

UNIVERSITY OF CALICUT				
M.Sc. Programme in Botany (CBCSS) (from 2019 admissions onwards)				
Programme, structure of courses and distribution of credits				
Course	Title	Credits		
		Internal	External	Total credits
Semester I				
BOT1C01	Phycology, Bryology, Pteridology and Gymnosperms	20%	80%	5
BOT1C02	Mycology and Lichenology, Microbiology and Plant Pathology	20%	80%	5
BOT1C03	Angiosperm Anatomy, Angiosperm Embryology, Palynology and Lab Techniques	20%	80%	5
BOT1L01	Practicals of Phycology, Bryology, Pteridology, Gymnosperms, Mycology and Lichenology	20%	80%	2.5
BOT1L02	Practicals of Microbiology, Plant Pathology, Angiosperm Anatomy, Angiosperm Embryology, Palynology and Lab Techniques.	20%	80%	2.5
Semester II				
BOT2C04	Cell Biology, Molecular Biology and Biophysics	20%	80%	5
BOT2C05	Cytogenetics, Genetics, Biostatistics, Plant Breeding and Evolution	20%	80%	5
BOT2C06	Plant Ecology, Conservation Biology, Phytogeography and Forest Botany	20%	80%	5
BOT2L03	Practicals of Cell Biology, Molecular Biology, Biophysics and Cytogenetics	20%	80%	2.5
BOT2L04	Practicals of Genetics, Biostatistics, Plant Breeding, Plant Ecology, Conservation Biology, Phytogeography and Forest Botany	20%	80%	2.5
Semester III				
BOT3C07	Plant Physiology, Metabolism and Biochemistry	20%	80%	5
BOT3C08	Angiosperm Morphology, Angiosperm Taxonomy and Plant Resources	20%	80%	5
BOT3C09	Biotechnology and Bioinformatics	20%	80%	5
BOT3L05	Practicals of Plant Physiology, Metabolism, Biochemistry, Angiosperm Morphology and Angiosperm Taxonomy	20%	80%	2.5
BOT3L06	Practicals of Plant Resources, Biotechnology and Bioinformatics	20%	80%	2.5
Semester IV				
BOT4E01	Elective I	20%	80%	5
BOT4E02	Elective II	20%	80%	5
BOT4L07	Practicals of Electives	20%	80%	2
BOT4D01	Dissertation	20%	80%	5
BOT4V01	Viva voce	0%	100%	3
Total				80 credits
Audit Courses (To be completed within the first three semesters by the students)				
ACIAEC	Ability Enhancement Course	100%	0%	4
AC2PCC	Professional Competency Course	100%	0%	4
(The credits earned through the audit courses will not be added for SGPA/CGPA)				
Duration of Theory Examinations (External) as well as Practical Examinations (External) will be 3 hours				
1 credit = 1.25 hours of teaching; There will be no regular classes/workload for audit courses.				
1 theory/dissertation hour= 1.5 hours of workload; 1 practical hour= 1 hour of workload				

ADMISSION:

Admission for the programme shall be as per the CBCSS PG Regulations in force.

ATTENDANCE:

The requirement of attendance shall be as per the CBCSS PG Regulation in force.

EVALUATION AND GRADING

EVALUATION: The evaluation scheme for each course shall contain two parts; (a) Internal / Continuous Assessment (CA) and (b) External / End Semester Evaluation (ESE). Of the total, 20% weightage shall be given to Internal evaluation / Continuous assessment and the remaining 80% to External/ESE and the ratio and weightage between Internal and External is 1:4. Primary evaluation for Internal and External shall be based on 6 letter grades (A+, A, B, C, D and E) with numerical values (Grade Points) of 5, 4, 3, 2, 1 & 0 respectively.

Grade Point Average: Internal and External components are separately graded and the combined grade point with weightage 1 for Internal and 4 for external shall be applied to calculate the Grade Point Average (GPA) of each course. Letter grade shall be assigned to each course based on the categorization based on Ten point scale.

Evaluation of Audit Courses: The examination and evaluation shall be conducted by the college in a common pattern for all the PG programmes. The question paper shall be for minimum 20 weightage and a minimum of 2 hour duration for the examination. The result has to be intimated/ uploaded to the University during the Third Semester as per the notification of the University.

INTERNAL EVALUATION / CONTINUOUS ASSESSMENT (CA)

This assessment shall be based on a predetermined transparent system involving periodic written tests, assignments, seminars and viva-voce in respect of theory courses and based on tests, lab skill and records/viva in respect of practical courses.

The criteria and percentage of weightage assigned to various components for internal evaluation are as follows:

(a) Theory:

SI.No	Component	Percentage Weightage
1	Examination /Test	40%
2	Seminars / Presentation	20%
3	Assignment	20%
4	Attendance	20%

(b) Practical :

1	Lab Skill	40%
2	Records	30%
3	Practical Test	30%

(Grades shall be given for the internal evaluation based on the grades A+, A, B, C, D & E with grade points 5,4,3,2, 1 &0 respectively. The overall grades shall be as per the Ten point scale. There shall be no separate minimum Grade Point for internal evaluation. To ensure transparency of the evaluation process, the internal assessment marks awarded to the students in each course in a semester shall be published on the notice board before 5 days of commencement of external examination. There shall not be any chance for improvement of internal marks. The course teacher shall maintain the academic record of each student registered for the course, which shall be forwarded to the University, through the college Principal, after being endorsed by the Head of the Department. Class tests for internal evaluation should be spread during the semester and the grades displayed on the notice board. Valued answer scripts shall be made available to the students for perusal. Each student shall be required to do at least one assignment for each course. Assignments after valuation must be returned to the students. The teacher shall define the expected quality of the above in terms of structure, content, presentation etc. and inform the same to the students. Punctuality in submission is to be considered. Every student shall deliver one seminar / presentation as an internal component for every course and must be evaluated by the respective course teacher in terms of structure, content, presentation and interaction. The soft and hard copies of the seminar report are to be submitted to the course

teacher. All the records of Continuous Assessment (CA) must be kept in the college and must be made available for verification by university, if asked for.)

EXTERNAL / END SEMESTER EVALUATION (ESE)

The semester-end examinations in theory courses shall be conducted by the University with question papers set by external experts. The evaluation of the answer scripts shall be done by examiners based on a well-defined scheme of valuation. After the external evaluation, only Grades are to be entered in the space provided in the answer script for individual questions and calculations need to be done only up to the Cumulative Grade Point (CGP) and all other calculations including grades are to be done by the University. Students shall have the right to apply for revaluation or scrutiny as per rules within the time permitted for it. Photocopies of the answer scripts of the external examination shall be made available to the students for scrutiny on request by them as per rules. The external evaluation shall be done immediately after the examination preferably in a Centralized Valuation Camp.

PATTERN OF QUESTIONS FOR EXTERNAL ESE

Questions shall be set to assess the knowledge acquired, standard, and application of knowledge, application of knowledge in new situations, critical evaluation of knowledge and the ability to synthesize knowledge. Due weightage shall be given to each module based on content/teaching hours allotted to each module. It has to be ensured that questions covering all skills are set. The setter shall also submit a detailed scheme of evaluation along with the question paper. A question paper shall be a judicious mix of short answer type, short essay type /problem solving type and long essay type questions. The question shall be prepared in such a way that the answers can be awarded A+, A, B, C, D & E Grades. End Semester Evaluation in Practical Courses shall be conducted and evaluated by two examiners of which one should be an External Examiner and the other examiner should be the teacher who offers the course/ the senior most teacher who offers the course. Different types of questions shall be given different weightages to quantify their range given in the following model:

Number of questions to be answered:

1. Theory

Sl. No.	Type of Individual Questions	Total No. of Questions	Weightage
1.	Short answer	4 out of 7	2x4=8
2.	Short essay/problem solving	4 out of 7	3x4=12
3	Long Essay type	2 out of 4	5x2=10
	Total	10 out of 18	30

(All questions should be in such away that 6 grades could be awarded. Short answer questions should have a minimum of 4 value points, short essays a minimum of 6 value points and long essays a minimum of 10 value points)

2. Practicals

Sl. No.	Type of Individual Questions	Total No. of Questions	Weightage
1.	Major Experiments/ Problems	3	3x5=15
2.	Minor Experiments/ Problems	3	3x2=6
3	Spotters/ Identifications	5	5x1=5
4	Lab Records	1	2
5	Submissions/Tour Reports	1	2
	Total	13	30

EVALUATION OF PROJECT WORK | DISSERTATION

There shall be External and Internal evaluation with the same criteria for Project Work done and the grading system shall be followed as per the specific guidelines. For a pass in Project Work, a student has to secure a minimum of P

Grade in External and Internal examination combined. If the students could not secure minimum P Grade in the Project work, they will be treated as failed in that attempt and the students may be allowed to rework and resubmit the same in accordance with the University exam stipulations. There shall be no improvement chance for Project Work.

The External and Internal evaluation of the Project Work shall be done based on the following criteria and weightages as detailed below:

Sl. No.	Criteria	% of Weightage	Weightage
1	Relevance of the topic	10	3
2	Methodology & Analysis	40	12
3	Discussion	10	3
4	Viva Voce (on the project)	40	12
	Total	100	30

COMPREHENSIVE VIVA-VOCE

There shall be an External Comprehensive Viva-Voce at the end of the IVth Semester. The External Viva Voce shall be conducted by one External Examiner appointed by the University and the Head of the Department as the Internal Examiner. For a pass in comprehensive viva-voce, a student has to secure a minimum of P Grade or a pass. Failed candidates can reappear for the same next time in accordance with the University exam stipulations. There shall be no improvement chance for comprehensive viva-voce.

DIRECT GRADING SYSTEM

Direct Grading System based on a 10 Point scale is used to evaluate the performance (External and Internal Examinations of students) for all courses (Theory & Practical)/Semester/Overall Programme, Letter grades and GPA/SGPA/CGPA are given on the following way :

- a) First Stage Evaluation for both Internal and External will be done by the teachers concerned in the following scale :
- | | |
|----|---|
| A+ | 5 |
| A | 4 |
| B | 3 |
| C | 2 |
| D | 1 |
| E | 0 |

- b) The Grade Range for both Internal & External shall be :

Letter Grade	Grade Range	Range of %	Merit indicator
O	4.25 - 5.00	85-100	Outstanding
A+	3.75 - 4.24	75-84.99	Excellent
A	3.25 - 3.74	65-74.99	Very Good
B+	2.75 - 3.24	55-64.99	Good
B	2.50 - 2.74	50-54.99	Above Average
C	2.25 - 2.49	45-49.99	Average
P	2.00 - 2.24	40-44.99	Pass
F	< 2.00	Below 40	Fail
I	0		Incomplete
Ab	0		Absent

No separate minimum is required for Internal Evaluation for a pass, but a minimum P Grade is required for a pass in the external evaluation. However, a minimum P grade is required for pass in a course. A student who fails to secure a minimum grade for a pass in a course will be permitted to write the examination along with the next batch.

IMPROVEMENT OF COURSE

The candidates who wish to improve the grade / grade point of the external examination of a course they have passed already can do the same by appearing in the external examination of the concerned semester along with the immediate junior batch. A candidate will be permitted to improve the CGPA of the Programme within a continuous period of four semesters immediately following the completion of the programme allowing only once for a particular semester. The CGPA for the betterment appearance will be computed based on the SGPA secured in the original or betterment appearance of each semester whichever is higher.

SGPA CALCULATION

SGPA is the ratio of sum of the product of the number of credits with the grade points scored by a student in all the courses taken by a student and the sum of the number of credits of all the courses taken by a student. After the successful completion of a semester, Semester Grade Point Average (SGPA) of a student in that semester is calculated using the formula given below:

$$\text{SGPA (S}_j\text{)} = \Sigma(\text{C}_i \times \text{G}_i) / \text{C}_r$$

Where 'S_j' is the j semester, 'G_i' is the grade point scored by the student in the i course, 'C_i' is the credit of the i course, 'C_r' is the total credits of the semester.

CGPA CALCULATION

$$\text{CGPA} = \Sigma(\text{C}_i \times \text{S}_i) / \text{C}_r$$

Where C_i is the credit of the ith semester, S_i is the SGPA of the ith semester and C_r is the total number of credits in the programme. The CGPA is also calculated in the same manner taking into account all the courses undergone by a student over all the semesters of a programme. The SGPA and CGPA shall be rounded off to 2 decimal points. For the successful completion of a semester, a student should pass all courses and score a minimum SGPA of 2.0. However, the students are permitted to move to the next semester irrespective of their SGPA.

DETAILED SYLLABUS

BOT1 C01. PHYCOLOGY, BRYOLOGY, PTERIDOLOGY AND GYMNOSPERMS (1.5+1+2+1.5 = 6 hours per week)

Phycology

1. Classification of Algae-comparative Survey of important systems - Fritsch-Smith-Round. Criteria for algal classification-Phylogenetic considerations.
2. Biological importance of Planktons.
3. Algal cytology-Basic ideas of cell features-Electron microscopic studies of algal cell, cell wall, flagella, chloroplast, pyrenoid, eyespot- their importance in classification.
4. Reproduction-Different types of life cycles in algae.
5. General account of energy sources and pigments in algae.
6. Economic importance of algae-Roll of algae in soil fertility, algae in industry-Biological importance of phytoplanktons and water blooms.
7. General account of thallus structure, cell ultra-structure, reproduction, relationships and evolutionary trends in the following groups: Chlorophyta, Xanthophyta, Bacillariophyta, Phaeophyta, Rhodophyta.

References:

1. Fritsch, F.E. The structure and Reproduction of Algae.
2. Smith, G.M. Manual of Phycology
3. Round, F.E, The Biology of Algae.
4. Pold and Wyane. Introduction of Algae.

Bryology

1. General characters and systems of classifications of Bryophytes
2. General account of the anatomy, reproduction, life history and phylogeny of Sphaerocarpaceae, Marchantiales, Jungermanniales, Calobryales, Anthocerotales, Sphagnales, Andreales, Funariales and Polytrichales
3. Origin and evolution of Bryophytes- gametophytic and sporophytic.
4. A general account of fossil Bryophytes and their affinities.
5. Economic importance of Bryophytes.