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(Accredited by NAAC with Grade A+)

GU/Acad –PG/BoS - CDT/2025-26/690 Date: 09.01.2026

CIRCULAR

The syllabus of the Change of Discipline Test (CDT) for **Master of Science in Botany** Programme, approved by the Standing Committee of the Academic Council in its meeting held on 24th & 25th 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 V LAWANDE
Digitally signed by ASHWIN V LAWANDE
Date: 2026.01.09 15:37:21 +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 OF DISCIPLINE TEST (CDT) FOR MASTER OF SCIENCE IN BOTANY PROGRAMME

Effective from AY: 2026-2027

Modules	Content
Module 1	**Diversity of Microbes and Non-flowering plants**
	Viruses - Structure, characteristics, viroids, virusoids and prions; **Bacteria -** Features of eubacteria and archaebacteria, shapes and arrangements; **Fungi -** Characteristics, Ainsworth's classification, morphology of *Mucor, Aspergillus, Agaricus, Saccharomyces*, economic importance; **Lichens -** Characteristics, types, mycorrhiza; **Algae -** Characteristics, thallus variation, morphology of *Nostoc, Spirogyra, Sargassum, Polysiphonia*, importance; **Bryophytes –** Characteristics, morphology of *Riccia, Anthoceros, Funaria*, significance; **Pteridophytes –** Features, morphology and reproduction of *Psilotum, Selaginella, Equisetum, Pteris*; **Gymnosperms –** Characteristics, morphology of *Cycas, Pinus, Gnetum*, importance.
Module 2	**Plant Anatomy, Reproductive Biology and Palynology** Meristems, simple and complex tissues; primary and secondary growth, stem, root and leaf anatomy, Structure of anther, microsporogenesis and megasporogenesis, development of male and female gametophytes, pollination types, ovule types, double fertilization, embryo and seed structure of dicot and monocot, anatomical adaptations to environment. Definition of palynology and pollen morphology - polarity, symmetry, shape, size, aperture (position and shape), sporoderm stratification and exine ornamentation, applications of palynology
Module 3	**Plant Physiology:** Water relations, water potential components, transpiration, ascent of sap, mineral nutrition, macronutrient and micronutrient roles, deficiency symptoms, phytohormones and physiological responses, biological nitrogen fixation and nitrate and ammonia assimilation, vernalization, abiotic stress responses including drought and salinity, photosynthetic pigments, light and dark reaction, metabolic pathways including glycolysis, TCA cycle, oxidative phosphorylation.
Module 4	**Cell Biology and Plant Biochemistry**
	Structure and differences between Prokaryotic (Bacterial Cell) and Eukaryotic cells (plant cell), cell wall, membranes, plastids, mitochondria

Approved by: Standing Committee of the Academic Council on 24th & 25th November 2025

	and cytoskeleton; cell cycle and its regulation; biomolecules - carbohydrates, lipids, proteins and nucleic acids, enzyme structure, mechanism and regulation, Classification of secondary metabolites and their functions; definition, classification, properties, occurrence, functions and deficiency diseases of vitamins A, B complex, C, D, E and K.
References/ Readings:	1. **Gangulee, SC, Das, KS, Dutta, CD. and Kar, AK** (1968). College Botany Vol. I, II and III. Central Education Enterprises 2. **Pandey, BP** (2017). Botany for Degree students: Biodiversity. S. Chand and Company Ltd., New Delhi. 3. **Sharma, OP** (2011). Series on Diversity of Microbes and Cryptogams: Algae. Mc Graw Hill Education India Pvt. Ltd., Chennai. 4. **Singh, V, Pande, PC and Jain, DK** (2019). A textbook of Botany Archegoniate (Bryophyta, Pteridophyta, Gymnosperms and Palaeobotany). Rastogi Publications, Meerut. 5. **Jain, VK** (2022). Fundamentals of Plant Physiology. S. Chand and Company, Delhi. 6. **Bhojwani, SS, Bhatnagar, SP and Dantu, PK** (2015). Embryology of Angiosperms. 6th edition. Vikas Publishing House Pvt. Ltd., Noida. 7. **Pandey, BP** (2014). Plant Anatomy. S. Chand & Company Pvt. Ltd., New Delhi. 8. **Campbell**, **MK** (2012). Biochemistry. 7th edition. Cengage Learning, Boston 9. **Jain**, **JL**, **Jain**, **S** and **Jain**, **N** (2007). Elementary Biochemistry. 3rd edition. S. Chand and Company Ltd., New Delhi. 10. **Erdtman, G** (1969). Handbook of palynology: morphology, taxonomy, ecology; an introduction to the study of pollen grains and spores. Hafner Pub. Co., New York.