

MANGALORE UNIVERSITY

BOTANY

(CORE AND GROUP-II ELECTIVE COURSES)

SYLLABUS

FOR

B.Sc. UNDER GRADUATE (UG) PROGRAMME

UNDER CBCS SCHEME

With effect from

Academic Year

2018-19

COURSES AND CREDITS
B.Sc. with Botany as an Optional Subject

	Semester-wise Course Topics	Teaching hrs/ week	Exam duration (Hrs)	Marks			No. of Credits
				I.A	Exam	Total	
SEMESTER - I							
Group I	BSCBOC 131 Microbes and Algae (T)	4	3	20	80	100	02
	BSCBOP 132 Microbes and Algae(P)	3	3	10	40	50	01
Group II	BSCBOCE 133 Elective Course:	2	2	10	40	50	01
SEMESTER - II							
Group I	BSCBOC 181 Fungi, Bryophytes, Histology and Anatomy(T)	4	3	20	80	100	02
	BSCBOP 182 Fungi, Bryophytes, Histology and Anatomy (P)	3	3	10	40	50	01
Group II	BSCBOCE 183 Elective Course:	2	2	10	40	50	01
SEMESTER - III							
Group I	BSCBOC 231 Pteridophytes, Gymnosperms and Angiosperm embryology(T)	4	3	20	80	100	02
	BSCBOP 232 Pteridophytes, Gymnosperms and Angiosperm embryology(P)	3	3	10	40	50	01
Group II	BSCBOCE 233 Elective Course:	2	2	10	40	50	01
SEMESTER - IV							
Group I	BSCBOC 281 Taxonomy and Economic Botany (T)	4	3	20	80	100	02
	BSCBOP 282 Taxonomy and Economic Botany (P)	3	3	10	40	50	01
Group II	BSCBOOE 283 Open Elective Course:	2	2	10	40	50	01
SEMESTER - V							
Group I	BSCBOC 331 Ecology and Environmental Biology (T1)	3	3	20	80	100	02
	BSCBOC 332 Plant Physiology (T2)	3	3	20	80	100	02
	BSCBOP 333 Ecology and Environmental Biology (P1)	2	2	10	40	50	01
	BSCBOP 334 Plant Physiology (P2)	2	2	10	40	50	01
SEMESTER - VI							
Group I	BSCBOC 381 Cytology, Molecular Biology and Genetics(T1)	3	3	20	80	100	02
	BSCBOC 382 Plant Propagation and Plant Biotechnology (T2)	3	3	20	80	100	02
	BSCBOP 383 Cytology, Molecular Biology and Genetics (P1)	4	4	10	40	50	01
	BSCBOP 384 Plant Propagation and Biotechnology (P2)	4	4	10	40	50	01
	T= Theory, P=Practicals					Total Credits	28

SEMESTER –V

BSCBOC 332: Plant Physiology - Theory

Unit	Topics	Teaching Hours
I	<p>Plant – Water relations: Fundamental concepts: Diffusion, Imbibition, Osmosis- endosmosis, exosmosis and osmotic pressure. Plasmolysis and Deplasmolysis. Water potential and its components,. Water absorption by plants: Soil water and its types, Mechanism of water absorption- Passive and Active absorption. Path of water movement- symplast, apoplast and transmembrane movement of water. Ascent of sap: Definition, path of ascent of sap, mechanism- root pressure theory and transpiration pull theory. Transpiration: Types – cuticular, lenticular and stomatal. Structure of stomata, mechanism of stomatal transpiration – starch hydrolysis and proton pump theories. Factors influencing transpiration. Significance of transpiration. Anti-transpirants and their practical applications. A brief account of Guttation.</p>	09
II	<p>Mineral Nutrition and Enzymes: Essential elements: Classification - Macro and Micronutrients. Functions and deficiency symptoms of macro elements- N, P, K and Mg. Functions and deficiency symptoms of Micronutrients- Zn, Mn and B. Hydroponics and its applications. Mechanism of mineral salt absorption: Passive absorption – diffusion, ion exchange. Active absorption- Cytochrome pump theory, Protein Lecithin theory. Enzymes: General properties of enzymes, IEC system of enzyme classification and nomenclature, mechanism of enzyme action, models of enzyme action - lock and key and induced fit models, enzyme inhibition- competitive and non-competitive, factors regulating enzyme action.</p>	09
III	<p>Photosynthesis, Organic translocation and Respiration: Photosynthesis: Photosynthetic reaction, photosynthetic pigments, photosystems I and II. Mechanism of photosynthesis - Light reaction and Dark reaction. Absorption spectrum and Action spectrum. Red drop and Emerson's effect. C₄ pathway and its significance. Factors affecting photosynthesis and law of limiting factors, Translocation of organic solutes: Path of translocation - Girdling experiment and isotopic studies. Mechanism of translocation- Protoplasmic streaming theory and Mass flow theory. Respiration: Definition and overall reaction, types of respiration- aerobic, anaerobic/ fermentation. Mechanism of aerobic respiration – glycolysis, Krebs's cycle and terminal oxidation. Anaerobic respiration – alcoholic and lactic acid fermentation. ATP yield during aerobic and anaerobic respirations. Respiratory quotient.</p>	09
IV	<p>Plant growth, Flowering, Movements and Dormancy: Plant growth: Definition, Phases of growth, Growth curve. Plant growth regulators: Growth promoters – Physiological effects of auxins, gibberellins and cytokinins. Growth inhibitors – Physiological effects of ethylene and abscisic acid. Practical applications of growth regulators in the field of agriculture and horticulture</p>	09

	<p>Physiology of flowering: Photoperiodism - short day, long day and dayneutral plants. Phytochrome theory. Vernalisation and its practical applications.</p> <p>Plant movements: Nastic movements – nyctinastic, chemonastic and seismonastic. Tropic movements – phototropic, hydrotropic, geotropic and thigmotropic.</p> <p>Dormancy in plants: Definition and types. Bud dormancy - induction and breaking. Seed dormancy – causes and methods of breaking.</p>	
Total		42 Hours

REFERENCE BOOKS:

1. Mukherjee, S. A.K. Ghosh(1998) Plant Physiology ,Tata McGraw Hill Publishers(P) Ltd., New Delhi.
2. Salisbury, F.B & C.W. Ross (1999): Plant Physiology CBS Publishers and Printers, New Delhi.
3. Pandey, SN and Sinha, BK (2001). Plant Physiology. Third revised edition, Vikas Publishing House Pvt. Ltd, New Delhi
4. Devlin, RM (1974). Plant Physiology, Affiliated East West Press Pvt. Ltd
5. Noggle, GR. and Fritz, GJ (1976). Introductory Plant Physiology, Prentice-Hall, India.
6. Jain, VK (2007). Fundamentals of Plant physiology, S. Chand & Company ltd, New Delhi.
7. Nobel, PS (1970). Introduction to Biophysical Plant Physiology. W. H. Freeman and Company, San Francisco.
8. Verma, V(2008). Text book of plant Physiology, Ane's student edition, New Delhi
9. SundaraRajan S (2012). College Botany, Vol. VI. Part 2- Plant Physiology. Himalaya Publications.
10. Jain V.K. (2017). Fundamentals of Plant Physiology. S Chand Publishers.

SEMESTER –V

BSCBOP 333: Ecology and Environmental Biology – Practicals

Practical No.	Experiment
1	Determination of pH of different types of Soils
2	Estimation of salinity of soil/water samples.
3	Study of Ecological instruments – Wet and Dry thermometer, Altimeter, Hygrometer, Soil thermometer, Rain Gauge, Barometer, etc
4	Hydrophytes: Morphological adaptations in <i>Pistia</i> , <i>Eichhornia</i> , <i>Hydrilla</i> , <i>Nymphaea</i> and Anatomical adaptations of Hydrophytes - <i>Hydrilla</i> and <i>Nymphaea</i> .
5	Xerophytes: Morphological adaptations in <i>Asparagus</i> , <i>Casuarina</i> , <i>Acacia</i> , <i>Aloe vera</i> , <i>Euphorbia tirucalli</i> and Anatomical adaptations of <i>Casuarina phylloclade</i> .
6	Epiphytes: Morphological adaptations in <i>Acampe</i> , <i>Bulbophyllum</i> , <i>Drynaria</i> and Anatomical adaptations of epiphytic root of <i>Acampe</i> / <i>Vanda</i> . Halophytes: Vivipary and Pneumatophores
7	Study of local vegetation types by field trips
8	Project work
9	Project work
10	Project work

***PROJECT WORK ON ECOLOGY:**

Students should undertake a short project related to any of the following ecological aspects, either individually or in groups, and submit the report at the time of practical examination along with the certified class record.

Project Reports to be prepared according to the Format provided.

Projects may be undertaken on:

- Structure of local ecosystems - pond ecosystem /forest ecosystem/grassland ecosystem/river ecosystem/marine ecosystem.
- Documentation/assessment of ecosystem services like carbon sequestration by trees.
- Enumeration/documentation of local biodiversity
- Listing of local RET species of plants, assessment of their population status, etc.
- Documentation of local conservation practices , sacred trees, sacred landscapes, etc.
- Documentation/Assessment of local pollution issues, etc.

Format for Project Report (Typed or Handwritten): The project Report must present information organised in the following sections. The number of pages may be limited to 10-15 typed pages in case of individual projects and 20-25 pages, in case of group projects.

1.	Introduction with objectives of the work
2.	Review of literature/ earlier work
3.	Study area and Methods followed