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(Accredited by NAAC with Grade A+)

GU/Acad –PG/BoS- CDT /2025-26/575 Date: 26.11.2025

CIRCULAR

The syllabus for the Change in Discipline Test (CDT) of **Master of Science in Zoology** Programme, approved by the Academic Council in its meeting held on 7th November 2025 is attached.

The Dean/Vice-Dean (Academic) of the School of Biological Sciences and Biotechnology and the Principals of all the affiliated Colleges are requested to take note of the above and bring the contents of this Circular to the notice of all concerned, including students aspiring to pursue the Master's Programmes.

ASHWIN VYAS LAWANDE
Digitally signed by ASHWIN VYAS LAWANDE
Date: 2025.11.26 18:06:04 +05'30'

(Ashwin V. Lawande)
Deputy Registrar – Academic

To,
1. The Dean, School of Biological Sciences and Biotechnology, Goa University.
2. The Vice-Dean (Academic), School of Biological Sciences and Biotechnology, Goa University.
3. Principals of all the affiliated Colleges.

Copy to:
1. Controller of Examinations, Goa University.
2. Assistant Registrar (Admissions), Goa University.
3. Assistant Registrar Examinations (UG/PG), Goa University.
4. Director, Directorate of Internal Quality Assurance, Goa University for uploading the Syllabus on the University website.

GOA UNIVERSITY

SYLLABUS FOR CHANGE IN DISCIPLINE TEST (CDT) FOR MASTER OF SCIENCE IN ZOOLOGY PROGRAMME

Effective from AY: 2026-27

Modules	Content
Module 1:	**Molecular Biology**
	Structure and types of nucleic acids; mechanisms of DNA replication, transcription, translation, and gene regulation in prokaryotes and eukaryotes; post-transcriptional modifications and DNA repair. Study and interpretation of DNA forms, gene expression processes, and isolation and estimation of nucleic acids using electrophoretic techniques.
Module 2:	**Human Physiology**
	Structure and function of digestive, muscular, respiratory, circulatory, urinary, and reproductive systems; mechanisms of digestion, muscle contraction, respiration, circulation, osmoregulation, and reproduction with hormonal control. Physiological measurements of respiration, cardiovascular function, muscle activity, renal parameters, reflexes, and metabolic indices using standard laboratory techniques.
Module 3:	**Histology and Endocrinology**
	Structure, histology, and functions of major endocrine glands (hypothalamus, pituitary, thyroid, parathyroid, adrenal, testes, and ovaries); hormone types, mechanisms, feedback control, and related disorders.
Module 4:	**Bio-entrepreneurship**
	Concept, scope, and types of entrepreneurships; competencies and processes of enterprise creation with emphasis on animal and life sciences. Opportunity identification, innovation, funding avenues, business organization types, government support schemes, IPR protection, and preparation of business plans for financial assistance.
Module 5:	**Concepts in Genetic Engineering**
	Concept, history, scope, and microbial basis of biotechnology with emphasis on *E. coli* as a model organism. principles of genetic engineering: vectors, enzymes, CRISPR, cloning, sequencing, gene transfer, GMOs, and gene therapy; microbial culture, staining, biochemical tests, DNA isolation, restriction digestion, ligation, and sequencing techniques.

Approved by: Academic Council on 7th November 2025

Module 6:	**Evolution** Origin of Earth and life, major evolutionary theories from pre-Darwinian to modern synthesis, variation, natural selection, isolation, adaptation, and speciation. Population genetics, fossil records, geological time scale, evolution of horse and man, mass extinctions, and evidences of evolution, with practical studies on Hardy–Weinberg equilibrium, allele frequency, and evolutionary trends in key fossil species.
Module 7:	**Biochemistry of Metabolic Processes** Overview of metabolic pathways, energy concepts, and regulation of catabolism and anabolism. Carbohydrate, lipid, and amino acid metabolism, oxidative phosphorylation, and metabolic disorders, biochemical estimations of glucose, lipids, amino acids, and enzyme activity using chromatographic and spectrophotometric methods.
References/ Readings:	1. Ahn, M. J., & Meeks, M. (2008). Building a conducive environment for life science-based entrepreneurship and industry clusters. *Journal of commercial biotechnology*, *14*(1), 20-30. 2. Clark, D. P., & Pazdernik, N. J. (2012). *Molecular biology*. Elsevier. 3. Guyton, A. C., & Hall, J. E. (2011). *Guyton and Hall textbook of medical physiology*. Elsevier. 4. Hall, B. K., & Hallgrímsson, B. (2007). *Strickberger's Evolution:*. Jones & Bartlett Publishers. 5. Hoffman, R., Benz, E. J., Silberstein, L. E., Heslop, H., Weitz, J., & Salama, M. E. (Eds.). (2022). *Hematology E-book: basic principles and practice*. Elsevier Health Sciences. 6. Jain, J. L. (2004). *Fundamentals of biochemistry*. S. Chand Publishing. 7. Lodish, H. F. (2008). *Molecular cell biology*. Macmillan. 8. Neill, J. (2006). *Knobil and Neill's Physiology of Reproduction-Volume 1*. Academic Press. 9. Owen, J. A., Punt, J., Stranford, S. A., & Jones, P. P. (2013). *Kuby immunology* (Vol. 27, p. 109). New York: WH Freeman. 10. Pal, G. K. (2021). *Textbook of Medical Physiology 4th Edition-E-Book*. Elsevier Health Sciences. 11. Plant, T. M., & Zeleznik, A. J. (Eds.). (2014). *Knobil and Neill's physiology of reproduction*. Academic Press. 12. Primrose, S. B., & Twyman, R. (2013). *Principles of gene manipulation and genomics*. John Wiley & Sons. 13. Rodwell, V. W., Bender, D. A., Botham, K. M., Weil, A. P., & Kennelly, P. J. (2015). *Harper's illustrated biochemistry*. McGraw-Hill Education. 14. Shimasaki, C. D. (2009). *The business of bioscience: what goes into making a biotechnology product*. Springer Science & Business Media. 15. Silberstein, L. E., & Anastasi, J. (2017). *Hematology: Basic Principles and Practice E-Book: Basic Principles and Practice*. Elsevier Health Sciences. 16. Strickberger, M. W. (2005). *Evolution*. Jones & Bartlett Learning. 17. Upadhyay, A., Upadhyay, K., & Nath, N. (2003). Biophysical Chemistry Principles & Techniques Handbook. Himalaya Publishing House, 2003.