science, Paper II shall be set in the respective

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interdisciplinary Programmes such as Marine Science, Paper II shall be set in the respective subject specialization of the candidates. Each candidate is permitted to answer questions only from the respective specialisation.

- c. Syllabi for the Papers shall be as per CSIR-UGC/UGC NET examinations.
- d. In case of subjects which are not included under NET, such as those Subjects under Life Sciences, the concerned Department shall set the syllabus which shall be notified while announcing the admission.
- e. Admission to the Ph.D. Programme shall be twice a year: In July/ August through Entrance examination, and in January for those candidates who are exempted from Entrance Test. However, the facility is also extended to those Candidates who are successful in the Entrance Test of July/ August of the same academic year or the preceding academic year.

subject specialization of the candidates. Each candidate is permitted to answer questions only from the respective specialisation.

- c. Syllabi for the Papers shall be as per CSIR-UGC/UGC NET examinations.
- d. In case of subjects which are not included under NET, such as those Subjects under Life Sciences, the concerned Department shall set the syllabus which shall be notified while announcing the admission.
- e. Admission to the Ph.D. Programme shall be twice a year: In July/ August through Entrance examination, and in January for those candidates who are exempted from Entrance Test. However, the facility is also extended to those Candidates who are successful in the Entrance Test of July/ August of the same academic year or the preceding academic year.

f. The Entrance Test shall be followed by a personal interview in the concerned Department. The recognized Guides of the concerned Department of Goa University shall be the members of the Departmental Selection Committee. In case of Subjects not offered at the University Departments, the personal interview shall be conducted at the respective Research Centres. However, if the same subject is offered in more than one Centre, the personal interview shall be conducted jointly in one of the Centres. The number of vacancies shall depend on the number of existing students per faculty member, the available specialization among the Guides, and the research interest of the candidate as indicated in the application.

g. While grading the candidates for admission to Ph.D. Programme, in addition to the percentage of marks obtained in the written test and qualifying examination, the overall temperament/ behaviour of the

f. The Entrance Test shall be followed by a personal interview in the concerned Department. The recognized Guides of the concerned Department of Goa University shall be the members of the Departmental Selection Committee. In case of Subjects not offered at the University Departments, the personal interview shall be conducted at the respective Research Centres. However, if the same subject is offered in more than one Centre, the personal interview shall be conducted jointly in one of the Centres. The number of vacancies shall depend on the number of existing students per faculty member, the available specialization among the Guides, and the research interest of the candidate as indicated in the application.

g. While grading the candidates for admission to Ph.D. Programme, in addition to the percentage of marks obtained in the written test and qualifying examination, the overall temperament/ behaviour of the student shall also be assessed. While making

student shall also be assessed. While making a recommendation, the availability of an Academician/Scientist to guide a candidate shall be considered.

(i) Candidates who have been selected for admission to the Ph.D. Programme shall be placed under category A.

(ii) Candidates who have not been selected for admission to the Ph.D. Programme shall be placed under category B.

h. Subsequent to the interview, the Head of the Department/ Research Centre shall forward the details of the admission process in selecting the candidates to the Academic Section of Goa University.

i. The Lists of selected candidates shall be placed before the University Ph.D. Admission Committee for consideration. The recommendations of the Committee shall be approved by

a recommendation, the availability of an Academician/Scientist to guide a candidate shall be considered.

(i) Candidates who have been selected for admission to the Ph.D. Programme shall be placed under category A.

(ii) Candidates who have not been selected for admission to the Ph.D. Programme shall be placed under category B.

h. Subsequent to the interview, the Head of the Department/ Research Centre shall forward the details of the admission process in selecting the candidates to the Academic Section of Goa University.

i. The Lists of selected candidates shall be placed before the University Ph.D. Admission Committee for consideration. The recommendations of the Committee shall be approved by the Vice-Chancellor and thereafter the lists so approved shall be



<p>the Vice-Chancellor and thereafter the lists so approved shall be published on the University website.</p> <p>(iv) Exemption from the Entrance Test: Candidates who have qualified in the examinations of apex bodies such as CSIR-UGC/UGC NET JRF/ lecturership, SET/SLET examination of different Indian States/ GATE with a valid certificate, or regular M.Phil. Degree holders admitted on the basis of Entrance Examination and interview shall be exempted from appearing for the Entrance Test. Such shall be eligible to appear for an interview in the concerned Department.</p> <p>(v) Application for inter-disciplinary research and for change of Subject/ Faculty shall be considered on the basis of the candidate's proven ability and the results of the Entrance Test/qualifying CSIR-UGC/ UGC NET examination in any allied subjects, which shall be drawn up</p>	<p>published on the University website.</p> <p>(iv) Exemption from the Entrance Test: Candidates who have qualified in the examinations of apex bodies such as CSIR-UGC/UGC NET JRF/ lecturership, SET/SLET examination of different Indian States/ GATE with a valid certificate, or regular M.Phil. Degree holders admitted on the basis of Entrance Examination and interview shall be exempted from appearing for the Entrance Test. Such candidates shall be eligible to appear for an interview in the concerned Department.</p> <p>(v) Application for inter-disciplinary research and for change of Subject/ Faculty shall be considered on the basis of the candidate's proven ability and the results of the Entrance Test/qualifying CSIR-UGC/ UGC NET examination in any allied subjects, which shall be drawn up and notified by the University, followed by a personal interview in the Department, where the registration is sought.</p>	<p>Word added</p> <p><a href="#">(Back to Index)</a> <a href="#">(Back to Agenda)</a></p>
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<p>and notified by the University, followed by a personal interview in the Department, where the registration is sought.</p> <p>(vi) The Department Selection Committee shall formally allocate a selected candidate to the respective Guide depending on the number of vacancies announced by the Guide. Preference shall be given to those who have been awarded JRF in the CSIR-UGC/UGC NET examination.</p> <p>(vii) Only the predetermined number of students declared by the University on its website, shall be admitted to the Ph.D. Programme in the respective Departments.</p>	<p>(vi) The Department Selection Committee shall formally allocate a selected candidate to the respective Guide depending on the number of vacancies announced by the Guide. Preference shall be given to those who have been awarded JRF in the CSIR-UGC/UGC NET examination.</p> <p>(vii) Only the predetermined number of students declared by the University on its website, shall be admitted to the Ph.D. Programme in the respective Departments.</p>	
<p>(viii) The admission to the Ph.D. Programme shall be based on the State Reservation Policy.</p> <p>(ix) A candidate from another University seeking Ph.D. registration in this University shall obtain a provisional statement of eligibility from this</p>	<p>(viii) The admission to the Ph.D. Programme shall be based on the State Reservation Policy.</p> <p>(ix) A candidate from another University seeking Ph.D. registration in this University shall obtain a provisional statement of eligibility from this University by applying for the same in the prescribed form and paying the prescribed fees.</p>	

<p>University by applying for the same in the prescribed form and paying the prescribed fees.</p> <p>(x) A list of teachers/ scientists recognized by the University as Guides for the Ph.D. Programme in various Subjects together with the names of the University Departments/ Research Centres to which they are attached shall be available for reference in the University Office and on the University website.</p> <p>(xi) Every candidate shall have to compulsorily reside within the territorial jurisdiction of Goa University during the first three years of the period of research leading to Ph.D. Degree.</p> <p>(xii) In special cases, the Academic Council may permit a confirmed candidate to reside outside the territorial jurisdiction of Goa University for the conduct of research work on the</p>	<p>(x) A list of teachers/ scientists recognized by the University as Guides for the Ph.D. Programme in various Subjects together with the names of the University Departments/ Research Centres to which they are attached shall be available for reference in the University Office and on the University website.</p> <p>(xi) Every candidate shall have to compulsorily reside within the territorial jurisdiction of Goa University during the first three years of the period of research leading to Ph.D. Degree.</p> <p>(xii) In special cases, the Academic Council may permit a confirmed candidate to reside outside the territorial jurisdiction of Goa University for the conduct of research work on the recommendation of the Department Research Committee (DRC) constituted as specified in OA-19.3(ii), the HOD and</p>	<p style="text-align: right;"><a href="#">(Back to Index)</a> <a href="#">(Back to Agenda)</a></p>
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<p>recommendation of the Department Research Committee (DRC) constituted as specified in OA-19.3(ii), the HOD and the Dean of the concerned faculty.</p> <p>(xiii) In case of relocation of a Ph.D. Research Scholar due to reasons such as marriage, or change of job by the Guide, the research data shall be allowed to be transferred to Goa University provided all other conditions of the Ordinance are followed in letter and spirit, and the research work does not pertain to the project secured by the parent institution/ supervisor from any funding agency. In such a case, the scholar shall have to give due credit to the parent Guide and the Institution for the part of the research already done. Similarly, in the event of a Guide leaving Goa University, she/he may be permitted to transfer the Ph.D. Research Scholar to her/his new place of work provided the Ph.D. Research Scholar has no objection for the same.</p>	<p>the Dean of the concerned faculty.</p> <p>(xiii) In case of relocation of a Ph.D. Research Scholar due to reasons such as marriage, or change of job by the Guide, the research data shall be allowed to be transferred to Goa University provided all other conditions of the Ordinance are followed in letter and spirit, and the research work does not pertain to the project secured by the parent institution/ supervisor from any funding agency. In such a case, the scholar shall have to give due credit to the parent Guide and the Institution for the part of the research already done. Similarly, in the event of a Guide leaving Goa University, she/he may be permitted to transfer the Ph.D. Research Scholar to her/his new place of work provided the Ph.D. Research Scholar has no objection for the same.</p>	
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(xiv) A list of students registered for the Ph.D. Programmes including the name of the registered candidate, topic of her/his research, name of her/his Guides, Co-Guide, if applicable, and date of registration shall be maintained on the university website on a year to year basis.

(xiv) A list of students registered for the Ph.D. Programmes including the name of the registered candidate, topic of her/his research, name of her/his Guides, Co-Guide, if applicable, and date of registration shall be maintained on the university website on a year to year basis.

**OA-19A.2A Admission Procedure for the Foreign Students:**

- (i) Each Department/Centre shall announce Ph.D seats for foreign students, area-wise, on a supernumerary basis in January and July/August. The supernumerary seats would be about 15 percent of total seats offered.\*
- (ii) The foreign students may apply either through their Government/ICCR Scholarship or on a self-financing basis. In case they apply on a self-financing basis, they shall submit proof of having sufficient means of meeting the financial costs of their entire education (such as bank statement of the students or their parents).
- (iii) The foreign students applying from their respective countries shall apply 'in absentia' and appearing for the Entrance Test and Personal Interview shall not be mandatory for them.
- (iv) The foreign students shall send the application to the Registrar, Goa University with copies to the Head of the Concerned Department/Centre and the Director, International Office, Goa University

Separate provision has been made to admit Foreign Students.

giving full details of the subject/area applying for, a preliminary research proposal giving the Objectives, Scope, Hypothesis, Methodology and Tentative Chapterisation of about 1000 words and certified scanned copies of their School/College/Degree certificates.

- (v) In case the Department/Centre gives in principle approval for accepting the student, the Academic Section shall decide on the issue of a letter of Provisional Eligibility, which can be used by the student to initiate his/her visa formalities.
- (vi) After the admission to the Ph.D. programme, the foreign students shall be guided by the same Ordinance, rules and framework as applicable to other students of Goa University.

\* The formula for determining number of supernumerary Ph.D. seats available in a Department/Centre shall be as follows:

$$N=(t \times 0.15) - f$$

Where n is number of supernumerary Ph.D. seats available to foreign students/ applicants, t is the total number of Ph.D. seats in the Department/Centre (calculated upon the basis of 8 seats per Professor, 6 seats per Associate Professor and 4 seats per Assistant Professor), and f is the number of supernumerary seats already occupied.

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**D 5.5 Proposed part amendment to Ordinance OA 5.16 Instructions relating to the grace mark at the University Examinations.**

**Annexure I**

Existing Provisions		Proposed Provisions		Justification
OA-5.16.1C.(i)	Sports Merit Marks allotted to a student passing on his/her own merit shall be indicated separately in the mark sheet and shall be counted for the purpose of class, honours or distinction. However, unless otherwise eligible, the same shall not be counted for the purpose of obtaining any University scholarship, prizes, medals or placement in order of merit/rank for the said exam.	OA-5.16.1C.(i)	Sports Merit Marks allotted to a student passing on his/her own merit shall be indicated separately in the mark sheet and shall be counted for the purpose of class, honours, distinction, admission to an educational institution or job. However, unless otherwise eligible, the same shall not be counted for the purpose of obtaining any University scholarship, prizes, medals or placement in order of merit/rank for the said exam.	Sports achievements should be encouraged and the marks earned should be acknowledged and students be given the advantage for availing academic and job opportunities.

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D 5.6 To consider the Representation received from students of V.M. Salgaocar College of Law regarding amended Ordinance OC-34A and OC-35A.

Annexure I

From:-  
K. Krubeshwaran  
H. No. A/F-2 Neelgagan Appts.  
Arlem-Raia, Salcete-Goa  
PINCODE : 403720  
Mobile no. 9923901323

Date : 17.08.2017

**MATTER MOST URGENT**

To,

1. Her Excellency, Smt. Mridula Sinha  
Governor of Goa,  
Raj Bhavan, Dona Paula - Goa
2. <sup>Registrar</sup>~~The Chancellor~~  
Goa University  
Goa.
3. The Vice Chancellor  
Goa University  
Taleigao Plateau-Goa.
4. The Dean – Faculty of Law  
V.M. Salgaocar College of Law  
Miramar-Goa.

**Subject : Representation with regards to:  
your Amended Ordinance dated 26-07-  
2017 no. OC-34A 1.3 – (ii), (ii)A, (iii),  
(iii)A, (iv), (iv)A, (v), (v)A, (vi).**

Your Excellency,

The students of batch 2015-2016 admitted at the V.M.  
Salgaocar College of Law, Miramar, Panjim-Goa have to make the  
following Representation :-

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1. That an amended Ordinance dated 26-07-2017, No. OC-34A 1.3 – (ii), (ii)A, (iii), (iii)A, (iv), (iv)A, (v), (v)A, (vi) has been brought out, surprisingly in the middle of the semester and after the admissions for the Academic Year 2017-2018.
2. That on perusal of the said Ordinance it is seen that the Amended Ordinance is applicable only to the students admitted to the First Year B.A LLB/ B.Com LLB for the academic year 2016-2017 onwards, and further candidates who are eligible to appear for Semesters I & II shall be eligible for admissions to the second year irrespective of any backlogs in Semester I & II and so on.
3. We the Batch of 2015-2016 (now in the third year of the BA LLB course) have been left out and this facility is denied and is not extended to us, therefore the students who have not been successful in the III & IV Semester Examination held in April 2017 have been denied of this facility.
4. Having denied the said facility to the Students of Batch 2015-2016, these students **could not seek admission** to the current Academic Year **2017-2018**, but students of Batch 2016-2017 who had backlogs were admitted to the current Academic year 2017-2018 on 4<sup>th</sup> and 5<sup>th</sup> August 2017 by virtue of the said Amended Ordinance dated 26-7-2017 No. OC-34A.

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5. The students of Batch 2016-2017 with backlogs have also been admitted for the current Academic year 2017-2018 and have also been accommodated in the middle of the Semester.
6. Furthermore, to our utter surprise vide notice dated 16/08/2017 issued by Dr. M.R.K. Prasad, Principal, V.M. Salgaocar College of Law, we understand that the LL.B degree students enrolled in the academic year 2016-2017 have also been given the same facility of seeking admission irrespective of any backlogs in the previous semesters and therefore can now seek fresh admissions on 17<sup>th</sup> and 18<sup>th</sup> August 2017.

However the students of Batch 2015-2016 with backlogs have been precluded from taking admissions to the current academic year 2017-2018.

Furthermore the batch of 2015-2016, as seen above is denied the Right of Equality as per Article 14 of our Constitution.

Your Excellency, will realise from the above that the Amendment to the said Ordinance dated 26-7-2017 No. OC-34A is causing great prejudice, and is totally unfair and biased towards the students of batch 2015-2016, vis-a-vis the students of batch 2016-2017, thereby crushing dreams of young, energetic and enthusiastic students from pursuing their career in Law.

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In view of the above the students of Batch 2015-2016 seek the intervention of Your Excellency, to also include the students of batch 2015-2016 and to rectify the Amended Ordinance dated 26-7-2017 No. OC-34A on an urgent basis and save the precious Academic year of these students as the rights of these students are to be protected and not violated.

These Students shall remain forever grateful for your kindness.

Respectfully yours,



( K. Krubeshwaran)  
*Representative of the*  
*Students of Batch 2015-2016*

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Amended OC-34A Ordinance of Goa University as  
obtained from Goa University website as on 17/08/2017

OC-34A.1.3

(Notified on 25<sup>th</sup> July, 2017) ELIGIBILITY FOR ADMISSION

(i) **ELIGIBILITY FOR ADMISSION TO FIRST YEAR B.A. LL.B. and/or B.Com. LL.B.**

Candidates who have passed the Higher Secondary of 12<sup>th</sup> Standard examination of Goa Board of Higher Secondary Education or any other equivalent examination recognized by Goa University in any stream of knowledge with a minimum of 45% marks (40% marks in case of SC/ST applicants and 42% for OBC applicants) shall be eligible for admission to the First Year provided the candidate:

- a) (effective from 6<sup>th</sup> November, 2015) – Deleted --
- b) appears and is declared passed at the common or college entrance examination.
- c) If the candidate is from any Board or University other than Goa Board of Higher Secondary Education the candidate obtains the eligibility certificate from Goa University.

OC-34A.1.3

(Notified on 26<sup>th</sup> July, 2017) ELIGIBILITY FOR ADMISSION:

(ii) **ELIGIBILITY FOR ADMISSION TO SECOND YEAR OF B.A. LL.B. and/or B.Com. LL.B.**

A candidate who has passed the first semester examination of the integrated Programme shall be eligible for admission to the Second Year of the respective Programme.

- (ii) A (Applicable to students admitted to the first year of B.A. LL.B./B.Com. LL.B. for the Academic Year 2016 – 17 onwards)  
Candidates who are eligible to appear for Semesters I and II shall be eligible for admission to Second Year irrespective of backlogs in Semester I and II.

(iii) **ELIGIBILITY FOR ADMISSION TO THIRD YEAR OF B.A. LL.B. and/or B.Com. LL.B.**

A candidate who has passed the First, Second and Third Semester examinations of the Integrated Programme shall be eligible for admission to the Third Year of the respective Programme.

- (iii) A (Applicable to students admitted to the First year of B.A. LL.B./B.Com. LL.B. for the Academic Year 2016 – 17 onwards)  
Only those candidates, who have passed Semesters I and II, fulfilled the requirement of the Semesters III and IV and have not more than five papers as backlog from Semesters III and IV taken together, shall be considered eligible for admission to the Third Year.

(iv) **ELIGIBILITY FOR ADMISSION TO FOURTH YEAR OF B.A. LL.B. and/or B.Com. LL.B.**

A candidate who has passed the First, Second, Third, Fourth and Fifth Semester examinations of the Integrated Programme shall be eligible for admission to the Fourth Year of the respective Programme.

- (iv) A (Applicable to students admitted to the first year of B.A. LL.B./B.Com. LL.B. for the Academic Year 2016 – 17 onwards)  
Only those candidates, who have passed Semesters I, II, III and IV, fulfilled the requirement of Semesters V and VI and have not more than five papers as backlog from Semesters V and VI taken together, shall be considered eligible for admission to the Fourth Year.

(v) **ELIGIBILITY FOR ADMISSION TO FIFTH YEAR OF B.A. LL.B. and/or B.Com. LL.B.**

A candidate who has passed the First, Second, Third, Fourth, Fifth, Sixth and Seventh Semester examinations of the Integrated Programme shall be eligible for admission to the Fifth Year of the respective Programme.

(v)A (Applicable to students admitted to the first year of B.A. LL.B./B.Com. LL.B. for the Academic Year 2016 - 17 onwards)  
Only those candidates, who have passed Semesters I to VI, fulfilled the requirement of Semesters VII and VIII and have not more than five papers as backlog from Semesters VII and VIII taken together, shall be considered eligible for admission to the Fifth Year.

(vi) (Applicable to students admitted to the first year of B.A.LL.B./B.Com.LL.B. for the Academic Year 2016-17 onwards)  
In respect of the students who appear for more than one Semester, the result of the higher Semester(s) can be declared irrespective of the performance in the lower Semester(s). However, if there is a backlog in the preceding Semester(s), the remark 'Not Cleared Lower Examination(s)' (NCLE) shall be shown in the remark column of the higher Semester in which the student is successful.

**OC-34A.2**

**PROGRAMME STRUCTURE**

The Programme shall be a semester Programme of ten semesters. Each academic year shall consist of two semesters. Each semester shall consist of five courses including the practical courses.

**OC-34A.2.1**

**CONTACT HOURS**

(i) There shall be minimum of 8 contact hours per week in each of the 5 courses of a semester which would include lectures, seminars, workshops and other related classroom and practical activities.

(ii) Each contact hour shall be of 50 minutes.

(iii) The teaching schedule shall be arranged in such a way that five courses shall be taught during each semester. In addition, workload for teaching and guidance of a) legal aid and b) internship shall be calculated separately @ one lecture per week for a batch of 30 students.

(iv) The number of students per class/ division shall be limited to 60. If the intake of students exceeds 60 for a semester, the College should arrange for additional class / division.

(v)The programme shall be 5 years of 10 semesters. Each academic year shall consist of 2 semesters. Each semester shall consist of 5 courses of 100 marks including practicals.

(vi) Every student shall undergo 20 weeks compulsory internship spanning the entire programme. However, such internship shall not be more than 4 weeks in an academic year or at a time.

(vii) In addition, the student shall undergo training at the legal aid clinic established by the college for a minimum duration of 200 hours spanning over the entire programme of 5 years.

**Annexure II**

**PROPOSED PART ADDENDUM TO OC-34A ORDINANCE RELATING TO THE INTEGRATED FIVE YEAR DOUBLE DEGREE PROGRAMME IN LAW BACHELOR OF ARTS AND BACHELOR OF LAWS (B.A.LL.B.) AND/OR BACHELOR OF COMMERCE AND BACHELOR OF LAWS (B.Com.LL.B.)**

Ordinance No.	Existing Provisions	Ordinance No.	Proposed Provisions	Justification
OC-34A.1.3  (ii)	<p><b>ELIGIBILITY FOR ADMISSION: ELIGIBILITY FOR ADMISSION TO SECOND YEAR OF B.A. LL.B. and/or B.Com. LL.B.</b></p> <p>A candidate who has passed the first semester examination of the integrated programme shall be eligible for admission to the Second Year of the respective programme.</p>	OC-34A.1.3  (ii)	<p><b>ELIGIBILITY FOR ADMISSION: ELIGIBILITY FOR ADMISSION TO SECOND YEAR OF B.A. LL.B. and/or B.Com. LL.B.</b></p> <p>A candidate who has passed the first semester examination of the integrated programme shall be eligible for admission to the Second Year of the respective programme.</p>	No Change
(ii) A	NIL	(ii) A	<p>(Applicable to students admitted to the first year of B.A. LL.B./B.Com. LL.B. for the Academic Year 2016 – 17 onwards)</p> <p>Candidates who are eligible to appear for Semesters I and II shall be eligible for admission to Second Year irrespective of backlogs in Semester I and II.</p>	<p><del>Clauses (ii)A, (iii)A,</del> (iv)A, (v)A are added as students coming from different streams taking admission to Law Programme have difficulty in the first year to adjust to the requirement of the Programme. As a result many students fail in the</p>

				<p>first year and essentially loose a year due to existing ATKT rules right from the first year, unlike other streams. As a result, students could not take admission to the next year and thus loose two to three years for failure of even one subject. Hence students cannot complete the programme within the double duration period.</p>
			<b>ELIGIBILITY FOR ADMISSION TO</b>	
<b>(iii)</b>	<b>ELIGIBILITY FOR ADMISSION TO THIRD YEAR OF B.A. LL.B. and/or B.Com. LL.B.</b>	<b>(iii)</b>	<b>THIRD YEAR OF B.A. LL.B. and/or B.Com. LL.B.</b>	No Change
			A candidate who has passed the First, Second and Third Semester	

<p style="text-align: center;"><b>(iii) A</b></p>	<p>A candidate who has passed the First, Second and Third semester examinations of the integrated programme shall be eligible for admission to the Third Year of the respective programme.</p> <p style="text-align: center;"><b>NIL</b></p>	<p style="text-align: center;"><b>(iii) A</b></p>	<p>examinations of the Integrated Programme shall be eligible for admission to the Third Year of the respective Programme.</p> <p>(Applicable to students admitted to the <b>second year of B.A. LL.B./B.Com. LL.B.for the Academic Year 2017 – 18 onwards</b>)</p> <p>Only those candidates, who have passed Semesters I and II, fulfilled the requirement of the Semesters III and IV and have not more than five papers as backlog from Semesters III and IV taken together, shall be considered eligible for admission to the Third Year.</p> <p><b>ELIGIBILITY FOR ADMISSION TO</b></p>	
<p style="text-align: center;"><b>(iv)</b></p>	<p><b>ELIGIBILITY FOR ADMISSION TO</b></p>	<p style="text-align: center;"><b>(iv)</b></p>	<p><b>FOURTH YEAR OF B.A. LL.B. and/or B.Com. LL.B.</b></p> <p>A candidate who has passed the First, Second, Third, Fourth and Fifth</p>	<p>No Change</p>



	<p><b>FOURTH YEAR OF B.A. LL.B. and/or B.Com. LL.B.</b></p> <p>A candidate who has passed the First, Second, Third, Fourth and Fifth semester examinations of the integrated programme shall be</p>		<p>Semester examinations of the Integrated Programme shall be eligible for admission to the Fourth Year of the respective Programme.</p> <p>(Applicable to students admitted to</p>	
(iv)A	<p>eligible for admission to the Fourth Year of the respective programme.</p> <p>NIL</p>	(iv) A	<p>the <b>third year of B.A. LL.B./B.Com. LL.B. for the Academic Year 2018 – 19 onwards</b>)</p> <p>Only those candidates, who have passed Semesters I, II, III and IV, fulfilled the requirement of Semesters V and VI and have not more than five papers as backlog from Semesters V and VI taken together, shall be considered eligible for admission to the Fourth Year.</p>	
(v)		(v)	<p><b>ELIGIBILITY FOR ADMISSION TO FIFTH YEAR OF B.A. LL.B. and/or B.Com. LL.B.</b></p>	No Change

	<p><b>ELIGIBILITY FOR ADMISSION TO FIFTH YEAR OF B.A. LL.B. and/or B.Com. LL.B.</b></p> <p>A candidate who has passed the First, Second, Third, Fourth, Fifth, Sixth and Seventh semester examinations of the</p>		<p>A candidate who has passed the First, Second, Third, Fourth, Fifth, Sixth and Seventh Semester examinations of the Integrated Programme shall be eligible for admission to the Fifth Year of the respective Programme.</p> <p>(Applicable to students admitted to the fourth year of B.A. LL.B./B.Com. LL.B. for the Academic Year 2019 – 20 onwards)</p>	
(v)A	<p>integrated programme shall be eligible for admission to the Fifth Year of the respective programme.</p> <p>NIL</p>	(v) A	<p>Only those candidates, who have passed Semesters I to VI, fulfilled the requirement of Semesters VII and VIII and have not more than five papers as backlog from Semesters VII and VIII taken together, shall be considered eligible for admission to the Fifth Year.</p>	
(vi)		(vi)	<p>(Applicable to students admitted under OC-34A.1.3 (ii)A, (iii)A, (iv)A, and (v) A</p>	

	NIL		In respect of the students who appear for more than one semester, the result of the higher semester(s) can be declared irrespective of the performance in the lower semester(s). However, if there is a backlog in the preceding semester(s), the remark 'Not Cleared Lower Examination(s)' (NCLE) shall be shown in the remark column of the higher semester in which the student is successful.	
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**PROPOSED PART ADDENDUM TO OC-35A ORDINANCE RELATING TO THREE YEAR LL.B. DEGREE PROGRAMME IN LAW**

Ordinance No.	Existing Provisions	Ordinance No.	Amended Provision/Proposal	Justification
<p><b>OC-35A.1.3</b></p> <p style="text-align: right;"><b>(ii)</b></p>	<p><b>ELIGIBILITY FOR ADMISSION</b></p> <p><b>ELIGIBILITY FOR ADMISSION TO SECOND YEAR OF LL.B.</b> Only candidates who have passed the First Semester Examination of the First Year LL.B. shall be eligible for</p>	<p><b>OC-35A.1.3</b></p> <p style="text-align: right;"><b>(ii)</b></p> <p style="text-align: right;"><b>(ii)A</b></p>	<p><b>ELIGIBILITY FOR ADMISSION</b></p> <p><b>ELIGIBILITY FOR ADMISSION TO SECOND YEAR OF LL.B.</b> Only candidates who have passed the First Semester Examination of the First Year LL.B. shall be eligible for admission to the Second Year LL.B.</p>	<p>No Change</p>
<p style="text-align: right;"><b>(ii)A</b></p>	<p>admission to the Second Year LL.B.</p> <p><b>NIL</b></p>		<p>(Applicable to students admitted to the first year of LL.B. Degree for the Academic Year 2016 – 17 onwards) Candidates who are eligible to appear for Semesters I and II shall be automatically eligible for admission to Second Year LL.B. irrespective of backlogs in Semesters I and II.</p>	<p>Cluses (ii)A, (iii)A, are added as students coming from different streams taking admission to law programme have difficulty in the first year to adjust to the requirement of the programme. As a result many students fail in the first year and essentially loose a year due to existing ATKT rules right from the first year, unlike other streams. As a result, students could not take</p>

		(iii)		admission to the next year and thus loose two to three years for failure of even one subject. Hence students cannot complete the programme within the double duration period.
		(iii)A		No Change
(iii)	<p><b>ELIGIBILITY FOR ADMISSION TO THIRD YEAR OF LL.B.</b></p> <p>Only candidates who have passed the First, Second and Third Semester examination shall be eligible for admission to the Third Year LL.B.</p>	(v)	<p><b>ELIGIBILITY FOR ADMISSION TO THIRD YEAR OF LL.B.</b></p> <p>Only candidates who have passed the First, Second and Third Semester examination shall be eligible for admission to the Third Year LL.B.</p>	
(iii)A	<p>examination shall be eligible for admission to the Third Year LL.B.</p> <p>NIL</p>		<p>(Applicable to students admitted to the <b>second year of LL.B. Degree for the Academic Year 2017 – 18 onwards</b>)</p> <p>Only those candidates, who have passed Semesters I and II, fulfilled the requirement of the Semesters III and IV</p>	

			and have not more than five papers as backlog from Semesters III and IV taken together, shall be considered eligible	
(v)	NIL		for admission to the Third Year LL.B. <b>(Applicable to students admitted under OC-35A.1.3 (ii) A and (iii)A</b> In respect of the students who appear for more than one semester, the result of the higher semester(s) can be declared irrespective of the performance in the lower semester(s). However, if there is a backlog in the preceding semester(s), the remark 'Not Cleared Lower Examination(s)' (NCLE) shall be shown in the remark column of the higher semester in which the student is successful.	

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**D 7.1 To consider the recommendation of the Committee to devise a faculty wise common question paper format for the B.A./B.Sc./B.Com. programs under CBCS.**

**Annexure I**

**Report of The Committee Constituted to Devise Faculty Wise Common Question Papers for B.A, B.Sc., and B.Com under CBCS**

The Vice Chancellor has constituted a Committee to discuss the examination schemes and to devise a faculty wise common question paper format for the CBCS at the undergraduate level as per the order No.Gu/Acad-PG/34/question-paper/1315 dated 10/05/2017. The Committee met on 18-5-2017 and 7-6-2017 to discuss the above and to devise a faculty wise common question paper. The Committee noted that the CBCS system of UGC at UG level does not suggest a specific pattern of question paper. The Committee perused the existing question papers of B.A, B.Sc. and B.com and found that different faculties have followed different patterns of question papers. The committee felt that it would be better to have separate formats of question papers for B.A, B, Sc. and B.Com as has been followed.

The Committee members unanimously agreed to suggest one model question paper for B.A (arts and humanities subjects). On the other hand, looking at the different nature of the subjects within the science faculty, the committee has decided to recommend three different patterns of question papers for B.Sc. The committee also decided to recommend two formats of question papers for B.Com as it has both theory papers and practical papers. The question paper pattern for theory papers of B.Com shall be the same as that of the question paper of B.A. Degree. In case of B.Sc. where more than two formats are prescribed, the Committee suggests that the BOS of respective subject to adopt the format suitable to their subject and to follow the same for all papers in that subject. The committee is of the opinion that for an eighty marks question paper, two hours of examination time is not enough therefore recommend for enhancing examination time from present two hours to three hours. In order to provide more choice and flexibility to the students and to the paper setters, the Committee decided to propose straight choice to the students in all sections and in all formats (except practical papers of Commerce) of the question papers. The committee also proposed a common pattern of question paper for 60 Marks SEA Examination, common to all faculties. The model question papers are designed by the Committee only for 4 credit courses. The BOS may be permitted to design the question papers for 1, 2, and 6 credits courses strictly following the pattern provided by the Committee and adopted by the respective BOS for 4 credit courses.

The formats of question papers for B.A (1 set), B.Sc. (3 sets) and B.Com (2 sets) are given in the Annexure-1

The committee discussed the need for ensuring coverage of all topics/modules in the question paper in proportion to the number of lectures allotted to the topic/module. The committee prepared a format as a guideline for the Paper Setters to be filled in and submitted along with the question papers. The recommended format is given Annexure-II.

Committee members thank the Vice Chancellor for entrusting this noble task of preparing model question papers. [\(Back to Index\)](#) [\(Back to Agenda\)](#)

Prof. P.K. Sudarsan  
Chairman

**Members**

1. Prof. Ramesh Pai.....
2. Prof. Savita Kerkar.....
3. Prof. Nina Calderia.....
4. Dr. Anthony Satish B.....

**ANNEXURE-1**  
**CBCS MODEL QUESTION PAPER FOR B.A**

Maximum Marks: 80

Time : 3 Hours.

**Instructions:**

- Section I: Attempt any SIX questions out of 8 (4 Marks each)  
Section II Attempt any FOUR questions out of 6 (8 Marks each)  
Section III Attempt any TWO questions out of 4 (12 Marks each)

Section 1  
Attempt Any SIX

- 1.
- 2
- 3
- 4
- 5
- 6.
- 7.
- 8.

(6 x 4 =24 marks)

Section II  
Attempt Any FOUR

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

(4 x 8 =32 Marks)

Section III



Attempt any TWO ([Back to Index](#)) ([Back to Agenda](#))

- 1.
- 2.
- 3.
- 4.

(2 x 12= Marks)

**CBCS MODEL QUESTION PAPER For B.Sc. (Model-I)**

Maximum Marks: 80

Time : 3 Hours

**Instructions:**

Section 1: Attempt ANY 10 questions out of 14 (2 Marks Each)

Section II Attempt ANY 10 questions out of 14 (6 Marks Each)

Section 1

Attempt any Ten

- 1.
- 2.
- 3.
- 4.
- 5.
- .
- .
- 13.
- 14.

(10 x 2=20 Marks)

Section II

Attempt any Ten

- 1.
- 2.
- 3.
- 4
- .
- .
- 13.
- 14.

(10 x 6=60 Marks)

**CBCS MODEL QUESTION PAPER For B.Sc (Model -II)**

Maximum Marks: 80

Time : 3 Hours

**Instructions:**

Section 1: Attempt ANY 10 questions out of 13 (2 Marks Each)

Section II Attempt ANY 12 questions out of 15 (5 Marks Each)

Section 1  
Attempt any 10

- 1.
- 2.
- 3.
- 4.
  
- 10
- 11
- 13.

(10 x 2=20 Marks)

Section II  
Attempt any 12

- 1.
- 2.
- 3.
- 4.
- 5.
- .
- .
- .
- 12
- 13
- 14
- 15

(12 x 5=60 Marks)

**CBCS MODEL QUESTION PAPER B.Sc (Model III)**

Maximum Marks: 80

Time : 3 Hours

Instructions

- Section 1: Attempt ANY 5 out of 8 (4 Marks Each)  
Section II: Attempt ANY 5 out of 8 (6 Marks Each)  
Section III: attempt ANY 3 out of 5 (10 Marks Each)

Section 1  
Attempt any 5

- 1.
- 2.
  
- 5
- 6
- 7

(5 x 4=20 Marks)

Section III  
Attempt any 5

- 1.
- 2.
- 5.
- 6.
- 7.

(5 x 6=30 Marks)

Section III  
Attempt any 3

- 1.
- 2.
- 3
- 4.
- 5.

(3 x 10= 30 Marks)

**CBCS QUESTION PAPER B.Com (Model I)\***

Maximum Marks: 80

Time : 3 hours

Instructions

Section 1: Question 1 is Compulsory

Section II :Attempt ANY THREE out Five

Section 1

- 1.

(1 x 20=20 Marks)

Section II  
Attempt any Three

- 1.
- 2.
- 3.
- 4.
- 5.

(3 x 20=60 Marks)

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\*For Practical Papers Accountancy, Costing and Income Tax

**CBCS MODEL QUESTION PAPER B.Com (Model II)**

Maximum Marks: 80

Time : 3 Hours

**Instructions:**

Section I: Attempt any SIX questions out of 8 (4 Marks Each)

Section II: Attempt any Four questions out of 6 (8 Marks Each)

Section III Attempt any two questions out of 4 (12 Marks Each)

Section 1

Attempt Any SIX

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

(6 x 4 =24 marks)

Section II

Attempt Any FOUR

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

(4 x 8 =32 Marks)

Section III

Attempt any TWO

- 1.
- 2.
- 3.
- 4.

(2 x 12= Marks)

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**CBCS MODEL QUESTION PAPER For 60 Marks Paper**  
**(Common For B.A, B.Sc. and B.Com)**

Maximum Marks: 60

Time : 3 Hours

**Instructions:**

Section I: Attempt any Five questions out of 7 (2Marks Each)

Section II: Attempt any Five questions out of 7 (4 Marks Each)

Section III Attempt any two questions out of 4 (10 Marks Each)

Section 1  
Attempt Any Five

- 1.
- 2
- 3
- 4
- 5
- 6.
- 7.

(5 x 2 =10 marks)

Section II  
Attempt Any Five

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.

(5 x 4 =20 Marks)

Section III  
Attempt any TWO

- 1.
- 2.
- 3.
- 4.

(2 x 10= 20 Marks)

**ANNEXURE-II**  
**GUIDELINE FOR PAPER SETTERS**

Formats to be filled by the Paper setter

Questions: Section I	Marks	Module No.s
1		
2		

3		
4		
5		
6		
7		
8		
.		
Questions: Section	Marks	Module No.s
II		
1		
2		
3		
4		
5		
6		
.		
Questions Section:	Marks	Module No.s
III		
1		
2		
3		
.		

Modules	No. of Lectures Allotted to Each Module	Marks Assigned to Each Module by the Paper setter	Ratio of Lectures to marks *
I	15	20	0.75
II			
II			
IV			
V			

\*Ideally the ratio for each module should be 0.75 (60 lectures/80 Marks). But it may vary between 0.65 to 0.85. For Example, if Module I has been allotted 15 hours of teaching/contact, then the marks assigned to Module I should be 20 so that the ratio 0.75 is maintained.

Signature of The Paper Setter

Signature of The Chairperson

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## D 7.2 Recognition of Indian Council of Higher Education, India, Navi Mumbai for admission to degree programs of Goa University.

Annexure I

(An Autonomous Institute Approved by Ministry of HRD, India)

**Indian Council of Higher Secondary Education, India**  
**भारतीय उच्च माध्यमिक शिक्षा परिषद, भारत.**

115, Shiksha Bhawan Sector 21, Opp. Central Park, Kharghar, Navi Mumbai - 410210.  
M : 8291821241/42/43/44/45 www.ichseindia.com / E-mail: info@ichseindia.org

Ref: ICHSE/Navimumbai/Equivalency/NI

000177

Date: JUN 2017

सेवा मे,

Vice Chancellor, Goa University, Sub  
Post Office Goa University, Taleigao  
Plateau, Goa-403206

GOA UNIVERSITY  
Taleigao Plateau  
14/2017  
Date: 29/6/17

विषय : भारतीय उच्च माध्यमिक शिक्षा परिषद भारत द्वारा संचालित हायस्कूल (१० वी) तथा इण्टरमीडिएट (१२वी) कमजोर मैकेन्डरी (मेट्रिक) तथा सीनियर मैकेन्डरी (हायर मैकेन्डरी) के समकक्ष मान्यता घोषित करने के सम्बन्ध में |

महोदय,

निवेदन है कि उक्त न्याय/ बोर्ड की स्थापना भारतीय न्याय अधिनियम १८८२ एवं भारतीय रजिस्ट्रेशन अधिनियम १९०६ के अन्तर्गत दिनांक १ मई २०१३ को एक स्वायत्त शासी संस्था (ऑटोनॉमस बॉडी) के रूप में की गई है | चूंकि न्याय/ बोर्ड का कार्यक्षेत्र सम्पूर्ण भारत होने के नाते भारत के समस्त हिंदी भाषा प्रदेशों में लाखों छात्र/छात्राएं प्रतिवर्ष परीक्षा उत्तीर्ण कर उच्च शिक्षा एवं वोकेशनल पाठ्यक्रमों में प्रवेश लेंगे तथा उक्त बोर्ड का पाठ्यक्रम अन्य बॉर्डों व पीएनविसिटी कोर्स संचालित करने वाले विश्वविद्यालयों के समकक्ष हैं सेल्फ रिकॉग्निशन एक्ट (हिंदी शिक्षण संस्थान) भाषा दिनांक ०५ मई १९८८ के अनुसार हिंदी संस्थानों को भारत सरकार के शिक्षा विभाग द्वारा हाईस्कूल (दसवीं/मैकेन्डरी) एवं इण्टरमीडिएट (सीनियर मैकेन्डरी/१२वी) के पाठ्यक्रमों का संचालन करना एवं प्रणाम करने की शक्ति प्रदत्त है | तदनुसृत भारत सरकार के ही शिक्षा विभाग द्वारा १२ फरवरी १९९८ के पत्र क्रमांक/ Govt Notification No.2342/E/90 के अन्तर्गत उपरोक्त परीक्षाएं समकक्ष एवं मान्य हैं | सर्वोच्च न्यायालय द्वारा भी ए आई आर/१९९३ जे.पी कृष्णन बनाम आंध्रप्रदेश राज्य संख्या २१७८ के अनुसार स्वायत्त शासी (ऑटोनॉमस) संस्थाओं को शिक्षा एवं प्रमाणपत्र देने का अधिकार प्रदान किया गया है |

भारत सरकार के मिनिस्ट्री ऑफ लेजर एण्ड एम्प्लॉयमेंट एण्ड ट्रेनिंग ने अपने पत्रांक सं DGE&T-UI1011/1/2009-EE-1 दिनांक १५/११/२०१० के अनुसार अवगत कराया है कि नेशनल एम्प्लॉयमेंट सर्विस, एम्प्लॉयमेंट एक्सचेंज मिनिट No - 1/2010/ Ptl-VI/ 7-9 दिनांक ३० सितम्बर २०१० को इस आशय की सूचना भेज दी है कि जो विश्वविद्यालय या संस्थान नकली नहीं है उन संस्थानों में उत्तीर्ण छात्र/मैट्रिकेंट/डिप्लोमा के आधार पर संबंधित जिला सेवायोजना कार्यालय में पंजीकरण कराये | अतः भारतीय उच्च माध्यमिक शिक्षा परिषद, भारत द्वारा प्रदत्त प्रमाणपत्रों के आधार पर सेवा योजना कार्यालय में पंजीकरण कराया जा सकता है | उपरोक्त तथ्यों के आधार पर आपसे अनुरोध है कि उपरोक्त विषयक परिषद के आवेदन पत्र पर सहानुभूति पूर्वक विचार करते हुए उक्त परिषद की स्कूल (१० वी) एवं इण्टरमीडिएट (१२वी) को अन्य परिषदों/ बोर्डों के समकक्ष घोषित करने की कृपा करें | ताकि भविष्य में छात्र/ छात्राओं को आगामी पाठ्यक्रमों में प्रवेश के लिए किसी प्रकार की परेशानी न हो सके | समकक्षता के आदेश के प्रति परिषद कार्यालय को पत्र लिखने की कृपा करें |

विशेष सूचना : उक्त परिषद की अनुमोदन सम्बन्धी MHRD के कार्यालय द्वारा २७ जून २०१६ को स्वीकार कि जा चुकी है .

आभार सहित |

भवदीय .

[Signature]

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**D 7.3 To consider the request made by Prof. G. N. Nayak, Department of Marine Science to review amended Ordinance OA-19A.6 (iv).**

**Annexure I**

GOA UNIVERSITY  
DEPARTMENT OF MARINE SCIENCES

13.07.2017

**NOTE**

Sub: Request to reconsider changes on Ph.D. Guide OA-19A.6(iv)

Ref: 1. No.2/480/2017-Legal (Vol.XIII)/1018 dated 7.7.2017

2. Discussion held with the Vice Chancellor on 13.7.2017 at 1230 hrs

1. Provision in the Goa University Ordinance prior to changes was

(iv) A Guide shall not be permitted to register a candidate for Ph. D. Degree within the period of 3 years prior to superannuation. However, the Guide shall be permitted to register a research scholar with a Co-Guide during the said period. The Guide shall have to give an undertaking that she/he shall be available to provide guidance to the candidate.

2. Provision in the present Goa University Ordinance is

(iv) A Guide shall not be permitted to register a candidate for Ph. D. Degree within the period of 3 years prior to superannuation.

3. UGC Guidelines 2016 has provided the following. Related lines are reproduced here.

6.1 Any regular Professor of the University / Institution Deemed to be a University/College with at least five research publications in refereed journals and any regular Associate/Assistant Professor of the university/institution deemed to be a university/college with a Ph.D. degree and at least two research publications in refereed journals may be recognized as Research Supervisor.

6.2 Only a full time regular teacher of the concerned University/Institution Deemed to be a University/College can act as a supervisor. The external supervisors are not allowed. However, Co-Supervisor can be allowed in inter-disciplinary areas from other departments of the same institute or from other related institutions with the approval of the Research Advisory Committee.

4. UGC under BSR Faculty Scheme permits selected Faculty member to guide candidates for Ph.D. degree.



5. Considering the statement in the UGC guidelines, "The external supervisors are not allowed", following changes in the Goa University Ordinance is suggested.

(iv) A Guide shall be permitted to register a candidate for Ph. D. Degree with a Co-Guide during the period of 3 years prior to superannuation. The Co-Guide shall act as Guide upon superannuation of Guide and Guide may continue as a Co-guide to provide guidance to the candidate. In case the candidate has submitted synopsis before superannuation of Guide, then Guide continues as the main Guide.

#### **Justification**

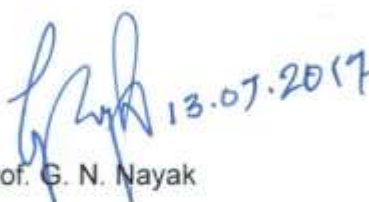
a. As per UGC Regulations, a full time regular teacher of Goa University can act as a Guide / Supervisor.

b. A full time regular and experienced teachers are not allowed to guide as per the changes brought out in the Ordinance for a period of 3 years prior to superannuation.

c. Not allowing an experienced teacher to guide is disadvantage to the students of Goa University and therefore changes brought out may not be in the interest of younger generation.

d. Executing research projects with research staff of the project registering for Ph.D. with another guide is not good for smooth conducting of the project. It ends up with discouragement to take up research projects last three years for active researcher and may affect research output of University.

d. Upon retirement in Goa University no faculty member retains his/her chamber / space.

  
Prof. G. N. Nayak

To,

The Vice Chancellor,  
Goa University

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[\(Back to Index\)](#) [\(Back to Agenda\)](#)

D 7.4 Report submitted by the Committee constituted to examine the provisions for students with special needs.

Annexure I

REPORT

**I - Minutes of the meetings of the Committee for Examining provisions of the ordinance for the students with special needs.**

- i) First Meeting held on 20/12/2016 in Deans office GMC Bambolim at 2.30 p.m.

The meeting was attended by all the members of the Committee namely the chairperson Dr.Pradeep Naik, Members Dr.Ketan Govekar and Shri.Vasant V. Sail.

The Chairperson of the meeting welcomed the members and explained them the need and purpose of forming the special committee by the Academic Council of the Goa University. He also briefed the members about the existing facilities provided to the students with special needs appearing the College and University examinations under OA-12.41.

Shri.Vasant Sail the member of the committee said that the existing provisions are not adequate to take care of the needs of the special students answering the examinations at College and University.

Dr.Ketan Govekar expressed his view that we need to examine the facilities provided by other educational institutions and also refer the provisions of the legislation giving such rights to the children with special needs seeking education.

The chairperson of the committee agreed to the views expressed by members and advised them to refer and examine in detail present facilities under OA.12.41, Government Orders and relative literature including legislative provisions so that some relevant issues can be brought in for discussions and deliberations to offer constructive suggestions. The meeting was adjourned till further notice.

- ii) Second meeting held on 17/01/2017 in Deans Office GMC Bambolim at 3.30 p.m.

The meeting was attended by the chairperson of the committee Dr.Pradeep G. Naik and the member Shri.Vasant V. Sail.

After the initial remark the committee discussed and deliberated thoroughly the issues affecting the education of children with disabilities in the College and University such as inclusive education, admission, infrastructural requirements, pedagogical needs, technical and financial support, mobility, social justice, assessment and evaluation, attendance, skill development, learning material, assistive devices, motivational needs, scholarships and other related matters.

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Based on the thorough examinations of the present facilities provided in OA-12-41 and deliberation on literature and legislative provisions protecting the rights of disabled children seeking education, the committee decided to recommend the following measures to the University for consideration:

- i) Amendment in the existing OA.12.41.
- ii) Suggest specific guidelines / instructions to promote and facilitate the education of children with disabilities studying in Colleges and University.
- iii) Establishment of Research Centre at the University to bring in continuous improvement in educational, vocational & skill development facilities.

It was decided to prepare draft proposals for the respective measures and submit to the University for the consideration:

The meeting concluded with expression of gratitude and thanks.

1)Dr.Pradeep G. Naik - Chairperson  
Dean, Goa Medical College  
Bambolim Goa.

2)Dr.Ketan Govekar - Member  
Associate Professor  
Dempe College of Arts & Science  
Miramar, Goa.

3)Shri. Vasant V.Sail - Member  
Associate Professor  
MES College of Arts & Commerce  
Zuarinagar, Goa.



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**I - Proposed Draft for Amendment of OA-12.41**

**OA-12.41**

- A.** The Chief Conductor is authorized to appoint a scribe / reader / Lab-assistant at the University / College examination and grant other facilities for a candidate who is unable to write script on medical grounds or due to disability. The scribe / reader / lab-assistant and other facilities be allowed in the following cases:
- i) To any candidate who has disability upto 40% or more duly certified by the competent medical authority and if so desired by the candidate.
  - ii) In case of sudden illness / accident / injury rendering the candidate unable to write / read the examination provided it is certified by the medical officer.
  - iii) The candidate may be allowed to meet the scribe / reader / lab-assistant a day before the examination to verify the suitability.
  - iv) In case of emergency, the change in scribe / reader / lab-assistant may be allowed. The candidate may be allowed to take more than one scribe / reader for writing different language papers.
  - v) The compensatory time not less than twenty (20) minutes per hour be allowed for candidates who use scribe / reader / lab-assistant in University / College examination.
  - vi) The candidates with disability as defined in A(i) & (ii) not availing the facility of scribe / reader / lab-assistant may be allowed fifty (50%) percent compensatory time than the normal duration for each paper / subject to a minimum of thirty (30) minute duration.
  - vii) The candidate shall not be charged any extra fees for availing the facility of scribe / reader / lab-assistant and assisting devices.
  - viii) The scribe / reader / lab-assistant shall be paid an honorarium by the University / College as the case may be and as prescribed by the University from time to time.
  - ix) The Chief Conductor shall make separate seating arrangement (separate block) for the candidates using the facility of a scribe / reader / lab-assistant preferably on the ground floor of the premises.

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- x) Candidates may be allowed to use assisting devices like talking calculator in case where calculators are allowed and question paper in enlarged print.
- B.** The candidates with disability as defined in A (i) are entitled to grace marks to the extent of hundred (100%) percent more than the grace marks allotted generally to the candidates appearing in University / College examination.
- C.** The candidates with disability as defined in A (i) are exempted from minimum attendance requirement of seventy - five (75%) percent in University / College examination. However, these candidates need to fulfill a minimum attendance requirement of fifty percent (50%) to appear in the examinations.  
If any such candidate needs further exemption in attendance, he / she may forward the case to the University with appropriate supporting medical documents seeking the exemption. Based on the request of the candidate, the Controller of Examination may decide the extent of further relief in attendance to the applicant.
- D.** The candidates having disability as defined in A (i) seeking alternative mode of examination / evaluation may be referred to the need - based special committee of the University consisting of the Controller of Examination, a Dean of the University and two senior teachers as subject experts.  
The committee based on the merit of the case and viability of alternative mode of evaluation / examination shall submit its decision to the University / College for its implementation.  
The candidate seeking such a customized mode of examination / evaluation should forward his / her request to the University within one month of commencement of the academic year of the programme / course of the University / College.

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**II – Proposed Draft Guidelines / Instructions to promote and facilitate the inclusive education of children with Disabilities in Colleges and University.**

- 1) Introduce comprehensive admission policy for students with special needs specifying the applicable reservation, relaxation and fee waiver (if any) and ensure discrimination free admission.
- 2) Make campus, buildings and other facilities accessible with appropriate ramps, lift and railings. All the footpaths & stairs must have railing on one side and make it free from any barrier.
- 3) Install scholarships, fee concession, financial support schemes to encourage and motivate children with disabilities to seek and sustain inclusive education.
- 4) Provide facilities to detect specific learning disabilities in children and take suitable pedagogical measures to overcome them.
- 5) Make use of assistive devices, recorders, talking books, sign language, interpreters, brail books for communication and learning and provide study material suitable to the students need.
- 6) Suggest suitable alternative mode of assessment required for any such students.
- 7) Introduce skill based vocational short term courses.
- 8) Establish Equity Opportunity Cell to monitor and ensure equal justice and welfare of children with disability.
- 9) Provide placement & Employment opportunities.
- 10) Train teachers to provide suitable pedagogical measures.

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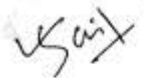
**III Resolution to be moved in the Academic Council for the establishment of Department of Disability Studies.**

The Committee for the special needs and propose suitable amendments would like to move resolution to the Academic Council for introduction of Department of Disability Studies or Centre for Disability Studies with the following objectives:

- 1) To address issues related with disabilities such as :
  - a) Education
  - b) Admission Policies
  - c) Human rights
  - d) Rehabilitation
  - e) Alternative mode of teaching - learning-evaluation
  - f) Infrastructure - physical and technological
  - g) Placement
  - h) Research

**Committee Members:**


- 1)Dr.Pradeep G. Naik - Chairperson  
Dean, Goa Medical College  
Bambolim Goa.
- 2)Dr.Ketan Govekar - Member  
Associate Professor  
Dempe College of Arts & Science  
Miramar, Goa.
- 3)Shri. Vasant V.Sail - Member  
Associate Professor  
MES College of Arts & Commerce  
Zuarinagar, Goa.



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D 7.5 To review the provision of Statutes SC-1 with regards to Corpus Fund to be maintained by affiliated colleges.

Annexure I



VIDYA VIKAS MANDAL

Vidya Vikas Mandal's

## SHREE DAMODAR COLLEGE OF COMMERCE & ECONOMICS

Accredited by NAAC at B Grade with CGPA of 2.81 on a 4-point scale  
Affiliated to Goa University, Recognized by UGC under Sec. 2(f) and 12(B)

Shree Damodar Educational Campus,  
G.R. Kare Road, Tansor, Comba, Margao, Goa - 403601.  
Tel : 0832 - 2714224 Telefax : 0832 - 2732084 E-mail : principal.sdcc@vvm.edu.in  
Website : www.damodarcollege.edu.in

39/1

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Ref: U/2 / 93 /17-18 Date: 08/07/2017

To,  
The Registrar  
Goa University  
Taleigao Plateau  
Goa

Sir,

**Ref: Your letter No. 5/15/Acad.Gen/Aff./583 dated 31/05/2017**

Vide the letter referred above, the College has been asked to maintain a corpus fund of Rs. 15.00 lakh or FDR to be held jointly by the College and the University.

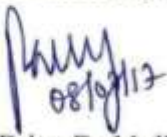
In this regard, I would like to bring your attention to the following:-

1. This issue has been discussed before at the Academic Council, of which I was a member from 2014-16, when AIC reports have been presented, and it has always been agreed, albeit orally, that this condition will not apply to Colleges which were in existence prior to the amendment to SC-1.
2. Furthermore, although this condition has become part of SC-1 on June 17, 2013, there are Colleges established after this date, to which this condition has not been made applicable.

In light of the above I request you to kindly drop the essential condition made by the Affiliation Inquiry Committee.

Thanking you,

Yours faithfully,

  
Dr. Prita D. Mallya  
Principal




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**D 7.6 Nomination of members on General Body of the Goa Board of Secondary and Higher Secondary Education for the term 2017-2021.**

**Annexure I**

**GOA BOARD OF SECONDARY AND HIGHER SECONDARY  
EDUCATION**  
(A Corporate statutory Body Constituted by an Act of the State Legislature)  
ALTO BETIM, BARDEZ-GOA, 403 521.

 Website [www.gbshse.gov.in](http://www.gbshse.gov.in) [sec-gbshse.goa@nic.in](mailto:sec-gbshse.goa@nic.in) Phone (0832) 2417593

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GBSHSE/I.T./Brd-Ele-2017/1573 Date: 13/07/2017

To,  
The Registrar,  
University of Goa,  
Bambolim - Goa

Sub: Reconstitution of the General Body of the Goa Board of Secondary and Higher Secondary Education for the term 2017 - 2021.

Sir/Madam,


The process of reconstituting the General Body of the Board for the term 2017-2021 has been commenced. As per Section 12 (ii) (Amendment) Act 1996 ( to the Principal Act 1975), two members to represent the University of Goa on the Board are to be sent of the Board. The Amendment to Section 12 (ii) is reproduced below for your ready reference.

"(ii) Two members one each from Science and Arts faculties to represent the University of Goa, to be elected by the Academic Council of the University from amongst its members of whom at least one member shall represent the colleges and until the first such elections are held, persons nominated by the Government from amongst the Principals and teachers of the colleges in the State."

The Names of the two elected members may kindly be communicated to this office, at the earliest.

Thanking you,

Yours faithfully,

  
( J. R. Rebello )  
Chairman -

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**D 7.8 Evaluation of present state of Research work of the Ph.D. students registered under Prof. R. B. Lohani in the subject of Electronics and Telecommunication Engineering at Goa College of Engineering.**

**Annexure I**

**GOA UNIVERSITY**  
**MINUTES OF THE MEETING**

A meeting of the Committee constituted vide Order No. 3/620/16/Acad-PG/Ph.D.-ETC/1035 dated 17.7.2017 was held on 27.7.2017 at 10.00 a.m. in the Placement hall to evaluate the present state of Research work of the Ph.D. students registered under Prof. R. B. Lohani in the subject of Electronics and Telecommunication Engineering at Goa College of Engineering.

The following members attended the meeting:

1. Prof. G. M. Naik, Chairperson
2. Prof. Rajesh Prabhugaonkar, Member
3. Prof. K. R. Pai, Member
4. Prof. H. G. Virani, Member
5. Dr. Nitesh Guinde, Member

Prof. V.N. Shet sought leave of absence.

The Chairperson welcomed the members of the Committee.

The Committee discussed various issues relating to the three Ph.D. students registered under Prof. R. B. Lohani. The Committee requested them to make a presentation about their research work and work done till date towards achieving their objectives in their chosen field.

Mr. Satarkar Pandharinath presented his work on Microstrip Patch Antenna using Metamaterial. In his presentation he mentioned that he has completed a lot of survey work and the designing of the Microstrip Antenna. The research scholar informed that he is ready to carry on his research work under a new Guide provided he is allowed to continue on the same area.

Ms. Remya Pillai presented her work in the area of Body Area Networks and also submitted her progress report which was done under the earlier Guide. She was desirous of working on the same topic as she has done a lot of background reading

and studied the tool over a period of two years. In case no options<sup>are</sup> available, the<sup>n</sup> in extreme case, she agreed to change the topic.

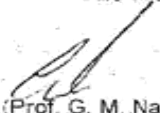
Mr. Gaitonde Jaya presented his research work in the area of some Theoretical Studies on Optical Field Effect Transistor. He feels that<sup>as</sup> he has completed 25% work, he is not ready for change of topic and wants to continue with the same guide. He requested for more time for any changes in his research plan.


All the students submitted their research proposal which was finalized in consultation with their guide. They also submitted their progress report.

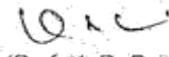
After the presentation the committee discussion and noted following points:

1. The Committee is of the opinion that all the three students have not done adequate literature survey in the chosen field and a lot of work needs to be done in this regards. They are at the initial stage of their research work and have not completed the course work. The objectives of research work presented were not well defined.
2. During the course of discussion, it was brought to the notice of the committee that Prof. R. B. Lohani has been discontinued as research guide. Therefore the committee also looked into the aspect of assigning new guide to the students.
3. There is only one recognised Ph.D. Guide in the area of Electronics and Communication (i.e Prof. Virani). He expressed that the research orientation of these three scholars does not suit his line of working and he would like to be excused from being a Guide to these students.

The meeting ended with thanks to the Chair.

  
(Prof. G. M. Naik)  
Chairperson

  
(Prof. Rajesh Prabhugaonkar)  
Member

  
(Prof. K. R. Pai)  
Member

  
(Prof. H. G. Virani)  
Member

  
(Dr. Nitesh Guinde)  
Member

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D 7.9 Request received from Mr. Andrew Menezes, Research Scholar, Department of Earth Science to waive of his Ph.D. fee.

Annexure I

From: Andrew Menezes  
B-502, Esmeralda Towers  
Voddlem Bhat  
Taliegao-403002.

20<sup>th</sup> July, 2017

To: The Vice-Chancellor  
Goa University  
Taliegao Plateau – 403206

Sub.: Waiver of fees

Sir

I am a PhD student registered in the Dept. of Earth Science of the Goa University since May 2012, under Dr. Kotha Mahender, (P. R. no. 201210084).

I have recently submitted my Synopsis (May 2017) and due to submit my Thesis.

I have paid the fees up to May 2016 (i.e for the 4 years since 2012).

I have been asked to pay fees for the years 2016-17 and 2017-18. In this regard, I seek your munificence for a waiver of fees. I am now a senior citizen and presently my source of income is my pension.

I shall be grateful if the Goa University grants me this assistance.

Thanking you

Sincerely


  
(Andrew Menezes)  
mob.: 9604787249

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D 7.10 Creation of new "Faculty of Pharmacy" or "Faculty of Pharmaceuticals Sciences" as faculty for Interdisciplinary sciences.

Annexure I



**भारतीय भेषजी परिषद्**  
( भेषजी अधिनियम, 1948 के अंतर्गत स्थापित )  
**PHARMACY COUNCIL OF INDIA**  
( CONSTITUTED UNDER THE PHARMACY ACT, 1948 )

तार	Telegram : 'फार्मकाउंसिल' 'FARM COUNCIL'	संयुक्त परिषद् भवन	Combined Councils' Building
दूरभाष	Telephone : 23239184, 23231348	कोटला रोड	Kotla Road
फैक्स	Fax : 011-23239184	ऐवान-ए-ग़ालिब मार्ग	Aiwan-E-Ghalib Marg
ई-मेल	E-Mail : pci@ndb.vsnl.net.in	पोस्ट बॉक्स नं. 7020	Post Box No. 7020
वेबसाइट	Website : www.pci.nic.in	नई दिल्ली - 110002	New Delhi - 110002

Ref.No.14-3/2016-PCI | 38880-39578 27 JUN 2017

To All Universities

**Sub: Christening of faculty of Pharm Sciences as faculty for interdisciplinary sciences.**

Sir/Madam

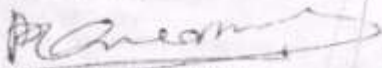
With reference to the subject cited above, I am directed to inform that subject cited matter was considered by 277/EC in its meeting held in June, 2017 in which after threadbare discussion, the following resolution was unanimously taken –

**Resolution**

- Under the Pharmacy Act, 1948 and various Regulations framed u/s 10 of the Pharmacy Act, the PCI approves the following pharmacy courses –  
D.Pharm  
B.Pharm  
M.Pharm  
B.Pharm (Practice)  
Pharm.D.
- It is encouraged that all Universities -
  - shall conduct the pharmacy courses approved under the Pharmacy Act and award diploma/degree certificates under the "Faculty of Pharmacy" or "Faculty of Pharmaceutical Sciences" only.
  - a University / institution which awards pharmacy degrees under the Faculty of Medicine / Science & Technology may also consider shifting to Faculty of Pharmacy/ Faculty of Pharmaceutical Sciences as it will –
    - nurture research in pharmaceutical sciences as pharmacy is a evolving discipline.
    - promote pharmaceutical care through education, research and creative endeavor.
    - help to advance the knowledge, expertise and competence of student pharmacists and pharmaceutical scientists.

This is for necessary action at your end.

Yours faithfully

  
(ARCHANA MUDGAL)  
Registrar-cum-Secretary

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D 8.6 Certificate issued stating that the Sports Marks can be aggregated to the overall marks.

Annexure I

21<sup>th</sup> 2017,  
The Controller of Examination  
Goa, University.

Subject:- To get the certificate from the Goa university  
as my sports merit marks are included for  
the overall percentage.

Respected madam,

I undersigned Shivprasad Rajesh Panohit was  
a bonafide student of Dhempde college of  
arts and science for the academic year  
2016/17. I have passed my T.T. BSc  
(computer science).

I would like to kindly request you to  
please that, I required a certificate from the  
Goa university as the sports merit marks are  
included for overall percentage.

I have got similar certificate from my college  
(copy of attached) on the basis of this certificate.  
I will be able to get the admission in D.Y.  
Patil college of pune for (MBA course)

I kindly request you to do the needful.  
(8237789822).

Thanking you.  
Yours Admirably.  
*Shivprasad*

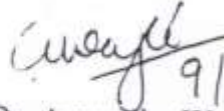
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Ref.: GU/Exam/Under-Grad./2017/860

**TO WHOMSOEVER IT MAY CONCERN**

This is to certify that Shri.Purohit Shivprasad Rajesh had passed the Bachelor of Science (B.Sc.) programme conducted by Goa University, through Dhempe College of Arts & Science, Miramar Goa, which is affiliated to Goa University. It is further certified that the Sports marks earned by Shri Purohit are to be aggregated to the total.

This certificate is issued at the request of Shri.Purohit Shivprasad Rajesh for the purpose of admission for further studies.

  
9/8/2017

Dr. Anuradha Wagle

CONTROLLER OF EXAMINATIONS

Taleigao Plateau, Goa.

Date: 9<sup>th</sup> August, 2017.

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**D 3.12 Minutes of the meeting of Board of Studies in English held on 10/08/2017**

**Annexure I**

**Paper: EGO-130**

**Credits: 01**

**Writing Lives: An Interactive Literary Series**

This course carries forward some of the themes covered in the earlier course on “The Gender of Literatures”. It combines the study of course material with the actual classroom exercise of writing lives. The syllabus would include readings, documentary and cinema. We would look at multiple literary genres – fiction, non-fiction, poetry, drama, pamphlets etc. The syllabus would remain gender-focused but its scope would extend beyond the mere ambit of “Gender Studies” and critique the different ways in which men and women have written lives.

In “writing lives” participants would be encouraged to use course material to sharpen their own offerings. They would work with the instructor to use experience, academic study, “histories”, “geographies” and contexts to produce **short written pieces**.

Those who register should note that this is **NOT** a creative writing workshop but a course that would insist on academic rigour and evidence of careful study. Marks would be assigned for evidence of having studied the prescribed material and for participation in classroom discussions.


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**D 7.14 Request for Issue of Eligibility Certificate to a candidate from Jharkhand State Open School.**

**Annexure I**

1



**भारतीय विद्यालय शिक्षा बोर्ड मण्डल**  
**Council of Boards of School Education in India**  
6H BigJo's Tower, A-8 Netaji Subhash Place, Ring Road, Delhi-110034

**President**  
Off. :

**Ref. No. COBSE/C.99/2015**

**15 June 2015**

**Puran Chand**  
General Secretary  
Off. : (011) 27351264  
Res. : (011) 25624401

**Mr. Gaurav Malik**  
Sangeeta Villa, Behind Tagore Hall  
Morabadi, Ranchi-834008  
(Jharkhand).

**Subject: No objection regarding admission.**

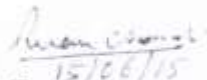
Sir,

Please refer to your letter dated 09.06.2015 regarding eligibility/ equivalence granted by the Board of Secondary Education, Rajasthan: Ajmer (BSER) to the students passing out of the Jharkhand State Open School, Ranchi for admission in class XI/ XII.

In this connection, it is clarified that each Board has framed its own guidelines and eligibility criteria for admission of students from other Boards. COBSE only grants membership to a Board/ Council and does not lay down any eligibility criteria for admission etc. The Boards function within their jurisdiction and COBSE has no power, control, authority or regulation over its member-Boards in their day to day administrative functioning. COBSE does not interfere in the internal affairs of a member-Board.

In view of the Eligibility Certificates No.636325 No.636327 dated 27.12.2014 issued by the Board of Secondary Education Rajasthan (Ajmer) to students of Jharkhand State Open School (JSOS) for admission under BSER and the certificate recorded by the Section Officer, Ministry of External Affairs, Government of India, there is no need for a separate certificate to be issued by COBSE.

Yours sincerely,

  
15/06/15  
(Puran Chand)  
General Secretary

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Telefax : 011-27353351 E-mail: cobseindia@gmail.com Website : www.cobse.org

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## JHARKHAND STATE OPEN SCHOOL

[Registered under Government of Jharkhand]

Shiksha Bhawan, Behind Tagore Hill, Morabadi, Ranchi, Jharkhand-834008

Ph: +91-651-2551111, E-mail ID:contact@jsos.ac.in Website: www.jsos.ac.in

Ref. No:OTH/JSOS/2016-025

Dated: 02/Feb/2016

### PUBLIC NOTICE

It has come to the notice of the Jharkhand State Open School (JSOS) registered under the Govt. of Jharkhand to provide secondary and sr. secondary education to students under open and distance module and to conduct examinations, testing and certification, it has submitted for Membership of Council of Boards of School Education in India (COBSE) under MHRD Govt. of India Vide Ref. No COBSE/C 77/2014 Dated 26 Dec 2014. The pass out students of JSOS, Ranchi are valid for pursuing higher education vide COBSE "no objection" letter ref: COBSE/C.99/2015 dated 15 June 2015.

It is also brought to the notice of public that certificates are issued by the JSOS only after conducting "public examination" at its designated centres and the results are displayed on the official website of JSOS ([www.jsos.ac.in](http://www.jsos.ac.in)). The certificates results of which are displayed on the official website of JSOS would only be validated by the JSOS and for postal verification you are requested to send documents along with a Demand Draft Rs.1000/- in favour of Jharkhand State Open School. Persons coming across any such publications/ information and in receipt of letters or emails containing such allegations are requested to ignore the same and bring them to the notice of the undersigned. In case of any doubt/ clarification in this regard, please establish contact direct telephonic contact which are available on official website of JSOS.



Director  
Jharkhand State Open School  
Ranchi.

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क्रम संख्या/S.NO.: 02541



# झारखण्ड स्टेट ऑपन स्कूल

## JHARKHAND STATE OPEN SCHOOL

इण्टरमीडिएट परीक्षा प्रमाण-पत्र (10+2)  
INTERMEDIATE CERTIFICATE EXAMINATION (10+2)

JUNE-2015

प्रमाण-पत्र सह अंक-पत्र  
(CERTIFICATE-CUM-MARKSHEET)



प्रमाण-पत्र क्रमांक ENROLLMENT NO.	अनुक्रमांक ROLL NO.	केंद्र/विद्यालय कोड CENTRE/SCHOOL CODE	प्रमाण-पत्र क्रमांक CERTIFICATE NO.
100300815420157	12001011	1003008	00005393

प्रमाणित किया जाता है कि  
CERTIFIED THAT

श्री / श्रीमती / कुमारी :

SHR/SMT/KM. **SHAIKH ARFAAZ**जिनके  
WHOSE

पिता का नाम श्री :

FATHER'S NAME IS SHRI **XEC TAJADIN**

माता का नाम श्रीमती :

MOTHER'S NAME IS SMT **SAHIDA BI**तथा जन्मतिथि **01-05-1996**AND DATE OF BIRTH IS **(FIRST MAY NINETEEN NINETY SIX)**

इण्टरमीडिएट सर्टिफिकेट परीक्षा केंद्र / संस्था

HAS APPEARED IN THE INTERMEDIATE CERTIFICATE EXAMINATION FROM  
SCHOOL / CENTRE **SAHARSH INSTITUTE OF IT & MANAGEMENT**

से सम्मिलित हुए

एवं उक्त परीक्षाफल

AND HAS BEEN DECLARED **PASSED IN FIRST DIVISION**

रह।

परीक्षार्थी के विषयवार प्राप्ति अंक निम्नवत् हैं। (MARKS OBTAINED BY THE CANDIDATE SUBJECT WISE ARE AS UNDER):-

विषय (SUBJECTS)	विषय कोड (SUBJECT CODE)	अधिकतम अंक (MAXIMUM MARKS)	प्राप्ति (MARKS OBTAINED)		योग (TOTAL)	योग शब्दों में (TOTAL IN WORDS)
			सिद्धि (THEORY)	प्रैक्टिकल (PRACTICAL)		
HINDI	301	100	64		64	SIX FOUR
ENGLISH	302	100	61		61	SIX ONE
ACCOUNTANCY	309	100	65		65	SIX FIVE
ECONOMICS	313	100	63		63	SIX THREE
BUSINESS STUDIES	311	100	62		62	SIX TWO
कुल योग एवं परिणाम GRAND TOTAL & RESULT	PASS	FIRST DIVISION			315/500	THREE ONE FIVE

स्थान / Place : रांची/Ranchi

दिनांक / Dated : 20-08-2015



परीक्षा नियंत्रक  
Controller of Examination  
Jharkhand State Open School  
Ranchi

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नोट : परीक्षार्थी को निर्गत करने के पूर्व विद्यालय/सेन्टर के प्रधानाचार्य/निदेशक द्वारा यह प्रमाणपत्र प्रतिहस्ताक्षरित किया जाए।  
Note : This certificate shall be countersigned by the Principal / Director of the School / Centre before issue to the Candidate.

Mr Satish Goswami

प्रधानाचार्य/निदेशक का नाम  
(Name of the Principal/Director)

प्रधानाचार्य/निदेशक के हस्ताक्षर  
(Signature of the Principal/Director)

विद्यालय/सेन्टर की मोहर  
(Rubber Stamp of the School/Centre)

तिथि (Date) : 25/08/2015

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S. No. **12279**

**JHARKHAND STATE OPEN SCHOOL  
RANCHI**



**Migration Certificate**

Enrollment No. **100300815420157** Roll No. **12001011**

Shri /Smt./Km. **SHAIKH ARFAAZ** Son/  
Daughter of Shri **XEC TAJADIN** who  
passed at the **INTERMEDIATE** certificate examination year  
**JUNE-2015** of this Jharkhand State Open School in **FIRST** Division is  
hereby informed that this Jharkhand State Open School has no objection  
to his/her prosecuting studies at any other University or Board.



Ranchi  
Date : **20-08-2015**

Controller of Examination  
Jharkhand State Open School  
Ranchi

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नोट : परीक्षार्थी को निर्गत करने के पूर्व विद्यालय/सिन्टर के प्रधानाचार्य/निदेशक द्वारा यह प्रमाणपत्र प्रतिहस्ताक्षरित किया जाए।  
Note : This certificate shall be countersigned by the Principal / Director of the School / Centre before issue to the Candidate.

Mr Satish Goswami

प्रधानाचार्य/निदेशक का नाम  
(Name of the Principal/Director)



विद्यालय/सिन्टर की मुहर  
(Rubber Stamp of the School/Centre)

प्रधानाचार्य/निदेशक के हस्ताक्षर  
(Signature of the Principal/Director)

तिथि (Date) : 25/08/2015

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