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# **BENGALURU CITY UNIVERSITY**

## **SYLLABUS For B.Sc BOTANY (I & II Semester)**

**CHOICE BASED CREDIT SYSTEM**

**2020-2021**



BENGALURU CITY UNIVERSITY  
BENGALURU

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SYLLABUS For B.Sc BOTANY  
(I & II Semesters)

CHOICE BASED CREDIT SYSTEM

2020-2021

**PROCEEDINGS OF THE MEETING OF THE BOARD OF STUDIES (UG) IN  
BOTANY BANGALORE CENTRAL UNIVERSITY HELD ON 28-06-2018 IN THE  
DEPARTMENT OF BOTANY, BANGALORE UNIVERSITY, BANGALORE**

**Venue:** Department of Botany, J. B. Campus, Bangalore University, Bangalore — 560 056.

**Date :** 28-06-2018

**Time :** 11.00 AM

**Agenda:**

1. To finalize the draft syllabus for Choice Based Credit System for B.Sc., Botany, for approval
2. Any other academic matter with the permission of the Chair.

**Members Present:**

1.	Smt. Shailaja. K. S	Member	Sd/-
2.	Dr. Dhaneshwari.	Member	Sd/-
3.	Dr.Sabiha Sultana.M	Member	Sd/-
4.	Dr. Lt. Ramakrishnaiah	Member	Sd/-
5.	Dr. Manjula. B. L	Member	Sd/-
6.	Prof. G. R. Janaradhan	External Member	Sd/-
7.	Prof. L. Rajanna	Chairman	Sd/-

**Members Absent**

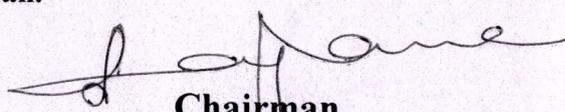
1.	Dr. Anitha. P	Member
2.	Dr. B. S. Jyothsna	Member
3.	Dr. N. Rajeshwari	External Member

**MINUTES OF THE BoS (UG) MEETING:**

Chairman welcomed the members to the meeting and thereafter the agenda were taken up for discussion

- a) The draft scheme of study. Examination and Syllabus for Choice Based Credit System for I and II Semester B. Sc., Botany, were scrutinized, discussed and approved after minor changes.
- b) The Chairperson BoS was authorized to make necessary modifications wherever it is required.

**The meeting ended with a vote of thanks by the Chairman.**

  
**Chairman**  
Professor & Chairman  
Department of Botany  
Bangalore University  
Bangalore - 560 056.

PROCEEDINGS OF THE MEETING OF THE BOARD OF STUDIES (BOS) IN  
 BOTANY BANGALORE CENTRAL UNIVERSITY HELD ON 28-06-2018 IN THE  
 DEPARTMENT OF BOTANY, BANGALORE UNIVERSITY, BANGALORE

Venue: Department of Botany, J.B. Campus, Bangalore University, Bangalore - 560 075

Date: 28-06-2018

Time: 11:00 AM

Agenda:

1. To finalize the draft syllabus for Choice Based Credit System for B.Sc. Botany, for approval
2. Any other academic matter with the permission of the Chair

Members Present

284		Member	1. Mr. Shalaja, K. S.
284		Member	2. Dr. Dhanashwari
284		Member	3. Dr. Sushma Sultana M.
284		Member	4. Dr. A. Ramakrishnaiah
284		Member	5. Dr. Manjula, B. J.
284	External Member		6. Prof. Q. R. Inarashan
284	Chairman		7. Prof. E. Rajanna

Members Absent

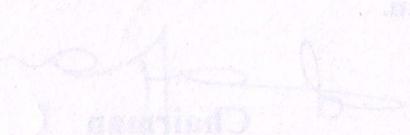
		Member	1. Dr. Anita P.
		Member	2. Dr. B. S. Jothana
	External Member		3. Dr. N. Rajanna

MINUTES OF THE BOS (BOS) MEETING:

Chairman welcomed the members to the meeting and thereafter the agenda were taken up for discussion.

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- b) The Chairperson BOS was authorized to make necessary modifications wherever it is required.

The meeting ended with a vote of thanks for the Chairman.

  
 Chairman  
 Professor & Chairman  
 Department of Botany  
 Bangalore University  
 Bangalore - 560 075

## MINUTES OF THE BOS (UG) MEETING:

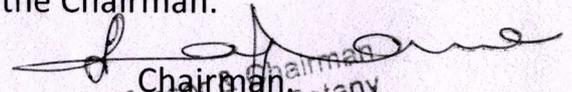
Chairman welcomed the members of the UG Board to the meeting and agenda was placed for discussion

- a. Discussed and finalized the syllabus and scheme of examination for I and II Semester B.Sc., Botany (Theory and Practicals) question paper pattern, and scheme of valuation for the introduction of choice based credit system (CBCS).
- b. The panel of Examiners was approved and recommended for UG Examinations for the academic year 2018-19
- c. Names were recommended for the constitution of a BoE for the academic year 2018 – 19
- d. Names were recommended by the BoS (UG) to be nominated by Vice Chancellor for BOAE.
- e. The Chairperson was authorized to finalize the BoE (UG) for the year 2018-19 after looking into the number of years of service and date of entry in to the service of the teachers for consideration.

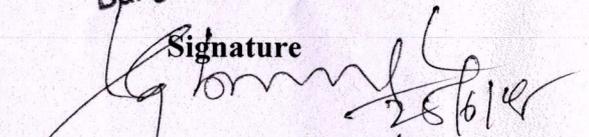
The meeting ended with a vote of thanks by the Chairman.

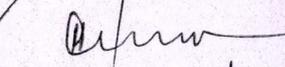
### Name of the Board of Members (UG)

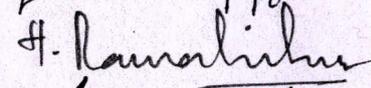
1. Prof. G.R. Janaksham
2. Dr. Sabiha Sultana
3. Prof. Phaneswar D
4. Dr. H. Ramkrishnaiah
5. Dr. B. L. Manjula
6. J. S. Shailaja
7. Dr. L. RAJANNA

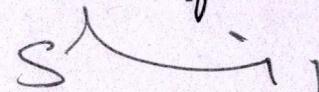
  
Chairman  
Professor & Chairman  
Department of Botany  
Bangalore University  
Bangalore - 560 056.

Signature

  
25/6/18

  
25/6/18

  
H. Ramkrishnaiah  
Manjula



  
Professor & Chairman  
Department of Botany  
Bangalore University  
Bangalore - 560 056.

MINUTES OF THE BOS (UG) MEETING:

Chairman welcomed the members of the UG Board to the meeting and agenda was placed for discussion

- a. Discussed and finalized the syllabus and scheme of examination for I and II Semester B.Sc., Botany (Theory and Practical) question paper pattern and scheme of valuation for the introduction of choice based credit system (CBCS).
- b. The panel of Examiners was approved and recommended for UG Examinations for the academic year 2018-19
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- e. The Chairperson was authorized to finalize the BoE (UG) for the year 2018-19 after looking into the number of years of service and date of entry in to the service of the teachers for consideration.

The meeting ended with a vote of thanks by the Chairman.

*[Handwritten signature]*  
 Professor & Chairman  
 Department of Botany  
 Bangalore University  
 Bangalore - 560 075

*[Handwritten signature]*  
 Professor & Chairman  
 Department of Botany  
 Bangalore University  
 Bangalore - 560 075

- Name of the Board Members (UG)
1. Prof. S.M. Jorastan
  2. Dr. S. S. S. S. S.
  3. Prof. P. P. P.
  4. Dr. A. A. A.
  5. Dr. A. A. A.
  6. Dr. S. S. S.
  7. Dr. C. R. R.

## I SEMESTER

### PAPER – I: MICROBIAL DIVERSITY AND PHYCOLOGY

52 Hours

- UNIT I: INTRODUCTION TO MICROBIOLOGY AND VIRUSES** 13 Hrs  
Introduction and Scope of Microbiology.  
**Branches of microbiology** - Industrial, Medical, Agricultural and Environmental Microbiology. Contributions of scientists to the field of Microbiology: Anton von Leeuwenhoek, Louis Pasteur, Robert Koch, Iwanowsky and W M Stanley.  
**Isolation of microbes from soil** – A brief account of culture media, serial dilution, pour plate method and colony characteristics of Bacteria.  
**Applied Microbiology**- A brief account of Bio-fertilizers, Biogas production and Bioremediation.  
**Introduction and properties of Viruses** - Architecture of TMV & T4 Bacteriophage Multiplication (lytic and lysogenic cycle) & Transmission of viruses. Tomato leaf curl disease. Brief account of Prions and Viroids
- UNIT II: STUDY OF BACTERIA** 13 Hrs  
Introduction, classification of Bacteria based on shape and flagella.  
Ultra structure of bacterial cell with special reference to Gram positive and Gram negative cell wall composition. Endospore – a brief account.  
**Reproduction** – Binary fission and genetic recombination (Transformation, Transduction and Conjugation).  
A brief account of plasmids – definition and properties. Structure and importance of Ti plasmid.  
Bacterial nutrition. Citrus canker disease  
**Economic importance** – Role of bacteria in Agriculture, Medicine and Industry.  
**General account of Phytoplasma** and Sandal spike disease.
- UNIT III: STUDY OF CYANOBACTERIA AND PHYCOLOGY: PART-I** 13 Hrs  
**Cyanobacteria:** Introduction, general characteristics, thallus structure, Ultra structure of the cell, reproduction, economic importance. SCP and Biofertilizer. Role in water pollution and treatment. Type study: *Anabaena*, *Spirulina* and *Scytonema*.  
**Phycology-Part-I:** Introduction, general characteristics, outlines of Fritsch's (1947) classification, thallus structure, pigmentation and reproduction.  
Occurrence, structure, reproduction and life cycle: *Chlamydomonas* and *Volvox*
- UNIT IV: PHYCOLOGY- PART –II** 13 Hrs  
Occurrence, structure, reproduction and life cycle: *Hydrodictyon*, *Oedogonium*, *Chara*, *Sargassum*, and *Polysiphonia*.  
Economic importance of Algae in Industry, Agriculture and Medicine.

## PRACTICAL PAPER – I

### MICROBIAL DIVERSITY AND PHYOLOGY

**Total Units: 13**

1. Study of instruments: autoclave, inoculation chamber/LAF, hot air oven, incubator and inoculation loop. **1 unit**
2. Sterilization of glassware and media preparation nutrient media (Nutrient Agar) Isolation of Bacteria from soil by pour plate method **1 unit**
3. Colony characteristics of Bacteria to identify colonies **1 unit**
4. Diseases: Tomato Leaf curl, Citrus Canker and Sandal spike **1 Unit**
5. Gram staining: Rhizobium from root nodules and Lactobacillus from curd **1 Unit**
6. Measurement of cell concentration – yeast cells / fungal spores using Haemocytometer **1 Unit**
7. Type study of Cyanobacteria: *Anabaena*, *Spirulina* and *Scytonema* **1 Unit**
8. Type study of Algae: *Chlamydomonas*, *Volvox*, *Hydrodictyon*, *Oedogonium*, *Chara*, *Sargassum* and *Polysiphonia* **6 Units**

## PRACTICAL QUESTION PAPER-I

### MICROBIAL DIVERSITY AND PHYOLOGY

Max Marks: 35

1. Identify & classify specimen **A, B, & C** with labelled diagrams and reasons 3 X 3 = 9
  2. Describe colony characteristics of **D** 1 X 2 = 2
  3. Identify and Comment on the instrument / Disease **E** 1 X 3 = 3
  4. Prepare a temporary slide of **F**, sketch, label and identify with reasons. Leave the preparation for evaluation 1 X 5 = 5
  5. Stain given material **G** by Gram staining. Write the procedure and identify with reasons. Leave the preparation for evaluation
- OR**
- Calculate the population of fungal spores / yeast cells in **G** using haemocytometer 1 X 4 = 4
6. Identify Slide **H** and **I** with labelled diagrams with reason 2 X 2 = 4
  7. Record and Submission 5 + 3 = 8

#### SCHEME OF VALUATION

1. Four specimens **A, B and C**, - one from Cyanobacteria, two from algae, (Identification – 1 mark, labelled diagram with reasons 2 marks)
  2. Colony characters of the given colony **D** – 2 marks,
  3. Instrument; (Identification 1 mark, working principle 1 Mark, Labelled diagram 1 mark) / Diseases (Identification 1 mark, Comment and Labelled diagram 2 marks)
  4. Specimen **F** from Cyanobacteria / algae - mounting – 2 marks. Identification – 1 mark, sketch with reasons 2 marks)
  5. Specimen **G** – Gram staining (Staining – 2 marks, Procedure and result – each 1 mark).
- OR**
- Calculation of fungal spores / yeast cells using haemocytometer (Procedure - 2 marks, calculation – 2 marks)
6. Two permanent slides **H & I** - from Cyanobacteria / algae (Identification – 1 mark, sketch with reasons - 1 mark)
  7. a) Record – 5 marks  
b) Submission of 3 algae / Cyanobacteria materials – 3 marks

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### Web Sites

<http://www.phycology.net/>

<http://www.algaebase.org/>

## II SEMESTER

### PAPER II: MYCOLOGY, BRYOLOGY AND PLANT ANATOMY

		52 Hrs
<b>UNIT I:</b>	<b>MYCOLOGY</b>	<b>13hrs</b>
	<b>Introduction:</b> General characters, thallus organisation, reproduction and outlines of Ainsworth classification Structure, reproduction and life history of <i>Albugo</i> , <i>Peziza</i> , <i>Puccinia</i> and <i>Cercospora</i> . <b>Economic importance:</b> Role of fungi in Medicine, Agriculture and Industry	
<b>UNIT II:</b>	<b>LICHENS, MYCORRHIZAE AND FUNGAL DISEASES</b>	<b>13 hrs</b>
	<b>Lichens:</b> General account, Structure and reproduction. Ecological and Economic importance. <b>Mycorrhizae:</b> General account <b>Fungal Diseases:</b> General account of symptoms, pathogen etiology, mode of infection. Management of fungal diseases: Koleroga, Coffee rust, Grain smut of Sorghum, Blast disease of Rice, Red rot of Sugarcane. <b>A brief account of Biopesticides:</b> Neem, <i>Trichoderma</i> and <i>Bacillus thuringiensis</i>	
<b>UNIT III:</b>	<b>BRYOPHYTA</b>	<b>13 hrs</b>
	General characters, Study of distribution, structure, reproduction, Classification and alternation of generation in <i>Marchantia</i> , <i>Anthoceros</i> and <i>Funaria</i>	
<b>UNIT IV:</b>	<b>PLANT ANATOMY</b>	<b>13 hrs</b>
	<b>Meristematic Tissues:</b> Structure, function and classification. Organisation of Apical Meristems: Tunica-carpus theory and Histogen theory. <b>Histology:</b> Structure, Classification and significance of simple, complex and secretory tissues. Types of vascular bundles <b>Secondary growth:</b> Dicot stem. Example: <i>Tridax</i> <b>Anomalous Secondary growth:</b> <i>Boerhaavia</i> and <i>Dracaena</i> .	

## PRACTICAL PAPER – II

### PAPER II: MYCOLOGY, BRYOLOGY AND PLANT ANATOMY

Total units - 13 Units

1. Identification and study of fungal members included in the theory **3 Units**
2. Study of lichens **1 Unit**
3. Study of Mycorrhiza **1 Unit**
4. Study of plant diseases included in the theory **2 Units**
5. Study of forms of Bryophytes included in the theory **3 Units**
6. Anatomy-sectioning: Dicot stem Ex. : *Tridax*  
Anomalous secondary growth in *Boerhaavia* and *Dracaena* **3 Units**
7. Project report of :
  - 1 Mushroom cultivation
  - 2 Application of Biofertilizers
  - 3 Isolation of Fungi from spoiled fruits & vegetables
  - 4 Study of Mycorrhizae

## PRACTICAL QUESTION PAPER - II

### PAPER II: MYCOLOGY, BRYOLOGY AND PLANT ANATOMY

Time: 3 hours

Max. Marks: 35

- Identify and classify specimens A, B & C with labelled diagrams and
1. reasons **3 X 3 = 9**
  2. Prepare a temporary stained T.S of the material D. Sketch, label and identify with reasons. Leave the preparation for evaluation **4**
  3. Write critical note on E **2**
  4. Identify the Slides F,G,H & I with labelled diagrams and reasons **4 X 3 = 12**
  5. Record and submission. **5 + 3 = 8**

## SCHEME OF VALUATION

1. Two specimens from Fungi and one from Bryophytes (Identification -1 mark, Labelled diagram with reasons 2 marks)
2. Any one of the following may be given-stem of *Tridax*, *Boerhaavia* or *Dracaena* (Staining and mounting- 2 marks, sketch and labelling- 1 mark, Identification with reasons- 1 mark)
3. One diseased plant/Lichens/ (Identification-1 mark & critical points 1 mark)
4. Two from Bryophytes, One from Fungi and One from Anatomy (Identification & Classification -2 mark, labelled diagrams with reasons-2 marks)
5. Record & Project submission: (marks 5+3)

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