



गोंयविद्यापीठ

ताळगांवपठार

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Goa University

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(Accredited by NAAC)

GU/Acad-Admissions/2023-24/128

Date: 09/06/2023

NOTIFICATION

ADMISSION TO MASTER OF SCIENCE IN ARTIFICIAL INTELLIGENCE (M.Sc. Artificial Intelligence) AND MASTER OF SCIENCE IN DATA SCIENCE (M.Sc. Data Science) PROGRAMME FOR ACADEMIC YEAR 2023-24

Applications for admission to the **TWO YEAR Master of Science in Artificial Intelligence (M.Sc. Artificial Intelligence) and Master of Science in Data Science (M.Sc. in Data Science)** Degree Programmes offered at Goa Business School, Goa University for the academic year 2023-24 shall be accepted through the online mode. Interested candidates are informed to visit the Goa University website www.unigoa.ac.in for details.

A. **Eligibility Criteria:**

- Bachelor Degree in Computer Science/Computer Applications/Engineering (Computer Science/Information Technology) or equivalent Degree.

OR

- Bachelor Degree in Mathematics/Statistics/Electronics. Such candidates shall be provisionally admitted until successful completion of Bridge Courses recommended to the students on a case to case basis by the respective mentors assigned to them at the time of Admission to the Programme and approved by the Computer Science and Technology Discipline Council.

Apart from the eligibility conditions mentioned above, a candidate has to qualify in the Entrance Test for M.Sc. in Artificial Intelligence and M.Sc. in Data Science.

B. **Admission Procedure:**

1. Admission to the **M.Sc. Artificial Intelligence and M.Sc. in Data Science** Programme shall be subject to the candidate fulfilling all the eligibility criteria.
2. After scrutiny of the applications received, a list of candidates who will have to appear for the Entrance test will be made available on the University website, www.unigoa.ac.in.
3. Based on the performance in the Entrance test for admission to the **M.Sc. Artificial Intelligence and M.Sc. in Data Science** Programme, the list of candidates selected for admission will be displayed on the Goa University website. Details of the Entrance Test are provided in the **section C** below.

Note: For dates related to submission of application forms for the **M.Sc. in Artificial Intelligence and M.Sc. in Data Science** Programme, Entrance Test and Admission, kindly check our website www.unigoa.ac.in regularly.

C. ENTRANCE TEST DETAILS:

The Entrance Test paper will consist of 50 multiple choice questions with following break-up under the three categories:

- A) Mathematics (20 questions)
- B) Analytical Ability & Logical Reasoning (20 questions)
- C) Basic Concepts of **Artificial Intelligence(for MSc AI) or Data Science(for MSc Data Science)** as the case may be (10 questions)

The duration of the test shall be 90 min.

D. Seat Matrix:

Refer Reservation Guidelines at **Appendix A**

Total Seats under each Programme	SC	ST	OBC	PwD	Other Indian Universities	General/ Unreserved Category	Economic Weaker Section (EWS)
20	1	2	5	1	2	7	2

Reserved Category Seats remaining vacant after the 1st Provisional List of the First Round of Entrance Test shall be transferred to the Un-reserved Category.

Fees:

Annual Fees Rs. 19,740/-(approximate) for each Programme.

Refund of Fees shall be as per the UGC Guidelines, refer **Appendix D**.

E. Filling up of the Online Application Form:

Admissions Portal Link: <https://tinyurl.com/2p8nbxed>

- a. The LAST DATE for submission of applications is **23rd June 2023**.
- b. Candidates are advised in their own interest to apply online much before the closing date and not wait till the last date for applying/payment of application fee to avoid the possibility of disconnection/inability/ failure to log on to the website on account of heavy load on the website.
- c. Goa University does not assume any responsibility to candidates in case they are unable to submit their application by the last date on account of the aforesaid reasons or for any other reason beyond the control of the University.
- d. Printout of the application form is **NOT REQUIRED** to be submitted to the University.
- e. After payment and submission of the application candidates will not be permitted to change your details.

Application Fees (To be paid online through GUMS portal only):

- INR 1000/-
- INR 500/- in case of SC/ST candidates of Goa.*
- No fees shall be charged from Persons with Disability.

*Candidates applying for admission under reserved categories shall be required to submit a certificate to that effect issued by the Officer of the rank of the Deputy Collector or any other authorized Officer as notified by the Government of Goa.

G. Schedule:

The Entrance test shall be conducted in offline mode only, on **3rd July 2023** at **Goa University**.

H. Selection Process:

Lists of Selected Candidates will be declared on the website tentatively by **7th July 2023**. Selected Candidates will be offered admission on a provisional basis and shall have to pay the Seat Confirmation Fee of INR. 5,000/- on GUMS through online mode.

The Admission for the academic year 2023-24 shall be based on the following Ordinances:

OA-20	Ordinance relating to the Policy of Admission to the Post Graduate Academic Programmes of Goa University
OA-35	OA-35 Ordinance governing the M.A., M.Sc. M.Com., M.S.W., M.T.T.M., M.P.Ed., M.L.I.Sc., MBA, MBA (FS), MBA (Executive), MCA and M. Sc. (I.H.T.M.) and other such Masters Programmes of study conducted by the on-campus Schools of Goa University and its Affiliated Colleges based on the Choice Based Credit System of Instruction. (Effective from Academic Year 2022-2023)

CONTACT INFORMATION**Admission Co-ordinators -**

M.Sc. Artificial Intelligence: Shri. S. Baskar

M.Sc. Data Science: Dr. P. Payaswini

Discipline of Computer Science & Technology
Goa Business School, Goa University
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Email ID: dcst@unigoa.ac.in

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Sd/-
(Prof. V. S. Nadkarni)
REGISTRAR

APPENDIX A
RESERVATION GUIDELINES

Reservation of seats for admission to the various Programmes of study shall be on the basis of the Reservation Policy of the Goa State Government.

Candidates applying for admission under the Reserved Categories shall be required to submit a valid Certificate to that effect issued by the Officer of the rank of the Deputy Collector or any other authorized Officer as notified by the Government of Goa.

1. **2%** of seats in each of the Post Graduate programmes of study, subject to a minimum of **one seat**, shall be reserved for candidates belonging to **SC Category** of Goa State.
2. **12%** of seats in each of the Post Graduate programmes of study, subject to a **minimum of one seat**, shall be reserved for candidates belonging to **ST Category of Goa State**.
3. **27%** of total seats, subject to a **minimum of two seats**, for admission to various programmes of study, shall be reserved for candidates belonging to the **Other Backward Classes Non Creamy Layer (OBC) of the State of Goa** as per the directives of the State Government.
4. **5%** of total seats, subject to **minimum one seat** for admission to the various programmes of study shall be reserved for **Person with Disability (PwD) candidates as per State Government directives**.
5. **10%** of seats, subject to a **maximum of two seats and a minimum of one seat** in each programme of study, shall be made available for candidates of other Indian Universities.
6. **10%** of total seats shall be reserved for **Economically Weaker Section of Un-Reserved Category (EWS)** as per the directives of the State Government.
7. **1%** of total seats shall be reserved for **Children of Ex-servicemen**.
8. **15%** of seats, over and above the allotted number of seats, shall be reserved as supernumerary seats for the overseas candidates, who are eligible for admission and are recommended by the Govt. of India under Scholarship from Govt. of India or under exchange programme (ICCR Programme). These seats shall be filled in accordance with the UGC Guidelines. Out of the 15% supernumerary seats, one seat in each program will be reserved for Kashmiri Migrants (KM) as per directives of the UGC.

Percentage of seats mentioned above is subject to change depending upon the Directives of the Goa State Government.

APPENDIX B – PROGRAMME STRUCTURE

M.Sc in Artificial Intelligence

To be effective from Academic Year 2023-24

M.Sc. in Artificial Intelligence Programme is aimed at imparting the following core skills to the students -

1. Artificial intelligence tools and techniques, including problem-solving, knowledge representation, machine learning, computer vision, human-computer interactions and (MIS) information diffusion.
2. Ethical computing and data science, exploring the ethical, legal, social and professional frameworks in which data scientists must operate, in business and society.
3. The application of Artificial Intelligence concepts in Research and real life applications

Pathway

Fundamentals (Mathematics and Problem Solving, Programming) → Core Courses (AI, Machine Learning, Deep Learning, etc.,) → Specialization (Natural Language Processing, Computer Vision) → Research and Dissertation (Core Research – Language Models, or Application Oriented Research or Product Based Research (MLOps, DevOps, Design Thinking , Pragmatic AI)

As per the above pathway vision, the structure for programme has been designed as follows –

M.Sc. in Artificial Intelligence to be effective from Academic Year 2023-24		
SEMESTER I – Total 20 credits		
Discipline Specific Core(DSC) Courses		
Course Code	Course Title	Credits
CSI-500	Fundamentals of Artificial Intelligence	2
CSI-501	Fundamentals of Artificial Intelligence Lab	2
CSI-502	Algorithms and Data structures	2
CSI-503	Algorithms and Data structures Lab	2
CSI-504	Mathematical Foundations for Artificial Intelligence	2
CSI-505	Mathematical Foundations for Artificial Intelligence Lab	2
CSI-506	Data Science Fundamentals	2
CSI-507	Data Science Fundamentals Lab	2
	Total Credits for DSC	16
Discipline Specific Elective(DSE) Courses – any one to be opted		
Course Code	Course Title	Credits
CSI-521	Natural Language Processing	4
CSI-522	Computer Vision	4
CSI-523	Robotics	4
CSI-524	IoT Architecture and Protocols	4
	Total Credits for DSE	4
SEMESTER II – Total 20 credits		
Discipline Specific Core(DSC) Courses		
Course Code	Course Title	Credits
CSI-508	Deep Learning	2
CSI-509	Deep Learning Lab	2
CSI-510	Big Data Frameworks	2
CSI-511	Big Data Frameworks Lab	2
CSI-512	Reinforcement Learning	2
CSI-513	Reinforcement Learning Lab	2

CSI-514	Software Engineering for AI Enabled systems	2
CSI-515	Software Engineering for AI Enabled systems Lab	2
	Total Credits for DSC	16
Discipline Specific Elective(DSE) Courses – any one to be opted		
Course Code	Course Title	Credits
CSI-525	Machine Translation	4
CSI-526	Mathematics for Computer Vision and Robotics	4
CSI-527	Soft computing	4
CSI-528	Regression Analytics and Predictive Models	4
CSI-529	Essentials of Data Analytics	4
	Total Credits for DSE	4
SEMESTER III – Total 20 credits		
Research Specific Elective(RSE) Courses – any two to be opted...		
RSE list		
Course Code	Course Title	Credits
CSI-600	Speech Processing	4
CSI-601	Advanced Machine Translation	4
CSI-602	Simulation and Modelling	4
CSI-603	MLOps	4
CSI-604	Generative Deep Learning Models	4
CSI-605	Data Engineering	4
CSI-606	Sensors , Actuators and Signal Conditioning	4
CSI-607	Signal Processing	4
CSI-608	Image Processing	4
	Total Credits for RSE	8
Generic Elective(GE) Courses - total 12 credits to be opted		
Course Code	Course Title	Credits
CSI-621	Corporate Skills	4
CSI-622	Research Methodology	4
	<i>To be opted from Courses from other Disciplines</i>	4
	Total Credits for GE Courses	12
SEMESTER IV – Total 20 credits		
One Research Specific Elective(RSE) Course to be opted from the RSE list given below in consultation with the Mentor. It can be completed in Semester 3.		
RSE List		
Course Code	Course Title	Credits
CSI-609	Financial Machine Learning	4
CSI-610	AI for Atmospheric Science	4
CSI-611	Pragmatic AI	4
CSI-612	AI for Medical Specialization	4
CSI-613	Design thinking for AI	4
CSI-614	Recommender Systems	4
CSI-615	Text Mining and Sentiment Analysis	4
CSI-616	Digital Twin	4
	Total Credits for RSE Courses	4
Dissertation Type		Credits
CSD-651:	Research Project in Academic or Research Institutes	16
Total Credits for Dissertation		16

APPENDIX C -PROGRAMME STRUCTURE

M.Sc in Data Science

To be effective from Academic Year 2023-24

M.Sc. in Data Science Programme is aimed at imparting the following core skills to the students -

1. Core Programming Skills and Techniques, including designing and coding applications, and the important principles of code design and development.
2. Data science tools and techniques, including the principles of data science, data analysis, visualisation and interpretation, and the use of “big data”.
3. The application of Data Science knowledge in Research and Industry

Pathway

Fundamentals (Mathematics and Problem Solving, Programming) → Core Courses (AI, Machine Learning, Deep Learning, etc.,) → Specialization (Natural Language Processing, Computer Vision) → Research and Dissertation

As per the above pathway vision, the structure for programme has been designed as follows –

M.Sc. in Data Science to be effective from Academic Year 2023-24

SEMESTER I – Total 20 credits

Discipline Specific Core(DSC) Courses

Course Code	Course Title	Credits
CSD-500	<i>Fundamentals of Data science (Theory)</i>	2
CSD-501	<i>Fundamentals of Data science (Practical)</i>	2
CSD-502	<i>Machine learning (Theory)</i>	2
CSD-503	<i>Machine learning (Practical)</i>	2
CSD-504	<i>Mathematical Foundations for Data Science (Theory)</i>	2
CSD-505	<i>Mathematical Foundations for Data Science (Practical)</i>	2
CSD-506	<i>Fundamentals of Artificial Intelligence (Theory)</i>	2
CSD-507	<i>Fundamentals of Artificial Intelligence (Practical)</i>	2
	<i>Total Credits for DSC</i>	16

Discipline Specific Elective(DSE) Courses – any one to be opted

Course Code	Course Title	Credits
CSD-521	<i>Domain specific Predictive Analytics</i>	4
CSD-522	<i>Design thinking for Data-Driven App Development</i>	4
	<i>Total Credits for DSE</i>	4

SEMESTER II – Total 20 credits

Discipline Specific Core(DSC) Courses

Course Code	Course Title	Credits
CSD-508	<i>Reinforcement learning (Theory)</i>	2
CSD-509	<i>Reinforcement learning (Practical)</i>	2
CSD-510	<i>Optimization techniques</i>	4
CSD-511	<i>MLOps(Theory)</i>	2
CSD-512	<i>MLOps (Practical)</i>	2
CSD-513	<i>Software Engineering for AI Enabled systems (Theory)</i>	2
CSD-514	<i>Software Engineering for AI Enabled systems (Practical)</i>	2
	<i>Total Credits for DSC</i>	16

Discipline Specific Elective(DSE) Courses – any one to be opted		
Course Code	Course Title	Credits
<i>CSD-523</i>	<i>Signal processing</i>	4
<i>CSD-524</i>	<i>Regression Analytics and Predictive Models</i>	4
	Total Credits for DSE	4
SEMESTER III – Total 20 credits		
Research Specific Elective(RSE) Courses – any two to be opted...		
RSE list		
Course Code	Course Title	Credits
<i>CSD-600</i>	<i>Speech Processing</i>	4
<i>CSD-601</i>	<i>Natural Language Processing</i>	4
<i>CSD-602</i>	<i>Simulation and Modelling</i>	4
<i>CSD-603</i>	<i>Deep Learning Models</i>	4
<i>CSD-604</i>	<i>Data Engineering</i>	4
<i>CSD-605</i>	<i>Sensors , Actuators and Signal Conditioning</i>	4
<i>CSD-606</i>	<i>Cloud Computing</i>	4
	Total Credits for RSE	8
Generic Elective(GE) Courses - total 12 credits to be opted		
Course Code	Course Title	Credits
<i>CSD-621</i>	<i>Corporate Skills</i>	4
<i>CSD-622</i>	<i>Research Methodology</i>	4
	<i>To be opted from Courses from other Disciplines</i>	4
	Total Credits for GE Courses	12
SEMESTER IV – Total 20 credits		
One Research Specific Elective(RSE) Course to be opted from the RSE list in consultation with the Mentor. It can be completed in Semester 3.		
RSE List		
Course Code	Course Title	Credits
<i>CSD-608</i>	<i>Financial Machine Learning</i>	4
<i>CSD-609</i>	<i>Data Science for Atmospheric Science</i>	4
<i>CSD-610</i>	<i>Pragmatic AI</i>	4
<i>CSD-611</i>	<i>AI for Medical Specialization</i>	4
<i>CSD-612</i>	<i>Recommender Systems</i>	4
<i>CSD-613</i>	<i>Text Mining and Sentiment Analysis</i>	4
	Total Credits for RSEC	4
Dissertation Type		Credits
<i>CSD-651:</i>	<i>Research Project in Academic or Research Institutes</i>	16
OR		
<i>CSA-652:</i>	<i>Industry Internship / Software Project Development</i>	
Total Credits for Dissertation		16

APPENDIX D
REFUND OF COURSE FEES

- a) If a student chooses to withdraw from the programme of study in which s/he is enrolled, the following five tier system shall be followed for the refund of fees remitted by her/him.

Sr. No.	Point of time when notice of withdrawal of admission is served to the Institution	% of refund of Aggregate fees*
1.	15 days or more before the formally notified last date of admission. #	100%
2	Less than 15 days before the formally notified last date of admission.	90%
3	15 days or less after the formally notified last date of admission.	80%
4	30 days or less, but more than 15 days after the formally notified last date of admission.	50%
5	More than 30 days after the formally notified last date of admission.	0%

* Inclusive of tuition fees and non-tuition fees but exclusive of Caution Deposit

Last date of admission shall be notified later on the university website.

- b) In case of (1) in the table above, 5% of the aggregate fees paid by the student, subject to a maximum of Rs. 5,000/- shall be deducted as processing charges from the refundable amount.
- c) All cases of refund of fees will be decided on a case to case basis on its merit.