

**ADUSUMILLI GOPALAKRISHNAIAH & SUGAR CANE
GROWERS SIDDHARTHA DEGREE COLLEGE OF ARTS &
SCIENCE, VUYYURU-521165, KRISHNA Dt., A.P.
(AUTONOMOUS)**

DEPARTMENT OF BOTANY

2018-2019



BOARD OF STUDIES

Minutes of Meeting

24-04-2018

Minutes of the meeting of Board of studies in Botany for the Autonomous courses of AG & SG Siddhartha Degree College of Arts & Science, Vuyyuru, held at 10:30 A.M on 24-04-2018 in the Department of Botany.

Members Present:

- 1) *CH. Beulah Ranjani* Chairman
(Smt. CH. Beulah Ranjani) Head, Department of Botany
AG & SG S Degree College of Arts & Science
Vuyyuru-521165
- 2) *L. Suseela* University
(Smt. Dr.L.Suseela) Nominee Department of Biotechnology & Head (I/c) Botany,
Krishna University,
Machilipatnam.
- 3) *T. Rose mary* Academic
(Dr. Mrs. Rose Mary) Council Nominee Head, Department of Botany
Andhra Loyola College
Vijayawada
- 4) *Ch. Srinivasa Reddy* Academic
(Sri.Dr.CH.Srinivasa Reddy) Council Nominee Head, Department of Botany
P.B. Siddhartha Degree College
Vijayawada
- 5) *N. Ramana Rao* Member
(Sri. N. Ramana Rao) Ad hoc Lecturer in Botany
AG & SGS Degree College of Arts &
Science (Autonomous), Vuyyuru-521165.
- 6) *E. Ganesh* Member
(Sri. E. Ganesh) Ad hoc Lecturer in Botany
AG & SGS Degree College of Arts &
Science (Autonomous), Vuyyuru-521165.

Agenda for B.O.S Meeting:

1. To recommend the syllabi (Theory & Practical), Model question paper & Guide lines for Semesters I & II of I B.Sc (BZC) in the academic year 2018-19.
2. To recommend the syllabi (Theory & Practical), Practical syllabus, Model question paper & Guide lines to the Paper setters for III & IV Semesters of II B.Sc (BZC) for the academic year 2018-19.
3. To recommend the syllabi (Theory & Practical), Practical syllabus, Model question paper & Guide lines to the Paper setters for V & VI Semesters of III B. Sc (BZC) for the academic year 2018-19.
4. To discuss to the syllabus of Elective & Clusters in VI semester to be for the academic year 2018-19.
5. To recommend the Guide lines to be followed by the question papers setters in Botany for I,II,III,IV,V&VI Semester –End exams.
6. To introduced a certificate course - Mushroom culture for B.Z.C students in this academic year of 2018-19.
7. To recommend the teaching and evolution methods to be followed under Autonomous statues.
8. Any other matter.

CH. Beelab Raju
Chairman

RESOLUTIONS

1. It is resolved to continue the same syllabi (Theory & Practical), model question paper & guide lines to be followed by the question paper setters of Botany of I & II semesters of I B.Sc. (B.Z.C) under Choice Based Credit System (CBCS) approved by the Academic Council of 2018 – 19.
2. It is resolved to implement the syllabi (Theory & Practical), model question paper & guide lines to be followed by the question papers under Choice Based Credit System (CBCS) setters of Botany of III & IV semesters of II B.Sc. (B.Z.C) approved by the Academic Council of 2018 – 19.
3. It is resolved to implement the same syllabi & model papers under Choice Based Credit System (CBCS) setters of Botany of III & IV semesters of II B.Sc. (B.Z.C) approved by the Academic Council of 2018 – 19.
4. It is resolved to follow Elective-AC (Plant tissue culture and its Biotechnological applications) and Cluster –B (plant Diversity and human welfare, Ethno Botany and Medicinal Botany, Pharmacognosy and phyto chemistry.) In VI Semester from the Academic year 2018-19.
5. It is resolved to Continue the same Blue prints of I,II,III,IV,V & VI Semesters of B. Sc Botany for the Academic year 2018-19.
6. It is resolved to
7. It is resolved to continue the following teaching and evolution methods for the Academic year 2018-19.
8. Any other matter.

Teaching methods:

Besides the conventional methods of teaching, we use modern technology i.e. Using of OHP and LCD projector to display on U boards etc; for better understanding of concepts.

Evaluation of a student is done by the following procedure:

- There are two components in the Valuation and Assessment of a student – Internal Assessment (IA) and Semester Examinations (SE).
(For the Batch of Students Admitted from 2018-2019 – UG)

Internal Assessment (IA):

- The maximum mark for IA is 30 and SEM is 70 for theory; and for practical papers 50.
- Each IA written examination is of 1 hour's duration for 20 marks. The tests will be conducted centrally. The average of two such IA is calculated for 20 marks.
- Other Innovative Components will be for 5 Marks. The innovative component is for 5 marks, conducted during the class hours by the staff member/ in charge of the subject, in the form of assignments/ quiz/ seminars /ppt/Online- assignments/Open Book/Viva Voce/ Group work/ Mini Project/ Exhibition, etc. The topic and time for submission/ presentation will be announced by the staff member/ in charge of the subject in advance. Each student should explain and defend his/her presentation. For attendance 5 Marks are allotted.

- The semester examination will be of 3 hours with maximum 70 marks.
- There is no passing minimum for IA.

Semester Examinations (SE):

- A student should register himself/herself to appear for the Semester Examinations by payment of the prescribed fee.
- The Semester Examinations will be in the form of a comprehensive examination covering the entire syllabus in each subject. It will be of 3 hours duration & Foundation course 2 hours irrespective of the number of credits allotted to it.
- If a candidate fails to obtain pass marks even after the due to less mark in the IA examination, the marks of the next examination will be converted to be out of 100.
- Even though the candidate is absent for two IA exams/obtain zero marks the external marks are considered (if he/she gets 40/70) and the result shall be declared as 'PASS'
- The maximum marks for each Paper shall be 100.

Evaluation of a student is done by the following procedure:

I. Internal Assessment Examinations:

- Out of maximum 100 marks in each paper, 30 marks shall be allocated for internal assessment.
- Out of these 30 marks, 15 marks are allocated for announced tests. Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks are allocated on the basis of candidate's percentage of attendance, 5 marks for seminars & remaining 5 marks for assignments to the Semesters I, II. For the III, IV, V & VI semesters it is resolved to continue the same as approved by Academic Council in 2017-18.

II. Semester-End Examinations:

- The maximum marks for II & III B.Sc (BZC) Semester-End examinations shall be 75 marks and duration of the examination shall be 3 Hours.
- Semester-End examinations shall be conducted in theory papers at the end of every semester while in practical papers, these examinations are conducted at end of I, II, III, IV, V & VI semesters.
- Discussed and recommended for organizing Seminars, Guest lectures, Work-shops to upgrade the knowledge of students, for the approval of the Academic Council.

Chairman

A.G & S.G. Siddhartha Degree College of Arts & Science

An autonomous college in the jurisdiction of Krishna University

BOTANY	BOT- 101C	w.e.f. 2018-19	B. Sc. (BZC)
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SEMESTER - I

PAPER - I

Total hours of teaching 60 hrs @ 4 hrs per week

Credits: 4

Microbial Diversity, Algae and Fungi

UNIT- I: Origin and Evolution of Life, Microbial diversity (12 hrs)

1. Origin of life –theories introduction; Lamarckism, Darwinism and Neo Darwinism.
2. Geological time scale
3. Microbial diversity-Mycoplasma – Chlamydia -Archaeobacteria –Actinomycetes

UNIT- II: VIRUSES AND BACTERIA (12 hrs)

1. Viruses: General account of Viruses, structure, replication and transmission of plant diseases caused by Viruses.
2. Bacteria: Structure, nutrition, reproduction and economic importance. Outlines of plant diseases of important crop plants caused by Bacteria (Citrus canker, leaf blight of rice, Angular leaf spot of Cotton) and their control.

UNIT III: CYANOBACTERIA AND LICHENS (12 hrs)

1. Cyanobacteria: General account of cell structure, thallus organization and their uses as Biofertilizers.
2. Structure, reproduction and life history of *Nostoc* and *Scytonema*.
3. Lichens – Morphology –Anatomy –Reproduction –Economic importance.

UNIT –IV Algae (12 hrs)

1. General account, Fritsch classification of Algae and economic importance.
2. Structure, reproduction, life history of *Oedogonium*, *Vaucheria* and *Ectocarpus*.

UNIT V: FUNGI (12 hrs)

1. General characters, classification (Alexopolous) and economic importance.
2. Structure, reproduction and life history of *Albugo*, *Penicillium*, *Puccinia*.
3. General account of plant diseases caused by Fungi (Late blight of potato, Red rot of Sugarcane and Paddy blast) and their control.

I B.Sc – BOTANY

Paper Code: BOT- 101 C

THEORY MODEL PAPER

SEMESTER- I

Paper-I: Microbial Diversity, Algae and Fungi

Time: 3 Hours

Max. Marks: 70

Pass Mark: 28

SECTION-A (Short Answer Questions)

Answer any Five of the following questions.

5x4=20M

1. Mycoplasma
2. Actinomycetes.
3. Struggle for existence.
4. Transformation.
5. Morphology of *Scytonema*.
6. Plurilocular sporangia.
7. Economic importance of *Penicillium*.
8. Red rot of Sugarcane

SECTION-B (Essay Questions)

Answer any five of the following questions.

5x10=50M

9. Write an essay on geological time scale.
10. Write an essay on the cell structure and nutrition in bacteria.
11. Describe the structure & replication of Virus.
12. Write an essay on Cyanobacteria as Biofertilizers.
13. Describe the morphology and economic importance of Lichens.
14. Describe the life history of macrandrous species in *Oedogonium*.
15. Describe the life history of *Vaucheria*.
16. Write about the life history of Macrocytic heterogenous rust.

Guide lines for paper setter: (for Paper I – BOT- 101C) w.e.f. 2018-19.

1. In **section A:** Unit II, III & IV must carry **ONE** question from each Unit and Unit V must carry **TWO** questions and Unit I must carry **THREE** questions.
2. In **section- B:** **ONE** question each from Unit I & III and **TWO** questions each from Unit II, IV & V.
3. See the following table and Model paper for marks distribution.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	3		1		
	12		10		22
Unit - II	1		2		
	4		20		24
Unit – III	1		1		
	4		10		14
Unit – IV	1		2		
	4		20		24
Unit – V	2		2		
	08		20		28
Max. Q & marks	8	(x 4) = 32	8	(x 10) = 80	(Total questions =16) Total marks = 112
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5		5		
	(5 X 4) = 20		(5 X 10) = 50		70

INTERNAL EXAMS – 30 Marks

(15 marks for unit tests, 5 marks for assignments, 5marks for attendance, 5marks for seminars).

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BOTANY	BOT- 201C	w.e.f.2018-19	B. Sc. (BZC)
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I B. Sc - BOTANY SYLLABUS

PAPER CODE : BOT – 201C

SEMESTER- II

Paper II: Diversity of Archaeogoniatae & Plant Anatomy

Total hours of teaching 60 hrs @ 4 hrs per week

Credits: 4

UNIT – I: BRYOPHYTA

(14 hrs)

- 1. Bryophyta:** General characters and classification (up to classes only).
2. Structure, reproduction and Life history of *Marchantia* and *Polytrichum*.
3. Evolution of Sporophyte in Bryophytes.

UNIT - II: PTERIDOPHYTA

(14 hrs)

- 1. Pteridophyta:** General characters and Classification (up to classes only).
2. Structure, reproduction and life history of *Lycopodium* and *Marsilea*.
3. Heterospory and seed habit
4. Stelar Evolution in Pteridophytes

UNIT – III: GYMNOSPERMS

(12 hrs)

- 1. Gymnosperms:** General characters and classification (up to classes only).
2. Morphology, Anatomy, reproduction and life history of *Pinus* and *Gnetum*.

UNIT – IV: Tissues and Tissue systems

(10 hrs)

1. Tissues: Meristematic and permanent tissues (Simple and Complex).
2. Shoot apical meristems and its histological organization.
3. Root apical meristems and its histological organization.

UNIT –V: Secondary growth.

(10 hrs)

1. Anomalous secondary growth in *Dracaena*, *Boerhaavia* and *Bignonia*.
2. Wood structure- general account, Study of local timbers Teak, Rosewood, Red sanders and *Terminalia tomentosa*.

I B. Sc – BOTANY Model Question Paper

Paper Code: BOT - 201

SEMESTER- II

PAPER-II: Diversity of Archaeogoniatae & Plant Anatomy

Time: 3 Hours

Max. Marks: 70

Pass Mark: 28

(Draw diagrams wherever necessary)

SECTION-A (Short Answer Questions)

Answer any **five** of the following question

5x4=20Marks

1. Gemma Cup.
2. Cone of *Lycopodium*
3. *Pinus* ovuliferous scale
4. Collenchyma.
5. Tunica – Corpus theory.
6. Phloem.
7. Botanical name, family and uses of Teak.
8. Botanical name, family and the properties of wood of Red sanders.

SECTION-B

Answer any **five** of the following questions:

5x10=50Marks

9. Write an essay on Evolution of sporophyte in Bryophytes.
10. Describe Sexual reproduction in *Polytrichum*.
11. Write an essay on the Stelar evolution in Pteridophytes.
12. Describe the structure of the sporocarp of *Marselia*.
13. Describe the internal structure of the *Pinus* needle & Mention its xerophytic characters.
14. Describe the female gametophyte in *Gnetum*.
15. Describe various theories regarding the organization of Root apex.
16. Give an account of the Anomalous secondary growth in *Boerhaavia*.

Guide lines for paper setter: (for Paper II – BOT- 201C) w.e.f. 2018-19.

- In **section A**: Unit I, II & III must carry **one** question from each Unit, Unit IV must carry **Three** questions and Unit V must carry **two** questions.
- In **section- B**: Set minimum **two** questions from Unit I, II & III. **One** question each from Unit IV and Unit V.
- See the following table and Model paper for marks distribution.
- Please provide the scheme of valuation for the paper.
- Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	1		2		
	04		20		24
Unit - II	1		2		
	04		20		24
Unit – III	1		2		
	04		20		24
Unit – IV	3		1		
	12		10		22
Unit – V	2		1		
	08		10		28
Max. Q & marks	5 (x 4) = 20		5 (x 10) = 50		(Total questions =16) Total marks = 112
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5		5		
	(5 X 4) = 20		(5 X 10) = 50		70

INTERNAL EXAMS – 30 Marks

(15 marks for unit tests, 5 marks for assignments, 5marks for attendance, 5marks for seminars).

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BOTANY	BOT-301C	w.e.f. 2018-19	B. Sc. (BZC)
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II B. Sc - BOTANY

SEMESTER - III

PAPER – III

Plant Taxonomy and Plant Physiology

Hours: 60 @ 4 hrs per week

UNIT – I: Introduction to Plant Taxonomy (12 hrs)

1. Fundamental components of taxonomy (identification, nomenclature, classification types and phylogeny)
2. Salient features and comparative account of Bentham & Hooker and Engler & Prantl's classification.
3. Role of chemotaxonomy, cytotaxonomy and taxometrics in relation to Taxonomy.

UNIT –II: Systematic Taxonomy (12 hrs)

1. Nomenclature and Taxonomic resources: An introduction to International Code of Botanical Nomenclature; Principles, Rules and Recommendations.
2. Systematic study and economic importance of plants belonging to the following families: Annonaceae, Capparidaceae, Rutaceae, Cucurbitaceae and Apiaceae

UNIT –III: Systematic Taxonomy (12 hrs)

1. Systematic study and economic importance of plants belonging to the following families: Asteraceae, Asclepiadaceae, Lamiaceae, Euphorbiaceae, Orchidaceae and Poaceae.

Plant Physiology

UNIT – IV: Plant – Water relations (12 hrs)

1. Importance of water to plant life, physical properties of water,
2. Diffusion, Imbibition and osmosis; water potential, osmotic potential and pressure potential.
3. Absorption, transport of water, ascent of sap.
4. Transpiration – types, stomata structure, movements and significance.

UNIT –V: Mineral nutrition and Fertilizers (12 hrs)

1. Mineral Nutrition: Essential macro and micro mineral nutrients and their role, mineral uptake (active and passive), deficiency symptoms.
2. Nitrogen cycle- biological nitrogen fixation.
3. Enzymes: Nomenclature, characteristics, mechanism and regulation of enzyme action, enzyme kinetics, factors regulating enzyme action.

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BOTANY	BOT- 301	w.e.f. 2018-19	B. Sc. (BZC)
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II B. Sc – BOTANY

Model Question Paper

SEMESTER- III

Paper Code: BOT - 301

Max. Marks: 75

PAPER-III: Plant Taxonomy and Plant Physiolog

Time: 3 Hours

Pass Marks: 30

(Draw diagrams wherever necessary)

SECTION-A (Short Answer Questions)

Answer any **five** of the following questions.

5x5=25Marks

1. Binomial nomenclature.
2. Cytotaxonomy.
3. Fruit in Rutaceae.
4. Pollination mechanism in Lamiaceae.
5. Water potential.
6. Types of Transpiration.
7. Imbibition.
8. Nitrogen.

SECTION-B

Answer any **five** of the following questions.

5x10=50Marks

9. Explain in brief Bentham & Hookers system of classification. Discuss the merits and demerits of the system.
10. Describe vegetative and floral characters of the family Cucurbitaceae.
11. Write an essay on ICBN.
12. Describe vegetative & floral characters of Asclepiadaceae.
13. Describe floral characters and economic importance of Euphorbiaceae.
14. Write an essay on Ascent of sap.
15. Write an essay on the absorption of mineral ions.
16. Explain the enzyme action and add a note on the factors that effect enzyme activity.

Guide lines for paper setter: (for Paper III – BOT- 301) w.e.f 2018-19

1. In **section A**: Unit II, III & V must carry **one** question from each Unit, Unit I must carry **two** questions and Unit IV must carry **three** questions.
2. In **section- B**: Set minimum **two** questions from Unit II, III & V. **One** question each from Unit I and Unit IV.
3. See the following table and Model paper for marks distribution.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		1		
	10		10		20
Unit - II	1		2		
	05		20		25
Unit – III	1		2		
	05		20		25
Unit – IV	3		1		
	15		10		25
Unit – V	1		2		
	05		20		25
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions =16) Total marks = 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5 (5 X 5M) = 25 M		5 (5 X 10M)= 50 M		75M

[INTERNAL EXAMS - 25Marks (15 marks for unit tests, 5 marks for assignments and remaining 5 marks for attendance.)]

II B.Sc - BOTANY PRACTICAL SYLLABUS (w.e.f. 2)

PAPER-III

SEMESTER-III

(BOT- 301P)

Practical – III:

Plant Taxonomy and Plant Physiology

Total hours of laboratory Exercises 45 hrs @ 3 per week

Suggested Laboratory Exercises:

1. Systematic study of locally available plants belonging to the families prescribed in theory Syllabus.
2. Demonstration of herbarium techniques.
3. Osmosis – by potato osmoscope method.
4. Determination of osmotic potential of vacuolar sap by plasmolytic method using leaves of *Rhoeo / Tradescantia*.
5. Determination of rate of transpiration using cobalt chloride method.
6. Demonstration of transpiration by Ganong's potometer.
7. Demonstration of ascent of sap / Transpiration pull.
8. Study of mineral deficiency symptoms using plant material/photographs.
11. Field visits.
12. Preparation and submission of 25 herbarium specimens for evaluation during the practical Examination.

II B.SC BOTANY PRACTICAL EXAM (BOT-301P) w.e.f. 2018-19

Time: 3 Hrs.

Max. Marks: 50

External Marks: 35

Plant Taxonomy and Plant Physiology

1. Describe specimen 'A' in technical terms. Draw neat labelled diagrams of twig with inflorescence, L.S of flower, T.S. of ovary, floral diagram and write the floral formula.

11M

2. Assign the Specimen 'B' to its family giving reasons. 3M
3. Write the salient features of experiment 'C' with the help of neat labelled diagram. 05M
4. Identify D &E. 03M
5. Herbarium. 03M
- Total 25M

Internal :

(Attendance – 5 M + Record -10M + Field trip diary – 5M + Viva – 5M)

Total -----50M

Scheme of valuation for II B.Sc

Botany practical Exam

Time: 3 Hrs.

External Marks: 25

1. Material 'A' - A twig with large sized flowers. (From the families mentioned in practical syllabus) - Description of veg. parts = 2 M; Description of floral parts = 4 M; One mark each for the diagrams of Twig with flower, L.S. of flower, T.S of ovary, Floral diagram and Floral formula.

Total = 11 M

2. Material 'B' – (Family name - 1, Identification with reasons - 2) Total = 03M

3. Material 'C' –Physiology –minor experiment

Salient features 3M

Diagram 2M =05M

4. 'D' & 'E'(2 Herbarium sheets from students collection) Total = 03M

[for each one, Botanical name - 1, Family – ½]

5. Herbarium. = 03 M

Total = 25 M

Internal :

25M

(Attendance – 5 M + Record -10M + Field trip diary – 5M + Viva – 5M)

BOTANY	BOT-401	w.e.f. 2018-19	B. Sc. (BZC)
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II B. Sc - BOTANY SYLLABUS

SEMESTER - IV

PAPER – IV

Hours: 60 @ 4 hrs per week

Plant Embryology and Plant Metabolism

UNIT – I: EMBRYOLOGY

(12hrs)

1. Introduction: History and Importance of Embryology.
2. Anther structure, Microsporogenesis and development of male gametophyte.
3. Ovule structure and types; Megasporogenesis; Monosporic; Bisporic and Tetrasporic types of female gametophyte / embryosac development.
4. Pollination -Types, Fertilization.

UNIT –II: EMBRYOLOGY AND PALYNOLOGY

(12 hrs)

1. Endosperm Development and types.
2. Embryo - development and types.
3. Polyembryony and Apomixis - an outline.
4. Palynology: Principles and applications.

UNIT –III: PLANT METABOLISM- I

(12 hrs)

1. Photosynthesis: Electromagnetic spectrum, absorption and action spectra; Red drop and Emerson enhancement effect, concept of Z scheme in photosystems, Photosynthetic pigments, mechanism of photosynthetic electron transport and evolution of oxygen, photo phosphorylation, carbon assimilation pathways: C₃, C₄ & CAM and Photorespiration.
2. Translocation of organic substances: Mechanism of phloem transport, source-sink relationships.

UNIT –IV: PLANT METABOLISM- II

(12 hrs)

1. Respiration: Aerobic and Anaerobic, Glycolysis, Krebs cycle, electron transport system, mechanism of oxidative phosphorylation, pentose phosphate pathway.
2. Lipid Metabolism: Structure and functions of lipids, conversion of lipids to carbohydrates, Beta-oxidation.

UNIT –V: GROWTH AND DEVELOPMENT

(12 hrs)

1. Growth and development: Definition, phases and kinetics of growth, Physiological effects of phytohormones - auxins, gibberellins, cytokinins, ABA and ethylene
2. Physiology of flowering and photoperiodism, role of phytochrome in flowering.
3. Stress Physiology: Concept and plant responses to water, salt and temperature stresses.

Suggested Reading

1. The embryology of angiosperms - Bhojwani S.S., Bhatnagar S.P. - Vikas publishing house private Ltd, New Delhi.
2. An introduction to the embryology of angiosperms - Maheswari. P - Tata Mac graw hill company Ltd, New Delhi.
3. Plant physiology - Taiz. L. and E. Zeizer - Sinauer Associates, Inc., publishers. Massachusetts, USA.
4. Introduction to Plant physiology - Hopkins - John Wiley and sons Inc., New York, USA.
5. Plant physiology - Salisbury. F.B. and C.W. Ross - Wordsworth Learning Inc., USA.

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BOTANY	BOT- 401	w.e.f. 2018-19	B. Sc. (BZC)
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II B. Sc – BOTANY Model Question Paper

Paper Code: BOT - 401

SEMESTER- IV

PAPER-IV: Plant Embryology and Plant Metabolism

Time: 3 Hours

Max. Marks: 75

Pass Mark: 30

(Draw diagrams wherever necessary)

SECTION-A (Short Answer Questions)

Answer any **five** of the following questions

5x5=25Marks

1. Microsporogenesis.
2. Allogamy.
3. Helobial endosperm.
4. Emerson enhancement effect.
5. Anaerobic respiration.
6. Ethylene.
7. Photoperiodism.
8. Phytochrome.

SECTION-B

Answer any **five** of the following questions.

5x10=50Marks

9. What is an Embryosac? Describe any five of the tetrasporic type of Embryosac developments.
10. Give an account of Polyembryony.
11. Write an essay on the Principles and applications of Palynology.
12. Describe the carbon assimilation pathway in C₄ plants.
13. Write an essay on the Translocation of organic substances in higher plants.
14. Describe various reactions of Krebs cycle.
15. Write an essay on various types of Lipids.
16. Give an account of Auxins and Gibberellins.

Guide lines for paper setter: (for Paper IV – BOT- 401) w.e.f. 2018-19

1. In **section A**: Unit II, III & IV must carry **one** question from each Unit, Unit I must carry **two** questions and Unit V must carry **three** questions.

2. In **section- B**: Set minimum **two** questions from Unit II, III & IV.

One question each from Unit I and Unit V.

3. See the following table and Model paper for marks distribution.

4. Please provide the scheme of valuation for the paper.

5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		1		
	10		10		20
Unit - II	1		2		
	05		20		25
Unit – III	1		2		
	05		20		25
Unit – IV	1		2		
	05		20		25
Unit – V	3		1		
	15		10		25
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions =16) marks = 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5		5		
		(5 X 5) = 25	(5 X 10) = 50		75

[INTERNAL EXAMS - 25Marks

(15 marks for unit tests, 5 marks for assignments and remaining 5 marks for attendance.)]

Total hours of laboratory Exercises 45 hrs @ 3 per week . w.e.f. 2018-19

Suggested Laboratory Exercises:

1. Structure of pollen grains using whole mounts (*Catharanthus, Hibiscus, Acacia, Grass*).
2. Demonstration of Pollen viability test using *in-vitro* germination (*Catharanthus*).
3. Study of ovule types and developmental stages of embryo sac using permanent slides / Photographs.
4. Structure of endosperm (nuclear and cellular); Developmental stages of dicot and monocot Embryos using permanent slides / Photographs.
5. Isolation and mounting of embryo (using *Symopsis / Senna / Crotalaria*).

Major experiments:

6. Separation of chloroplast pigments using paper chromatography technique.
7. Rate of photosynthesis under varying CO₂ concentration.
8. Effect of kind of light intensity on oxygen evolution during photosynthesis using Wilmontt' bubbler.
9. Titratable acidity estimation of Lemon or Tamarind leaves.

Minor experiments:

10. Release of CO₂ in Aerobic respiration.
11. Demonstration of the process of fermentation using Kuhne's fermentation vessel.
12. Demonstration of Phototropism.
13. Measuring the Plant growth using Arc Auxanometer.

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II BSc Botany Practical Exam (w.e.f. 2018-19)

IV Semester

Practical – IV

(BOT-401P)

Plant Embryology and Plant Metabolism

External Marks: 25

Model Paper

Time: 3 Hrs. **Max.Marks:50**

1. Conduct experiment ‘A’, write down the procedure and conclusions.

Tabulate the results if any.....11M

2. Write the salient features of experiment ‘B’ with the help of neat labelled diagram. 05M

3. Identify and write notes on ‘C, D & E’ (3X3M) 09M

Total marks for external exam 25M

Practical – IV

Scheme of valuation

(BOT-401P)

1. ‘A’ –Physiology –major experiment

Setting and conducting of the experiment	.....6M	
Procedure	.....3M	
Conclusion and tabulation	.....2M	= 11M

2. ‘B’- Physiology –minor experiment

Salient features	.....3M	
Diagram	.....2M	= 05M

3. ‘C’ from Anther T.S / Pollen grains.

‘D’ - Slide from types of Ovules.	.....	= 03M
‘E’– Slide from Embryosacs / Embryos.	.....	= 03M

(Identification - 1 + Diagram-1 + Notes- 1 =Total = 3marks for each)

(Total marks for external exam 25M)

Internal:

a) Record	.....10M	
b) Internal Practical Exam/ Self study project report.	05M
c) Attendance		05M
d) Viva		<u>05M</u>

Grand Total 50M

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BOTANY	BOT-501	2018-19	B.Sc. (BZC)
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PAPER – V

SEMESTER-V (2018-19)

Cell Biology, Genetics and Plant Breeding

Credits:03

Total Hours of teaching 60 hrs @ 6 hrs for Week

UNIT-I Cell Biology

1. Cell, Ultra Structure and functions of cell wall.
2. Molecular Organization of cell membranes.
3. Chromosomes; morphology, organization of DNA in a chromosome (Nucleosome model) Euchromatin and Heterochromatin.

UNIT-II Genetic Material

1. DNA as the Genetic Material: Griffith's and Avery's Transformation Experiment. Hershey - Chase Bacteriophage experiment.
2. DNA Structure (Watson & crick model) and replication of DNA (Semi Conservative).
3. Types of RNA (mRNA, tRNA, rRNA), their structure and function.

UNIT-III Mendelian Inheritance

1. Mendelian Inheritance (Mono – Di-hybrid Crosses), Back cross and Test cross.
2. Linkage: concept, complete and In-complete Linkage, Coupling and Repulsion; Linkage Maps Based on Two and Three Point cross.
3. Crossing over concept and significance.

UNIT-IV Gene Expression

1. Organization of gene, Transcription and Translation.
2. Mechanism and regulation of Gene Expression in Prokaryotes (Lac operas).
3. Mutations: Chromosomal Aberrations, Gene Mutations and Transposable Elements.

UNIT-V Plant Breeding

1. Introduction and objectives of Plant Breeding.
2. Methods of Crop Improvement: Procedure, Advantages and limitations of Introduction, Selection and Hybridization (Out lines only).

B.Sc – BOTANY

SEMESTER-V: THEORY MODEL PAPER

BOT-501

Time: 3 Hours

Max. Marks:75

SECTION-A

Answer any five of the following question

5x5=25M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION-B

Answer any FIVE of the following questions

5x10=50M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

Guide lines for paper setter: (for Paper V-BOT-501) W.e.f. 2018-19

1. In Section A: Unit I, III, V must carry one question from each unit. Unit II must carry 2 questions and Unit IV must carry three questions.
2. In section-B: Set minimum Two questions from Unit I, II & III
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in Marks
	Questions	Marks	Questions	Marks	
Unit – I	1		2		25
	5		20		
Unit – II	2		2		30
	10		20		
Unit –III	1		2		25
	5		20		
Unit-IV	3		1		25
	15		10		
Unit-V	1		1		15
	5		10		
Max .Q & marks	8 (x 5) =40		8 (x 10) = 80		(Total questions =16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5		5		75
	(5 x 5) = 25		(5 x 10) = 50		

INTERNAL EXAMS - 25Marks

(20 marks for unit tests, 5 marks for assignments 5marks for Attendance 5 marks for seminar remaining 5 marks for Objective type questions)

III B.SC-BOTANY Practical paper

Cell Biology, Genetics and Plant Breeding

SEMESTER-V

BOT-501-P

Time :3hrs

Max.marks:50

Total hours of teaching 30hrs @ 2 hrs per week

1. Study of the structure of cell organelles through photomicrographs.
2. Study of plant cell through temporary mounts.
3. Study of various stages of mitosis using cytological preparation of Onion root tips.
4. Study of DNA packing by micrographs.
5. Numerical problems solving Mendal's Laws of inheritance.
6. Chromosome mapping using 3 point test cross data.
7. Hybridization techniques –emasulation. Bagging (for demonstration only).
8. Field visit to a plant breeding research station.

III B.SC-SEMESTER-V, BOTANY PRACTICAL MODEL PAPER

PAPER –V: CELL BIOLOGY GENETICS AND PLANT BREEDING

1. Perform the Experiment A Squash technique.....12marks
2. Give the experimental protocol of the experiments. B.....4M
3. Solving numerical problems on Mendelian inheritance. C.D $2 \times 7 \frac{1}{2} = 15$ marks
4. Record.....5marks.
Viva.....4marks.
Internal Practical Exam.....10M

III B.SC-BOTANY Syllabus SEMESTER-V

Practical paper – V: Cell Biology, Genetics and Plant Breeding

Total hours of teaching 30hrs @ 2 hrs per week

1. Perform the Experiment A.

Squash technique4M

Procedure.....4M

diagram2M =10

2. Give the experimental protocol of the experiments. B.....4M

3. Genetic problem C, D

Salvation of problem..... 5M

Reasoning.....2M

2X7½=15M

Viva4M

Internal:

a) Record..... 5 M.

b)Internal Practical Exam.....10M

Books for Reference:

1. Old, R.W. and Primrose S.B. 1994, Principles of Gene Manipulation Blackwell Science, 19 London
2. Grierson, D. and Convey S.N. 1989, Plant Molecular Biology, Blackie Publishers, New York.
2. Lea, P.J. and Leegood R.C. 1999, Plant Biochemistry and Molecular Biology, John Wiley and Sons, London.
3. Power C.B., 1984, Cell Biology, Himalaya Publishing Co. Mumbai
4. De. Robertis and De Robertis, 1998, Cell and Molecular Biology, K.M. Verghese and Company .

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BOTANY	BOT-502	2018-19	B.Sc. (BZC)
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SEMESTER-V (2017-2018)

PAPER – VI

PLANT ECOLOGY & PHYTOGEOGRAPHY

Credits-03

Total Hours of teaching 60 hrs @ 6 hrs for Week

UNIT-I.ELEMENTS OF ECOLOGY

1. Ecology: Definition, branches and significance of ecology.
2. Climatic factors: Light, Temperature.
3. Edaphic factor: Origin, formation, composition and soil profile.
4. Biotic factor, Ecological adaptations of Plants.

Unit– II. Ecosystem Ecology

1. Ecosystem: concept and components, energy flow, food chain, food web, Ecological Pyramids.
2. Productivity of ecosystem-Primary, Secondary and Net productivity.
3. Biogeochemical cycles- Carbon, Nitrogen and Phosphorous.

Unit –III Population & Community ecology.

1. Population-definition, characteristics and importance (Density,Natality, Mortality, Growth Curves) outlines-ecotypes.
2. Plant communities- characters of a community, outlines – Frequency, density, cover, life forms, Biological Spectrum.
3. Ecological Succession: Hydrosere and Xerosere

Unit-IV Phytogeography

1. Principles of Phytogeography, Distribution (Wides, Endemic, Discontinuous species).
2. Phytogeographic regions of India.
3. Endemism – types and Causes.

Unit-V Plant Biodiversity and its Importance

1. Definition, Levels of Biodiversity – genetic, species and ecosystem.
2. Biodiversity and Hot-spots of India: North Eastern, Himalayas and Western Ghats.
3. Loss of Biodiversity-causes and Conservation (In-situ and Ex-Situ Methods).

B.Sc – BOTANY

SEMESTER-VI: THEORY MODEL PAPER

BOT-601

Time: 3 Hours

Paper VII C (el)

Max. Marks:75

SECTION-A

Answer any five of the following question

5x5=25M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION-B

Answer any FIVE of the following questions

5x10=50M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

Guide lines for paper setter: (for Paper V-BOT-501) W.e.f. 2018-19

1. In Section A: Unit I, II, III, must carry Two question from each unit. Unit IV, V must carry one question.
2. In section-B: Set minimum two questions from Unit I, II & III and Set One Question from IV, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section – A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
		10		20	30
Unit – II	2		2		
		10		20	30
Unit – III	2		2		
		10		20	30
Unit-IV	1		1		
		5		10	15
Unit-V	1		1		
		5		10	15
Max. Q & marks	8	(x 5) = 40	8	(x 10) = 80	(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5		5		
		(5 x 5) = 25		(5 x 10) = 50	75

INTERNAL EXAMS - 25Marks

(15 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.)

BOTANY PRACTICAL
PLANT ECOLOGY & PHYTOGEOGRAPHY

BOT-502-P

SEMESTER- V

Total hours of teaching 30 hrs @ 3 hrs per week

1. Study of instruments used to measure microclimatic variables; soil thermometer, maximum and minimum thermometer, anemometer, psychomotor, rain gauge, and lux meter.
2. Permeability (percolation; total capacity as well as rate of movement) of different soil samples.
3. Determination of soil pH
4. Study of morphological and anatomical adaptations of hydrophytes and xerophytes. (4each)
5. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method.
6. Study of Phytoplankton and macrophytes from water bodies.
7. Study of species diversity index of vegetation.
8. Estimation of Primary Productivity of an ecosystem.
9. To study field vegetation with respect to stratification, canopy cover and composition.
10. Study of plants included in agro forestry and social forestry.
11. To locate the hotspots, phyto geographical regions and distribution of endemic plants in the map of India.
12. The following practical should be conducted in the Field/lab with the help of Photographs, herbarium, Floras, Red data book- Study of endangered plants species, critically endangered plants species, vulnerable plant species and monotypic endemic genera of India.

BOTANY PRACTICAL
PLANT ECOLOGY & PHYTOGEOGRAPHY

SEMESTER- V

BOT-502-P

Total hours of teaching 30 hrs @ 3 hrs per week

1. Study Project under supervision.....12 Marks
2. Experiment A 07Marks
3. Anatomical adaptations of **B** (Section cutting)..... 07Marks
4. Spotters **C&D**(2x2 1/2) = 5 Marks
5. Record.....05Marks
6. Viva-Voc.....04Mrks
7. Internal practical exam.....10Marks

Total = 50 Marks

BOTANY PRACTICAL
PLANT ECOLOGY & PHYTOGEOGRAPHY

SEMESTER- V

BOT-502-P

Scheme of Valuation

1. Study Project under supervision
To study Honey Bees and Plants Yielding Honey 12 Marks
2. Experiment A -determination of soil porosity/PH..... 07Marks
3. Anatomical adaptations of **B** (Section cutting)
Xerophytes / Hydrophytes07Marks
4. Spotters **C&D** anemometer/rain gauze/lux meter(2x2 1/2) = 5 Marks
5. Viva-Voc.....04Mrks
6. Record.....05Marks
7. Internal practical exam.....10Marks

Total = 50 Marks

Books for Reference:

1. Daubenmire, R.F. (): Plants & Environment (2nd Edn.) John Wiley & Sons.,
New York22
2. Puri, .G.S. (1960): Indian Forest Ecology (Vol.I & II) Oxford Book Co., New Delhi
&Calcutta.
3. Billings, W.B. (1965): Plants and the Ecosystem Wadsworth Publishing Co., Inc.,
Belmont.
4. Misra, R. (1968): The Ecology work Book Oxford & INH Publishing Co., Calcutta

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BOTANY	BOT-601(GE)	2018-19	B.Sc. (BZC)
PAPER – VII – ELECTIVE-C			SEMESTER- VI
Plant tissue culture and its biotechnological applications			
Total hours of teaching 60hrs @ 6 hrs per week			Credits: 3

Unit I: PLANT TISSUE CULTURE – 1 **(12hrs)**

1. History of plant tissue culture research - basic principles of plant tissue callus culture, meristems culture, organ culture, Totipotency of cells.
2. Methodology - sterilization (physical and chemical methods), culture media, Murashige and Skoog's (MS medium), phytohormones, medium for micro-propagation/clonal propagation of ornamental and horticulturally important plants.
3. Callus subculture maintenance, growth measurements, morphogenesis in callus culture – Organogenesis, somatic embryogenesis.

UNIT-II: Plant Tissue culture -2 **(12hrs)**

1. Endosperm culture – Embryo culture -culture requirements – applications, embryo rescue technique.
2. Production of secondary metabolites.
3. Cryopreservation; Germ plasm conservation.

Unit III: Recombinant DNA technology **(12hrs)**

1. Restriction Endonucleases (history, types I-IV, biological role and application); concepts of restriction mapping.
2. Cloning Vectors: Prokaryotic (pUC 18, pBR322, Ti plasmid and Lambda phage, Eukaryotic Vectors (YAC and briefly PAC)
3. Gene cloning (Bacterial Transformation and selection of recombinant clones, PCR Mediated gene cloning)
4. Construction of genomic and cDNA libraries, screening DNA libraries to obtain gene of interest by complementation technique, colony hybridization.

Unit IV: Methods of gene transfer **(12hrs)**

1. Methods of gene transfer- Agrobacterium-mediated, direct gene transfer by Electroporation, Microinjection, Micro projectile bombardment
2. Selection of transgenics– selectable marker and reporter genes (Luciferase, GUS, GFP).

Unit V: Applications of Biotechnology **(12 hrs)**

1. Applications of Plant Genetic Engineering – crop improvement, herbicide resistance, insect resistance, virus resistance.
2. Genetic modification – transgenic plants for pest resistant (Bt-cotton); herbicide resistance (Round Up Ready soybean); improved agronomic traits flavrSavr tomato, Golden rice); Improved horticultural varieties (Moon dust carnations).

Guide lines for paper setter: (for Paper VII -BOT-601) W.e.f. 2018-19.

1. In Section A: Unit I,III,IV must carry Two question from each unit. Unit II, V must carry one question.
2. In section-B: Set minimum two questions from Unit I, II, III and Set One Question from IV, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section – A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
	10		20		30
Unit – II	1		2		
	5		20		25
Unit – III	2		2		
	10		20		30
Unit-IV	2		1		
	10		10		20
Unit-V	1		1		
	5		10		15
Max. Q & marks	8	(x 5) = 40	8	(x 10) = 80	(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5		5		
	(5 x 5) = 25		(5 x 10) = 50		75

INTERNAL EXAMS - 25Marks

(15 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.)

Plant Tissue Culture & Plant Biotechnology

SEMESTER- VI

BOT – 601P

Total hours of teaching 30hrs @ 2hrs per week

Credits:2

1. (a) Preparation of MS medium.
(b) Demonstration of in vitro sterilization methods and inoculation methods using leaf and nodal explants of Tobacco/ Datura/ Brassica etc.
2. Study of embryo and culture, micro propagation of Banana, somatic embryogenesis, artificial seeds through photographs.
3. Construction of restriction map of circular and linear DNA from the data provided.
4. Study of methods of gene transfer through photographs: Agrobacterium-mediated, direct gene transfer by electroporation, microinjection, and micro projectile bombardment.
5. Different steps involved in genetic engineering for production of Bt. cotton, Golden rice, Flavr Savr tomato through photographs.
6. Isolation of plasmid DNA.
7. Restriction digestion and gel electrophoresis of plasmid DNA (optional)
8. Field visit to a lab involved in tissue culture
9. Study project under supervision of lecturer – tissue culture/ genetic engineering

Expected domain skills to be achieved: Ability to prepare artificial nutrient media, preparing independently, applying various sterilization procedures for media, glassware and biological materials, invitro propagation of Banana callus, morphogenesis--s, clonal propagation methods, isolation of plasmid DNA individually and as a group.

Practical Paper VII-C
Plant Tissue Culture & Plant Biotechnology

SEMESTER- VI

BOT – 601(GE) P

Total hours of teaching 30hrs @ 2hrs per week

Credits: 2

Q1. Project report (A) -10M
Viva-voce on study project.....02M

Q2. Identify and write notes on B, C and D (3x3).....09 M
B- Tool/instrument/container used in sterilization
C- Tool/instrument/container used in gene transfer
D- GM crops (Photographs)

Q3. Construct restriction map of circular and/ or linear DNA from the data
Provided.....06M

Q 4. Field report.....03M

Total.....

30 Marks

Internal Assessment

a. Record -05M
b. Attendance.....05M
e. Internal practical exam.....10M

Total.....

20Marks

Total ----- 50M

Books for Reference:

1. Pullaiah. T. and M.V.Subba Rao. 2009. Plant Tissue culture. Scientific Publishers, New Delhi.
2. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
3. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.
4. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms. Vikas Publication House Pvt. Ltd., New Delhi. 5th edition.

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III-BZC B. Sc	BOTANY-VIII	BOT-602 (CE)	2018-19
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Paper – VIII-A-1: PLANT DIVERSITY AND HUMAN WELFARE

Credits: 3

Total hours of teaching 60hrs @ 6hrs per week

Unit- I: Plant diversity and its scope: (12hrs)

1. Genetic diversity, Species diversity, Plant diversity at the ecosystem level,
2. Agro biodiversity and Vavilov Crop centers.
3. Values and uses of biodiversity: Ethical and aesthetic values, Uses of plants.

Unit -II: Loss of biodiversity: (12hrs)

1. Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agro biodiversity, projected scenario for biodiversity loss.
2. Management of plant biodiversity: Organizations associated with biodiversity Management-Methodology for execution-IUCN, UNEP, UNESCO, WWF, NBPGR; Biodiversity legislation and conservations, Biodiversity information management and Communication.

Unit-III: Contemporary practices in resource management: (12hrs)

1. Environmental Impact Assessment (EIA), Geographical Information System GIS,
2. Solid and liquid waste management.

Unit -IV: Conservation of biodiversity (12hrs)

1. Conservation of genetic diversity, species diversity .
2. Social approaches to conservation, Biodiversity awareness Programmes, Sustainable development.

Unit- V: Role of plants in relation to Human Welfare (12hrs)

- 1 Importance of forestry, their utilization and commercial aspects-
 - a) Avenue trees, b) ornamental plants of India. c) Alcoholic beverages Through ages.
- 2 Fruits and nuts: Important fruit crops their commercial importance. Wood, fiber and their uses.

B.Sc – BOTANY

SEMESTER-VI: THEORY MODEL PAPER

BOT- 602 (CE)

Time: 3 Hours

Max. Marks:75

SECTION-A (Short Answer Questions)

Answer any five of the following question

5x5=25M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION-B (Essay Questions)

Answer any five of the following questions

5x10=50M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

INTERNAL EXAMS - 25Marks

(20 marks for unit tests, 5 marks for assignments 5marks for Attendance 5 marks for seminar remaining 5 marks for Objective type questions.)

Guide lines for paper setter: (for Paper VIII -BOT-602) W.e.f. 2018-19

1. In Section A: Unit I, II, III, must carry Two question from each unit. Unit IV, V must carry one question.
2. In section-B: Set minimum two questions from Unit I, II & III and Set One Question from IV, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
		10		20	30
Unit – II	2		2		
		10		20	30
Unit – III	1		2		
		05		20	25
Unit-IV	1		1		
		5		10	15
Unit-V	2		1		
		10		10	20
Max. Q & marks	8	(x 5) = 40	8	(x 10) = 80	(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5		5		
		(5 x 5) = 25		(5 x 10) = 50	75

INTERNAL EXAMS - 25Marks

(15 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc

PLANT DIVERSITY AND HUMAN WELFARE**SEMESTER- VI****BOT-602-A-1(CL)P**

Time: 3hrs

Max. Marks: 50

- 1) Study of plant diversity (flowering plants).
- 2) Study of exotic species- Identification and morphological characteristics.
- 3) Identification of forest trees through bark, wood, flowers, leaves and fruits.
- 4) Maceration, Study of wood (Tracheary elements, fibres).
- 5) Methods of preservation and canning of fruits.
- 6) Visit to the local ecosystem to study the plants.
- 7) Study of Solid and Liquid waste management systems in rural/urban areas.

SCHEME OF PRACTICAL EXAMINATION

- I. Assign the plants **A, B and C** to their respective families, giving reasons, family name and classification-1marks, important diagrams- 2 marks.....**09 marks**
- II. Give the protocol of **D****04marks**
- III. Comment on specimens **E, F and G****3x3 = 09 marks**
- IV. Report on Field visit..... **4 marks**
To study sources of firewood (10 plants), timber-yielding trees (10trees) and bamboos.
- V. Viva-Voce**04marks**
- Total..... **30 Marks**

Internals

- a. Record -05M
- b. Attendance.....05M
- c. Internal practical exam.....10M
- Total..... **20 Marks**

Total -----50M**KEY**

A-Cultivated Plant

B- Wild Plant

C –Exotic plant

D- Preservation and canning of fruits, solid and liquid waste management systems in rural/urban areas

E. Bark/wood/fruit yielding plant

F. Nuts/ Alcoholic beverage plant

G. wood /Fibre yielding plant

Paper – VIII-A-1: Practical's:

PLANT DIVERSITY AND HUMAN WELFARE

SEMESTER- VI

BOT-602-A-(CL) P

SCHEME OF PRACTICAL EXAMINATION

Time: 3hrs

Max. Marks: 50

I. Assign the plants **A, B and C** to their respective families, giving reasons, family name and classification-1marks, important diagrams- 2 marks.....**09 marks**

II. Give the protocol of **D****04marks**

III. Comment on specimens **E, F and G****3x3= 09 marks**

IV. Report on Field visit..... **4 marks**

To study sources of firewood (10 plants), timber-yielding trees (10trees) and bamboos.

V. Viva-Voce**4marks**

Total ---- 30marks

Internals:

a. Record -05M

b. Attendance.....05M

c. Internal practical exam.....10M

Total ---- 20marks

Total -----50M

KEY

A-Cultivated Plant

B- Wild Plant

C -Exotic plant

D- Preservation and canning of fruits, solid and liquid waste management systems in rural/urban areas

E. Bark/wood/fruit yielding plant

F. Nuts/ Alcoholic beverage plant

G. wood /Fibre yielding plant

Suggested Readings:

1. Krishnamurthy, K.V. (2004). An Advanced Text Book of Biodiversity - Principles and Practices. Oxford and IBH Publications Co. Pvt. Ltd. New Delhi.
2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications, New Delhi.
3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). An Introduction to Sustainable Development. Prentice Hall of India Private Limited, New Delhi.

III. BZC (B. Sc)	BOTANY-VIII	BOT- 603 (CE)	2018-19
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Paper – VIII-A-2

Credits: 3

ETHNOBOTANY AND MEDICINAL BOTANY

Total hours of teaching 60hrs @ 6hrs per week

Unit –I: Ethnobotany

(12hrs)

1. Introduction, concept, scope and objectives
2. Major and minor ethnic groups or Tribals of India, and their lifestyles.
3. Plants used by the tribal populations:
 - a) Food plants, b) intoxicants and beverages,
 - c) Resins and oils and miscellaneous uses.

Unit -II: Role of ethnobotany in modern Medicine

(12hrs)

1. Role of Ethnobotany in modern medicine with special example; *Rauwolfiaserpentina*, *Artemisia annua*, *Withaniasomnifera*.
2. Significance of the following plants in ethno botanical practices (along with their habitat and morphology)
 - a) *Azadirachtaindica*, b) *Vitexnegundo*, c) *Ocimum sanctum*, d) *phyllanthus niruri*
3. Role of ethnic groups in the conservation of plant genetic resources.

Unit-III: Ethno botany as a tool to protect interests of ethnic groups

(12hrs)

1. Sharing of wealth concept with few examples from India.
2. Biopiracy, Intellectual Property Rights and Traditional Knowledge.

Unit -IV: History, Scope and Importance of Medicinal Plants. Indigenous Medicinal Sciences

(12hrs)

1. Definition and Scope - Ayurveda: History, origin, Panchamahabhutas, saptadhatu and tridosha concepts, Rasayana, plants used in ayurvedic treatments.
- 2 Homeopathy: Origin of Homeopathy medicinal systems, Basis of Homeopathy, plants used in Homeopathy medicine.

Unit -V: Conservation of endangered and endemic medicinal plants

(12hrs)

1. Definition: endemic and endangered medicinal plants,
2. Red list criteria
3. *In situ* conservation: sacred groves, National Parks
4. *Ex situ* conservation: Botanical Gardens.

SEMESTER-VI: THEORY MODEL PAPER

BOT-VIII-603-A- 2(CL)

Time: 3 Hours

Max. Marks:75

SECTION-A

Answer any five of the following question.

5x5=25M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION-B

Answer any five of the following questions.

5x10=50M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

INTERNAL EXAMS - 25Marks

(20 marks for unit tests, 5 marks for assignments 5marks for Attendance 5 marks for seminar remaining 5 marks for Objective type questions.)

Guide lines for paper setter: (for Paper VIII-BOT-603(CE)) W.e.f. 2018-19

1. In Section A: Unit I, IV, must carry two questions from each unit. Unit II must carry Two Question. Unit III, V must carry one question.
2. In section-B: Set minimum Two questions from Unit I, II & IV and Set One Question from III , V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
	10		20		30
Unit – II	2		2		
	10		20		30
Unit – III	1		1		
	05		10		15
Unit-IV	2		2		
	10		20		30
Unit-V	1		1		
	5		10		15
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5		5		
	(5 x 5) = 25		(5 x 10) = 50		75

INTERNAL EXAMS - 25Marks (15 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.).

1. Ethno botanical specimens as prescribed in theory syllabus
2. Detailed morphological and anatomical study of medicinally important part(s) of locally available plants (Minimum 8 plants) used in traditional medicine.
3. Field visits to identify and collect ethno medicinal plants used by local tribes/folklore.

Practical Question Paper

I. Identify the specimen A- Give reasons (morphological and anatomical) and draw Labeled sketches10marks

II. Identify and write about the medicinal uses of B-and C..... 3x3= 09 marks

III. Comment on D and E.....2 x 2= 04 marks

IV. Report on Field visit:.....04 marks

List to be prepared mentioning special features of plants used by tribal Populations as Medicinal Plants & Spices. Write their botanical and common names, Parts used and diseases/disorders for which they are prescribed.

V. Viva-voce..... 03 marks

Total.....

30Marks

Internals

a. Record -05M

b. Attendance.....05M

c. Internal practical exam.....10M

Total.....

20 Marks

Total -----50M

KEY

A-Plants given in unit II (i)

B-Plants used in Ayurvedic preparations (Amla in Chyavanprash, Senna in Laxatives)

C - - Do -

D. Photographs of National parks, Biosphere reserves and Botanical gardens.

E. Photograph of famous personalities in Ayurveda/Siddha medicine.

Suggested Readings:

- 1) S.K. Jain, Manual of Ethnobotany, Scientific Publishers, Jodhpur, 1995.
- 2) Glimpses of Indian. Ethnobotny, Oxford and I B H, New Delhi – 1981.
- 3) S.K. Jain (ed.) 1989. Methods and approaches in ethnobotany. Society of ethnobotanists, Lucknow, India.
- 4) S.K. Jain, 1990. Contributions of Indian ethnobotny. Scientific publishers, Jodhpur.
- 5) Colton C.M. 1997. Ethnobotany – Principles and applications. John Wiley and sons Chichester

III-BZC B.Sc	BOTANY-VIII	BOT-604- (CE)	2018-19
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SEM-VI: **Pharmacognosy and Phytochemistry** Credits: 3
Total hours of teaching 60hrs @ 6hrs per week

Unit-I: Pharmacognosy

(12hrs)

1. Definition, Importance
2. Classification of drugs - Chemical and Pharmacological
3. Drug evaluation methods

Unit –II: Organoleptic and microscopic studies:

(12hrs)

1. Organoleptic and microscopic studies with reference to nature of active principles and common adulterants of
2. a) *Adhatoda vasica*(leaf) b) *Strychnosnuxvomica* (seed),
c) *Rauwolfia serpentina*(root) d) *Zinziberofficinalis* e) *Catharanthusroseus*.

Unit-III: Secondary Metabolites:

(12hrs)

1. Definition of primary and secondary metabolites and their differences, Major types - terpenes, Phenolics, alkaloids, terpenoids, steroids.
2. A brief idea about extraction of alkaloids. Origin of secondary metabolites–detailed account of Mevalonate pathway, Shikimate pathway.

UNIT-IV: Phytochemistry:

(12hrs)

Biosynthesis and sources of drugs:

1. Structural type biosynthesis importance of simple Phenolic compounds, coumarins, Flavonoids.
2. Steroids, sterols: Biosynthesis, commercial importance.
3. Alkaloids: Different groups, biosynthesis, bioactivity.
4. Volatile oils, aromatherapy.

UNIT-V: Enzymes, proteins and amino acids as drugs:

(12hrs)

1. Vaccines, toxins and toxoids, immune globulins, antiserums,
2. Vitamins, Antibiotics – chemical nature, mode of action.
3. Pharmacological action of plant drugs – tumor inhibitors, PAF antagonists, antioxidants, phytoestrogens and others.

B.Sc – BOTANY

SEMESTER-VI: THEORY MODEL PAPER

BOT-604-A- 3(CL)

Time: 3 Hours

Max. Marks:75

SECTION-A

Answer any five of the following question

5x5=25M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.

SECTION-B

Answer any five of the following questions

5x10=50M

- 9.
- 10.
- 11.
- 12.
- 13.
- 14.
- 15.
- 16.

INTERNAL EXAMS - 25Marks

(20 marks for unit tests, 5 marks for assignments 5marks for Attendance 5 marks for seminar remaining 5 marks for Objective type questions.)

Guide lines for paper setter: (for Paper VI-BOT-604) W.e.f. 2018-19.

1. In Section A: Unit III, IV, V must carry two questions from each unit. Unit I, II, must carry One question.
2. In section-B: Set minimum two questions from Unit I, II & III and Set One Question from IV, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	1		2		
	5		20		25
Unit – II	1		2		
	5		20		25
Unit – III	2		2		
	10		20		30
Unit-IV	2		1		
	10		10		20
Unit-V	2		1		
	10		10		20
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5		5		
	(5 x 5) = 25		(5 x 10) = 50		75

INTERNAL EXAMS - 25Mark

(15 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.)

Pharmacognosy and Phytochemistry

SEMESTER- VI
Time: 3 Hours

BOT-VIII-604-A- 3 (CL)P
Max. Marks- 50

1. Physical and chemical tests for evaluation of unorganized drugs- Asaphoetida. Honey, Castor oil. Acacia
2. Identification of bark drugs – cinchona, cinnamom
3. Identification of fruit drugs – Cardamom, Coriander
4. Identification of root and rhizome drugs- Ginger, Garlic, Turmeric
5. Identification of whole plant – Aloes, Vinca, Punarnava
6. Herbarium of medicinal plants (minimum of 20 platns)
7. Collection of locally available crude drugs from local venders (minimum of 20)

Practical Question Paper

- I. Identify the given crude drugs **A& B** by morphological study and chemical tests.....**2X5 = 10marks**
 - II. Perform suitable chemical test and identify the given phytochemical **C**.....**05marks**
 - III. Comment on D and E**2x3= 06 marks**
 - IV. Herbarium and submission of drugs -.....**5 marks**
 - IV. Viva-Voce**04 marks**
- Total..... **30Marks**

Internals

- a. Record -05M
 - b. Attendance.....05M
 - c. Internal practical exam.....10M
- Total..... **20Marks**

Total -----50M

KEY

A-Flower/fruit drugs

B-Rhizome/whole plant drugs

C- Tannins/ phenolics/steroids/ isoprenoids /Asaphoetida/ Honey/ Castor oil/ Acacia

D. Column Chromatography/ Gas Chromatogram/HPLC (photograph/ instrument used for chemical analysis of drugs.

BOOKS FOR REFERENCE:

1. Wallis, T. E. 1946. Text book of Pharmacognosy, J & A Churchill Ltd. 2.
Roseline, A. 2011. Pharmacognosy. MJP Publishers, Chennai.
2. Gurdeep Chatwal, 1980. Organic chemistry of natural productis.
Vol.I.Himalaya Publishing house.
3. Kalsi, P. S. and Jagtap, S., 2012. Pharmaceutical medicinal and natural
Product chemistry N.K. Mehra . Narosa Publishing House Pvt. Ltd. New
Delhi.
4. Agarwal, O. P. 2002. Organic chemistry–Chemistry of organic natural
products. Vol. II. Goel publishing house , Meerut.

**A.G& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS &
SCIENCE**

VUYYURU-521165, KRISHNA Dt., A.P.(Autonomous)

Accredited by NAAC with "A" Grade

2019-2020



DEPARTMENT OF BOTANY

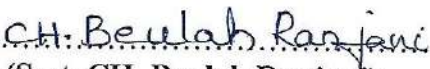

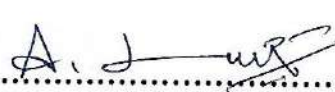



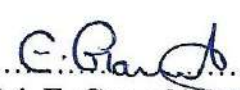
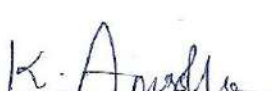
MINUTES OF BOARD OF STUDIES

EVEN SEMESTER

15-10-2019

Minutes of the meeting of Board of studies in Botany for the Autonomous courses of AG & SG Siddhartha Degree College of Arts & Science, Vuyyuru, held at 10:30 A.M on 15-10-2019 in the Department of Botany.

Members Present:-

- 1)  Chairman
(Smt. CH. Beulah Ranjani) Head, Department of Botany
AG & SG S Degree College of Arts & Science
Vuyyuru-521165.
- 2)  University
(Smt. Dr. L. Suseela) Nominee Department of Biotechnology &
Head (I/c) Botany,
Krishna University, Machilipatnam.
- 3)  Academic
(Sri. Dr. A. Srinivas Rao) Council Nominee Lecture in Botany,
Govt. Degree College Mandapeta,
East Godavari.
- 4)  Academic
(Smt. N. Manimala) Council Nominee Head, Department of Botany
Govt. Degree College Chinthalapudi,
West Godavari.
- 5)  Industrialist.
(Sri. S. Krishna Suman) Natural farming.
yakamuru
Vuyyuru, Krishna d.t
- 6)  Member
(Sri. N. Ramana Rao) Ad hoc Lecturer in Botany
AG & SGS Degree College of Arts &
Science (Autonomous), Vuyyuru-521165.
- 7)  Member
(Sri. E. Ganesh) Ad hoc Lecturer in Botany
AG & SGS Degree College of Arts &
Science (Autonomous), Vuyyuru-521165.
- 8)  student representative
(Miss K. Anusha MSc) Lecturer in chaitanya college,
Vuyyuru.

Agenda for B.O.S Meeting:

1. To recommend the syllabi (Theory & Practical), Model question paper & Guide lines for IISemesters of I B.Sc (BZC),ABC in the academic year 2019-20.
2. To recommend the syllabi (Theory & Practical), Model question paper& Guide lines for Semesters IVof II B.Sc (BZC),ABC in the academic year 2019-20.
3. To recommend the syllabi (Theory & Practical), Practical syllabus, Model question paper for General elective –A and Cluster elective C to the VI Semester of III B. Sc (BZC) for the academic year 2019-20.
4. To recommend the Guide lines to be followed by the question papers setters in Botany for II,,IV,VI Semester –End exams.
5. To continue a certificate course - Mushroom culture for II Year students in this academic year of 2019-20.
6. To recommend the teaching and evaluation methods to be followed under Autonomous statues.
- 7.Any other matter.

RESOLUTIONS

1. It is resolved to continue the same syllabi (Theory & Practical), model question paper & guide lines to be followed by the question paper setters of Botany of II of I B.Sc(B.Z.C) under Choice Based Credit System (CBCS) approved by the Academic Council of 2019-20.
2. It is resolved to continue the same syllabi (Theory & Practical), model question paper & guide lines to be followed by the question papers under Choice Based Credit System (CBCS) setters of Botany of IV semesters of II B.Sc. (B.Z.C) approved by the Academic Council of 2019-20.
3. It is resolved to follow Elective-AC (Plant tissue culture and its Biotechnological applications) and Cluster –A (plant Diversity and human welfare, Ethno Botany and Medicinal Botany, Pharmacognosy and phyto chemistry.) in VI Semester from the Academic year 2019-20.
In Ethno Botany and Medicinal Botany topic Medico ethanobotanical sources of India is added.
4. It is resolved to Continue the same Blue prints of II,IV,& VI Semesters of B. Sc Botany for the Academic year 2019-20.
5. It is resolved to implement certificate course for II Year students in the Academic year 2019-20.
6. It is resolved to continue the following teaching and evolution methods for the Academic year 2019-20.
7. Any other matter.

Teaching methods:

- Besides the conventional methods of teaching, we use modern technology i.e. Using of OHP and LCD projector to display on U boards etc; for better understanding of concepts.

Evaluation of a student is done by the following procedure:

- There are two components in the Valuation and Assessment of a student – Internal Assessment (IA) and Semester Examinations (SE).(For the Batch of Students Admitted from 2019-20 – UG).

Internal Assessment (IA):

- The maximum mark for IA is 30 and SEM is 70 for theory; and for practical papers 50.
- Each IA written examination is of 1 hour's duration for 20 marks. The tests will be conducted centrally. The average of two such IA is calculated for 20 marks.
- Other Innovative Components will be for 5 Marks. The innovative component is for 5 marks, conducted during the class hours by the staff member/ in charge of the subject, in the form of assignments/ quiz/ seminars /ppt /Open Book/Viva Voce/ Group work/ Mini Project/ Exhibition, etc. The topic and time for submission/ presentation will be announced by the staff member/ in charge of the subject in advance. Each student should explain and defend his/her presentation. For attendance 5 Marks are allotted.
- The semester examination will be of 3 hours with maximum 70 marks.
- There is no passing minimum for IA.

Semester Examinations (SE):

- A student should register himself/herself to appear for the Semester Examinations by payment of the prescribed fee.
- The Semester Examinations will be in the form of a comprehensive examination covering the entire syllabus in each subject. It will be of 3 hours duration & Foundation course 2 hours irrespective of the number of credits allotted to it.
- If a candidate fails to obtain pass marks even after the due to less mark in the IA examination, the marks of the next examination will be converted to be out of 100.
- Even though the candidate is absent for two IA exams/obtain zero marks the external marks are considered (if he/she gets 40/70) and the result shall be declared as 'PASS'
- The maximum marks for each Paper shall be 100.

Evaluation of a student is done by the following procedure:

I. Internal Assessment Examinations:

- Out of maximum 100 marks in each paper, 30 marks shall be allocated for internal assessment.
- Out of these 30 marks, 15 marks are allocated for announced tests. Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks are allocated on the basis of candidate's percentage of attendance, 5 marks for seminars & remaining 5 marks for assignments to the Semesters For the III, IV, V & VI semesters it is resolved to continue the same as approved by Academic Council in 2019-20.

II. Semester-End Examinations:

- The maximum marks for I & II B.Sc (BZC) Semester-End examinations shall be 70 marks and duration of the examination shall be 3 Hours.
- The maximum marks for III B.Sc (BZC) Semester-End examinations shall be 75 marks and duration of the examination shall be 3 Hours.
- Semester-End examinations shall be conducted in theory papers at the end of every semester while in practical papers, these examinations are conducted at end of I, II, III, IV, V & VI semesters.
- Discussed and recommended for organizing Seminars, Guest lectures, Work-shops to upgrade the Knowledge of students, for the approval of the Academic Council.

CH. Beulah Rajani
Chairman

A.G & S.G. Siddhartha Degree College of Arts & Science

An autonomous college in the jurisdiction of Krishna University

BOTANY	BOT - 201C	w.e.f.2019-20	B. Sc. (BZC)
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I B. Sc - BOTANY SYLLABUS

PAPER CODE : BOT – 201C

SEMESTER- II

Paper II: Diversity of Archegoniate & Plant Anatomy

Total hours of teaching 60 hrs @ 4 hrs per week

Credits: 3

UNIT – I: BRYOPHYTA (14 hrs)

- 1. Bryophyta:** General characters and classification (up to classes only).
2. Structure, reproduction and Life history of Marchantia and Polytrichum.
3. Evolution of Sporophyte in Bryophytes.

UNIT - II: PTERIDOPHYTA (14 hrs)

- 1. Pteridophyta:** General characters and Classification (up to classes only).
2. Structure, reproduction and life history of Lycopodium and Marsilea.
3. Heterospory and seed habit
4. Stelar Evolution in Pteridophytes

UNIT – III: GYMNOSPERMS (12 hrs)

- 1. Gymnosperms:** General characters and classification (up to classes only).
2. Morphology, Anatomy, reproduction and life history of Pinus and Gnetum.

UNIT – IV: Tissues and Tissue systems (10 hrs)

1. Tissues: Meristematic and permanent tissues (Simple and Complex).
2. Shoot apical meristems and its histological organization.
3. Root apical meristems and its histological organization.

UNIT –V: Secondary growth. (10 hrs)

1. Anomalous secondary growth in Dracaena, Boerhaavia and Bignonia.
2. Wood structure- general account, Study of local timbers Teak, Rosewood, Red sanders and Terminalia tomentosa.

I B. Sc - BOTANY Model Question Paper

Paper Code: BOT - 201

PAPER-II

SEMESTER- II

Paper title: Diversity of Archegoniate & Plant Anatomy

Time: 3 Hours

Max. Marks: 70

SECTION-A

Answer any **four** of the following question

4x5=20Marks

(Draw diagrams wherever necessary)

1. Gemma Cup.
2. Cone of Lycopodium
3. Pinus ovuliferous scale
4. Collenchyma.
5. Tunica – Corpus theory.
6. Phloem.
7. Botanical name, family and uses of Teak.
8. Botanical name, family and the properties of wood of Red sanders.

SECTION-B

Answer any **five** of the following questions:

5x10=50Marks

9. Write an essay on Evolution of sporophyte in Bryophytes.
10. Describe Sexual reproduction in Polytrichum.
11. Write an essay on the Stelar evolution in Pteridophytes.
12. Describe the structure of the sporocarp of Marselia.
13. Describe the internal structure of the Pinus needle & Mention its xerophytic characters.
14. Describe the female gametophyte in Gnetum.
15. Describe various theories regarding the organization of Root apex.
16. Give an account of the Anomalous secondary growth in Boerhaavia.

Guide lines for paper setter: (for Paper II – BOT - 201C) w.e.f. 2019-20.

1. In **section A**: Unit I, II & III must carry **one** question from each Unit, Unit IV must carry **Three** questions and Unit V must carry **two** questions.
2. In **section B**: Set minimum **two** questions from Unit I, II & III. **One** question each from Unit IV and Unit V.
3. See the following table and Model paper for marks distribution.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	1		2		
	05		20		25
Unit - II	1		2		
	05		20		25
Unit – III	1		2		
	05		20		25
Unit – IV	3		1		
	15		10		25
Unit – V	2		1		
	10		10		20
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions =16) Total marks = 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		
	(4X 5) = 20		(5 X 10) = 50		70

INTERNAL EXAMS – 30 Marks

(20 marks for unit tests, 5marks for attendance, 5marks for Seminars).

**I B.Sc SEMESTER - II
BOTANY PRACTICAL SYLLABUS**

Paper - II: Diversity of Archegoniate & Plant Anatomy **Paper - 201C (P)**
Total hours of laboratory Exercises 30 hrs @ 2 per week Credits - 2

I. Morphology (vegetative and reproductive structures), anatomy of the following:-

1. **Bryophyta** : Marchantia and Polytrichum.
2. **Pteridophyta**: Lycopodium and Marsilea.
3. **Gymnosperms** : Pinus and Gnetum.

II. Anatomy:-

1. Demonstration of double staining technique.
2. Tissue organization in root and shoot apices using permanent slides.
3. Preparation of double staining slides.
4. Anomalous secondary structure (Examples as given in theory syllabus).
5. Microscopic study of wood in T.S., T.L.S. and R.L.S.
6. Field visits.

**I B.Sc., SEMESTER-II: BOTANY PRACTICAL MODEL PAPER II
II P: Diversity of Archegoniate & plant Anatomy**

- Q.1. Cut T.S of the **material** – **A** Identify given reasons draw labeled diagrams.
Leave the preparation for evaluation. **4 marks**
2. Cut T.S of the **material** –**B** Identify given reasons draw labeled diagrams.
Leave the preparation for evaluation. **5 Marks**
3. Cut T.S of the **material** -**C** Identify given reasons draw labeled diagrams.
Leave the preparation for evaluation. **5 Marks**
4. Write a critical notes and Identify - **D, E, and F** **(3x3) = 9 Marks**
5. Viva- Voce (Any **2** simple questions from syllabus) - **2 Marks**
- Internal Assessment **25 Marks.**

Total : 50 Marks

Key:

- A. Bryophyta/ Pteridophyta material
- B. Gymnosperm material.
- C. Anatomy material.
- D. Whole specimen or permanent slide of Bryophyta/ Pteridophyta
- E. Whole specimen or permanent slide of Gymnosperm.
- F. Whole specimen or permanent slide of wood.

I B.Sc., SEMESTER-II: BOTANY PRACTICAL MODEL PAPER II
II P: Diversity of Archegoniate & plant Anatomy

A. Bryophyta / Pteridophyta - Section cutting..... (For A (Slide 2 marks, diagrams-1 marks, Identification-1 marks)	4 Marks
B. Gymnosperms - Section cutting.....	5 Marks
C. Anatomy - Section cutting..... (For B and C (Slide 3 marks, diagrams-1 marks, Identification-1 marks)	5 Marks
D. Bryophyta / Pteridophyta (From Bryophyta if “A” Material is from Pteridophyta.....Vice versa)	3 Marks
E. Gymnosperms.....	3Marks
F. Anatomy.....	3Marks
(For D, E and F = Identification -1Mark , Notes -1Mark, Diagram – 1Mark).	
G. Viva.....	2 marks

Total: **25 Marks**

Internal Assessment

a) Record	10Marks
b) Submission of Chart / Model	5 Marks
c) Attendance	5 Marks
d) Internal Practical Exam	5 Marks

Total : **25 Marks**

Total: 50 Marks

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BOTANY	BOT-401C	w.e.f. 2019-20	B. Sc. (BZC)
SEMESTER - IV	II B. Sc - BOTANY SYLLABUS		PAPER – IV

Plant Embryology and Plant Metabolism

Hours: 60 @ 4 hrs per week

UNIT – I: EMBRYOLOGY (12hrs)

1. Introduction: History and Importance of Embryology.
2. Anther structure, Microsporogenesis and development of male gametophyte.
3. Ovule structure and types; Megasporogenesis; Monosporic; Bisporic and Tetrasporic types of female gametophyte / embryosac development.
4. Pollination -Types, Fertilization.

UNIT –II: EMBRYOLOGY AND PALYNOLOGY (12 hrs)

1. Endosperm Development and types.
2. Embryo - development and types.
3. Polyembryony and Apomixis - an outline.
4. Palynology: Principles and applications.

UNIT –III: PLANT METABOLISM- I (12 hrs)

1. Photosynthesis: Electromagnetic spectrum, absorption and action spectra; Red drop and Emerson enhancement effect, concept of Z scheme in photosystems, Photosynthetic pigments, mechanism of photosynthetic electron transport and evolution of oxygen, photo phosphorylation, carbon assimilation pathways: C₃, C₄ & CAM and Photorespiration.
2. Translocation of organic substances: Mechanism of phloem transport, source-sink relationships.

UNIT –IV: PLANT METABOLISM- II (12 hrs)

1. Respiration: Aerobic and Anaerobic, Glycolysis, Krebs cycle, electron transport system, mechanism of oxidative phosphorylation, pentose phosphate pathway.
2. Lipid Metabolism: Structure and functions of lipids, conversion of lipids to carbohydrates, Beta-oxidation.

UNIT –V: GROWTH AND DEVELOPMENT (12 hrs)

1. Growth and development: Definition, phases and kinetics of growth, Physiological effects of phytohormones - auxins, gibberellins, cytokinins, ABA and ethylene
2. Physiology of flowering and photoperiodism, role of phytochrome in flowering.
3. Stress Physiology: Concept and plant responses to water, salt and temperature stresses.

BOTANY	BOT- 401	w.e.f. 2019-20	B. Sc. (BZC)
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II B. Sc – BOTANY Model Question Paper

Paper Code: BOT - 401

SEMESTER- IV

PAPER-IV: Plant Embryology and Plant Metabolism

Time: 3 Hours

Max. Marks: 70

SECTION-A

Answer any **four** of the following questions
(Draw diagrams wherever necessary)

4x5=20Marks

1. Microsporogenesis.
2. Allogamy.
3. Helobial endosperm.
4. Emerson enhancement effect.
5. Anaerobic respiration.
6. Ethylene.
7. Photoperiodism.
8. Phytochrome.

SECTION-B

Answer any **five** of the following questions.

5x10=50Marks

(Draw diagrams wherever necessary)

9. What is an Embryosac? Describe any five of the tetrasporic type of Embryosac developments.
10. Give an account of Polyembryony.
11. Write an essay on the Principles and applications of Palynology.
12. Describe the carbon assimilation pathway in C4 plants.
13. Write an essay on the Translocation of organic substances in higher plants.
14. Describe various reactions of Krebs cycle.
15. Write an essay on various types of Lipids.
16. Give an account of Auxins and Gibberellins.

Guide lines for paper setter: (for Paper IV – BOT- 401) w.e.f. 2019-20

1. In **section A:** Unit II, III & IV must carry **one** question from each Unit, Unit I must carry **two** questions and Unit V must carry **three** questions.
2. In **section- B:** Set minimum **two** questions from Unit II, III & IV.
One question each from Unit I and Unit V.
3. See the following table and Model paper for marks distribution.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		1		
	10		10		20
Unit - II	1		2		
	05		20		25
Unit – III	1		2		
	05		20		25
Unit – IV	1		2		
	05		20		25
Unit – V	3		1		
	15		10		25
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions =16) marks = 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		
	(4 X 5) = 20		(5 X 10) = 50		70

[INTERNAL EXAMS - 30Marks

(20marks for unit tests, 5 marks for seminar and remaining 5 marks for attendance).

II B. Sc – BOTANY SEMESTER- IV.

PRACTICAL SYLLABUS

PAPER- IV - Plant Embryology and Plant Metabolism

(BOT – 401)

Total hours of laboratory Exercises 45 hrs @ 3 per week . w.e.f. 2019-20

Suggested Laboratory Exercises:

1. Structure of pollen grains using whole mounts (Catharanthus, Hibiscus, Acacia, Grass).
2. Demonstration of Pollen viability test using in- vitro germination (Catharanthus).
3. Study of ovule types and developmental stages of embryo sac using permanent slides / Photographs.
4. Structure of endosperm (nuclear and cellular); Developmental stages of dicot and monocot Embryos using permanent slides / Photographs.
5. Isolation and mounting of embryo (using Symopsis / Senna / Crotalaria).

Major experiments:

6. Separation of chloroplast pigments using paper chromatography technique.
7. Rate of photosynthesis under varying CO₂ concentration.
8. Effect of kind of light intensity on oxygen evolution during photosynthesis using Wilmontt' bubbler.
9. Titratable acidity estimation of Lemon or Tamarind leaves.

Minor experiments:

10. Release of CO₂ in Aerobic respiration.
11. Demonstration of the process of fermentation using Kuhne's fermentation vessel.
12. Demonstration of Phototropism.
13. Measuring the Plant growth using Arc Auxanometer.

1. Conduct experiment 'A', write down the procedure and conclusions.

Tabulate the results if any.....11M

2. Write the salient features of experiment 'B' with the help of neat labelled diagram. 05M

3. Identify and write notes on 'C, D & E' (3X3M) 09M

Total 25M

Scheme of valuation

1. 'A' –Physiology –major experiment

Setting and conducting of the experiment 6M, Procedure 3M, Conclusion1M, tabulation1M.

= 11M

2. 'B'- Physiology –minor experiment Salient features 3M, Diagram2M

= 05M

3. Identify C, D and E (3X3)

(Identification - 1 + Diagram-1 + Notes- 1 =Total = 3marks for each)

= 09

'C' from Anther T.S / Pollen grains.

'D' - Slide from types of Ovules.

'E'– Slide from Embryosacs / Embryos.

(Total.....25M)

Internal:

a) Record10M

b) Internal Practical Exam/ Self study project report. 08M

c) Attendance 05M

d) Assignment 02M

Grand Total 50M

BOTANY	BOT-601 (GE)	2019-2020	B.Sc. (BZC)
PAPER – VII	ELECTIVE-C	SEMESTER- VI	
Plant tissue culture and its Biotechnological applications			
Total hours of teaching 45hrs @ 3hrs per week			Credits: 3

Unit I: PLANT TISSUE CULTURE – 1

(12hrs)

1. History of plant tissue culture research - basic principles of plant tissue callus culture, meristems culture, organ culture, Totipotency of cells.
2. Sterilization procedures, culture media composition and preparations of explants. Murashige and Skoog's (MS medium), Cell and protoplast culture.
3. Somatic Hybrids and Cybrids (out lines), Artificial Seeds, Somaclonal variations. Applications of Tissue culture (Brief account).

UNIT-II: Plant Tissue culture -2

(12hrs)

1. Endosperm culture – Embryo culture -culture requirements – applications, embryo rescue technique.
2. Cryopreservation; Germ plasm conservation.

Unit III: Recombinant DNA technology

(12hrs)

1. r-DNA technology: Steps in r-DNA technology and tools.
2. Cloning Vectors: Prokaryotic (pBR322, Ti plasmid and Lambda phage, Eukaryotic Vectors (YAC and briefly PAC).
3. Gene cloning (Bacterial Transformation and selection of recombinant clones, PCR Mediated gene cloning)

Unit IV: Methods of gene transfer

(12hrs)

1. Methods of gene transfer- Agrobacterium-mediated, direct gene transfer By Electroporation, Microinjection, Micro projectile bombardment.
2. Selection of transgenics– selectable marker and reporter genes (Luciferase, GUS, GFP).

Unit V: Applications of Biotechnology

(12 hrs)

1. Applications of Plant Genetic Engineering – crop improvement, herbicide resistance, insect resistance, virus resistance.
2. Genetic modification – transgenic plants for pest resistant (Bt-cotton); herbicide resistance (Round Up Ready soybean); improved agronomic traits flavrSavr tomato, Golden rice.

Plant tissue culture and its Biotechnological applications

SEMESTER- VI

ELECTIVE-C

PAPER – VII

Time: 3 Hours

Paper code: BOT-VII C

Max. Marks: 75

SECTION-A

Answer any five of the following question

5x5=25M.

(Draw diagrams wherever necessary)

1. Organ culture.
2. Somatic hybrids.
3. Cryopreservation.
4. Application of tissue culture.
5. Restriction Endonuclease.
6. Bacterial transformation.
7. GUS.
8. Bt-Cotton.

SECTION-B

Answer any Five of the following questions.

5x10=50M.

(Draw diagrams wherever necessary)

9. Describe the composition and preparation of different culture media.
10. Explain the callus sub-culture and their growth and measurement.
11. Give an account on secondary metabolites.
12. Write notes on endosperm culture and their applications.
13. Explain the PCR mediated gene cloning.
14. Explain the various types of cloning vectors.
15. Write about methods of gene transfer techniques.
16. Write an essay on application of Biotechnology in the field of medicine and industry.

Guide lines for paper setter: (for Paper VII -BOT-601) W.e.f. 2019-20.

1. In Section A: Unit I,III,IV must carry Two question from each unit. Unit II, V must carry one question.
2. In section-B: Set minimum two questions from Unit I, II, III and Set One Question from IV, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section – A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
	10		20		30
Unit – II	1		2		
	5		20		25
Unit – III	2		2		
	10		20		30
Unit-IV	2		1		
	10		10		20
Unit-V	1		1		
	5		10		15
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5		5		
	(5 x 5) = 25		(5 x 10) = 50		75

INTERNAL EXAMS - 25Marks

(15 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.)

Plant Tissue Culture & Plant Biotechnology

SEMESTER- VI

Total hours of teaching 30hrs @ 2hrs per week

BOT – 601P

Credits:2

1. (a) Preparation of MS medium.

(b) Demonstration of in vitro sterilization methods and inoculation methods using leaf and nodal explants of Tobacco/ Datura/ Brassica etc.
2. Study of embryo and culture, micro propagation of Banana, somatic embryogenesis, artificial seeds through photographs.
3. Construction of restriction map of circular and linear DNA from the data provided.
4. Study of methods of gene transfer through photographs: Agrobacterium- mediated, direct gene transfer by electroporation, microinjection, and micro projectile bombardment.
5. Different steps involved in genetic engineering for production of Bt. cotton, Golden rice, Flavr Savr tomato through photographs.
6. Isolation of plasmid DNA.
7. Restriction digestion and gel electrophoresis of plasmid DNA (optional)
8. Field visit to a lab involved in tissue culture
9. Study project under supervision of lecturer – tissue culture/ genetic engineering

Expected domain skills to be achieved: Ability to prepare artificial nutrient media, preparing independently, applying various sterilization procedures for media, glassware and biological materials, invitro propagation of Banana callus, morphogenesis--s, clonal propagation methods, isolation of plasmid DNA individually and as a group.

Total hours of teaching 30hrs @ 2hrs per week**Credits: 2**

Q1. Project report (A) -.....	10M
Viva-voce on study project.....	02M
Q2. Identify and write notes on B, C and D (3x3).....	09 M
B- Tool/instrument/container used in sterilization	
C- Tool/instrument/container used in gene transfer	
D- GM crops (Photographs)	
Q3. Construct restriction map of circular and/ or linear DNA from the data Provided.....	06M
Q 4. Field report.....	03M

Total.....30 **Marks****Internal Assessment**

a. Record -	05M
b. Attendance.....	05M
e. Internal practical exam.....	10M

Total... 20Marks

Total ----- 50M

III-BZC B. Sc	BOTANY-VIII	BOT-602 (CE)	2019-20
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Paper – VIII-A-1: PLANT DIVERSITY AND HUMAN WELFARE Credits: 3

Total hours of teaching 60hrs @ 6hrs per week

Unit- I: Plant diversity and its scope: (12hrs)

1. Genetic diversity, Species diversity, Plant diversity at the ecosystem level,
2. Agro biodiversity and Vavilov Crop centers.
3. Values and uses of biodiversity: Ethical and aesthetic values, Uses of plants.

Unit -II: Loss of biodiversity: (12hrs)

1. Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agro biodiversity, projected scenario for biodiversity loss.
2. Management of plant biodiversity: Organizations associated with biodiversity Management-Methodology for execution-IUCN, UNEP, UNESCO, WWF, NBPGR; Biodiversity legislation and conservations, Biodiversity information management and Communication.

Unit-III: Contemporary practices in resource management: (12hrs)

1. Environmental Impact Assessment (EIA), Geographical Information System GIS,
2. Solid and liquid waste management.

Unit -IV: Conservation of biodiversity (12hrs)

1. Conservation of genetic diversity, species diversity.
2. Social approaches to conservation, Biodiversity awareness Programmes, Sustainable development.

Unit- V: Role of plants in relation to Human Welfare (12hrs)

- 1 Importance of forestry, their utilization and commercial aspects-
a) Avenue trees, b) ornamental plants of India.
- 2 Fruits and nuts: Important fruit crops their commercial importance.
Wood, fiber and their uses.

III B. Sc – BOTANY Model paper (2019-2020)
SEMESTER- VI Paper – VIII-A-1 PAPER – VIII
PLANT DIVERSITY AND HUMAN WELFARE

Time: 3 Hours

Max. Marks: 75

SECTION-A

Answer any five of the following question

5x5=25M.

1. Species Diversity.
2. Wild Taxa.
3. NBPGR.
4. Biodiversity and its Conservation.
5. EIA.
6. Geographical information system (GIS).
7. Sustainable Development.
8. Fiber and their uses.

SECTION-B

Answer any Five of the following questions.

5x10=50M.

9. Give a Note on Plant Diversity and its Scope.
10. Write about Values and Uses of Biodiversity.
11. What is Biodiversity? Discuss about the Loss of Biodiversity?
12. Explain the Various Types Organizations in Biodiversity?
13. Write an essay on EIA ?
14. Write essay an Solid and Liquid Waste Management?
15. What is Conservation? Explain the In-situ and Ex-situ conservation?
16. What are Fruit crops? Explain their Commercial importance?

Guide lines for paper setter: (for Paper VIII -BOT-602) W.e.f. 2019-20

1. In Section A: Unit I, II, III, must carry Two question from each unit. Unit IV, V must carry one question.

2. In section-B: Set minimum two questions from Unit I, II & III and Set One Question from IV, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
	10		20		30
Unit – II	2		2		
	10		20		30
Unit – III	1		2		
	05		20		25
Unit-IV	1		1		
	5		10		15
Unit-V	2		1		
	10		10		20
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5		5		
	(5 x 5) = 25		(5 x 10) = 50		75

INTERNAL EXAMS - 25Marks

(15 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc)

Paper – VIII-A-1: Practicals:

PLANT DIVERSITY AND HUMAN WELFARE

SEMESTER- VI

BOT-602-A-1(CL) P

Time: 3hrs

Max. Marks: 50

- 1) Study of plant diversity (flowering plants).
- 2) Study of exotic species- Identification and morphological characteristics.
- 3) Identification of forest trees through bark, wood, flowers, leaves and fruits.
- 4) Maceration, Study of wood (Tracheary elements, fibres).
- 5) Methods of preservation and canning of fruits.
- 6) Visit to the local ecosystem to study the plants.
- 7) Study of Solid and Liquid waste management systems in rural/urban areas.

SCHEME OF PRACTICAL EXAMINATION

- I. Assign the plants **A, B and C** to their respective families, giving reasons, family name and classification-1marks, important diagrams- 2 marks.....**09 marks**
- II. Give the protocol of **D****04marks**
- III. Comment on specimens **E, F and G****3x3 = 09 marks**
- IV. Report on Field visit..... **4 marks**
To study sources of firewood (10 plants), timber-yielding trees (10trees) and bamboos.
- V. Viva-Voce**04marks**
- Total..... **30 Marks**

Internals

- a. Record -05M
- b. Attendance.....05M
- c. Internal practical exam.....10M
- Total..... **20 Marks**

Total -----50M

KEY

A-Cultivated Plant

B- Wild Plant

C –Exotic plant

D- Preservation and canning of fruits, solid and liquid waste management systems in rural/urban areas

E. Bark/wood/fruit yielding plant

F. Nuts/ Alcoholic beverage plant

G. wood /Fibre yielding plant

Paper – VIII-A-1: Practical's:

PLANT DIVERSITY AND HUMAN WELFARE

SEMESTER- VI

BOT-602-A-(CL) P

SCHEME OF PRACTICAL EXAMINATION

Time: 3hrs

Max. Marks: 50

- I. Assign the plants **A, B and C** to their respective families, giving reasons, family name and classification-1marks, important diagrams- 2 marks.....**09 marks**
- II. Give the protocol of **D**.....**04marks**
- III. Comment on specimens **E, F and G****3x3= 09 marks**
- IV. Report on Field visit..... **4 marks**
To study sources of firewood (10 plants), timber-yielding trees (10trees) and bamboos.
- V. Viva-Voce.....**4marks**

Total ---- 30marks

Internals:

- a. Record -05M
- b. Attendance.....05M
- c. Internal practical exam.....10M

Total ---- 20marks

Total -----50M

KEY

A-Cultivated Plant

B- Wild Plant

C –Exotic plant

D- Preservation and canning of fruits, solid and liquid waste management systems in rural/urban areas

E. Bark/wood/fruit yielding plant

F. Nuts/ Alcoholic beverage plant

G. wood /Fibre yielding plant

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III. BZC (B. Sc)	BOTANY-VIII	BOT- 603 (CE)	2019-20
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Paper – VIII-A-2

Credits: 3

ETHNOBOTANY AND MEDICINAL BOTANY

Total hours of teaching 60hrs @ 6hrs per week

Unit –I: Ethnobotany (12hrs)

1. Introduction, concept, scope and objectives
2. Major and minor ethnic groups or Tribal's of India, and their lifestyles.
3. Plants used by the tribal populations:
 - a) Food plants, b) Intoxicants
 - c) Beverages, d) Resins and oils and miscellaneous uses.

Unit -II: Role of ethnobotany in modern Medicine (12hrs)

1. Role of Ethnobotany in modern medicine with special example; Rauvolfiasepentina, Artemisia annua, Withaniasomnifera.
2. Significance of the following plants in ethno botanical practices (along with their habitat and morphology)
 - a)Azadirachta indica, b)Vitexnegundo,c)Ocimum sanctum,,d) phyllanthus niruri
3. Medico-Ethnobotanical Sources of India.

Unit-III: Ethno botany as a tool to protect interests of ethnic groups (12hrs)

1. Sharing of wealth concept with few examples from India.
2. Biopiracy, Intellectual Property Rights and Traditional Knowledge.

Unit -IV: History, Scope and Importance of Medicinal Plants, Indigenous Medicinal Sciences (12hrs)

1. Definition and Scope-Ayurveda: History, origin, panchamahabhutas, saptadhatu and tridosha concepts, Rasayana, plants used in ayurvedic treatments.
- 2 Homeopathy: Origin of Homeopathy medicinal systems, Basis of Homeopathy, plants used in Homeopathy medicine.

Unit -V: Conservation of endangered and endemic medicinal plants (12hrs)

1. Definition: endemic and endangered medicinal plants,
2. Red list criteria
3. In situ conservation: Sacred groves, National Parks
4. Ex situ conservation: Botanical Gardens, Seed Banks.

III B. Sc – BOTANY Model paper (2019-2020)

Title of the Paper: **ETHNOBOTANY AND MEDICINAL BOTANY**

SEMESTER- VI
Time: 3 Hours

PAPER – VIII

Cluster – A

Paper – VIII-A-2
Max. Marks: 75

SECTION-A

Answer any five of the following question

5x5=25M.

1. Intoxicants.
2. Withania somnifera.
3. Phyllanthus niruri
4. Curcuma langa.
5. Biopiracy
6. Saptdhatu and Tridosha.
7. Tumors treatments.
8. Red list criteria.

SECTION-B

Answer any Five of the following questions.

5x10=50M.

9. Explain the Relevance of Ethno-Botany in the present Context.
10. Discuss about Major and Minor Ethnic groups of India.
11. Write about Botanical name, Family, Active principle and medicinal uses of Rauwolfia serpentina, Artemisia annua.
12. Write about the Medico-Ethnobotanical Sources of India.
13. Write about the Intellectual property rights and Traditional knowledge.
14. Write an Essay on Basic concepts of Ayurveda.
15. What is Homeopathy system of Medicine ? Explain their Basic Concepts ?
16. Give an account of Endemic and Endangered Medicinal plants ?

Guide lines for paper setter: (for Paper VIII-BOT-603(CE)) W.e.f. 2019-20

1. In Section A: Unit I, IV, must carry two questions from each unit. Unit II must carry Two Question. Unit III, V must carry one question.

2. In section-B: Set minimum Two questions from Unit I, II & IV and Set One Question from III , V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
	10		20		30
Unit – II	2		2		
	10		20		30
Unit – III	1		1		
	05		10		15
Unit-IV	2		2		
	10		20		30
Unit-V	1		1		
	5		10		15
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5		5		
	(5 x 5) = 25		(5 x 10) = 50		75

INTERNAL EXAMS - 25Marks

(15 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.).

**III B. Sc – Practical Paper
ETHNOBOTANY AND MEDICINAL BOTANY
BOT-VIII-603-A- 2 (CL) P**

**SEMESTER- VI
Time: 3 Hours**

Max. Marks- 50

1. Ethno botanical specimens as prescribed in theory syllabus
2. Detailed morphological and anatomical study of medicinally important part(s) of locally available plants (Minimum 8 plants) used in traditional medicine.

3. Field visits to identify and collect ethno medicinal plants used by local tribes/folklore.

Practical Question Paper

- I. Identify the specimen A- Give reasons (morphological and anatomical) and draw Labeled sketches10marks
- II. Identify and write about the medicinal uses of B and C.....2x4 = 08 marks
- III. Comment on D and E.....2 x 2= 04 marks
- IV. Report on Field visit:.....04 marks
List to be prepared mentioning special features of plants used by tribal Populations as Medicinal Plants & Spices. Write their botanical and common names, Parts used and diseases/disorders for which they are prescribed.
- V. Viva-voce..... 04 marks
- Total.....**30Marks**

Internals Assessment

- a. Record -05M
- b. Attendance.....05M
- c. Internal practical exam.....10M
- Total.....**20 Marks**

Total-----50Marks

KEY

- A-Plants given in unit II (i)
- B-Plants used in Ayurvedic preparations (Amla in Chyavanprash, Senna in Laxatives)
- C - - Do -
- D. Photographs of National parks, Biosphere reserves and Botanical gardens.
- E. Photograph of famous personalities in Ayurveda/Siddha medicine.

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III-BZC B.Sc	BOTANY-VIII	BOT-604- (CE)	2019-20
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SEM-VI: **Pharmacognosy and Phytochemistry** Credits: 3
Total hours of teaching 60hrs @ 6hrs per week

Unit-I: Pharmacognosy

(12hrs)

1. Definition, Importance
2. Classification of drugs - Chemical and Pharmacological
3. Drug evaluation methods

Unit –II: Organoleptic and microscopic studies:

(12hrs)

1. Organoleptic and microscopic studies with reference to nature of active principles and common adulterants of
2. a) *Adhatoda vasica*(leaf) b) *Strychnos nuxvomica* (seed),
c) *Rauwolfia serpentina*(root) d) *Zinziber officinalis* e) *Catharanthus roseus*.

Unit-III: Secondary Metabolites:

(12hrs)

1. Definition of primary and secondary metabolites and their differences, Major types - terpenes, Phenolics, alkaloids, terpenoids, steroids.
2. A brief idea about extraction of alkaloids. Origin of secondary metabolites—detailed account of Mevalonate pathway, Shikimate pathway.

UNIT-IV: Phytochemistry:

(12hrs)

Biosynthesis and sources of drugs:

1. Structural type biosynthesis importance of simple Phenolic compounds, coumarins, Flavonoids.
2. Steroids, sterols: Biosynthesis, commercial importance.
3. Alkaloids: Different groups, biosynthesis, bioactivity.
4. Volatile oils, aromatherapy.

UNIT-V: Enzymes, proteins and amino acids as drugs:

(12hrs)

1. Vaccines, toxins and toxoids, immune globulins, antiserums,
2. Vitamins, Antibiotics – chemical nature, mode of action.
3. Pharmacological action of plant drugs – tumor inhibitors, PAF antagonists, antioxidants, phytoestrogens and others.

SEMESTER- VI

Paper – VIII-A-3

PAPER – VIII Cluster – A

Title of the Paper: **Pharmacognosy and Photochemistry**

Time: 3 Hours

Max. Marks:

75

SECTION-A

Answer any five of the following question

5x5=25M.

1. Classification of Drugs.
2. Catharanthus roseus.
3. Difference between Primary and Secondary Metabolites.
4. Trpenoids.
5. Flavonoids.
6. Aromatherapy
7. Vaccines.
8. Vitamins.

SECTION-B

Answer any Five of the following questions.

5x10=50M.

9. Give an account on Pharmacognosy ?
10. Write an essay on Drug Evolution methods ?
11. Write about nature and Active principles of *Adhatda vasica*, *Rauwfia serpentine* ?
12. Write about common Adulteration of *Zanzibar officinalis*, *Strychnosnuxvomica* ?
13. Give an Brief note on Extraction of Alkalods ?
14. Give an account of mevalonate pathway ?
15. Write about Bio-Synthesis and Commercial importance of Steroids, Sterols ?
16. Explain the role of Different Enzyme inhibitors ?

Guide lines for paper setter: (for Paper VI-BOT-604) W.e.f. 2019-20.

1. In Section A: Unit III, IV, V must carry two questions from each unit. Unit I, II, must carry One question.
2. In section-B: Set minimum two questions from Unit I, II & III and Set One Question from IV, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	1		2		
	5		20		25
Unit – II	1		2		
	5		20		25
Unit – III	2		2		
	10		20		30
Unit-IV	2		1		
	10		10		20
Unit-V	2		1		
	10		10		20
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5		5		
	(5 x 5) = 25		(5 x 10) = 50		75

INTERNAL EXAMS - 25Mark

(15 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.)

Pharmacognosy and Phytochemistry

SEMESTER- VI
Time: 3 Hours

BOT-VIII-604-A- 3 (CL)P
Max. Marks- 50

-
1. Physical and chemical tests for evaluation of unorganized drugs-
Asaphoetida, Honey, Castor oil. Acacia
 2. Identification of bark drugs – cinchona, cinnamom
 3. Identification of fruit drugs – Cardamom, Coriander
 4. Identification of root and rhizome drugs- Ginger, Garlic, Turmeric
 5. Identification of whole plant – Aloes, Vinca, Punarnava
 6. Herbarium of medicinal plants (minimum of 20 platns)
 7. Collection of locally available crude drugs from local venders (minimum of 20)

Practical Question Paper

- I. Identify the given crude drugs **A & B** by Anatomical study and Morphological Study.....**2X5 = 10marks**
 - II. Perform suitable chemical test and identify the given phytochemical **C**.....**.05marks**
 - III. Comment on D and E**2x3= 06 marks**
 - IV. Herbarium and submission of drugs -..... **.05 marks**
 - IV. Viva-Voce**.04 marks**
- Total..... **30Marks**

Internals:

- a. Record -05M
 - b. Attendance.....05M
 - c. Internal practical exam.....10M
- Total.....20Marks**

Total -----50M

KEY

A-Flower/fruit drugs

B-Rhizome/whole plant drugs

C- Tannins/ phenolics/steroids/ isoprenoids /Asaphoetida/ Honey/ Castor oil/ Acacia

D. Column Chromatography/ Gas Chromatogram/HPLC (photograph/ instrument used for chemical analysis of drugs.

First year II sem

Suggested Reading

1. The embryology of angiosperms - Bhojwani S.S., Bhatnagar S.P. - Vikas publishing house private Ltd, New Delhi.
2. An introduction to the embryology of angiosperms - Maheswari. P - Tata Mac graw hill company Ltd, New Delhi.
3. Plant physiology - Taiz. L. and E. Zeizer - Sinauer Associates, Inc., publishers. Massachusetts, USA.
4. Introduction to Plant physiology - Hopkins - John Wiley and sons Inc., New York, USA.
5. Plant physiology - Salisbury. F.B. and C.W. Ross - Wordsworth Learning Inc., USA.

Elective paper

Books for Reference:

1. Pullaiah. T. and M.V.Subba Rao. 2009. Plant Tissue culture. Scientific Publishers, New Delhi.
2. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
3. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.
4. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms. VikasPublicationHouse Pvt. Ltd., New Delhi. 5th edition.

CLUSTER PAPER I

Suggested Readings:

1. Krishnamurthy, K.V. (2004). An Advanced Text Book of Biodiversity - Principles and Practices. Oxford and IBH Publications Co. Pvt. Ltd. New Delhi.
2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications, New Delhi.

3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). An Introduction to Sustainable Development. Prentice Hall of India Private Limited, New Delhi.

CLUSTER PAPER II

Suggested Readings:

- 1) S.K. Jain, Manual of Ethnobotany, Scientific Publishers, Jodhpur, 1995.
- 2) Glimpses of Indian. Ethnobotny, Oxford and I B H, New Delhi – 1981.
- 3) S.K. Jain (ed.) 1989. Methods and approaches in ethnobotany. Society of ethnobotanists, Lucknow, India.
- 4) S.K. Jain, 1990. Contributions of Indian ethnobotny. Scientific publishers, Jodhpur.
- 5) Colton C.M. 1997. Ethnobotany – Principles and applications. John Wiley and sons Chichester

CLUSTER PAPER III

BOOKS FOR REFERENCE:

1. Wallis, T. E. 1946. Text book of Pharmacognosy, J & A Churchill Ltd. 2. Roseline, A. 2011. Pharmacognosy. MJP Publishers, Chennai.
2. Gurdeep Chatwal, 1980. Organic chemistry of natural productis. Vol.I.Himalaya Publishing house.
3. Kalsi, P. S. and Jagtap, S., 2012. Pharmaceutical medicinal and natural Product chemistry N.K. Mehra . Narosa Publishing House Pvt. Ltd. New Delhi.
4. Agarwal, O. P. 2002. Organic chemistry–Chemistry of organic natural products. Vol. II. Goel publishing house , Meerut.

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CERTIFICATE COURSE

SEMESTER - III

Total hours of teaching 30 hrs @ 4 hrs per week

MUSHROOM CULTIVATION

Max.Marks:30

UNIT-1

(8 hrs)

1. Mushroom Cultivation- Introduction, Uses, Types of mushrooms.
2. Preparation of Mother Spawn in Saline bottle, sterilization.
3. Cultivation of milky mushrooms.

UNIT-2

(8 hrs)

4. Soil PH, Water, Soil sterilization, dark room, light room.
5. Controled room temperature, culture caring.
6. Diseases and their controlling methods.

UNIT-3

(8 hrs)

7. Storage and nutritional value.
8. Industrial edible mushrooms, poisonous mushrooms.
9. Importance and Medicinal value of mushrooms.

UNIT-4

(6 hrs)

10. Types of food prepared from mushrooms -
11. Marketing in India. Export value.

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CERTIFICATE COURSE

SEMESTER - III

MUSHROOM CULTIVATION

Max.Marks:30

Model paper

SECTION-A

Answer any 4 of the following question

4x3=12M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

SECTION-B

Answer any 3 of the following question

3x6=18M

- 7.
- 8.
- 9.
- 10.
- 11.
- 12.

ADUSUMILLI GOPALAKRISHNAIAH & SUGAR CANE GROWERS SIDDHARTHA DEGREE
COLLEGE OF ARTS & SCIENCE, VUYYURU-521165, KRISHNA Dt., A.P. (AUTONOMOUS).

NAAC reaccredited at 'A' level

DEPARTMENT OF BOTANY



BOS MEETING 16 - 04 -2019

ACADEMIC YEAR - (2019-20)

ODD SEM – I, III & V

Minutes of the meeting of Board of studies in Botany for the Autonomous courses of AG & SG Siddhartha Degree College of Arts & Science, Vuyyuru, held at 10:30 A.M on 16-04-2019 in the Department of Botany.

Members Present:-

- 1). *CH. Beulah Ranjani* Chairman
(Smt. CH. Beulah Ranjani) Head, Department of Botany
AG & SG S Degree College of Arts & Science
Vuyyuru-521165.
- 2). *L. Suseela 16/4/19* University
(Smt. Dr. L. Suseela) Nominee Department of Biotechnology &
Head (I/c) Botany,
Krishna University, Machilipatnam.
- 3). *A. Srinivas Rao 16/04/19* Academic
(Sri. Dr. A. Srinivas Rao) Council Nominee Lecture in Botany,
Govt. Degree College Mandapeta,
East Godavari.
- 4). *N. Manimala* Academic
(Smt. N. Manimala) Council Nominee Head, Department of Botany
Govt. Degree College Chinthalapudi,
West Godavari.
- 5). *S. Krishna Suman* Industrialist.
(Sri. S. Krishna Suman) Natural farming.
yakamuru
Vuyyuru, Krishna d.t
- 6). *N. Ramana Rao* Member
(Sri. N. Ramana Rao) Ad hoc Lecturer in Botany
AG & SGS Degree College of Arts &
Science (Autonomous), Vuyyuru-521165.
- 7). *E. Ganesh* Member
(Sri. E. Ganesh) Ad hoc Lecturer in Botany
AG & SGS Degree College of Arts &
Science (Autonomous), Vuyyuru-521165.
- 8). *K. Anusha* student representative
(Miss K. Anusha MSc) Lecturer in chaitanya college,
Vuyyuru.

Agenda for B.O.S Meeting:

1. To recommend the syllabi (Theory & Practical), Model question paper & Guide lines for Semesters I & II of I B.Sc (BZC) in the academic year 2019-20.
2. To recommend the syllabi (Theory & Practical), Model question paper & Guide lines for Semesters III & IV of II B.Sc (BZC) in the academic year 2019-20.
3. To recommend the syllabi (Theory & Practical), Practical syllabus, Model question paper & Guide lines to the Paper setters for V & VI Semesters of III B. Sc (BZC) for the academic year 2019-20.
4. To discuss to the syllabus of Elective & Clusters in VI semester to be for the academic year 2019-20.
5. To recommend the Guide lines to be followed by the question papers setters in Botany for I,II,III,IV,V & VI Semester –End exams.
6. To continue a certificate course - Mushroom culture for II Year students in this academic year of 2019-20.
7. To recommend the teaching and evaluation methods to be followed under Autonomous statues.
8. Any other matter.

CH. Beulah Rajani
Chairman

RESOLUTIONS

1. It is resolved to continue the same syllabi (Theory & Practical), model question paper & guide lines to be followed by the question paper setters of Botany of I & II semesters of I B.Sc (B.Z.C) under Choice Based Credit System (CBCS) approved by the Academic Council of 2019-20.
2. It is resolved to implement the syllabi (Theory & Practical), model question paper & guide lines to be followed by the question papers under Choice Based Credit System (CBCS) setters of Botany of III & IV semesters of II B.Sc. (B.Z.C) approved by the Academic Council of 2019-20.
3. It is resolved to implement the same syllabi & model papers under Choice Based Credit System (CBCS) setters of Botany of V & VI semesters of III B.Sc. (B.Z.C) approved by the Academic Council of 2019-20.
4. It is resolved to follow Elective-AC (Plant tissue culture and its Biotechnological applications) and Cluster –A (plant Diversity and human welfare, Ethno Botany and Medicinal Botany, Pharmacognosy and phyto chemistry.) In VI Semester from the Academic year 2019-20.
5. It is resolved to Continue the same Blue prints of III,IV,V & VI Semesters of B. Sc Botany for the Academic year 2019-20.
6. It is resolved to implement certificate course for II Year students.
7. It is resolved to continue the following teaching and evolution methods for the Academic year 2019-20.
8. Any other matter.

Teaching methods:

- Besides the conventional methods of teaching, we use modern technology i.e. Using of OHP and LCD projector to display on U boards etc; for better understanding of concepts.

Evaluation of a student is done by the following procedure:

- There are two components in the Valuation and Assessment of a student – Internal Assessment (IA) and Semester Examinations (SE).(For the Batch of Students Admitted from 2019-20 – UG).

Internal Assessment (IA):

- The maximum mark for IA is 30 and SEM is 70 for theory; and for practical papers 50.
- Each IA written examination is of 1 hour's duration for 20 marks. The tests will be conducted centrally. The average of two such IA is calculated for 20 marks.
- Other Innovative Components will be for 5 Marks. The innovative component is for 5 marks, conducted during the class hours by the staff member/ in charge of the subject, in the form of assignments/ quiz/ seminars /ppt /Open Book/Viva Voce/ Group work/ Mini Project/ Exhibition, etc. The topic and time for submission/ presentation will be announced by the staff member/ in charge of the subject in advance. Each student should explain and defend his/her presentation. For attendance 5 Marks are allotted.
- The semester examination will be of 3 hours with maximum 70 marks.
- There is no passing minimum for IA.

Semester Examinations (SE):

- A student should register himself/herself to appear for the Semester Examinations by payment of the prescribed fee.
- The Semester Examinations will be in the form of a comprehensive examination covering the entire syllabus in each subject. It will be of 3 hours duration & Foundation course 2 hours irrespective of the number of credits allotted to it.
- If a candidate fails to obtain pass marks even after the due to less mark in the IA examination, the marks of the next examination will be converted to be out of 100.
- Even though the candidate is absent for two IA exams/obtain zero marks the external marks are considered (if he/she gets 40/70) and the result shall be declared as 'PASS'
- The maximum marks for each Paper shall be 100.

Evaluation of a student is done by the following procedure:

I. Internal Assessment Examinations:

- Out of maximum 100 marks in each paper, 30 marks shall be allocated for internal assessment.
- Out of these 30 marks, 15 marks are allocated for announced tests. Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks are allocated on the basis of candidate's percentage of attendance, 5 marks for seminars & remaining 5 marks for assignments to the Semesters For the III, IV, V & VI semesters it is resolved to continue the same as approved by Academic Council in 2019-20.

II. Semester-End Examinations:

- The maximum marks for I & II B.Sc (BZC) Semester-End examinations shall be 70 marks and duration of the examination shall be 3 Hours.
- The maximum marks for III B.Sc (BZC) Semester-End examinations shall be 75 marks and duration of the examination shall be 3 Hours.
- Semester-End examinations shall be conducted in theory papers at the end of every semester while in practical papers, these examinations are conducted at end of I, II, III, IV, V & VI semesters.
- Discussed and recommended for organizing Seminars, Guest lectures, Work-shops to upgrade the Knowledge of students, for the approval of the Academic Council.

Chairman

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BOTANY	BOT - 101C	w.e.f. 2019-20	B. Sc. (BZC)
SEMESTER - I		PAPER - I	

Microbial Diversity, Algae and Fungi

Total hours of teaching 60 hrs @ 4 hrs per week

Credits: 3

UNIT- I: Origin and Evolution of Life, Microbial diversity (12 hrs)

1. Origin of life - theories introduction: Lamarckism, Darwinism and Neo Darwinism.
2. Geological time scale
3. Microbial diversity: Mycoplasma - Chlamydia – Archaeobacteria - Actinomycetes

UNIT- II: VIRUSES AND BACTERIA (12 hrs)

1. Viruses: General account of Viruses, structure, replication and transmission of plant Diseases caused by Viruses.
2. Bacteria: Structure, nutrition, reproduction and economic importance. Outlines of Plant diseases of important crop plants caused by Bacteria (Citrus canker, leaf blight of rice, Angular leaf spot of Cotton) and their control.

UNIT III: CYANOBACTERIA AND LICHENS (12 hrs)

1. Cyanobacteria: General account of cell structure, thallus organization and their uses as Biofertilizers.
2. Structure, reproduction and life history of Nostoc and Scytonema.
3. Lichens – Morphology – Anatomy – Reproduction – Economic importance.

UNIT –IV Algae (12 hrs)

1. General account, Fritsch classification of Algae and economic importance.
2. Structure, reproduction, life history of Oedogonium, Vaucheria and Ectocarpus.

UNIT V: FUNGI (12 hrs)

1. General characters, classification (Alexopolous) and economic importance.
2. Structure, reproduction and life history of Albugo, Penicillium, Puccinia.
3. General account of plant diseases caused by Fungi (Late blight of potato, Red rot of Sugarcane and Paddy Blast) and their control.

I B.Sc - BOTANY

Paper Code: BOT - 101 C

THEORY MODEL PAPER

SEMESTER - I

Paper-I: Microbial Diversity, Algae and Fungi

Time: 3 Hours

Max. Marks: 70

SECTION-A

Answer any Four of the following questions.

4x5=20M

1. Mycoplasma
2. Actinomycetes.
3. Struggle for existence.
4. Transformation.
5. Morphology of Scytonema.
6. Plurilocular sporangia.
7. Economic importance of Penicillium.
8. Red rot of Sugarcane

SECTION-B

Answer any five of the following questions.

5x10=50M

9. Write an essay on geological time scale.
10. Write an essay on the cell structure and nutrition in bacteria.
11. Describe the structure & replication of Virus.
12. Write an essay on Cyanobacteria as Biofertilizers.
13. Describe the life history of macrandrous species in Oedogonium.
14. Describe the life history of Vaucheria.
15. Describe the life history of Penicillium.
16. Write about the life history of Macrocytic heterogenous rust.

Guide lines for paper setter: (for Paper I – BOT - 101C) w.e.f. 2019-20.

1. In **section A**: Unit II, III & IV must carry **ONE** question from each Unit, Unit V must carry **TWO** questions and Unit I must carry **THREE** questions.
2. In **section B**: **ONE** question each from Unit I & III and **TWO** questions each from Unit II, IV & V.
3. See the following table and Model paper for marks distribution.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	3		1		
	15		10		25
Unit - II	1		2		
	5		20		25
Unit – III	1		1		
	5		10		15
Unit – IV	1		2		
	5		20		25
Unit – V	2		2		
	10		20		30
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions =16) Total marks = 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		
	(4 X 5) = 20		(5 X 10) = 50		70

INTERNAL EXAMS – 30 Marks

(**20** marks for unit tests, **5marks** for attendance, **5marks** for Seminars).

I B.Sc - SEMESTER - I: BOTANY PRACTICAL SYLLABUS

Paper - 101C (P): Microbial Diversity, Algae and Fungi

Time: 3hrs.

Max. Marks: 50

Total hours of laboratory Exercises 30 hrs @ 2 per week

Credits - 2

-
1. Knowledge of Equipment used in Microbiology: Spirit lamp, Inoculation loop, Hot-air oven, Autoclave/Pressure cooker, laminar air flow chamber and Incubator...etc.

 2. Preparation of liquid and solid media for culturing of microbes (Demonstration).

 3. Study of viruses and bacteria using electron photo micrographs .

 4. Gram staining Bacteria.

 5. Study of Plant disease symptoms caused by Bacteria (Citrus canker, leaf blight of rice, Angular leaf spot of Cotton) and viruses (TMV, Bheni vein clearing and Leaf curl of Papaya), Fungi (Late blight of potato, Red rot of Sugarcane and Paddy blast).

 6. Study of vegetative and reproductive structures of the following :
 - a) Algae: Oedogonium, Vaucheria , Ectocarpus, Nostoc and Scytonema.
 - b) Fungi: Albugo, Penicillium and Puccinia .

 7. Section cutting of diseased material infected by Fungi and identification of Pathogens as per theory syllabus.

 8. Lichens: Different types of thalli and anatomy

 9. Field Visit.
-

B.Sc - SEMESTER - I
BOTANY PRACTICAL PAPER - I
Paper-101C (P): Microbial Diversity, Algae and Fungi
Time: 3hrs. Credits - 2 Max. Marks: 50

1. Identify giving reasons Three of the given **Algal mixture** "A". Leave your preparation for evaluation. Draw labeled diagrams. (Slide— $\frac{1}{2}$ mark, Diagrams- $\frac{1}{2}$ mark, Identification--1mark) 2 x 2 = 4 Marks

 2. Make suitable stained preparation of the **material "B"** to bring out the details of internal structure identify giving reasons. Draw labeled diagrams and leave your preparations for evaluation. (Slide-2 marks, diagrams-1 marks, Identification- 1marks) 04 Marks

 3. **Conduct C** - Gram staining of Bacteria (Preparation 2m, procedure 3marks) 05 Marks

 4. Write critical notes and Identify **D, E, F, G and H** (Identification--1mark, Notes 1marks) 5X2 = 10 Marks

 5. **Viva** – voce (Any three simple questions from syllabus) 2 Marks
- Total: **25 Marks**

Internal Assessment

- | | |
|--------------------------------|---------|
| a) Record | 10Marks |
| b) Submission of Chart / Model | 5 Marks |
| c) Attendance | 5 Marks |
| d) Internal Practical Exam | 5 Marks |

Total : **25 Marks**

Total: 50 Marks

Key:

- A. Algal material
- B. Fungi material
- C. Bacterial culture
- D. One of the instruments of Micro biology laboratory.
- E. Whole specimen or a permanent slide of Algae.
- F. Whole specimen or a permanent slide of Fungi.
- G. Whole specimen or a permanent slide of Plant disease studied.
- H. Whole specimen or a permanent slide of Lichens.

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BOTANY	BOT-301C	w.e.f. 2019-20	B. Sc. (BZC)
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II B. Sc - BOTANY

SEMESTER - III

PAPER – III

Plant Taxonomy and Plant Physiology

Hours: 60 @ 4 hrs per week

Credits: 3

UNIT – I: Introduction to Plant Taxonomy

(12 hrs)

1. Fundamental components of taxonomy (identification, nomenclature, classification types and phylogeny)
2. Salient features of Bentham & Hooker classification.
3. Role of chemotaxonomy, cytotaxonomy and Embryology in relation to Taxonomy.
4. APG IV System of Classification – 2016.

UNIT –II: Systematic Taxonomy

(12 hrs)

1. Nomenclature and Taxonomic resources: An introduction to International Code of Botanical Nomenclature; Principles, Rules and Recommendations.
2. Systematic study and economic importance of plants belonging to the following families: Annonaceae, Capparidaceae, Rutaceae, Cucurbitaceae and Apiaceae

UNIT –III: Systematic Taxonomy

(12 hrs)

1. Systematic study and economic importance of plants belonging to the following families: Asteraceae, Asclepiadaceae, Lamiaceae, Euphorbiaceae, Orchidaceae and Poaceae.

Plant Physiology

UNIT – IV: Plant – Water relations

(12 hrs)

1. Importance of water to plant life, physical properties of water,
2. Diffusion, Imbibition and osmosis; water potential, osmotic potential and pressure potential.
3. Absorption, transport of water, ascent of sap.
4. Transpiration – types, stomata structure, movements and significance.

UNIT –V: Mineral nutrition, Fertilizers and Enzymes

(12 hrs)

1. Mineral Nutrition: Essential macro and micro mineral nutrients and their role, mineral uptake (active and passive), deficiency symptoms.
2. Nitrogen cycle- biological nitrogen fixation.
3. Enzymes: Nomenclature, characteristics, mechanism and regulation of enzyme action, enzyme kinetics, factors regulating enzyme action.

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BOTANY	BOT- 301C	w.e.f. 2019-20	B. Sc. (BZC)
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II B. Sc – BOTANY

Model Question Paper

SEMESTER- III

PAPER-III: Plant Taxonomy and Plant Physiology

Time: 3 Hours

Max. Marks: 70

SECTION-A

Answer any **four** of the following questions.

4x5 = 20Marks

(Draw diagrams wherever necessary)

1. Binomial nomenclature.
2. Cytotaxonomy.
3. Fruit in Rutaceae.
4. Pollination mechanism in Lamiaceae.
5. Water potential.
6. Types of Transpiration.
7. Imbibition.
8. Nitrogen.

SECTION-B

Answer any **five** of the following questions.

5x10 = 50Marks

(Draw diagrams wherever necessary)

9. Explain in brief Bentham & Hookers system of classification. Discuss the merits and demerits of the system.
10. Describe vegetative and floral characters of the family Cucurbitaceae.
11. Write an essay on ICBN.
12. Describe vegetative & floral characters of Asclepiadaceae.
13. Describe floral characters and economic importance of Euphorbiaceae.
14. Write an essay on Ascent of sap.
15. Write an essay on the absorption of mineral ions.
16. Explain the enzyme action and add a note on the factors that effect enzyme activity.

Guide lines for paper setter: (for Paper III – BOT- 301) w.e.f 2019-20

1. In **section A:** Unit II, III & V must carry **one** question from each Unit, Unit I must carry **two** questions and Unit IV must carry **three** questions.
2. In **section- B:** Set minimum **two** questions from Unit II, III & V. **One** question each from Unit I and Unit IV.
3. See the following table and Model paper for marks distribution.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		1		
	10		10		20
Unit - II	1		2		
	05		20		25
Unit – III	1		2		
	05		20		25
Unit – IV	3		1		
	15		10		25
Unit – V	1		2		
	05		20		25
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions =16) Total marks = 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4 (4 X 5M) = 20 M		5 (5 X 10M)= 50 M		70M

INTERNAL EXAMS - 30Marks

(20 marks for unit tests, 5 marks for seminar and remaining 5 marks for attendance).

II B.Sc - BOTANY PRACTICAL SYLLABUS (w.e.f. 2)

PAPER-III

SEMESTER-III

(BOT- 301P)

Practical – III:

Plant Taxonomy and Plant Physiology

Total hours of laboratory Exercises 45 hrs @ 3 per week

Suggested Laboratory Exercises:

1. Systematic study of locally available plants belonging to the families prescribed in theory Syllabus.
2. Demonstration of herbarium techniques.
3. Osmosis – by potato osmoscope method.
4. Determination of osmotic potential of vacuolar sap by plasmolytic method using leaves of *Rhoeo* / *Tradescantia*.
5. Determination of rate of transpiration using cobalt chloride method.
6. Demonstration of transpiration by Ganong's potometer.
7. Demonstration of ascent of sap / Transpiration pull.
8. Study of mineral deficiency symptoms using plant material/photographs.
11. Field visits.
12. Preparation and submission of 25 herbarium specimens for evaluation during the practical Examination.

II B.SC BOTANY PRACTICAL EXAM (BOT-301P) w.e.f. 2019-20

Plant Taxonomy and Plant Physiology

Time: 3 Hrs

Max. Marks: 50

-
- | | |
|---|-----|
| 1. Describe specimen 'A' in technical terms. Draw neat labelled diagrams of twig with inflorescence, L.S of flower, T.S. of ovary, floral diagram and write the floral formula. | 11M |
| 2. Assign the Specimen 'B' to its family giving reasons. | 3M |
| 3. Write the salient features of experiment 'C' with the help of neat labelled diagram. | 05M |
| 4. Identify D &E. | 03M |
| 5. Herbarium. | 03M |
| Total | 25M |

Internal :

(Attendance – 5 M + Record -10M + Field trip diary – 5M + Viva – 2M+Assignment-3M)
Total -----50M

Scheme of valuation

Time: 3 Hrs.

External Marks: 25

- | | |
|---|--------|
| 1. Material 'A' - A twig with large sized flowers. (From the families mentioned in practical syllabus) Description of veg. parts = 2 M; Description of floral parts = 4 M; One mark each for the diagrams of Twig with flower, L.S. of flower, T.S of ovary, Floral diagram and Floral formula. | = 11 M |
| 2. Material 'B' – (Family name - 1, Identification with reasons - 2) | = 03M |
| 3. Material 'C' –Physiology –minor experiment (Salient features 3, Diagram 2M) | = 05M |
| 4. 'D' & 'E'(2 Herbarium sheets from students collection) | = 03M |
| [for each one, Botanical name - 1, Family – ½] | |
| 5. Herbarium. | = 03 M |
| Total | = 25 M |

Internal :

25M

(Attendance – 5 M + Record -10M + Field trip diary – 5M + Viva – 2M+Assignment-3M)

A.G & S.G. Siddhartha Degree College of Arts & Science

An Autonomous College in the Jurisdiction of Krishna University

BOTANY	BOT-501C	2019-20	B.Sc. (BZC)
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PAPER – V Cell Biology, Genetics and Plant Breeding SEMESTER-V (2019-20)
Total Hours of teaching 60 hrs @ 6 hrs for Week Credits: 03

UNIT-I Cell Biology (12 hrs)

1. Cell, Ultra Structure and functions of cell wall.
2. Molecular Organization of cell membranes.
3. Chromosomes; morphology, organization of DNA in a chromosome (Nucleosome model) Euchromatin and Heterochromatin.

UNIT-II Genetic Material (12 hrs)

1. DNA as the Genetic Material: Griffith's and Avery's Transformation Experiment. Hershey - Chase Bacteriophage experiment.
2. DNA Structure (Watson & crick model) and replication of DNA (Semi Conservative).
3. Types of RNA (mRNA, tRNA, rRNA), their structure and function.

UNIT-III Mendelian Inheritance (12 hrs)

1. Mendelian Inheritance (Mono – Di-hybrid Crosses), Back cross and Text cross.
2. Linkage: concept, complete and In-complete Linkage, Coupling and Repulsion; Linkage Maps Based on Two and Three Point cross.
3. Crossing over concept and significance.

UNIT-IV Gene Expression (12 hrs)

1. Organization of gene, Transcription and Translation.
2. Mechanism and regulation of Gene Expression in Prokaryotes (Lac operon).
3. Mutations: Chromosomal Aberrations, Gene Mutations and Transposable Elements.

UNIT-V Plant Breeding (12 hrs)

1. Introduction and objectives of Plant Breeding.
2. Methods of Crop Improvement: Procedure, Advantages and limitations of Introduction, Selection and Hybridization (Out lines only).

B.Sc – BOTANY
SEMESTER -V. THEORY MODEL PAPER

Time: 3 Hours

Max. Marks: 75

SECTION-A

Answer any five of the following question

5x5=25M.

(Draw diagrams wherever necessary)

1. Nucleosome
2. Griffith experiment.
3. t RNA
4. Back cross and test cross.
5. Transcription.
6. Three point test cross.
7. Hybridization.
8. Crossing over.

SECTION-B

Answer all of the following questions.

5x10= 50M.

(Draw diagrams wherever necessary)

9. Describe the Ultra structure and functions of cell membrane.
10. What is cell theory? Write about eukaryotic cell components.
11. Write about structure and replication of DNA.
12. DNA as a genetic material proof with suitable experiments.
13. Explain the Mendel's law of inheritance.
14. Define linkage. Describe the different types of Linkage.
15. Write an essay on mechanism and Regulation of gene Expression in Prokaryotes.
16. Discuss about methods of Crop improvement.

Guide lines for paper setter: (for Paper V-BOT-501) W.e.f. 2019-20

1. In Section A: Unit I, III, V must carry one question from each unit. Unit II must carry 2 questions and Unit IV must carry three questions.
2. In section-B: Set minimum Two questions from Unit I, II & III
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	1		2		
	5		20		25
Unit – II	2		2		
	10		20		30
Unit –III	1		2		
	5		20		25
Unit-IV	3		1		
	15		10		25
Unit-V	1		1		
	5		10		15
Max .Q & marks	8 (x 5) =40		8 (x 10) = 80		(Total questions =16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5		5		
	(5 x 5) = 25		(5 x 10) = 50		75

INTERNAL EXAMS - 25Marks

(15 marks for unit tests, 5marks for Attendance 5 marks for seminars)

III B.SC-BOTANY Practical paper
Cell Biology, Genetics and Plant Breeding

SEMESTER-V

BOT-501-P

Time :3hr

Total hours of teaching 30hrs @ 2 hrs per week

Max.marks:50

1. Study of the structure of cell organelles through photomicrographs.
2. Study of plant cell through temporary mounts.
3. Study of various stages of mitosis using cytological preparation of Onion root tips.
4. Study of DNA packing by micrographs.
5. Numerical problems solving Mendal's Laws of inheritance.
6. Chromosome mapping using 3 point test cross data.
7. Hybridization techniques –emasculation. Bagging (for demonstration only).
8. Field visit to a plant breeding research station.

III B.SC-SEMESTER-V, BOTANY PRACTICAL MODEL PAPER

PAPER –V: CELL BIOLOGY GENETICS AND PLANT BREEDING

1. Perform the Experiment A Squash technique.....12M
2. Give the experimental protocol of the experiments. B.....04M
3. Solving numerical problems on Mendelian inheritance....C, D..... $2 \times 7.5 = 15M$
4. Record.....05M
- Viva.....04M
- Internal Practical Exam.....10M

III B.SC-BOTANY Syllabus SEMESTER-V

Practical paper – V: Cell Biology, Genetics and Plant Breeding

Total hours of teaching 30hrs @ 2 hrs per week

1. Perform the Experiment A.

Squash technique4M

Procedure.....4M

diagram2M =10

2. Give the experimental protocol of the experiments. B.....4M

3. Genetic problem C, D

Salvation of problem..... 5M

Reasoning.....2¹/₂M

2X7¹/₂=15M

Viva4M

Internal:

a) Record.....5 M.

b)Internal Practical Exam.....10M

Books for Reference:

1. Old, R.W. and Primrose S.B. 1994, Principles of Gene Manipulation Blackwell Science,19 London 2. Grierson, D. and Convey S.N. 1989, Plant Molecular Biology, Blackie Publishers, NewYork.
2. Lea, P.J. and Leegood R.C. 1999, Plant Biochemistry and Molecular Biology, John Wiley and Sons, London.
3. Power C.B., 1984, Cell Biology, Himalaya Publishing Co. Mumbai
4. De. Robertis and De Robertis, 1998, Cell and Moleceular Biology, K.M. Verghese andCompany .

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BOTANY	BOT-502	2019-20	B.Sc. (BZC)
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SEMESTER-V (2019-20)

PAPER – VI

PLANT ECOLOGY & PHYTOGEOGRAPHY

Credits-03

Total Hours of teaching 60 hrs @ 6 hrs for Week

UNIT-I-ELEMENTS OF ECOLOGY

(12 hrs)

1. Ecology: Definition, branches and significance of ecology.
2. Climatic factors: Light, Temperature.
3. Edaphic factor: Origin, formation, composition and soil profile.
4. Biotic factor, Ecological adaptations of Plants.

Unit– II. Ecosystem Ecology

(12 hrs)

1. Ecosystem: concept and components, energy flow, food chain, food web, Ecological Pyramids.
2. Productivity of ecosystem-Primary, Secondary and Net productivity.
3. Biogeochemical cycles- Carbon, Nitrogen and Phosphorous.

Unit –III Population & Community ecology.

(12 hrs)

1. Population-definition, characteristics and importance (Density, Natality, Mortality, Growth Curves) outlines-ecotypes.
2. Plant communities- characters of a community, outlines – Frequency, density, cover, life forms, Biological Spectrum.
3. Ecological Succession: Hydrosere and Xerosere

Unit-IV Phytogeography

(12 hrs)

1. Principles of Phytogeography, Distribution (Wides, Endemic, Discontinuous species).
2. Phytogeographic regions of India.
3. Endemism – types and Causes.

Unit-V Plant Biodiversity and its Importance

(12 hrs)

1. Definition, Levels of Biodiversity – genetic, species and ecosystem.
2. Biodiversity and Hot-spots of India: North Eastern, Himalayas and Western Ghats.
3. Loss of Biodiversity-causes and Conservation (In-situ and Ex-Situ Methods).

B.Sc – BOTANY

SEMESTER –VI THEORY MODEL PAPER

PLANT ECOLOGY & PHYTOGEOGRAPHY

Time: 3 Hours

Max. Marks: 75

SECTION-A

Answer any five of the following question.

5x5=25M.

(Draw diagrams wherever necessary)

1. Soil profile.
2. Biotic factor.
3. Food web.
4. Energy Flow in Ecosystem.
5. Natality.
6. Biological Spectrum
7. Endemism.
8. Red-Data book.

SECTION-B

Answer any Five of the following questions.

5x10=50M.

(Draw diagrams wherever necessary)

9. Discusses the importance of Temperature Factor on Plant Growth.
10. Briefly Discuss the Ecological Adaptations of Xerophytes.
11. What are Ecological Pyramids? Describe the Pyramids of numbers, BioMass and Energy.
12. What are biogeochemical cycles? Give an account of Nitrogen cycle?
13. What is Plant Succession? Describe Hydrosere?
14. What are the Characters of Plant Communities.
15. What are Principles of Plant Phytogeography.
16. What is Biodiversity? Explain the Levels of Biodiversity.

Guide lines for paper setter: (for Paper V-BOT-501) W.e.f. 2019-20

1. In Section A: Unit I, II, III, must carry Two question from each unit. Unit IV, V must carry one question.
2. In section-B: Set minimum two questions from Unit I, II & III and Set One Question from IV, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section – A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
		10		20	30
Unit – II	2		2		
		10		20	30
Unit – III	2		2		
		10		20	30
Unit-IV	1		1		
		5		10	15
Unit-V	1		1		
		5		10	15
Max. Q & marks	8	(x 5) = 40	8	(x 10) = 80	(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	5		5		
		(5 x 5) = 25		(5 x 10) = 50	75

INTERNAL EXAMS - 25Marks

(15 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.)

**BOTANY PRACTICAL
PLANT ECOLOGY & PHYTOGEOGRAPHY**

SEMESTER- V

BOT-502-P

Total hours of teaching 30 hrs @ 3 hrs per week

1. Study of instruments used to measure microclimatic variables; soil thermometer, maximum and minimum thermometer, anemometer, psychrometer, rain gauge, and lux meter.
2. Permeability (percolation; total capacity as well as rate of movement) of different soil samples.
3. Determination of soil pH
4. Study of morphological and anatomical adaptations of hydrophytes and xerophytes. (4each)
5. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method.
6. Study of Phytoplankton and macrophytes from water bodies.
7. Study of species diversity index of vegetation.
8. Estimation of Primary Productivity of an ecosystem.
9. To study field vegetation with respect to stratification, canopy cover and composition.
10. Study of plants included in agro forestry and social forestry.
11. To locate the hotspots, phyto geographical regions and distribution of endemic plants in the map of India.
12. The following practical should be conducted in the Field/lab with the help of Photographs, herbarium, Floras, Red data book- Study of endangered plants species, critically endangered plants species, vulnerable plant species and monotypic endemic genera of India.

BOTANY PRACTICAL
PLANT ECOLOGY & PHYTOGEOGRAPHY

SEMESTER- V

BOT-502-P

Total hours of teaching 30 hrs @ 3 hrs per week

1. Study Project under supervision.....12 Marks
2. Experiment A 07Marks
3. Anatomical adaptations of B (Section cutting)..... 07Marks
4. Spotters C&D(2x2 1/2) = 5 Marks
5. Record.....05Marks
6. Viva-Voc.....04Mrks
7. Internal practical exam.....10Marks

Total = 50 Marks

BOTANY PRACTICAL
PLANT ECOLOGY & PHYTOGEOGRAPHY

SEMESTER- V

BOT-502-P

Scheme of Valuation

1. Study Project under supervision
To study Honey Bees and Plants Yielding Honey 12 Marks
2. Experiment A -determination of soil porosity/PH..... 07Marks
3. Anatomical adaptations of B (Section cutting)
Xerophytes / Hydrophytes07Marks
4. Spotters C&D anemometer/rain gauze/lux meter (2x2 1/2) = 5 Marks
5. Viva-Voc.....04Mrks
6. Record.....05Marks
7. Internal practical exam.....10Marks

Total = 50 Marks

Books for Reference:

1. Daubenmire, R.F. (): Plants & Environment (2nd Edn.,) John Wiley & Sons., New York22
2. Puri, .G.S. (1960): Indian Forest Ecology (Vol.I & II) Oxford Book Co., New Delhi &Calcutta.
3. Billings, W.B. (1965): Plants and the Ecosystem Wadsworth Publishing Co., Inc., Belmont.
4. Misra, R. (1968): The Ecology work Book Oxford & INH Publishing Co., Calcutta

**A.G& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS &
SCIENCE**

VUYYURU-521165, KRISHNA Dt., A.P.(Autonomous)

Accredited by NAAC with "A" Grade

2020-2021



DEPARTMENT OF BOTANY

MINUTES OF BOARD OF STUDIES

ODD SEMESTER

16-07-2020

Minutes of the meeting of Board of studies in Botany for the Autonomous courses of AG & SG Siddhartha Degree College of Arts & Science, Vuyyuru, held at 10:30 A.M on 16-07-2020 through Online.

Members Present:-

- 1) CH. Beulah Ranjani
(CH. Beulah Ranjani) **Chairman** Head, Department of Botany,
A.G & S.G.S Degree College of Arts
& Science (Autonomous), Vuyyuru.
- 2) G. Ramesh
(Dr. G.Ramesh) **University
Nominee** Head, Department of Botany,
K.B.N.College, Vijayawada.
- 3) A. Srinivasa Rao
(Dr.A.Srinivasa Rao) **Academic Council
Nominee** Lecturer in Botany,
Govt.Degree College Mandapeta,
East Godavari.
- 4) N. Manimala
(N.Manimala) **Academic Council
Nominee** Head, Department of Botany,
Govt.Degree College, Chintalapudi.
- 5) S. Krishna Suman
(S.Krishna Suman) **Industrialist** Natural Farming,
Yakamuru, Vuyyuru, Krishna Dt.
- 6) N. Ramana Rao
(N.Ramana Rao) **Member** Adhoc Lecturer in Botany,
A.G & S.G.S Degree College of Arts
& Science (Autonomous), Vuyyuru.
- 7) E. Ganesh
(E.Ganesh) **Member** Adhoc Lecturer in Botany,
A.G & S.G.S Degree College of Arts
& Science (Autonomous), Vuyyuru.
- 8) K. Anusha
(K.Anusha) **Student Representative** Lecturer, Chaitanya College,
Vuyyuru.

Agenda for B.O.S Meeting.

1. To recommend the syllabi (Theory & Practical), Model question paper for I Semester of I B.Sc (B.Z.C), (A.B.C) for the academic year 2020 - 2021.
2. To recommend the syllabi (Theory & Practical), Model question paper for III Semester of II B.Sc (B.Z.C), (A.B.C) for the academic year 2020 - 2021.
3. To recommend the syllabi (Theory & Practical), Model question paper for V Semester of III B.Sc (B.Z.C), (A.B.C) for the academic year 2020 - 2021.
4. To recommend the syllabi (Theory & Practical), Model question paper and Blue print of I, III & V semester of I, II & III B.Sc (B.Z.C), (A.B.C.) for the academic year 2020 - 2021.
5. To recommend the syllabi of Competitive Botany as Unit- VI in I, III Semesters for the Academic year 2020 - 2021.
6. To recommend the teaching and evolution methods to be followed under Autonomous status.
7. Any other matter.

C. B. Rao
Chairman.

RESOLUTIONS

1. It is resolved to continue changed syllabi (Theory & Practical), model question paper of I Semester of I B.Sc (B.Z.C), (A.B.C) under Choice Based Credit System (CBCS) for the academic Year 2020 – 2021.
2. It is resolved to continue the same syllabi (Theory & Practical), model question paper of III Semester of II B.Sc (B.Z.C), (A.B.C) under Choice Based Credit System (CBCS) for the academic Year 2020 – 2021.
3. It is resolved to continue the same syllabi (Theory & Practical), model question paper of V Semester of III B.Sc (B.Z.C), (A.B.C) under Choice Based Credit System (CBCS) for the academic Year 2020 – 2021.
4. It is resolved to follow the Model question paper and Blue print of I, III & V semester of I, II & III B.Sc (B.Z.C), (A.B.C.) for the academic year 2020-2021.
5. It is resolved to follow the syllabus of Competitive Botany as Unit- VI in I, III Semesters for the Academic year 2020-2021. Questions from the VI-Unit will be given in IA-1, IA-II but not in semester end exams.
6. It is resolved to continue the following teaching & evolution methods for the Academic year 2020 - 2021.
7. Any other matter.

Teaching methods:

Besides the conventional methods of teaching, we use modern technology i.e. Using of OHP and LCD projector to display on U boards etc; for better understanding of concepts.

Evaluation of a student is done by the following procedure:

- **Internal Assessment Examination:**
- Out of maximum 100 marks in each paper for I, II & III B.Sc (B.Z.C), (A.B.C) 30 marks shall be allocated for internal assessment.
- Out of these 30 marks, 20 marks are allocated for announced tests (i.e . IA-1& IA-2). Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks are allocated on the basis of candidate's percentage of attendance and remaining 5 marks are allocated for the assignment for I, II & III B.Sc (B.Z.C), (A.B.C).

- **Semester – End Examination:**

- The maximum mark for I, III, V Bsc (B.Z.C), (A.B.C) semester – End examination shall be 70 marks and duration of the examination shall be 3 hours. Even though the candidate is absent for two IA exams/ obtain Zero marks the external marks are considered (if the candidate gets 40/70) and the result shall be declared as “PASS”.
- Semester – End examination shall be conducted in theory papers at the end of every semester, while in practical papers, these examinations are conducted at the end of I, III & V semester for I, II & III B.Sc (B.Z.C), (A.B.C).
- Discussed and recommended for organizing Seminars, Guest lectures, Work – Shops to upgrade the Knowledge of students, for the approval of the Academic Council.

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BOTANY	BOT - 101C	w.e.f. 2020-21	B. Sc. (BZC)
SEMESTER - I	Fundamentals of Microbes and Non-vascular Plants		PAPER - I

(Viruses, Bacteria, Fungi, Lichens, Algae and Bryophytes)

Unit – 1: Origin of life and Viruses **12Hrs.**

1. Origin of life, five kingdom classification of R.H. Whittaker
2. Discovery of microorganisms, Pasteur experiments, germ theory of diseases.
3. Shape and symmetry of viruses; structure of TMV and multiplication of TMV; A brief account of Prions and Viroids.
4. A general account on symptoms of plant diseases caused by Viruses. Transmission of plant viruses and their control.

Unit – 2: Special groups of Bacteria and Eubacteria **12Hrs.**

1. Brief account of Archaeobacteria, Actinomycetes and Cyanobacteria.
2. Cell structure and nutrition of Eubacteria.
3. Reproduction- Asexual (Binary fission and endospores) and bacterial recombination (Conjugation, Transformation, Transduction).
4. Economic importance of Bacteria with reference to their role in Agriculture and industry (fermentation and medicine).
5. A general account on symptoms of plant diseases caused by Bacteria; Citrus canker.

Unit – 3: Fungi & Lichens **12 Hrs.**

1. General characteristics of fungi and Ainsworth classification (upto classes).
2. Structure, reproduction and life history of (a) *Rhizopus* (Zygomycota) and (b) *Puccinia* (Basidiomycota).
3. Economic uses of fungi in food industry, pharmacy and agriculture.
4. A general account on symptoms of plant diseases caused by Fungi; Blast of Rice.
5. Lichens- structure and reproduction; ecological and economic importance.

Unit – 4: Algae **12 Hrs.**

1. General characteristics of Algae (pigments, flagella and reserve food material); Fritsch classification. (upto classes).
2. Thallus organization and life cycles in Algae.
3. Occurrence, structure, reproduction and life cycle of (a) *Spirogyra* (Chlorophyceae) and (b) *Oedogonum* (chlorophyceae) .
4. Economic importance of Algae.

Unit – 5: Bryophytes **12 Hrs.**

1. General characteristics of Bryophytes; classification upto classes.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life cycle of (a) *Marchantia* (Hepaticopsida) and (b) *Funaria* (Bryopsida).
3. General account on evolution of sporophytes in Bryophyta.

BOTANY	BOT-301C	w.e.f. 2020-21	B. Sc. (BZC)
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II B. Sc - BOTANY

SEMESTER - III

PAPER – III

Plant Taxonomy and Plant Physiology

Hours: 60 @ 4 hrs per week

Credits: 3

UNIT – I: Introduction to Plant Taxonomy (12 hrs)

1. Fundamental components of taxonomy (identification, nomenclature, classification types and phylogeny)
2. Salient features of Bentham & Hooker classification.
3. Role of chemotaxonomy, cytotoxicity and Embryology in relation to Taxonomy.
4. APG IV System of Classification – 2016.

UNIT –II: Systematic Taxonomy (12 hrs)

1. Nomenclature and Taxonomic resources: An introduction to International Code of Botanical Nomenclature; Principles, Rules and Recommendations.
2. Systematic study and economic importance of plants belonging to the following families: Annonaceae, Capparidaceae, Rutaceae, Cucurbitaceae and Apiaceae

UNIT –III: Systematic Taxonomy (12 hrs)

1. Systematic study and economic importance of plants belonging to the following families: Asteraceae, Asclepiadaceae, Lamiaceae, Euphorbiaceae, Orchidaceae and Poaceae.

Plant Physiology

UNIT – IV: Plant – Water relations (12 hrs)

1. Importance of water to plant life, physical properties of water,
2. Diffusion, Imbibition and osmosis; water potential, osmotic potential and pressure potential.
3. Absorption, transport of water, ascent of sap.
4. Transpiration – types, stomata structure, movements and significance.

UNIT –V: Mineral nutrition, Fertilizers and Enzymes (12 hrs)

1. Mineral Nutrition: Essential macro and micro mineral nutrients and their role, mineral uptake (active and passive), deficiency symptoms.
2. Nitrogen cycle- biological nitrogen fixation.
3. Enzymes: Nomenclature, characteristics, mechanism and regulation of enzyme action, enzyme kinetics, factors regulating enzyme action.

UNIT –VI (Competitive Syllabus)

1. Definitions of Growth and Classification Based on Growth Habits.
2. Fruitarianism – Introduction, Varieties, Nutrition and Nutritional effects Vitamin B12
3. Biological Nitrogen Fixation.

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BOTANY	BOT- 301C	w.e.f. 2020-21	B. Sc. (BZC)
II B. Sc – BOTANY	Model Question Paper	SEMESTER- III	
PAPER-III: Plant Taxonomy and Plant Physiology			
Time: 3 Hours		Max. Marks: 70	

SECTION-A

Answer any **four** of the following questions.

4x5 = 20Marks

(Draw diagrams wherever necessary)

1. Binomial nomenclature.
2. Cytotaxonomy.
3. Fruit in Rutaceae.
4. Pollination mechanism in Lamiaceae.
5. Water potential.
6. Types of Transpiration.
7. Imbibition.
8. Nitrogen.

SECTION-B

Answer any **five** of the following questions.

5x10 = 50Marks

(Draw diagrams wherever necessary)

9. Explain in brief Bentham & Hookers system of classification. Discuss the merits and demerits of the system.
10. Describe vegetative and floral characters of the family Cucurbitaceae.
11. Write an essay on ICBN.
12. Describe vegetative & floral characters of Asclepiadaceae.
13. Describe floral characters and economic importance of Euphorbiaceae.
14. Write an essay on Ascent of sap.
15. Write an essay on the absorption of mineral ions.
16. Explain the enzyme action and add a note on the factors that effect enzyme activity.

Guide lines for paper setter: (for Paper III – BOT- 301) w.e.f 2020-21

1. In **section A**: Unit II, III & V must carry **one** question from each Unit, Unit I must carry

- two** questions and Unit IV must carry **three** questions.
- In **section- B**: Set minimum **two** questions from Unit II, III & V. **One** question each from Unit I and Unit IV.
 - See the following table and Model paper for marks distribution.
 - Please provide the scheme of valuation for the paper.
 - Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		1		
	10		10		20
Unit - II	1		2		
	05		20		25
Unit – III	1		2		
	05		20		25
Unit – IV	3		1		
	15		10		25
Unit – V	1		2		
	05		20		25
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions =16) Total marks = 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4 (4 X 5M) = 20 M		5 (5 X 10M)= 50 M		70M

INTERNAL EXAMS - 30Marks

(20 marks for unit tests, 5 marks for seminar and remaining 5 marks for attendance).

PAPER-III

SEMESTER-III

(BOT- 301P)

Practical – III:

Plant Taxonomy and Plant Physiology

Total hours of laboratory Exercises 45 hrs @ 3 per week

Suggested Laboratory Exercises:

1. Systematic study of locally available plants belonging to the families prescribed in theory Syllabus.
2. Demonstration of herbarium techniques.
3. Osmosis – by potato osmoscope method.
4. Determination of osmotic potential of vacuolar sap by plasmolytic method using leaves of *Rhoeo* / *Tradescantia*.
5. Determination of rate of transpiration using cobalt chloride method.
6. Demonstration of transpiration by Ganong's potometer.
7. Demonstration of ascent of sap / Transpiration pull.
8. Study of mineral deficiency symptoms using plant material/photographs.
11. Field visits.
12. Preparation and submission of 25 herbarium specimens for evaluation during the practical Examination.

Plant Taxonomy and Plant Physiology

Time: 3 Hrs

Max. Marks: 50

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- | | |
|---|-----|
| 1. Describe specimen 'A' in technical terms. Draw neat labelled diagrams of twig with inflorescence, L.S of flower, T.S. of ovary, floral diagram and write the floral formula. | 11M |
| 2. Assign the Specimen 'B' to its family giving reasons. | 3M |
| 3. Write the salient features of experiment 'C' with the help of neat labelled diagram. | 05M |
| 4. Identify D & E. | 03M |
| 5. Herbarium. | 03M |
| Total | 25M |

Internal :

(Attendance – 5 M + Record -10M + Field trip diary – 5M + Viva – 2M+Assignment-3M)

Total -----50M

Scheme of valuation

Time: 3 Hrs.

External Marks: 25

- | | |
|---|--------|
| 1. Material 'A' - A twig with large sized flowers. (From the families mentioned in practical syllabus) Description of veg. parts = 2 M; Description of floral parts = 4 M; One mark each for the diagrams of Twig with flower, L.S. of flower, T.S of ovary, Floral diagram and Floral formula. | = 11 M |
| 2. Material 'B' – (Family name - 1, Identification with reasons - 2) | = 03M |
| 3. Material 'C' –Physiology –minor experiment (Salient features 3, Diagram 2M) | = 05M |
| 4. 'D' & 'E' (2 Herbarium sheets from students collection) | = 03M |
| 5. Herbarium.
[for each one, Botanical name - 1, Family – ½] | = 03 M |

Internal :

(Attendance – 5 M + Record -10M + Field trip diary – 5M + Viva – 2M+Assignment-3M)

BOTANY	BOT-501C	2020-2021	B.Sc. (BZC)
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PAPER – V Cell Biology, Genetics and Plant Breeding SEMESTER-V (2020-2021)
Total Hours of teaching 60 hrs @ 6 hrs for Week Credits: 03

UNIT-I Cell Biology (12 hrs)

1. Cell, Ultra Structure and functions of cell wall.
2. Molecular Organization of cell membranes.
3. Chromosomes; morphology, organization of DNA in a chromosome (Nucleosome model) Euchromatin and Heterochromatin.

UNIT-II Genetic Material (12 hrs)

1. DNA as the Genetic Material: Griffith's and Avery's Transformation Experiment. Hershey - Chase Bacteriophage experiment.
2. DNA Structure (Watson & crick model) and replication of DNA (Semi Conservative).
3. Types of RNA (mRNA, tRNA, rRNA), their structure and function.

UNIT-III Mendelian Inheritance (12 hrs)

1. Mendelian Inheritance (Mono – Di-hybrid Crosses), Back cross and Test cross.
2. Linkage: concept, complete and In-complete Linkage, Coupling and Repulsion; Linkage Maps Based on Two and Three Point cross.
3. Crossing over concept and significance.

UNIT-IV Gene Expression (12 hrs)

1. Organization of gene, Transcription and Translation.
2. Mechanism and regulation of Gene Expression in Prokaryotes (Lac operon).
3. Mutations: Chromosomal Aberrations, Gene Mutations and Transposable Elements.

UNIT-V Plant Breeding (12 hrs)

1. Introduction and objectives of Plant Breeding.
2. Methods of Crop Improvement: Procedure, Advantages and limitations of Introduction, Selection and Hybridization (Out lines only).

**B.Sc – BOTANY
SEMESTER -V. THEORY MODEL PAPER**

Time: 3 Hours

Max. Marks: 70

SECTION-A

Answer any four of the following question

4x5=20M.

(Draw diagrams wherever necessary)

1. Nucleosome
2. Griffith experiment.
3. t RNA
4. Back cross and test cross.
5. Transcription.
6. Three point test cross.
7. Hybridization.
8. Crossing over.

SECTION-B

Answer all of the following questions.

5x10= 50M.

(Draw diagrams wherever necessary)

9. Describe the Ultra structure and functions of cell membrane.
10. What is cell theory? Write about eukaryotic cell components.
11. Write about structure and replication of DNA.
12. DNA as a genetic material proof with suitable experiments.
13. Explain the Mendel's law of inheritance.
14. Define linkage. Describe the different types of Linkage.
15. Write an essay on mechanism and Regulation of gene Expression in Prokaryotes.
16. Discuss about methods of Crop improvement.

Guide lines for paper setter: (for Paper V-BOT-501) W.e.f. 2020-21

1. In Section A: Unit I, III, V must carry one question from each unit. Unit II must carry 2 questions and Unit IV must carry three questions.

2. In section-B: Set minimum Two questions from Unit I, II & III
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	1		2		
	5		20		25
Unit – II	2		2		
	10		20		30
Unit –III	1		2		
	5		20		25
Unit-IV	3		1		
	15		10		25
Unit-V	1		1		
	5		10		15
Max .Q & marks	8 (x 5) =40		8 (x 10) = 80		(Total questions =16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		
	(4 x 5) = 20		(5 x 10) = 50		70

INTERNAL EXAMS – 30 Marks

(20 marks for unit tests, 5 marks for Attendance 5 marks for seminars)

III B.SC-BOTANY Practical paper

Cell Biology, Genetics and Plant Breeding

SEMESTER-V

BOT-501-P

Time :3hr

Total hours of teaching 30hrs @ 2 hrs per week

Max.marks:50

-
1. Study of the structure of cell organelles through photomicrographs.
 2. Study of plant cell through temporary mounts.
 3. Study of various stages of mitosis using cytological preparation of Onion root tips.
 4. Study of DNA packing by micrographs.
 5. Numerical problems solving Mendal's Laws of inheritance.
 6. Chromosome mapping using 3 point test cross data.
 7. Hybridization techniques –emasculation. Bagging (for demonstration only).
 8. Field visit to a plant breeding research station.

III B.SC-SEMESTER-V, BOTANY PRACTICAL MODEL PAPER

PAPER –V: CELL BIOLOGY GENETICS AND PLANT BREEDING

1. Perform the Experiment A Squash technique 13M
2. Give the experimental protocol of the experiments. B.....04M
3. Solving numerical problems on Mendelian inheritance...C, D..... $2 \times 7 = 14$ M
4. Record.....05M
- Viva.....04M
- Internal Practical Exam.....10M

III B.SC-BOTANY Syllabus SEMESTER-V

Practical paper – V: Cell Biology, Genetics and Plant Breeding

Total hours of teaching 30hrs @ 2 hrs per week

1. Perform the Experiment A.

Squash technique5M
Procedure.....5M
diagram3M = 13

2. Give the experimental protocol of the experiments. B.....4M

3. Genetic problem C, D

Salvation of problem.....5 M
Reasoning.....2 M

2X7 = 14M

Viva4M

Internal:

a) Record.....5M.

b)Internal Practical Exam.....10M

Books for Reference:

1. Old, R.W. and Primrose S.B. 1994, Principles of Gene Manipulation Blackwell Science, 19 London 2. Grierson, D. and Convey S.N. 1989, Plant Molecular Biology, Blackie Publishers, New York.
2. Lea, P.J. and Leegood R.C. 1999, Plant Biochemistry and Molecular Biology, John Wiley and Sons, London.
3. Power C.B., 1984, Cell Biology, Himalaya Publishing Co. Mumbai
4. De. Robertis and De Robertis, 1998, Cell and Moleceular Biology, K.M. Verghese and Company .

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BOTANY	BOT-502	2020-2021	B.Sc. (BZC)
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SEMESTER-V (2020-2021)

PAPER – VI

Total Hours of teaching 60 hrs @ 6 hrs for Week

UNIT-I-ELEMENTS OF ECOLOGY

(12 hrs)

1. Ecology: Definition, branches and significance of ecology.
2. Climatic factors: Light, Temperature.
3. Edaphic factor: Origin, formation, composition and soil profile.
4. Biotic factor, Ecological adaptations of Plants.

Unit– II. Ecosystem Ecology

(12 hrs)

1. Ecosystem: concept and components, energy flow, food chain, food web, Ecological Pyramids.
2. Productivity of ecosystem-Primary, Secondary and Net productivity.
3. Biogeochemical cycles- Carbon, Nitrogen and Phosphorous.

Unit –III Population & Community ecology.

(12 hrs)

1. Population-definition, characteristics and importance (Density, Natality, Mortality, Growth Curves) outlines-ecotypes.
2. Plant communities- characters of a community, outlines – Frequency, density, cover, life forms, Biological Spectrum.
3. Ecological Succession: Hydrosere and Xerosere

Unit-IV Phytogeography

(12 hrs)

1. Principles of Phytogeography, Distribution (Wides, Endemic, Discontinuous species).
2. Phytogeographic regions of India.
3. Endemism – types and Causes.

Unit-V Plant Biodiversity and its Importance

(12 hrs)

1. Definition, Levels of Biodiversity – genetic, species and ecosystem.
2. Biodiversity and Hot-spots of India: North Eastern, Himalayas and Western Ghats.
3. Loss of Biodiversity-causes and Conservation (In-situ and Ex-Situ Methods).

B.Sc – BOTANY

SEMESTER –VI THEORY MODEL PAPER

PLANT ECOLOGY & PHYTOGEOGRAPHY

Time: 3 Hours

Max. Marks: 70

SECTION-A

Answer any four of the following question.

4x5=20M.

(Draw diagrams wherever necessary)

1. Soil profile.
2. Biotic factor.
3. Food web.
4. Energy Flow in Ecosystem.
5. Natality.
6. Biological Spectrum
7. Endemism.
8. Red-Data book.

SECTION-B

Answer any Five of the following questions.

5x10=50M.

(Draw diagrams wherever necessary)

9. Discusses the importance of Temperature Factor on Plant Growth.
10. Briefly Discuss the Ecological Adaptations of Xerophytes.
11. What are Ecological Pyramids? Describe the Pyramids of numbers, BioMass and Energy.
12. What are biogeochemical cycles? Give an account of Nitrogen cycle?
13. What is Plant Succession? Describe Hydrosere?
14. What are the Characters of Plant Communities.
15. What are Principles of Plant Phytogeography.
16. What is Biodiversity? Explain the Levels of Biodiversity.

Guide lines for paper setter: (for Paper V-BOT-501) W.e.f. 2020-21

1. In Section A: Unit I, II, III, must carry Two question from each unit. Unit IV, V must carry

one question.

2. In section-B: Set minimum two questions from Unit I, II & III and Set One Question from IV, V.

3. See the following table and Model paper.

4. Please provide the scheme of valuation for the paper.

5. Question paper should be both in English and Telugu media.

Unit	Section – A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		30
	10		20		
Unit – II	2		2		30
	10		20		
Unit – III	2		2		30
	10		20		
Unit-IV	1		1		15
	5		10		
Unit-V	1		1		15
	5		10		
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		70
	(4 x 5) = 20		(5 x 10) = 50		

INTERNAL EXAMS - 30Marks

(20 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.)

**BOTANY PRACTICAL
PLANT ECOLOGY & PHYTOGEOGRAPHY**

SEMESTER- V

BOT-502-P

Total hours of teaching 30 hrs @ 3 hrs per week

1. Study of instruments used to measure microclimatic variables; soil thermometer, maximum and minimum thermometer, anemometer, psychomotor, rain gauze, and lux meter.
2. Permeability (percolation; total capacity as well as rate of movement) of different soil samples.
3. Determination of soil pH
4. Study of morphological and anatomical adaptations of hydrophytes and xerophytes. (4each)
5. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method.
6. Study of Phytoplankton and macrophysics from water bodies.
7. Study of species diversity index of vegetation.
8. Estimation of Primary Productivity of an ecosystem.
9. To study field vegetation with respect to stratification, canopy cover and composition.
10. Study of plants included in agro forestry and social forestry.
11. To locate the hotspots, phyto geographical regions and distribution of endemic plants in the map of India.
12. The following practical should be conducted in the Field/lab with the help of Photographs, herbarium, Floras, Red data book- Study of endangered plants species, critically endangered plants species, vulnerable plant species and monotypic endemic genera of India.

**BOTANY PRACTICAL
PLANT ECOLOGY & PHYTOGEOGRAPHY**

SEMESTER- V

Total hours of teaching 30 hrs @ 3 hrs per week

BOT-502-P

1. Study Project under supervision.....	12 Marks
2. Experiment A	07Marks
3. Anatomical adaptations of B (Section cutting).....	07Marks
4. Spotters C&D .....	.(2x2 1/2) = 5 Marks
5. Record.....	05Marks
6. Viva-Voc.....	04Mrks
7. Internal practical exam.....	10Marks

Total = 50 Marks

BOTANY PRACTICAL
PLANT ECOLOGY & PHYTOGEOGRAPHY
 SEMESTER- V BOT-502-P
Scheme of Valuation

1. Study Project under supervision To study Honey Bees and Plants Yielding Honey	12 Marks
2. Experiment A -determination of soil porosity/PH.....	07Marks
3. Anatomical adaptations of B (Section cutting) Xerophytes / Hydrophytes	07Marks
4. Spotters C&D anemometer/rain gauze/lux meter	(2x2 1/2) = 5 Marks
5. Viva-Voc.....	04Mrks
6. Record.....	05Marks
7. Internal practical exam.....	10Marks

Total = 50 Marks

**A.G& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS &
SCIENCE**

VUYYURU-521165, KRISHNA Dt., A.P.(Autonomous)

Accredited by NAAC with "A" Grade

2020-2021



DEPARTMENT OF BOTANY


MINUTES OF BOARD OF STUDIES


EVEN SEMESTER


12-04-2021


Minutes of the meeting of Board of studies in Botany for the Autonomous courses of AG & SG
Siddhartha Degree College of Arts & Science, Vuyyuru, held at 10:00 A.M on 12-04-2021 in the
Department of Botany.


Members Present:-


- 1)..... Chairman Head, Department of Botany
(Smt. CH. Beulah Ranjani) AG & SG S Degree College of Arts &
Science Vuyyuru- 521165.


- 2)..... University
(Sri. Dr. K. Ramesh) Nominee Department of Botany &
Head (I/c) Botany,
The Hindu College, Guntur .


- 3)..... Academic
(Sri. Dr. A. Srinivas Rao) Council Nominee Lecture in Botany,
Govt. Degree College Mandapeta,
East Godavari.

- 4)..... Academic
(Smt. N. Manimala) Council Nominee Head, Department of Botany
Govt. Degree College Chinthalapudi,
West Godavari.

- 5)..... Industrialist.
(Sri. S. Krishna Suman) Natural farming.
yakamuru
Vuyyuru, Krishna dt

- 6)..... Member
(Sri. N. Ramana Rao) Ad hoc Lecturer in Botany
AG & SGS Degree College of Arts &
Science (Autonomous),
Vuyyuru-521165.

- 7)..... Member
(Ms. G. Rebecca Rachel) Ad hoc Lecturer in Botany
AG & SGS Degree College of Arts &
Science (Autonomous),
Vuyyuru-521165.

- 8)..... student representative Lecturer in chaitanya college.
Gudiwada

Agenda for B.O.S Meeting.

1. To recommend the syllabi (Theory & Practical), Model question paper for II Semester of I B.Sc (B.Z.C), (A.B.C) for the academic year 2020 - 2021.
2. To recommend the syllabi (Theory & Practical), Model question paper for IV Semester of II B.Sc (B.Z.C), (A.B.C) for the academic year 2020 - 2021.
3. To recommend the syllabi (Theory & Practical), Model question paper for VI Semester of III B.Sc (B.Z.C) for the academic year 2020 - 2021.
4. To discuss to the syllabus of Elective & Clusters in VI semester to be for the academic year 2020 21.
5. To recommend the syllabi (Theory & Practical), Model question paper and Blue print of II, IV & VI semester of I, II & III B.Sc (B.Z.C), (A.B.C.) for the academic year 2020 - 2021.
6. To recommend the syllabi of Competitive Botany as Unit- VI in II, IV Semesters for the Academic year 2020 - 2021.
7. To continue a certificate course - Mushroom culture for II Year students in this academic year of 2020-21
8. It is resolved to implement skill development course – plant nursery for I Year students B.Sc (B.Z.C E.M , T.M & AQUA)
9. To recommend the teaching and evolution methods to be followed under Autonomous statues.
10. Any other matter.

CH. Beulah Rajane
Chairman.

RESOLUTIONS

1. It is resolved to continue changed syllabi (Theory & Practical), model question paper of II Semester of I B.Sc (B.Z.C), (A.B.C) under Choice Based Credit System (CBCS) for the academic Year 2020 – 2021.

2. It is resolved to continue the same syllabi (Theory & Practical), model question paper of IV Semester of II B.Sc (B.Z.C), (A.B.C) under Choice Based Credit System (CBCS) for the academic Year 2020 – 2021.

3. It is resolved to continue the same syllabi (Theory & Practical), model question paper of VI Semester of III B.Sc (B.Z.C) under Choice Based Credit System (CBCS) for the academic Year 2020 – 2021.

4. It is resolved to follow Elective-AC (Plant tissue culture and its Biotechnological applications) and Cluster –A (plant Diversity and human welfare, Ethno Botany and Medicinal Botany Pharmacognosy and phyto chemistry.) In VI Semester from the Academic year 2020-21.

5. It is resolved to follow the Model question paper and Blue print of II, IV & VI semester of I, II & III B.Sc (B.Z.C), (A.B.C.) for the academic year 2020-2021.

6. It is resolved to follow the syllabus of Competitive Botany as Unit- VI in II, IV Semesters for the Academic year 2020-2021. Questions from the VI-Unit will be given in IA-1, IA-II but not in semester end exams.

7. It is resolved to implement certificate course for II Year students.

8. It is resolved to implement skill development course – plant nursery for I Year students B.Sc (B.Z.C E.M , T.M & AQUA)

9. It is resolved to continue the following teaching & evolution methods for the Academic year 2020 - 2021.

10. Any other matter.

Teaching methods:

Besides the conventional methods of teaching, we use modern technology i.e. Using of OHP and LCD projector to display on U boards etc; for better understanding of concepts.

Evaluation of a student is done by the following procedure:

- **Internal Assessment Examination:**

- Out of maximum 100 marks in each paper for I, II & III B.Sc (B.Z.C), (A.B.C) 30 marks shall be allocated for internal assessment.
- Out of these 30 marks, 20 marks are allocated for announced tests (i.e . IA-1& IA-2). Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks are allocated on the basis of candidate's percentage of attendance and remaining 5 marks are allocated for the assignment for I, II & III B.Sc (B.Z.C), (A.B.C).

- **Semester – End Examination:**

- The maximum mark for II, IV, VI Bsc (B.Z.C), (A.B.C) semester – End examination shall be 70 marks and duration of the examination shall be 3 hours. Even though the candidate is absent for two

-

- IA exams/ obtain Zero marks the external marks are considered (if the candidate gets 40/70) and the result shall be declared as “PASS”.
- Semester – End examination shall be conducted in theory papers at the end of every semester, while in practical papers, these examinations are conducted at the end of II, IV & VI semester for I, II & III B.Sc (B.Z.C), (A.B.C).
- Discussed and recommended for organizing Seminars, Guest lectures, Work – Shops to upgrade the Knowledge of students, for the approval of the Academic Council.

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BOTANY	BOT-201C	w.e.f. 2020-21	B. Sc. (BZC)
SEMESTER - II	I B. Sc - BOTANY SYLLABUS		PAPER – II

**Basics of Vascular plants and Phytogeography
(Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography)**

Unit – 1: Pteridophytes **12 Hrs.**

1. General characteristics of Pteridophyta; classification of Smit (1955) upto divisions.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life History of (a) *Lycopodium* (Lycopsida) and (b) *Marsilea* (Filicopsida).
3. Stellar evolution in Pteridophytes;
4. Heterospory and seed habit.

Unit:-2 Gymnosperms: **14hrs.**

1. General characteristics of Gymnosperms; Sporne classification upto classes.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life history of (a) *Cycas* (Cycadopsida) and (b) *Gnetum* (Gnetopsida).
3. Outlines of geological time scale.
4. A brief account on Cycadeoidea.

Unit – 3: Basic aspects of Taxonomy **13Hrs.**

1. Aim and scope of taxonomy; Species concept: Taxonomic hierarchy, species, genus and family.
2. Plant nomenclature: Binomial system, ICBN- rules for nomenclature.
3. Herbarium and its techniques, BSI herbarium and Kew herbarium; concept of digital herbaria.
4. Bentham and Hooker system of classification;
5. Systematic description and economic importance of the following families:
(a) Ammonaceae (b) Curcubitaceae

Unit – 4: Systematic Taxonomy **13 Hrs.**

1. Systematic description and economic importance of the following families:
(a) Asteraceae (b) Asclepiadaceae (c) Amaranthaceae (d) Euphorbiaceae
(e) Arecaceae and (f) Poaceae
2. Outlines of Angiosperm Phylogeny Group (APG IV).

Unit – 5: Phytogeography **08 Hrs.**

1. Principles of Phytogeography, Distribution (wides, endemic, discontinuous species)
2. Endemism – types and causes.
3. Phytogeographic regions of India.
4. Vegetation types in Andhra Pradesh.

Unit – 6: Competitive syllabus: (Economic Botany)

1. Edible oils: ground nut, coconut & sesamum.
2. Sugar & Starch: sugar cane, beetroot, potato.
3. Paper & Pulp: Bamboo, & Eucalyptus
4. Medicinal & Aromatic: Ashwagandha, Aloevera, holy basil, amla, mint, Lavender.

A.G & S.G. Siddhartha Degree College of Arts & Science

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BOTANY	BOT- 201	w.e.f. 2020-21	B. Sc. (BZC)
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I B. Sc – BOTANY Model Question Paper

SEMESTER- II

Paper Code: BOT - 201

PAPER-II: Basics of Vascular plants and Phytogeography

(Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography)

Time: 3 Hours

Max. Marks: 70

SECTION-A

Answer any **four** of the following questions

4x5=20Marks

(Draw diagrams wherever necessary)

1. Cone of Lycopodium
2. Seed habit
3. Pinus ovuliferous scale
4. T.S of gnetum leaf
5. Herbarium and its techniques
6. Cyathium
7. Discontinuous species
8. Endemism

SECTION-B

Answer any **five** of the following questions.

5x10=50Marks

(Draw diagrams wherever necessary)

9. Describe the structure and reproduction of Lycopodium?
10. Write an essay on stelar evolution in Pteridophyta?
11. Describe the internal structure of the pinus needle and mention its xerophytic characters.
12. Write an essay on geological time scale?
13. Give an account on Bentham and Hooker system of classification?
14. Write an essay on ICBN?
15. Give an account of the family Asclepiadaceae?
16. Describe the principles of phytogeography?

Guide lines for paper setter: (for Paper I – BOT - 101C) w.e.f. 2020-21.

1. In **section A**: **ONE** question each from Unit III, IV and **TWO** questions each from Unit I, II & V.
2. In **section B**: **ONE** question each from Unit IV, V and **TWO** questions each from Unit I, II& III.
3. See the following table and Model paper for marks distribution.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
	10		20		30
Unit - II	2		2		
	10		20		30
Unit – III	1		2		
	5		20		25
Unit – IV	1		1		
	5		10		15
Unit – V	2		1		
	10		10		20
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions =16) Total marks = 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		
	(4 X 5) = 20		(5 X 10) = 50		70

INTERNAL EXAMS – 30 Marks

(20 marks for unit tests, 5marks for attendance, 5marks for Seminars).

Practical syllabus of Botany Core Course – 2/ Semester – II

Basics of Vascular plants and Phytogeography

(Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography)

(Total hours of laboratory exercises 30 Hrs. @ 02 Hrs. /Week)

Course Outcomes:

On successful completion of this course students shall be able to:

1. Demonstrate the techniques of section cutting, preparing slides, identifying of the material and drawing exact figures.
2. Compare and contrast the morphological, anatomical and reproductive features of vascular plants.
3. Identify the local angiosperms of the families prescribed to their genus and species level and prepare herbarium.
4. Exhibit skills of preparing slides, identifying the given twigs in the lab and drawing figures of plant twigs, flowers and floral diagrams as they are.
5. Prepare and preserve specimens of local wild plants using herbarium techniques.

Practical Syllabus:

1. Study/ microscopic observation of vegetative, sectional/anatomical and reproductive structures of the following using temporary or permanent slides/ specimens/ mounts
 - a. Pteridophyta : *Lycopodium* and *Marselia*
 - b. Gymnosperms: *Cycas* and *Gnetum*
2. Study of fossil specimens of *Cycadeoidea* and *Pentoxylon* (photographs /diagrams can be shown if specimens are not available).
3. Demonstration of herbarium techniques.
4. Systematic / taxonomic study of locally available plants belonging to the families prescribed in theory syllabus. (Submission of 30 number of Herbarium sheets of wild plants with the standard system is mandatory).
5. Mapping of phytogeographical regions of the globe and India.

Model Question Paper for Practical Examination

Semester – II/ Botany Core Course – 2

Basics of Vascular plants and Phytogeography

(Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography)

Time:3Hrs.

Max.Marks: 50

1. Take T.S. of the material 'A' (Pteridophyta), make a temporary slide and Justify with with identification characters.....**6 M**
2. Take T.S. of the material 'B' (Gymnosperms), make a temporary slide and justify with identification characters **06 M**
3. Describe the vegetative and floral characters of the material 'C'(Taxonomy of Angiosperms) derive and its systematic position.....**05 M**
4. Identify the specimen 'D' (Fossil Gymnosperm) and give specific reasons.....**04 M**
5. Locate the specified phytogeographical regions (2x2M) in the world / India (**E**) map supplied to you.....**04 M**

Total: 25M

Internals:

- a) Record 10M
- b) Herbarium 04M
- c) Field note book 03M
- d) Viva-voce..... 03M
- e) Attendance..... 05M

Total: 25M

Suggested co-curricular activities for Botany Core Course-2 in Semester-II:

A. Measurable :

a. student seminars:

1. Fossil Pteridophytes.
2. Aquatic ferns and tree ferns
3. Ecological and economic importance of Pteridophytes
4. Evolution of male and female gametophytes in Gymnosperms.
5. Endemic and endangered Gymnosperms.
6. Ecological and economic importance of Gymnosperms.
7. Floras and their importance: Flora of British India and Flora of Madras Presidency.
8. Botanical gardens and their importance: National Botanic garden and Royal Botanic garden.
9. Artificial, Natural and Phylogenetic classification systems.
10. Molecular markers used in APG system of classification.
11. Vessel less angiosperms.
12. Insectivorous plants.
13. Parasitic angiosperms.
14. Continental drift theory and species isolation.

b. Student Study Projects :

1. Collection and identification of Pteridophytes from their native locality/ making an album by collecting photographs of Pteridophytes.
2. Collection and identification of Gymnosperms from their native locality/ making an album by collecting photographs of Gymnosperms.
3. Collection of information on famous herbaria in the world and preparation of a report.
4. Collection of information on famous botanic gardens in the world and preparation of a report.
5. Collection of data on vegetables (leafy and fruity) plants in the market and preparation of a report on their taxonomy.
6. Collection and identification of fresh and dry fruits plants in the market and preparation of a report on their taxonomy.
7. Collection of data on plants of ethnic and ethno botanical importance from their native locality.
8. Preparation of a local flora by enlisting the plants of their native place.

c. Assignments: Written assignment at home / during '0' hour at college; preparation of charts with drawings, making models etc., on topics included in syllabus.

B. General :

1. Visit to Botanic garden in a Research institute/University to see the live plants.
2. Virtual tour in websites for digital herbaria and botanic gardens.
3. Acquaint with standard floras like – Flora of Madras Presidency, Flora of their respective district in Andhra Pradesh.
4. Looking into vegetation of different phytogeographical regions using web resources.
5. Group Discussion (GD)/ Quiz/ Just A Minute (JAM) on different modules in syllabus of the course.

Text books:

- Botany – I (Vrukshasastram-I) : Telugu Akademi, Hyderabad
- Botany – II (Vrukshasastram-II) : Telugu Akademi, Hyderabad
- Acharya, B.C., (2019) *Archchegoniates*, Kalyani Publishers, New Delhi
- Bhattacharya, K., G. Hait & Ghosh, A. K., (2011) *A Text Book of Botany, Volume- II*, New Central Book Agency Pvt. Ltd., Kolkata

Books for Reference:

- Smith, G.M. (1971) *Cryptogamic Botany Vol. II.*, Tata McGraw Hill, New Delhi
- Sharma, O.P. (2012) *Pteridophyta*. Tata McGraw-Hill, New Delhi
- Kramer, K.U. & P. S. Green (1990) *The Families and Genera of Vascular Plants, Volume –I: Pteridophytes and Gymnosperms* (Ed. K. Kubitzki) Springer-Verlag, New York
- Bhatnagar, S.P. & Alok Moitra (1996) *Gymnosperms*. New Age International, New Delhi
- Coulter, J.M. & C.J. Chamberlain (1910) *Morphology of Gymnosperms*, The University of Chicago Press, Chicago, Illinois
- Govil, C.M. (2007) *Gymnosperms : Extinct and Extant*. KRISHNA Prakashan Media (P) Ltd. Meerut & Delhi
- Sporne, K.R. (1971) *The Morphology of Gymnosperms*. Hutchinsons Co. Ltd., London

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BOTANY	BOT-401C	w.e.f. 2020-21	B. Sc. (BZC)
SEMESTER - IV	II B. Sc - BOTANY SYLLABUS		PAPER – IV

Plant Embryology and Plant Metabolism

Hours: 60 @ 4 hrs per week

UNIT – I: EMBRYOLOGY

(12hrs)

1. Introduction: History and Importance of Embryology.
2. Anther structure, Micro sporogenesis and development of male gametophyte.
3. Ovule structure and types; Mega sporogenesis; Monosporic; Bisporic and Tetrasporic types of female gametophyte / embryosac development.
4. Pollination -Types, Fertilization.

UNIT –II: EMBRYOLOGY AND PALYNOLOGY

(12 hrs)

1. Endosperm Development and types.
2. Embryo - development and types.
3. Polyembryony and Apomixis - an outline.
4. Palynology: Principles and applications.

UNIT –III: PLANT METABOLISM- I

(12 hrs)

1. Photosynthesis: Electromagnetic spectrum, absorption and action spectra; Red drop and Emerson enhancement effect, concept of Z scheme in photosystems, Photosynthetic pigments, mechanism of photosynthetic electron transport and evolution of oxygen, photo phosphorylation, carbon assimilation pathways: C₃, C₄ & CAM and Photorespiration.
2. Translocation of organic substances: Mechanism of phloem transport, source-sink relationships.

UNIT –IV: PLANT METABOLISM- II

(12 hrs)

1. Respiration: Aerobic and Anaerobic, Glycolysis, Krebs cycle, electron transport system, mechanism of oxidative phosphorylation, pentose phosphate pathway.
2. Lipid Metabolism: Structure and functions of lipids, conversion of lipids to carbohydrates, Beta-oxidation.

UNIT –V: GROWTH AND DEVELOPMENT

(12 hrs)

1. Growth and development: Definition, phases and kinetics of growth, Physiological effects of phytohormones - auxins, gibberellins, cytokinins, ABA and ethylene
2. Physiology of flowering and photoperiodism, role of phytochrome in flowering.
3. Stress Physiology: Concept and plant responses to water, salt and temperature stresses.

UNIT –VI: Competitive syllabus:

1. Biofertilizers: Components of biofertilizers- bio compost tricho –card, azotobacter, phosphours, vermin compst, importance of biofertilizers, applications of biofertilizers.

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BOTANY	BOT- 401	w.e.f. 2020-21	B. Sc. (BZC)
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II B. Sc – BOTANY Model Question Paper

SEMESTER- IV

Paper Code: BOT - 401

PAPER-IV: Plant Embryology and Plant Metabolism

Time: 3 Hours

Max. Marks: 70

SECTION-A

Answer any **four** of the following questions
(Draw diagrams wherever necessary)

4x5=20Marks

9. Microsporogenesis.
10. Allogamy.
11. Helobial endosperm.
12. Emerson enhancement effect.
13. Anaerobic respiration.
14. Ethylene.
15. Photoperiodism.
16. Phytochrome.

SECTION-B

Answer any **five** of the following questions.
(Draw diagrams wherever necessary)

5x10=50Marks

9. What is an Embryosac? Describe any five of the tetrasporic type of Embryosac developments.
10. Give an account of Polyembryony.
11. Write an essay on the Principles and applications of Palynology.
12. Describe the carbon assimilation pathway in C4 plants.
13. Write an essay on the Translocation of organic substances in higher plants.
14. Describe various reactions of Krebs cycle.
15. Write an essay on various types of Lipids.
16. Give an account of Auxins and Gibberellins.

Guide lines for paper setter: (for Paper IV – BOT- 401) w.e.f. 2020-21

1. In **section A:** Unit II, III & IV must carry **one** question from each Unit, Unit I must carry **two** questions and Unit V must carry **three** questions.

2. In **section- B:** Set minimum **two** questions from Unit II, III & IV.

One question each from Unit I and Unit V.

3. See the following table and Model paper for marks distribution.

4. Please provide the scheme of valuation for the paper.

5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		1		
	10		10		20
Unit - II	1		2		
	05		20		25
Unit – III	1		2		
	05		20		25
Unit – IV	1		2		
	05		20		25
Unit – V	3		1		
	15		10		25
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions =16) marks = 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		
	(4 X 5) = 20		(5 X 10) = 50		70

[INTERNAL EXAMS - 30Marks

(20marks for unit tests, 5 marks for seminar and remaining 5 marks for attendance).

II B. Sc – BOTANY SEMESTER- IV.

PRACTICAL SYLLABUS

PAPER- IV - Plant Embryology and Plant Metabolism (BOT – 401)

Total hours of laboratory Exercises 45 hrs @ 3 per week . w.e.f. 2019-20

Suggested Laboratory Exercises:

1. Structure of pollen grains using whole mounts (Catharanthus, Hibiscus, Acacia, Grass).
2. Demonstration of Pollen viability test using in- vitro germination (Catharanthus).
3. Study of ovule types and developmental stages of embryo sac using permanent slides / Photographs.
4. Structure of endosperm (nuclear and cellular); Developmental stages of dicot and monocot Embryos using permanent slides / Photographs.
5. Isolation and mounting of embryo (using Symopsis / Senna / Crotalaria).

Major experiments:

6. Separation of chloroplast pigments using paper chromatography technique.
7. Rate of photosynthesis under varying CO₂ concentration.
8. Effect of kind of light intensity on oxygen evolution during photosynthesis using Wilmontt' bubbler.
9. Titratable acidity estimation of Lemon or Tamarind leaves.

Minor experiments:

10. Release of CO₂ in Aerobic respiration.
11. Demonstration of the process of fermentation using Kuhne's fermentation vessel.
12. Demonstration of Phototropism.
13. Measuring the Plant growth using Arc Auxanometer.

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II BSc Botany Practical Exam (w.e.f. 2020-21)

IV Semester

Practical – IV

(BOT-401P)

Plant Embryology and Plant Metabolism Model Paper

Time: 3 Hrs.

Max.Marks:50

1. Conduct experiment ‘A’, write down the procedure and conclusions.

Tabulate the results if any.....11M

2. Write the salient features of experiment ‘B’ with the help of neat labelled diagram. 05M

3. Identify and write notes on ‘C, D & E’ (3X3M)09M

Total25M

Scheme of valuation

1. ‘A’ –Physiology –major experiment

Setting and conducting of the experiment 6M, Procedure 3M, Conclusion1M,
tabulation1M. =11M

2. ‘B’- Physiology –minor experiment Salient features 3M, Diagram2M.....= 05M

3. Identify C, D and E (3X3)

(Identification - 1 + Diagram-1 + Notes- 1 =Total = 3marks for each)..... = 09M

‘C’ from Anther T.S / Pollen grains.

‘D’ - Slide from types of Ovules.

‘E’– Slide from Embryosacs / Embryos.

(Total.....25M)

Internal:

a) Record..... 10M

b) Attendance.....05M

c) Internal Practical Exam.....04M

d) Self study project report.....06M

Total.....25M

Grand Total50M

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BOTANY	BOT-601 (GE)	2020-2021	B.Sc. (BZC)
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PAPER – VII

ELECTIVE-C

SEMESTER- VI

Plant tissue culture and its Biotechnological applications

Total hours of teaching 45hrs @ 3hrs per week

Credits: 3

Unit I: PLANT TISSUE CULTURE – 1

(12hrs)

1. History of plant tissue culture research - basic principles of plant tissue callus culture, meristems culture, organ culture, Totipotency of cells.
2. Sterilization procedures, culture medium composition and preparations of explants. Murashige and Skoog's (MS medium), Cell and protoplast culture.
3. Somatic Hybrids and Cybrids (out lines), Artificial Seeds, Somaclonal variations. Applications of Tissue culture (Brief account).

UNIT-II: Plant Tissue culture -2

(12hrs)

1. Endosperm culture – Embryo culture -culture requirements – applications, embryo rescue technique.
2. Cryopreservation; Germ plasm conservation.

Unit III: Recombinant DNA technology

(12hrs)

1. r-DNA technology: Steps in r-DNA technology and tools
2. Cloning Vectors: Prokaryotic (pBR322, Ti plasmid and Lambda phage, Eukaryotic Vectors (YAC and briefly PAC).
3. Gene cloning (Bacterial Transformation and selection of recombinant clones, PCR Mediated gene cloning)

Unit IV: Methods of gene transfer

(12hrs)

1. Methods of gene transfer- Agro bacterium-mediated, direct gene transfer By Electroporation, Microinjection, Micro projectile bombardment.
2. Selection of transgenics – selectable marker and reporter genes (Luciferase, GUS, GFP).

Unit V: Applications of Biotechnology

(12 hrs)

1. Applications of Plant Genetic Engineering – crop improvement, herbicide resistance, insect resistance, virus resistance.
2. Genetic modification – transgenic plants for pest resistant (Bt-cotton); herbicide resistance (Round Up Ready soybean); improved agronomic traits flavrSavr tomato, Golden rice.

III B. Sc – BOTANY Model paper (2019-2020)

Plant tissue culture and its Biotechnological applications

SEMESTER- VI

ELECTIVE-C PAPER – VII

Time: 3 Hours

Paper code: BOT-VII C

Max. Marks: 70

SECTION-A

Answer any FOUR of the following question

4x5=20M.

(Draw diagrams wherever necessary)

1. Organ culture.
2. Somatic hybrids.
3. Cryopreservation.
4. Plasmids
5. Colony Hybridization.
6. Electroporation.
7. GUS.
8. Bt-Cotton.

SECTION-B

Answer any Five of the following questions.

5 x 10= 50M.

(Draw diagrams wherever necessary)

9. Describe the composition and preparation of MS culture media.
10. Give an account on applications of tissue culture?
11. Write about Germplasm conservation?
12. Write notes on endosperm culture and their applications.
13. Explain the PCR mediated gene cloning.
14. Explain the various types of cloning vectors.
15. Write about methods of gene transfer techniques.
16. Give an account on transgenic plants?

Guide lines for paper setter: (for Paper VII -BOT-601) W.e.f. 2020-21.

1. In Section A: Unit I,III,IV must carry Two question from each unit. Unit II, V must carry one question.
2. In section-B: Set minimum two questions from Unit I, II, III and Set One Question from IV, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section – A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
	10			20	30
Unit – II	1		2		
		5		20	25
Unit – III	2		2		
		10		20	30
Unit-IV	2		1		
		10		10	20
Unit-V	1		1		
		5		10	15
Max. Q & marks	8	(x 5) = 40	8	(x 10) = 80	(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		
		(4 x 5) = 20		(5 x 10) = 50	70

INTERNAL EXAMS - 30Marks

(20 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.)

Plant Tissue Culture & Plant Biotechnology

SEMESTER- VI

Total hours of teaching 30hrs @ 2hrs per week

BOT – 601P

Credits:2

1. (a) Preparation of MS medium.

(b) Demonstration of in vitro sterilization methods and inoculation methods using leaf and nodal explants of Tobacco/ Datura/ Brassica etc.
2. Study of embryo and culture, micro propagation of Banana, somatic embryogenesis, artificial seeds through photographs.
3. Construction of restriction map of circular and linear DNA from the data provided.
4. Study of methods of gene transfer through photographs: Agrobacterium- mediated, direct gene transfer by electroporation, microinjection, and micro projectile bombardment.
5. Different steps involved in genetic engineering for production of Bt. cotton, Golden rice, Flavr Savr tomato through photographs.
6. Isolation of plasmid DNA.
7. Restriction digestion and gel electrophoresis of plasmid DNA (optional)
8. Field visit to a lab involved in tissue culture
9. Study project under supervision of lecturer – tissue culture/ genetic engineering

Expected domain skills to be achieved: Ability to prepare artificial nutrient media, preparing independently, applying various sterilization procedures for media, glassware and biological materials, invitro propagation of Banana callus, morphogenesis--s, clonal propagation methods, isolation of plasmid DNA individually and as a group.

Plant Tissue Culture & Plant Biotechnology

SEMESTER- VI

BOT – 601(GE) P

Total hours of teaching 30hrs @ 2hrs per week

Credits: 2

Q1. Project report (A) -.....	10M
Viva-voce on study project.....	02M
Q2. Identify and write notes on B, C and D (3x2).....	06 M
B- Tool/instrument/container used in sterilization	
C- Tool/instrument/container used in gene transfer	
D- GM crops (Photographs)	
Q3. Construct restriction map of circular and/ or linear DNA from the data Provided.....	04M
Q4. Field report.....	03M

Total.....25 **Marks**

Internal Assessment

a. Record -	05M
b. Attendance.....	05M
e. Internal practical exam.....	05M
d. preparing album for P.T & B.T. Applications.....	10M

Total... 25Marks

Total ----- 50M

III-BZC(B. Sc)	BOTANY-VIII	BOT-602 (CE)	2020-21
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Paper – VIII-A-1: PLANT DIVERSITY AND HUMAN WELFARE Credits: 3
Total hours of teaching 60hrs @ 6hrs per week

Unit- I: Plant diversity and its scope: (12hrs)

1. Genetic diversity, Species diversity, Plant diversity at the ecosystem level,
2. Agro biodiversity and Vavilov Crop centers.
3. Values and uses of biodiversity: Ethical and aesthetic values, Uses of plants.

Unit -II: Loss of biodiversity: (12hrs)

1. Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agro biodiversity, projected scenario for biodiversity loss.
2. Management of plant biodiversity: Organizations associated with biodiversity Management-Methodology for execution-IUCN, UNEP, UNESCO, WWF, NBPGR; Biodiversity legislation and conservations, Biodiversity information management and Communication.

Unit-III: Contemporary practices in resource management: (12hrs)

1. Environmental Impact Assessment (EIA), Geographical Information System GIS,
2. Solid and liquid waste management.

Unit -IV: Conservation of biodiversity (12hrs)

1. Conservation of genetic diversity, species diversity.
2. Social approaches to conservation, Biodiversity awareness Programmes, Sustainable development.

Unit- V: Role of plants in relation to Human Welfare (12hrs)

- 1 Importance of forestry, their utilization and commercial aspects-
 - a) Avenue trees, b) ornamental plants of India.
- 2 Fruits and nuts: Important fruit crops their commercial importance. Wood, fiber and their uses.

PLANT DIVERSITY AND HUMAN WELFARE

Time: 3 Hours

Max. Marks 70

SECTION-A**Answer any FOUR of the following question****4 x 5=20M.**

1. Species Diversity.
2. Wild Taxa.
3. NBPGR.
4. Biodiversity and its Conservation.
5. EIA.
6. Geographical information system (GIS).
7. Sustainable Development.
8. Fiber and their uses.

SECTION-B**Answer any Five of the following questions.****5 x 10 = 50M.**

9. Give a note on Plant Diversity and its Scope.
10. Write about Values and Uses of Biodiversity.
11. What is Biodiversity? Discuss about the Loss of Biodiversity?
12. Explain the Various Types Organizations in Biodiversity?
13. Write an essay on EIA?
14. Write essay on Liquid Waste Management?
15. What is Conservation? Explain the In-situ conservation?
16. What are Fruit crops? Explain their Commercial importance?

1. In Section A: Unit I, II, III, must carry Two question from each unit. Unit IV, V must carry one question.
2. In section-B: Set minimum two questions from Unit I, II & III and Set One Question from IV, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
	10		20		30
Unit – II	2		2		
	10		20		30
Unit – III	1		2		
	05		20		25
Unit-IV	1		1		
	5		10		15
Unit-V	2		1		
	10		10		20
Max. Q & marks	8	(x 5) = 40	8	(x 10) = 80	(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		
	(4 x 5) = 20		(5 x 10) = 50		70

INTERNAL EXAMS - 30Marks

(20 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc)

- 1) Study of plant diversity (flowering plants).
- 2) Study of exotic species- Identification and morphological characteristics.
- 3) Identification of forest trees through bark, wood, flowers leaves and fruits.
- 4) Maceration, Study of wood (Tracheary elements, fibres).
- 5) Methods of preservation and canning of fruits.
- 6) Visit to the local ecosystem to study the plants.
- 7) Study of Solid and Liquid waste management systems in rural/urban areas.

SCHEME OF PRACTICAL EXAMINATION

- I. Assign the plants **A, B and C** to their respective families, giving reasons, family name and classification- 1marks, important diagrams- 2 marks.....**09 marks**
- II. Give the protocol of **D****04marks**
- III. Comment on specimens **E, F and G****3x2 = 06 marks**
- IV. Report on Field visit..... **4 marks**
To study sources of firewood (10 plants), timber-yielding trees (10trees) and bamboos.
- V. Viva-Voce**02marks**
Total..... **25 Marks**

Internals

- a. Record -05M
- b. Attendance.....05M
- c. Internal practical exam.....5M
- d. project work on Cultivated Plant, Wild Plant, Exotic plant ...10M
- Total..... **25 Marks**

Total -----**50M**

KEY

A-Cultivated Plant

B- Wild Plant

C –Exotic plant

D- Preservation and canning of fruits, solid and liquid waste management systems in rural/urban areas

E. Bark/wood/fruit yielding plant

F. Nuts/ Alcoholic beverage plant

G. wood /Fibre yielding plant

PLANT DIVERSITY AND HUMAN WELFARE

SEMESTER- VI

BOT-602-A-(CL) P

SCHEME OF PRACTICAL EXAMINATION

Time: 3hrs

Max. Marks: 50

- I. Assign the plants **A, B and C** to their respective families, giving reasons, family name and classification-1marks, important diagrams- 2 marks.....**09 marks**
- II. Give the protocol of **D**.....**04marks**
- III. Comment on specimens **E, F and G****3x2= 06 marks**
- IV. Report on Field visit..... **4 marks**
To study sources of firewood (10 plants), timber-yielding trees (10trees) and bamboos.
- V. Viva-Voce.....**2marks**

Total --- 25marks

Internals:

- a. Record05M
- b. Attendance.....05M
- c. Internal practical exam.....05M
- d. project work on Cultivated Plant, Wild Plant, Exotic plant....10M

Total --- 25marks

Total -----50M

KEY

A-Cultivated Plant

B- Wild Plant

C –Exotic plant

D- Preservation and canning of fruits, solid and liquid waste management systems in rural/urban areas

E. Bark/wood/fruit yielding plant

F. Nuts/ Alcoholic beverage plant

G. wood /Fibre yielding plant

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III. BZC (B. Sc)	BOTANY-VIII	BOT- 603 (CE)	2020-21
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Paper – VIII-A-2

Credits: 3

ETHNOBOTANY AND MEDICINAL BOTANY

Total hours of teaching 60hrs @ 6hrs per week

Unit-I: Ethnobotany

(12h)

1. Introduction, concept, scope and objectives
2. Major and minor ethnic groups or Tribal's of India, and their lifestyles.
3. Plants used by the tribal populations:
 - a) Food plants, b) Intoxicants
 - c) Beverages, d) Resins and oils and miscellaneous uses.

Unit -II: Role of ethnobotany in modern Medicine

(12hrs)

1. Role of Ethnobotany in modern medicine with special example; Rauvolfia sreperntina, Artemisia annua, Withaniasomnifera.
2. Significance of the following plants in ethno botanical practices (along with their habitat and morphology)
 - a)Azadirachtaindica, b)Vitexnegundo, c)Ocimum sanctum,,d) phyllanthus niruri
3. Medico-Ethnobotanical Sources of India.

Unit-III: Ethno botany as a tool to protect interests of ethnic groups

(12hrs)

1. Sharing of wealth concept with few examples from India.
2. Biopiracy, Intellectual Property Rights and Traditional Knowledge.

Unit -IV: History, Scope and Importance of Medicinal Plants, Indigenous Medicinal Sciences (12hrs)

1. Definition and Scope-Ayurveda: History, origin, panchamahabhutas, saptadhatu and tridosha concepts, Rasayana, plants used in ayurvedic treatments.
- 2 Homeopathy: Origin of Homeopathy medicinal systems, Basis of Homeopathy, plants used in Homeopathy medicine.

Unit -V: Conservation of endangered and endemic medicinal plants

(12hrs)

1. Definition: endemic and endangered medicinal plants,
2. Red list criteria
3. In situ conservation: Sacred groves, National Parks
4. Ex situ conservation: Botanical Gardens, Seed Banks.

III B. Sc – BOTANY Model paper (2019-2020)
Title of the Paper: **ETHNOBOTANY AND MEDICINAL BOTANY**

SEMESTER- VI
Time: 3 Hours

PAPER – VIII

Cluster – A

Paper – VIII-A-2
Max. Marks: 70

SECTION-A

Answer any four of the following question

4x5=20M.

1. Intoxicants.
2. Withania somnifera.
3. Phyllanthus niruri
4. Curcuma langa.
5. Biopiracy
6. Saptdhatu and Tridosha.
7. Tumors treatments.
8. Red list criteria.

SECTION-B

Answer any Five of the following questions.

5 x10=50M.

9. Explain the Relevance of Ethno-Botany in the present Context.
10. Discus about Major and Minor Ethnic groups of India.
11. Write about Botanical name, Family, Active principle and medicinal uses of Rauvolfia serpentine, Artemisia annua.
12. Write about the Medico-Ethnobotanical Sources of India.
13. Write about the Intellectual property rights and Traditional knowledge.
14. Write an Essay an Basic concepts of Ayurveda.
15. What is Homeopathy system of Medicine ? Explain their Basic Concepts ?
16. Give an account of Endemic and Endangered Medicinal plants ?

1. In Section A: Unit I, IV, must carry two questions from each unit. Unit II must carry Two Question. Unit III, V must carry one question.
2. In section-B: Set minimum Two questions from Unit I, II & IV and Set One Question from III , V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
	10		20		30
Unit – II	2		2		
	10		20		30
Unit – III	1		1		
	05		10		15
Unit-IV	2		2		
	10		20		30
Unit-V	1		1		
	5		10		15
Max. Q & marks	8	(x 5) = 40	8	(x 10) = 80	(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		
	(4 x 5) = 20		(5 x 10) = 50		70

INTERNAL EXAMS - 30Marks

(20 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.).

ETHNOBOTANY AND MEDICINAL BOTANY

SEMESTER- VI

BOT- VIII- 603- A- 2 (CL) P

Time: 3 Hours

Max. Marks- 50

1. Ethno botanical specimens as prescribed in theory syllabus
2. Detailed morphological and anatomical study of medicinally important part(s) of locally available plants (Minimum 8 plants) used in traditional medicine.
3. Field visits to identify and collect ethno medicinal plants used by local tribes/folklore.

Practical Question Paper

- I. Identify the specimen A- Give reasons (morphological and anatomical) and draw Labeled sketches10marks
- II. Identify and write about the medicinal uses of B and C.....2x2 = 04 marks
- III. Comment on D and E.....2 x 2= 04 marks
- IV. Report on Field visit:.....04 marks
List to be prepared mentioning special features of plants used by tribal Populations as Medicinal Plants & Spices. Write their botanical and common names, Parts used and diseases/disorders for which they are prescribed.
- V. Viva-voce..... 03 marks
- Total.....**25 Marks**

Internals Assessment

- a. Record -05M
- b. Attendance.....05M
- c. Internal practical exam.....05M
- d. Major and minor ethnic groups or Tribal's of India, and their lifestyles miniproject.....10M
- Total.....**25 Marks**

Total-----50Marks

KEY

- A-Plants given in unit II (i)
- B-Plants used in Ayurvedic preparations (Amla in Chyavanprash, Senna in Laxatives)
- C - - Do -
- D. Photographs of National parks, Biosphere reserves and Botanical gardens.
- E. Photograph of famous personalities in Ayurveda/Siddha medicine.

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III-BZC B.Sc	BOTANY-VIII	BOT-604- (CE)	2020-21
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SEM-VI: **Pharmacognosy and Phytochemistry** Credits: 3
Total hours of teaching 60hrs @ 6hrs per week

Unit-I: Pharmacognosy: (12hrs)

1. Definition, Importance
2. Classification of drugs - Chemical and Pharmacological
3. Drug evaluation methods

Unit –II: Organoleptic and microscopic studies: (12hrs)

1. Organoleptic and microscopic studies with reference to nature of active principles and common adulterants of
2. a) Adhatoda vasica(leaf) b) Strychnosnuxvomica (seed),
c)Rauwolfia serpentina(root) d)Zinziberofficinalis e)Catharanthusroseus.

Unit-III: Secondary Metabolites: (12hrs)

1. Definition of primary and secondary metabolites and their differences, Major types - terpenes, Phenolics, alkaloids, terpenoids, steroids.
2. A brief idea about extraction of alkaloids. Origin of secondary metabolites–detailed account of Mevalonate pathway, Shikimate pathway.

UNIT-IV: Phytochemistry: (12hrs)

Biosynthesis and sources of drugs:

1. Structural type biosynthesis importance of simple Phenolic compounds, coumarins, Flavonoids.
2. Steroids, sterols: Biosynthesis, commercial importance.
3. Alkaloids: Different groups, biosynthesis, bioactivity.

It is resolved to implement skill development course – plant nursery for I Year students B.Sc (B.Z.C E.M , T.M & AQUA)

- 4 .Volatile oils, aromatherapy.

UNIT-V: Enzymes, proteins and amino acids as drugs: (12hrs)

1. Vaccines, toxins and toxoids, immune globulins, antiserums,
2. Vitamins, Antibiotics – chemical nature, mode of action.
3. Pharmacological action of plant drugs – tumor inhibitors, PAF antagonists, antioxidants, phytoestrogens and others.

III B. Sc – BOTANY Model paper (2020-2021)

SEMESTER- VI

Paper – VIII-A-3

PAPER – VIII Cluster – A

Title of the Paper: **Pharmacognosy and Photochemistry**

Time: 3 Hours

Max. Marks: 70

SECTION-A

Answer any **Four** of the following question

4x5=20M.

1. Classification of Drugs.
2. Catharanthus roseus.
3. Difference between Primary and Secondary Metabolites.
4. Trpenoids.
5. Flavonoids.
6. Aromatherapy
7. Vaccines.
8. Vitamins.

SECTION-B

Answer any **Five** of the following questions.

5 x10=50M.

9. Give an account on Pharmacognosy?
10. Write an essay on Drug Evolution methods?
11. Write about nature and Active principles of Adhathoda vasica, Rauwolfia serpentine?
12. Write about common Adulteration of Zinziber officinalis, Strychnos nuxvomica?
13. Give an Brief note on Extraction of Alkaloids?
14. Give an account of mevalonate pathway?
15. Write about Bio-Synthesis and Commercial importance of Steroids, Sterols?
16. Explain the role of Different Enzyme inhibitors?

1. In Section A: Unit III, IV, V must carry two questions from each unit. Unit I, II, must carry One question.
2. In section-B: Set minimum two questions from Unit I, II & III and Set One Question from IV, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	1		2		
	5		20		25
Unit – II	1		2		
	5		20		25
Unit – III	2		2		
	10		20		30
Unit-IV	2		1		
	10		10		20
Unit-V	2		1		
	10		10		20
Max. Q & marks	8	(x 5) = 40	8	(x 10) = 80	(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		
	(5 x 5) = 25		(5 x 10) = 50		70

INTERNAL EXAMS - 30Mark
(20 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.)

Pharmacognosy and Phytochemistry

SEMESTER- VI
Time: 3 Hours

BOT-VIII-604-A- 3 (CL)P
Max. Marks- 50

-
1. Physical and chemical tests for evaluation of unorganized drugs-
Asaphoetida, Honey, Castor oil. Acacia
 2. Identification of bark drugs – cinchona, cinnamom
 3. Identification of fruit drugs – Cardamom, Coriander
 4. Identification of root and rhizome drugs- Ginger, Garlic, Turmeric
 5. Identification of whole plant – Aloe, Vinca, Punarnava
 6. Herbarium of medicinal plants (minimum of 20 platns)
 7. Collection of locally available crude drugs from local venders (minimum of 20)

Practical Question Paper

- | | |
|--|------------------------|
| I. Identify the given crude drugs A& B by Anatomical study and Morphological Study..... | 2X5 = 10marks |
| II. Perform suitable chemical test and identify the given phytochemical C | 05marks |
| III. Comment on D and E | 2x2= 04 marks |
| IV. Herbarium and submission of drugs -..... | .04 marks |
| IV. Viva-Voce | 02 marks |
| Total..... | <u>25 Marks</u> |

Internals:

- | | |
|----------------------------------|------|
| a. Record - | 05M |
| b. Attendance..... | 05M |
| c. Internal practical exam..... | 05M |
| d. Miniproject on medicinal..... | 10 M |

Total..... 20Marks

Total -----50M

KEY

A-Flower/fruit drugs

B-Rhizome/whole plant drugs

C- Tannins/ phenolics/steroids/ isoprenoids /Asaphoetida/ Honey/ Castor oil/ Acacia

D. Column Chromatography/ Gas Chromatogram/HPLC (photograph/ instrument used for chemical analysis of drugs.

Elective paper

Books for Reference:

1. Pullaiah. T. and M.V.Subba Rao. 2009. Plant Tissue culture. Scientific Publishers, New Delhi.
2. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
3. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.
4. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms. Vikas Publication House Pvt. Ltd., New Delhi. 5th edition.

CLUSTER PAPER I

Suggested Readings:

1. Krishnamurthy, K.V. (2004). An Advanced Text Book of Biodiversity - Principles and Practices. Oxford and IBH Publications Co. Pvt. Ltd. New Delhi.
2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications, New Delhi.
3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). An Introduction to Sustainable Development. Prentice Hall of India Private Limited, New Delhi.

CLUSTER PAPER II

Suggested Readings:

- 1) S.K. Jain, Manual of Ethnobotany, Scientific Publishers, Jodhpur, 1995.
- 2) Glimpses of Indian. Ethnobotny, Oxford and I B H, New Delhi – 1981.
- 3) S.K. Jain (ed.) 1989. Methods and approaches in ethnobotany. Society of ethnobotanists, Lucknow, India.
- 4) S.K. Jain, 1990. Contributions of Indian ethnobotny. Scientific publishers, Jodhpur.
- 5) Colton C.M. 1997. Ethnobotany – Principles and applications. John Wiley and sons Chichester.

CLUSTER PAPER III

BOOKS FOR REFERENCE:

1. Wallis, T. E. 1946. Text book of Pharmacognosy, J & A Churchill Ltd. 2. Roseline, A. 2011. Pharmacognosy. MJP Publishers, Chennai.
2. Gurdeep Chatwal, 1980. Organic chemistry of natural productis. Vol.I.Himalaya Publishing house.
3. Kalsi, P. S. and Jagtap, S., 2012. Pharmaceutical medicinal and natural Product chemistry N.K. Mehra . Narosa Publishing House Pvt. Ltd. New Delhi.
4. Agarwal, O. P. 2002. Organic chemistry–Chemistry of organic natural products. Vol. II. Goel publishing house , Meerut.

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BOTANY	PNT - 501	w.e.f. 2020-21	B. Sc. (BZC),Aqua
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SEMESTER - I

SKILL DEVELOPMENT COURSE

Credits: 02

Paper title: PLANT NURSERY

Total 30 hrs (02h/wk)

Max Marks: 50

Learning Outcomes:

On successful completion of this course students will be able to;

- 1. Understand the importance of a plant nursery and basic infrastructure to establish it.**
- 2. Explain the basic material, tools and techniques required for nursery.**
- 3. Demonstrate expertise related to various practices in a nursery.**
- 4. Comprehend knowledge and skills to get an employment or to become an entrepreneur in plant nursery sector.**

Syllabus:

Unit-1: Introduction to plant nursery

06 Hrs.

1. Plant nursery: Definition, importance.
2. Different types of nurseries –on the basis of duration, plants produced, structure used.
3. Basic facilities for a nursery; layout and components of a good nursery.
4. Plant propagation structures in brief.
5. Bureau of Indian Standards (BIS-2008) related to nursery.

Unit- 2: Necessities for nursery

09 Hrs.

1. Nursery beds – types and precautions to be taken during preparation.
2. Growing media, nursery tools and implements, and containers for plant nursery, in brief.
3. Seeds and other vegetative material used to raise nursery. In brief.
4. Outlines of vegetative propagation techniques to produce planting material.
5. Sowing methods of seeds and planting material.

Unit-3: Management of nursery

09 Hrs.

1. Seasonal activities and routine operations in a nursery.
2. Nursery management – watering, weeding and nutrients; pests and diseases.
3. Common possible errors in nursery activities.
4. Economics of nursery development, pricing and record maintenance.
5. Online nursery information and sales systems.

Guide lines for paper setter: (PNT - 501C) w.e.f. 2020-21.

1. In **section A:** Unit I & Unit II must carry **THREE** questions and Unit III must carry **TWO** questions.
2. In **section B:** **TWO** question each from Unit I, II & III
3. See the following table and Model paper for marks distribution.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	3		2		
	15		20		35
Unit - II	3		2		
	15		20		35
Unit – III	2		2		
	10		20		30
Max. Q & marks	8	(x 5) = 40	6	(x 10) = 50	(Total questions =14) Total marks =100
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		3		
	(4 X 5) = 20		(3 X 10) = 30		50

MODEL QUESTION PAPER

PLANT NURSERY

Time: 2 hrs

Max. Marks: 50

SECTION- A

4x5 =20 M

Answer any four questions. Each answer carries 5 marks

1. Importance of nursery
2. Components of a good nursery
3. Growing medium
4. Micro-propagation
5. Grafting
6. Nursery pests
7. Greenhouse
8. Record Management

SECTION B

3x10 = 30 M

Answer any three questions. Each answer carries 10 marks

1. Describe different types of nursery?
2. Plant propagation structures in brief.
3. Describe the precautions to be taken during the preparation of a nursery bed?
4. Sowing methods of seeds and planting material.
5. Common possible errors in nursery activities?
6. Pricing and record maintenance of nursery management?

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CERTIFICATE COURSE

SEMESTER - III

Total hours of teaching 30 hrs @ 4 hrs per week

MUSHROOM CULTIVATION

Max.Marks:50

UNIT-1

(8 hrs)

1. Mushroom Cultivation- Introduction, Uses, Types of mushrooms.
2. Preparation of Mother Spawn in Saline bottle, sterilization.
3. Cultivation of milky mushrooms.

UNIT-2

(8 hrs)

4. Soil PH, Water, Soil sterilization, dark room, light room.
5. Controlled room temperature, culture caring.
6. Diseases and their controlling methods.

UNIT-3

(8 hrs)

7. Storage and nutritional value.
8. Industrial edible mushrooms, poisonous mushrooms.
9. Importance and Medicinal value of mushrooms.

UNIT-4

(6 hrs)

10. Types of food prepared from mushrooms -
11. Marketing in India. Export value.

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CERTIFICATE COURSE

SEMESTER - III

MUSHROOM CULTIVATION

Max.Marks:50

Model paper

SECTION-A

Answer any 5 of the following question

5x4=20M

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

SECTION-B

Answer any 3 of the following question

3x10 =30M

- 7.
- 8.
- 9.
- 10.
- 11.
- 12.

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2021-2022



DEPARTMENT OF BOTANY

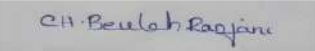

MINUTES OF BOARD OF STUDIES


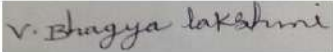


EVEN SEMESTER


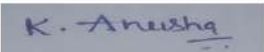
04-04-2021

Minutes of the meeting of Board of studies in Botany for the Autonomous courses of AG & SG Siddhartha Degree College of Arts & Science, Vuyyuru, held at 10:30 A.M on 04-04-2022 in the Department of Botany through online.

Members Present:-

- 1) .....Chairman
(Smt. CH. Beulah Ranjani) Head, Department of Botany
A. G & S.G S Degree College of
Arts & Science Vuyyuru- 521165.
- 2) .....University
(Sri. Dr. K. Ramesh) Nominee Department of Botany &
Head (I/c) Botany,

The Hindu College, Guntur .
- 3) .....Academic
(Sri. Dr.Ch. Srinivasa Reddy) Council Nominee Lecture in Botany,
SRR& CVR Govt. Degree College
Vijayawada, 520004
- 4) .....Academic
(Smt.V. Bhagya Lakshmi) Council Nominee Head, Department of Botany
SDMSK, Vijayawada,
- 4) .....Industrialist. Natural farming.
(Sri. S. Krishna Suman) yakamuru
Vuyyuru, Krishna d.t
- 5) .....Member
(Sri. N. Ramana Rao) Ad hoc Lecturer in Botany
AG & SGS Degree College of
Arts & Science (Autonomous),

Vuyyuru-521165.
- 6) .....Member
(Ms. G. Rebecca Rachel) Ad hoc Lecturer in Botany
AG & SGS Degree College of Arts &
Science (Autonomous), Vuyyuru-521165.
- 7) .....student representative
(Ms K. Anusha MSc) Lecturer in chaitanya
Gudiwada

Agenda for B.O.S Meeting.

1. To recommend the syllabi (Theory & Practical), Model question paper for II Semester of I B.Sc (A.B.C) for the academic year 2021-2022.
2. To recommend the syllabi (Theory & Practical), Model question paper for IV Semester of II B.Sc (A.B.C) for the academic year 2021-2022.
3. To recommend the syllabi (Theory & Practical), Model question paper for VI Semester of III B.Sc (A.B.C) for the academic year 2021-2022.
4. To recommend the syllabi (Theory & Practical), Model question paper and Blue print of II, IV & VI semester of I, II, III B.Sc (A.B.C.) for the academic year 2021-2022.
5. To recommend the teaching and evolution methods to be followed under Autonomous status.
6. Any other matter.

Dr. Anilakrishnan
Chairman.

RESOLUTIONS

1. It is resolved to continue the same syllabi (Theory & Practical), model question paper & guide lines to be followed by the question paper setters of Botany of II semester of I B.Sc. (B.Z.C) under Choice Based Credit System (CBCS) approved by the Academic Council of 2021 – 2022.
2. It is resolved to implement the syllabi (Theory & Practical), model question paper & guide lines to be followed by the question papers under Choice Based Credit System (CBCS) setters of Botany of IV Semester of II B.Sc. (B.Z.C) approved by the Academic Council of 2021 –2022.
3. It is resolved to implement the same syllabi & model papers under Choice Based Credit System (CBCS) Setters of Botany of VI semester of III B.Sc. (B.Z.C) approved by the Academic Council of 2021-2022.
4. It is resolved to Continue the same Blue prints of I,IV, &VI Semesters of B.Sc Botany for the Academic year 2021-2022.
5. It is resolved to continue the following teaching & evolution methods for the Academic year 2021-22.
6. Any other matter.

Teaching methods:

Besides the conventional methods of teaching, we use modern technology i.e. Using of OHP and LCD projector to display on U boards etc; for better understanding of concepts.

Evaluation of a student is done by the following procedure:

• Internal Assessment Examination:

- Out of maximum 100 marks in each paper for II, III B.Sc, 30 marks shall be allocated for internal assessment.
- Out of these 30 marks, 20 marks are allocated for announced tests (i.e . IA-1& IA-2). Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks are allocated on the basis of candidate's percentage of attendance and remaining 5 marks are allocated for the assignment for II, III B.SC.
- Out of maximum 100 marks in each paper for II B.Sc, 25 marks shall be allocated for internal assessment.
- Out of these 25 marks, 15 marks are allocated for announced tests (i.e. IA-1& IA-2). Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks allocated on the basis of candidate's percentage of attendance / assignment for II semester.
- There is no pass minimum for internal assessment for I, II, III B.Sc

• Semester – End Examination:

- The maximum mark for II (BZC) semester – End examination shall be 75 marks and duration of the examination shall be 3 hours.
- The maximum mark for II, III B.Sc semester- End examination shall be 70 marks and duration of the examination shall be 3 hours. Even through the candidate is absent for two IA exams / obtain zero marks the external marks are considered (if the candidate gets 40/70) and the result shall be declared as "PASS"
- Semester – End examination shall be conducted in theory papers at the end of every semester, while in practical papers, these examinations are conducted at the end of I, IV, & VI semester for I, II & III B.Sc.
- Discussed and recommended for organizing Seminars, Guest lectures, Work – Shops to upgrade the Knowledge of students, for the approval of the Academic Council.

Course Structure of BZC, AQUA Syllabus

year	semester	Paper code	Title of the paper	Marks(100)		Credits
				Internal assessment	semester	
I	II	BOTT2IA	Basics of Vascular plants and Phytogeography	25	75	4
			Practical-I	10	40	2
	II	BOT-PNT	Plant nursery management	40	10	2
II	IV	BOT-401	Plant Physiology and Metabolism	30	70	3
			Practical- 401	25	25	2
II	IV	BOT-402	Cell Biology, Genetics and Plant Breeding.	30	70	3
			Practical- – 402	25	25	2
III	VI	BOT-601	Plant Tissue Culture and its Biotechnological Applications(G.E)	30	70	3
			Practical-v- 601	15	35	2
III	VI	BOT-602	Plant Diversity and Human welfare (C.E)	30	70	3
			Practical-v- 602	20	30	2
	VI	BOT-603	Ethnobotany and Medicinal Botany(C.E)	30	70	3
			Practical-v- 603	20	30	2
	VI	BOT-604	Pharmacognosy and Phytochemistry(C.E)	30	70	3
			Practical-v- 604	20	30	2

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Title of the Paper: Basics of Vascular plants and Phytogeography

(Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography)

Semester : II

Course Code	BOTT21A	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	25
No. of Lecture Hours / Week	4	Semester End Exam Marks	75
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2017-18	Year of Offering: 2021 - 22	Year of Revision: -	Percentage of Revision: -

Course Prerequisites: Knowledge of Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography studied in intermediate.

Course Description:

This course will provide one with a basic and comprehensive understanding of anatomical structure and functions. Enable the student with depth of topics and helps them to gain an appreciation in the embryology of Angiosperms. On the other hand, importance of understanding plant ecology and biodiversity provides an extensive knowledge to the student.

Course Objectives:

1. The study of Pteridophytes
2. The study of Gymnosperms
3. Knowledge of Basic aspects of Taxonomy
4. Study of Systematic Taxonomy
5. Knowledge of Phytogeography

Course Outcomes: At the end of this course, students should be able to:

CO1: Gain knowledge in the classification and comparison of Pteridophytes and Gymnosperms based on their morphology, anatomy, reproduction and life cycle.

CO2: Justify evolutionary trends in Tracheophytes to adapt for land habitat. Evaluate the ecological, ethnic and economic value of different tracheophytes and summarize their good and services for human welfare

CO3: Explanation of the process of fossilization and compare the characteristics of extinct and extant plants.

CO4: Analyze the morphology of the most common Angiosperm plants of their localities and recognize their families.

CO5: Locate different Phytogeographical regions of the world and India and analyze their floristic wealth.

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	<p>Pteridophytes General characteristics of Pteridophyta; classification of Smith (1955) upto divisions. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life history of (a) <i>Lycopodium</i> (Lycopsida) and (b) <i>Marsilea</i> (Filicopsida). Stellar evolution in Pteridophytes Heterospory and seed habit.</p>	12
II	<p>Gymnosperms General characteristics of Gymnosperms; Sporne classification upto classes. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life history of (a) <i>Cycas</i> (<i>Cycadopsida</i>) and (b) <i>Gnetum</i> (<i>Gnetopsida</i>). Outlines of geological time scale. A brief account on Cycadeoidea</p>	12
III	<p>Basic aspects of Taxonomy Aim and scope of taxonomy; Species concept: Taxonomic hierarchy, species, genus and family. Plant nomenclature: Binomial system, ICBN –rules for nomenclature. Herbarium and its techniques, BSI herbarium and Kew herbarium; concept of digital herbaria. Bentham and Hooker system of classification Systematic description and economic importance of the following families:(a) Annonaceae (b) Curcubitaceae</p>	
IV	<p>Systematic Taxonomy Systematic description and economic importance of the following families: (a) Asteraceae (b) Asclepiadaceae (c) Amaranthaceae (d) Euphorbiaceae (e) Orchidaceae (f) Arecaceae (i) Poaceae Outlines of Angiosperm Phylogeny Group (APG IV).</p>	12
V	<p>Phytogeography Principles of Phytogeography, Distribution (wides, endemic, discontinuous species) Endemism – types and causes. Phytogeographic regions of World. Pytogeographic regions of India. Vegetation types in Andhra Pradesh</p>	12

Textbook:

1. Botany – I (Vrukshasastram-I): Telugu Akademi, Hyderabad
2. Botany – II (Vrukshasastram-II): Telugu Akademi, Hyderabad
3. Acharya, B.C., (2019) Archchegoniates, Kalyani Publishers, New Delhi.
4. Bhattacharya, K., G. Hait & Ghosh, A. K., (2011) A Text Book of Botany, Volume II, New Central Book Agency Pvt. Ltd., Kolkata
5. Hait, G., K. Bhattacharya & A.K. Ghosh (2011) A Text Book of Botany, Volume-I, New Central Book Agency Pvt. Ltd., Kolkata
6. Pandey, B.P. (2013) College Botany, Volume-I, S. Chand Publishing, New Delhi Pandey, B.P. (2013) College Botany, Volume-II, S. Chand Publishing, New Delhi

Recommended Reference book:

1. Smith, G.M. (1971) Cryptogamic Botany Vol. II., Tata McGraw Hill, New Delhi
 2. Sharma, O.P. (2012) Pteridophyta. Tata McGraw-Hill, New Delhi
 3. Kramer, K.U. & P. S. Green (1990) The Families and Genera of Vascular Plants, Volume –I: Pteridophytes and Gymnosperms (Ed. K. Kubitzki) .Springer-Verlag, New York
 6. Bhatnagar, S.P. & Alok Moitra (1996) Gymnosperms. New Age International, New Delhi Govil, C.M. (2007) Gymnosperms : Extinct and Extant. KRISHNA Prakashan Media (P) Ltd. Meerut & Delhi
 7. Sporne, K.R. (1971) The Morphology of Gymnosperms. Hutchinsons Co. Ltd., London
 8. Arnold, C.A., (1947) An introduction to Paleobotany McGraw –Hill Book Company, INC, New York
 9. Stewart, W.N., and G.W. Rothwell (2005) Paleobotany and the evolution of plants Cambridge University Press, New York Cambridge. London.
 10. Sambamurthy, A.V.S.S. (2005) Taxonomy of Angiosperms I. K. International Pvt. Ltd., New Delhi
 11. Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi.
 12. Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA, U.S.A.
 - Cain, S.A. (1944) Foundations of Plant Geography Harper & Brothers, N.Y.
 13. Mani, M.S (1974) Ecology & Biogeography of India Dr. W. Junk Publishers, The Hague
- Course Delivery method:** Face-to-face / Blended

Course has focus on: Foundation

Websites of Interest:

<https://www.youtube.com/watch?v=VA2LNWkZNW0>

<https://www.youtube.com/watch?v=zDUCacewuAg>

[https://www.youtube.com/watch?v=sfFDOSM-](https://www.youtube.com/watch?v=sfFDOSM-EuA)

[EuAhttps://www.youtube.com/watch?v=wKNox2weqW4](https://www.youtube.com/watch?v=wKNox2weqW4)

Co-curricular Activities:

A. Measurable:

1. Collection and identification of Pteridophytes from their native locality/ making an album by collecting photographs of Pteridophytes.
2. Collection and identification of Gymnosperms from their native locality/making an album by collecting photographs of Gymnosperms.
3. Collection of information on famous herbaria in the world and preparation of a report.
4. Collection of information on famous botanic gardens in the world and preparation of a report.
5. Collection of data on plants of ethnic and ethnobotanical importance from Their native locality
6. Preparation of a local flora by enlisting the plants of their native place.

c. Assignments: Written assignment at home / during 'O' hour at college;

Lycopodium-life cycle, Marselia-life cycle, Cycas-life cycle, Gnetum-life cycle, Bentham & Hooker classification, Stellar evolution in Pteridophytes, characteristics of Cycadeoidea, Asteraceae-taxonomy, Asclepiadaceae-taxonomy, Euphorbiaceae-taxonomy, Cucurbitaceae-taxonomy, Principles of phytogeography, Endemism types & causes, Phytogeographic regions of India.

preparation of charts with drawings, making models etc., on topics included in syllabus. Five kingdom classification, Miller & Urey experiment, Shape and Symmetry of viruses.

B. General:

1. Quiz

Model Question Paper Structure for SEE

Max.: 75 Marks

Min.Pass : 30 Marks

Section-A

Answer Any Five atleast one from each unit

5 x 5M = 25Marks

1. What is meant by heterospory? Justify the advantage of heterospory over homosporous.
CO1, L1.
2. Write about Protocorm and its morphological nature. CO1, L6.
3. Explain the characteristics of Cycadeoidea. CO2, L2.
4. Enumerate Geological time scale. CO2, L1.
5. Describe ICBN rules for nomenclature. CO3, L2.
6. Write a note on Angiosperms Phylogeny Group. CO4, L6.
7. Discuss about the Vegetation types in Andhra Pradesh. CO5, L2.
8. Explain the causes and types of Endemism. CO5, L2.

Section-B

Answer the following questions (5 x 10M = 50Marks)

9. (a) Describe diverse gametophytes present in the *Lycopodium* species. CO1, L2.
(Or) Unit I
(b) What is sporocarp? Describe the structure of *Marselia* Sporocarp. CO1, L2.
10. (a) Describe the anatomy of *Cycas* leaflet. Add a note on xerophytic features of it. CO2, L2.
(Or) Unit II
(b) Describe the structure of *Gnetum* male and female cones. CO2, L2.
11. (a) What is Natural System of Classification, Bentham and Hooker System of Classification? CO3, L1.
(Or) Unit III
(b) Describe vegetative and floral characters of Cucurbitaceae. Add a note on and economic Importance CO3, L1.
12. (a) Elucidate floral characters of Asteraceae. CO4, L1.
(Or) Unit IV
(b) Describe floral characters of Poaceae. Add a note on economic importance CO4, L1.
13. (a) What is Phytogeography? Explain principles of Phytogeography. CO5, L2.
(Or) Unit V
(b) Explain about Phytogeographic region of India. CO5, L1.

A.G. & S.G. SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE
Vuyyuru - 521165.

NAAC recredited at 'A' level

Autonomous -ISO 9001 – 2015 Certified

Title of the Paper: **Basics of Vascular plants and Phytogeography**
(Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography)
Total Number of Lecture Hours: 30

SEMESTER - II	BOTT21A	2021-22	B.Sc, B.Z.C,A.B.C
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Course Prerequisites: Knowledge of Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography studied in intermediate.

Course Description:

This course will provide one with a basic and comprehensive understanding of anatomical structure and functions. Enable the student with depth of topics and helps them to gain an appreciation in the embryology of Angiosperms. On the other hand, importance of understanding plant ecology and biodiversity provides an extensive knowledge to the student.

Course Objectives

1. The study of Pteridophytes
2. The study of Gymnosperms
3. Knowledge of Basic aspects of Taxonomy
4. Study of Systematic Taxonomy
5. Knowledge of Phytogeography

Course Outcomes: At the end of this course, students should be able to:

CO1: Demonstrate the techniques of section cutting, preparing slides, identifying of the material and drawing exact figures.

CO2: Compare and contrast the morphological, anatomical and reproductive features of vascular plants.

CO3: Identify the local angiosperms of the families prescribed to their genus and species level and prepare herbarium.

CO4: Exhibit skills of preparing slides, identifying the given twigs in the lab and drawing figures of plant twigs, flowers and floral diagrams as they are.

CO5: Prepare and preserve specimens of local wild plants using herbarium techniques.

Syllabus

1. Study/ microscopic observation of vegetative, sectional/anatomical and Reproductive structures of the following using temporary or permanent slides/ specimens/ mounts:
 - a. Pteridophyta: *Lycopodium* and *Marselia*
 - b. Gymnosperms: *Cycas* and *Gnetum*
2. Study of fossil specimens of Cycadeoidea and Pentoxylon (photographs /diagramscan be shown if specimens are not available).
3. Demonstration of herbarium techniques.
4. Systematic / taxonomicstudy of locally available plants belonging to the families prescribed in theory syllabus. (Submission of 30 number of Herbarium sheets of wildplants with the standard system is mandatory).
5. Mapping of phytogeographical regions of the globe and India.

Textbook:

1. A text book of Practical Botany-I Ashok Bendra and Ashok kumar
2. Practical manual of College Botany I and II- B.S..Reddy and S.M.Reddy

Course Delivery method: Face-to-face / Blended.**Course has focus on:**

Skill Development **Websites of**

Interest:

<https://youtu.be/RJsOOhws5gI>

<https://youtu.be/9xtB1G4kISQ>

<https://youtu.be/2wFN9YmkBOQ>

Model Question Paper Structure for SEE

Time: 3hrs.

Max. Marks 40M

1. Take T.S. of the material 'A' (Pteridophyta), make a temporary slide and justify the identification with apt points.....**8M**
2. Take T.S. of the material 'B' (Gymnosperms), make a temporary slide and justify the identification with apt points.....**8M**
3. Describe the vegetative and floral characters of the material 'C' (Taxonomy of Angiosperms) and derive its systematic position.....**8M**
4. Identify the specimen 'D' (Fossil Gymnosperm) and give specific reasons.....**3M**

1. Locate the specified phytogeographical regions the world / India (E) map supplied to you

2X2=4 M

2. Record + Herbarium & amp; Field note book **5+4 = 9M**

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Vuyyuru - 521165.

NAAC reaccredited at 'A' level

Autonomous -ISO 9001 – 2015 Certified

Title of the Paper: **Plant Physiology and Metabolism**

Semester: IV

Course Code	BOT - 401	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2021-22	Year of Offering: 2021 - 22	Year of Revision: --	Percentage of Revision: -

Learning Objectives:

- On successful completion of this course, the students will be able to;
- Comprehend the importance of water in plant life and mechanisms for transport of water and solutes in plants.
- Evaluate the role of minerals in plant nutrition and their deficiency symptoms.
- Interpret the role of enzymes in plant metabolism.
- Critically understand the light reactions and carbon assimilation processes responsible for synthesis of food in plants.
- Analyze the biochemical reactions in relation to Nitrogen and lipid metabolisms.
- Evaluate the physiological factors that regulate growth and development in plants.
- Examine the role of light on flowering and explain physiology of plants under stress conditions

THEORY: Learning outcomes:

- On _____
successful completion of this course, the students will be able to;
Understand on the organization of tissues and tissue systems in plants.
- Illustrate and interpret various aspects of embryology.
- Discuss the basic concepts of plant ecology, and evaluate the effects of environmental and biotic factors on plant communities.
- Appraise various qualitative and quantitative parameters to study the population and community ecology.
- Correlate the importance of biodiversity and consequences due to its loss.
- Enlist the endemic/endangered flora and fauna from two biodiversity hot spots in India and assess strategies for their conservation.

SYLLABUS

Unit – 1	<p>Plant - water relations 10HRS</p> <p>Importance of water to plant life, physical properties of water, diffusion, Imbibition, Osmosis. Water potential, osmotic potential, pressure potential.</p> <p>Absorption and lateral transport of water; Ascent of sap</p> <p>Transpiration: stomata structure and mechanism of stomatal movements (K^+ ion flux).</p> <p>Mechanism of phloem transport; source-sink relationships.</p>
Unit – 2	<p>Mineral nutrition, Enzymes and Respiration 14 HRS</p> <p>Essential macro and micro mineral nutrients and their role in plants; symptoms of mineral deficiency.</p> <p>Absorption of mineral ions; passive and active processes.</p> <p>Characteristics, nomenclature and classification of Enzymes. Mechanism of enzyme action, enzyme kinetics.</p> <p>Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron transport system, mechanism of oxidative phosphorylation, Pentose Phosphate Pathway (HMP shunt).</p>
Unit – 3	<p>Photosynthesis and Photorespiration 12 HRS</p> <p>Photosynthesis: Photosynthetic pigments, absorption and action spectra; Red drop and Emerson enhancement effect</p> <p>Concept of two photosystems; mechanism of photosynthetic electron transport and evolution of oxygen; photophosphorylation</p> <p>Carbon assimilation pathways (C_3, C_4 and CAM); Photorespiration - C_2 pathway</p>
Unit – 4	<p>Nitrogen and lipid metabolism 12 HRS</p> <p>Nitrogen metabolism: Biological nitrogen fixation – asymbiotic and symbiotic nitrogen fixing organisms. Nitrogenase enzyme system.</p> <p>Lipid metabolism: Classification of Plant lipids, saturated and unsaturated fatty acids.</p> <p>Anabolism of triglycerides, β-oxidation of fatty acids, Glyoxylate cycle.</p>
Unit – 5	<p>Plant growth – development and stress physiology 12 HRS</p> <p>Growth and Development: Definition, phases and kinetics of growth.</p> <p>Physiological effects of Plant Growth Regulators (PGRs) - auxins, gibberellins, cytokinins, ABA, ethylene and brassinosteroids.</p> <p>Physiology of flowering: Photoperiodism, role of phytochrome in flowering.</p> <p>Seed germination and senescence; physiological changes.</p>

Text books:

- Botany – IV (Vrukshasastram-II) : Telugu Akademi, Hyderabad
- Pandey, B.P. (2013) *College Botany, Volume-III*, S. Chand Publishing, New Delhi
- Ghosh, A. K., K. Bhattacharya & G. Hait (2011) *A Text Book of Botany, Volume- III*, New Central Book Agency Pvt. Ltd., Kolkata

Books for Reference:

- Aravind Kumar & S.S. Purohit (1998) *Plant Physiology – Fundamentals and Applications*, AgroBotanica, Bikaner
- Datta, S.C. (2007) *Plant Physiology*, New Age International (P) Ltd., Publishers, New Delhi
- Hans Mohr & P. Schopfer (2006) *Plant Physiology*, Springer (India) Pvt. Ltd., New Delhi
- Hans-Walter heldt (2005) *Plant Biochemistry*, Academic Press, U.S.A.
- Hopkins, W.G. & N.P.A. Huner (2014) *Introduction to Plant Physiology*, Wiley India Pvt. Ltd., New Delhi
- Noggle Ray & J. Fritz (2013) *Introductory Plant Physiology*, Prentice Hall (India), New Delhi
- Pandey, S.M. & B.K. Sinha (2006) *Plant Physiology*, Vikas Publishing House, New Delhi
- Salisbury, Frank B. & Cleon W. Ross (2007) *Plant Physiology*, Thomsen & Wadsworth, Australia & U.S.A
- Sinha, R.K. (2014) *Modern Plant Physiology*, Narosa Publishing House, New Delhi
- Taiz, L. & E. Zeiger (2003) *Plant Physiology*, Panima Publishers, New Delhi
- Verma, V. (2007) *Text Book of Plant Physiology*, Ane Books India, New Delhi

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BOTANY	BOT- 401C	w.e.f. 2021-22	B. Sc. (BZC), AQUA
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II B. Sc – BOTANY

Model Question Paper

SEMESTER- IV

PAPER-IV: Time: 3 Hours

Max. Marks: 70

.....
SECTION-A

Answer any four of the following questions.

4x 5 = 20Marks

(Draw diagrams wherever necessary)

1. Types of Transpiration
2. Water potential.
3. Nitrogen.
4. Anaerobic respiration.
5. Emerson enhancement effect
6. Ethylene.
7. Photo periodism.
8. β -oxidation of fatty acids.

SECTION-B

Answer any five of the following questions.

5x10 = 50Marks

(Draw diagrams wherever necessary)

9. Write an essay on Ascent of sap.
10. Write an essay on the Translocation of organic substances in higher plants
11. Write an essay on the absorption of mineral ions.
12. Give an account on Krebs cycle?
13. Describe the carbon assimilation pathway in C4 plants.
14. Explain the non cyclic electron transport and evolution of oxygen?
15. Write an essay on various types of Lipids.
16. describe about physiological effects in Auxins and Gibberellins.

Guide lines for paper setter: (for Paper III – BOT- 401) w.e.f 2021-22

1. In **section A**: Unit III, IV must carry **one** question, Unit I,II & V must carry **two** questions.
2. In **section- B**: Set minimum **two** questions from Unit I, II, III . **One** question each from Unit IV and Unit V.
3. See the following table and Model paper for marks distribution.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
	10		20		30
Unit - II	2		2		
	10		20		30
Unit – III	1		2		
	05		20		25
Unit – IV	1		1		
	05		10		15
Unit – V	2		1		
	10		10		20
Max. Q & marks	8	(x 5) = 40	8	(x 10) = 80	(Total questions =16) Total marks = 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4	(4 X 5M) = 20 M	5	(5 X 10M)= 50 M	70M

INTERNAL EXAMS - 30Marks

(20 marks for unit tests, 5marks for Attendance 5 marks for seminars)

Practical Syllabus of Botany Core Course – 4 / Semester – IV Plant Physiology and Metabolism

Course outcomes: On successful completion of this practical course, students shall be able to:

1. Conduct lab and field experiments pertaining to Plant Physiology, that is, biophysical and biochemical processes using related glassware, equipment, chemicals and plant material.
2. Estimate the quantities and qualitative expressions using experimental results and calculations
3. Demonstrate the factors responsible for growth and development in plants.

Practical Syllabus

1. Determination of osmotic potential of plant cell sap by plasmolytic method using

Rhoeo/ Tradescantia leaves.

2. Calculation of stomatal index and stomatal frequency of a mesophyte and a xerophyte.
3. Determination of rate of transpiration using Cobalt chloride method / Ganong's potometer (at least for a dicot and a monocot).
4. Effect of Temperature on membrane permeability by colorimetric method.
5. Study of mineral deficiency symptoms using plant material/photographs.
6. Demonstration of amylase enzyme activity and study the effect of substrate and Enzyme Concentration.
7. Separation of chloroplast pigments using paper chromatography technique.
8. Demonstration of Polyphenol oxidase enzyme activity (Potato tuber or Apple fruit)
9. Anatomy of C3, C4 and CAM leaves
10. Estimation of protein by biuret method/Lowry method
11. Minor experiments – Osmosis, Arc- auxonometer, ascent of sap through xylem, cytoplasmic streaming.

Model Question Paper for Practical Examination

Semester – IV/ Botany Core Course – 4

Plant Physiology and Metabolism

1. Conduct the experiment 'A' (Major experiment), write aim, principle, material and Apparatus/equipment, procedure, tabulates results and make conclusion..... 10 M
2. Demonstrate the experiment 'B' (Minor experiment), write the principle, procedure and give inference.....6 M
 1. Identify the following with apt reasons. 3 x 2 = 6 M
 - A. Plant water relations / Mineral nutrition
 - B. Plant metabolism
 - C. Plant growth and development
2. Viva-voce = 3 M

Internals:

1. Record10M
2. Assignments05 M
3. Project work.....05 M
4. Internal practical exam.....05 M

A. Measurable :

Student seminars:

1. Anti transpirants and their significance in crop physiology and horticulture.
2. Natural chelating agents in plants.
3. Criteria of essentiality of elements and beneficial elements.
4. Hydroponics, aquaponics and aeroponics.
5. Mycorrhizal association and mineral nutrition in plants.
6. Non- proteinaceous enzymes.
7. Respiratory inhibitors.
8. Structure of ATPase and Chemiosmotic hypothesis.
9. Transpiration and photosynthesis – a compromise.
10. Amphibolic pathways and bypass pathways in plants.
11. Non-biological nitrogen fixation.
12. Role of Hydrogenase in nitrogen fixation.
13. Plant lectins – their role in plants and use in medicine and medical research.

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Vuyyuru - 521165.

NAAC reaccredited at 'A' level

Title of the Paper: **Cell Biology, Genetics and Plant Breeding****Semester: IV**

Course Code	BOT - 402	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2021-22	Year of Offering: 2021 - 22	Year of Revision: --	Percentage of Revision: --

Theory: Learning out comes:

- On successful completion of this course, the students will be able to:
- Distinguish prokaryotic and eukaryotic cells and design the model of a cell.
- Explain the organization of a eukaryotic chromosome and the structure of genetic material.
- Demonstrate techniques to observe the cell and its components under a microscope.
- Discuss the basics of Mendelian genetics, its variations and interpret inheritance of traits in living beings.
- Elucidate the role of extra-chromosomal genetic material for inheritance of characters.
- Evaluate the structure, function and regulation of genetic material.
- Understand the application of principles and modern techniques in plant breeding.
- Explain the procedures of selection and hybridization for improvement of crops.

SYLLABUS

Unit – 1	The Cell: Cell theory; prokaryotic vs eukaryotic cell; animal vs plant cell; a brief account on ultra-structure of a plant cell.	12 Hrs.
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	<p>Ultra-structure of cell wall. Ultra-structure of plasma membrane and various theories on its organization. Polymorphic cell organelles (Plastids); ultra structure of chloroplast. Plastid DNA.</p>
Unit – 2	<p>Chromosomes: 11Hrs. Prokaryotic vs eukaryotic chromosome. Morphology of a eukaryotic chromosome. Euchromatin and Heterochromatin; Karyotype and ideogram. Brief account of chromosomal aberrations - structural and numerical changes Organization of DNA in a chromosome (nucleosome models).</p>
Unit – 3	<p>Mendelian and Non-Mendelian genetics 14Hrs. Mendel’s laws of inheritance. Incomplete dominance and co-dominance; Multiple allelism. Complementary, supplementary and duplicate gene interactions (plant based examples are to be dealt). A brief account of linkage and crossing over; Chromosomal mapping - 2 point and 3 point test cross.</p>
Unit – 4	<p>Structure and functions of DNA 12 Hrs. Watson and Crick model of DNA. Brief account on DNA Replication (Semi- conservative method). Brief account on Transcription, types and functions of RNA. Gene concept and genetic code and Translation. Regulation of gene expression in prokaryotes - Lac Operon.</p>
Unit – 5	<p>Plant Breeding 12 Hrs. Plant Breeding and its scope; Genetic basis for plant breeding. Plant Introduction and acclimatization. Definition, procedure; applications and uses; advantages and limitations of : (a) Mass selection, (b) Pure line selection and (c) Clonal selection. Hybridization – schemes, and technique; Heterosis (hybrid vigor). A brief account on Molecular breeding – DNA markers in plant breeding. RAPD, RFLP.</p>

**B.Sc – BOTANY
SEMESTER -V. THEORY MODEL PAPER**

Time: 3 Hours

Max. Marks: 70

SECTION-A

Answer any FOUR of the following question
(Draw diagrams wherever necessary)

4x5=20M.

1. Cell Theory
2. karyotype.
3. Rho - factor
4. Back cross and test cross.
5. supplementary genes
6. t RNA
- 7 RFLP
8. Hybridization.

SECTION-B

Answer any FIVE of the following questions.

5x10= 50M.

(Draw diagrams wherever necessary)

9. Describe the Ultra structure and functions of cell membrane.
10. Describe the Ultra structure of cell wall.
11. Give brief account on of chromosomal aberrations.
12. Explain the Mendel's law of inheritance.
13. Define linkage. Describe the different types of Linkage.
14. Write about structure and replication of DNA.
15. Write an essay on mechanism and Regulation of gene Expression in Prokaryotes
16. Discuss about methods of Crop improvement.

Guide lines for paper setter: (for Paper V-BOT-402) W.e.f. 2021-22

1. In Section A: Unit I & II, must carry one question from each unit. Unit III ,IV & V

Must carry 2 questions.

2. In section-B: Set minimum Two questions from Unit I, III & IV One question from Unit II&V.

3. See the following table and Model paper.

4. Please provide the scheme of valuation for the paper.

5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	1		2		25
	5		20		
Unit – II	1		1		15
	05		10		
Unit –III	2		2		30
	10		20		
Unit-IV	2		2		30
	10		20		
Unit-V	2		1		20
	10		10		
Max .Q & marks	8 (x 5) =40		8 (x 10) = 80		(Total questions =16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		70
	(4 x 5) = 20		(5 x 10) = 50		

INTERNAL EXAMS - 30Marks

(20 marks for unit tests, 5marks for Attendance 5 marks for seminars)

Practical Syllabus of Botany Core Course –5/IVSemester

Cell Biology, Genetics and Plant Breeding

(Total hours of laboratory exercises 30 Hrs. @ 02 Hrs. /Week)

Course Outcomes:

- After successful completion of this practical course the student shall be able to:

- Show the understanding of techniques of demonstrating Mitosis and Meiosis in the laboratory and identify different stages of cell division.
- Identify and explain with diagram the cellular parts of a cell from a model or picture and prepare models
- Solve the problems related to crosses and gene interactions.
- Demonstrate plant breeding techniques such as emasculation and bagging

Practical Syllabus:

1. Study of ultra structure of plant cell and its organelles using Electron microscopic Photographs/models.
2. Demonstration of Mitosis in *Allium cepa*/*Aloe vera* roots using squash technique; observation of various stages of mitosis in permanent slides.
3. Demonstration of Meiosis in P.M.C.s of *Allium cepa* flower buds using squash technique; observation of various stages of meiosis in permanent slides.
4. Study of structure of DNA and RNA molecules using models.
5. Solving problems monohybrid, dihybrid, back and test crosses.
6. Solving problems on gene interactions (atleast one problem for each of the gene interactions in the syllabus).
7. Chromosome mapping using 3- point test cross data.
8. Demonstration of emasculation, bagging, artificial pollination techniques for hybridization.

Model paper for Practical Examination

Semester-IV / Botany Core Course – 5

Cell Biology, Genetics and Plant Breeding

Max. Time: 3 Hrs.

Max. Marks: 50

1. Make a cytological preparation of given material 'A' (mitosis or meiosis in Onion) by squash technique, report any two stages, draw labeled diagrams and write the reasons.
10 M
2. Solve the given Genetic problem (Dihybrid cross/ Interaction of genes/ 3-point test cross) 'B' and write the conclusions. 7 M
3. Identify the following and justify with apt reasons. 3 x 2 = 06M
 - B. Cell Biology (Cell organelle)
 - C. Genetics (DNA/RNA)
 - D. Plant Breeding
4. Viva-voce = 2 M

Internals:

1. Record10M
2. Assignments.....05 M
3. Project work.....05 M
4. Internal practical exam.....05 M

Suggested co-curricular activities for Botany Core Course- 5 in Semester-IV:

A. Measurable :

a. Student seminars :

1. Light microscopy : bright field and dark field microscopy.
2. Scanning Electron Microscopy (SEM).

3. Transmission Electron Microscopy (TEM).
4. Mitosis and Meiosis
5. Cell cycle and its regulation.
6. Cell organelles bounded by single membrane.
7. Prokaryotic chromosomes
8. Special types of chromosomes : Polytene, Lampbrush and B-chromosomes.
9. Different forms of DNA.
10. Gene mutations.
11. DNA damage and repair mechanisms.
12. Reverse transcription.
13. Protein structure.
14. Modes of reproduction in plants.
15. Modes of pollination in plants

b. Student Study Projects :

1. Study of mitotic cell cycle in roots of *Allium cepa*
2. Study of mitotic cell cycle in roots of *Aloe vera*
3. Observation of chromosomal aberrations in *Allium cepa* root cells exposed to industrial effluent(s).
4. Observation of chromosomal aberrations in *Allium cepa* root cells exposed to heavy metal(s).
5. Observation of polyembryony in *Citrus* spp. and *Mangifera indica*.

c. Assignments: Written assignment at home / during 'O' hour at college; preparation of charts with drawings, making models etc., on topics included in syllabus.

B. General :

1. Field visit to Agriculture/Horticulture University/ Research station to observe Plant breeding methods.
2. Group Discussion (GD)/ Quiz/ Just A Minute (JAM) on different modules in syllabus of the course.

RECOMMENDED ASSESSMENT OF STUDENTS:

Recommended continuous assessment methods for all courses:

Some of the following suggested assessment methodologies could be adopted. Formal assessment for awarding marks for Internal Assessment in theory.

(a) Formal:

1. The oral and written examinations (Scheduled and surprise tests),
2. Simple, medium and Critical Assignments and Problem-solving exercises,
3. Practical assignments and laboratory reports,
4. Assessment of practical skills,
5. Individual and group project reports,
6. Seminar presentations,
7. Viva voce interviews.

(b) Informal:

1. Computerized adaptive testing, literature surveys and evaluations,
2. Peers and self-assessment, outputs form individual and collaborative work
3. Closed-book and open-book tests,

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Course Code	BOT - 601	Course Delivery Method	Class Room / Blended Mode - Both
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Hours			
Year of Introduction :2017-18	Year of Offering: 2019- 20	Year of Revision: -	Percentage of Revision: --

Title of the Paper: **Plant tissue culture and its Biotechnological applications**

Semester: **VI**

Course Description:

This course will provide one with a basic and comprehensive understanding of plant tissue culture. Enable the student with depth of topics and helps them to gain an appreciation in the tissue culture techniques. On the other hand, importance of understanding biotechnological applications provides an extensive knowledge to the student.

Course Objectives

1. To study methods of sterilization
2. To study medium preparation
3. To study tissue culturing techniques (endosperm, embryo)
4. To study research techniques, including methods of molecular biology, Genetic engineering.

Course Outcomes: At the end of this course, students should be able to: CO 1 : Analyze the basic principles of plant tissue culture CO2: Explain the, various culturing techniques.

CO3: Demonstrate recombinant DNA technology.

CO4: Discuss the methods of gene transfer.

CO5: Understand the applications of plant genetic engineering.

CO6: Elucidate the selection of transgenics.

SYLLABUS

Unit – 1	<p>PLANT TISSUE CULTURE – 1 (12hrs) History of plant tissue culture research - basic principles of plant tissue callus culture, Meristem culture, organ culture, Totipotency of cells. Sterilization procedures, culture media composition and preparations of explants. Murashige and Skoog's (MS medium), Cell and protoplast culture. Somatic Hybrids and Cybrids (out lines), Artificial Seeds, Somaclonal variations. Applications of Tissue culture (Brief account).</p>
Unit – 2	<p>Plant Tissue culture -2 (12hrs) Endosperm culture – Embryo culture -culture requirements – applications, embryo rescue technique. Cryopreservation; Germ plasm conservation.</p>

Unit – 3	R Recombinant DNA technology (12hrs) 1. r-DNA technology: Steps in r-DNA technology and tools 2. Cloning Vectors: Prokaryotic (pBR322, Ti plasmid and Lambda phage, Eukaryotic Vectors (YAC and briefly PAC) 3. Gene cloning (Bacterial Transformation and selection of recombinant clones, PCR Mediated gene cloning)
Unit – 4	Methods of gene transfer (12hrs) Methods of gene transfer- Agrobacterium-mediated, direct gene transfer By Electroporation, Microinjection, Micro projectile bombardment. 2. Selection of transgenics – selectable marker and reporter genes (Luciferase, GUS, GFP).
Unit – 5	Applications of Biotechnology (12 hrs) Applications of Plant Genetic Engineering – crop improvement, herbicide resistance, insect resistance, virus resistance. Genetic modification – transgenic plants for pest resistant (Bt-cotton); herbicide resistance (Round Up Ready soybean); improved agronomic traits flavrSavr tomato, Golden rice.

III B. Sc – BOTANY Model paper (2021-2022)

Plant tissue culture and its Biotechnological applications

SEMESTER- VI

ELECTIVE-C

PAPER – VII

Time: 3 Hours

Paper code: BOT-VII C

Max. Marks: 70

SECTION-A

Answer any FOUR of the following question
(Draw diagrams wherever necessary)

4x5=20M.

1. Organ culture.
2. Somatic hybrids.
3. Cryopreservation.

4. Application of tissue culture.
5. Restriction Endonuclease.
6. Bacterial transformation.
7. GUS.
8. Bt-Cotton.

SECTION-B

Answer any Five of the following questions.

5 x 10= 50M.

(Draw diagrams wherever necessary)

9. Describe the composition and preparation of different culture media.
10. Explain the callus sub-culture and their growth and measurement.
11. Give an account on secondary metabolites.
12. Write notes on endosperm culture and their applications.
13. Explain the PCR mediated gene cloning.
14. Explain the various types of cloning vectors.
15. Write about methods of gene transfer techniques.
16. Write an essay on application of Biotechnology in the field of medicine and industry.

Guide lines for paper setter: (for Paper VII -BOT-601) W.e.f. 2021-22.

1. In Section A: Unit I,III, IV must carry Two question from each unit. Unit II, V must carry one question.
2. In section-B: Set minimum two questions from Unit I, II, III and Set One Question from IV, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section – A		Section - B		Weightage in Marks
	Questions	Marks	Questions	Marks	

Unit – I	2	2		
	10	20	30	
Unit – II	1	2		
	5	20	25	
Unit – III	2	2		
	10	20	30	
Unit-IV	2	1		
	10	10	20	
Unit-V	1	1		
	5	10	15	
Max. Q & marks	8 (x 5) = 40	8 (x 10) = 80	(Total questions = 16) Marks 120	
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks
	5		5	
	(4 x 5) = 20		(5 x 10) = 50	
				70

INTERNAL EXAMS - 30Marks

(20 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.)

Practical Paper VII-C

Plant Tissue Culture & Plant Biotechnology

SEMESTER- VI

BOT – 601P

Total hours of teaching 30hrs @ 2hrs per week

Credits: 2

1. (a) Preparation of MS medium.
(b) Demonstration of in vitro sterilization methods and inoculation methods using leaf and nodal explants of Tobacco/ Datura/ Brassica etc.
2. Study of embryo and culture, micro propagation of Banana, somatic embryogenesis, artificial seeds through photographs.
3. Construction of restriction map of circular and linear DNA from the data provided.
4. Study of methods of gene transfer through photographs: Agrobacterium- mediated, directgene

transfer by electroporation, microinjection, and micro projectile bombardment.

5. Different steps involved in genetic engineering for production of Bt. cotton, Golden rice, Flavr Savr tomato through photographs.
6. Isolation of plasmid DNA.
7. Restriction digestion and gel electrophoresis of plasmid DNA (optional)
8. Field visit to a lab involved in tissue culture
9. Study project under supervision of lecturer – tissue culture/ genetic engineering.

Expected domain skills to be achieved: Ability to prepare artificial nutrient media, preparing independently, applying various sterilization procedures for media, glassware and biological materials, invitro propagation of Banana callus, morphogenesis--s, clonal propagation methods, isolation of plasmid DNA individually and as a group.

Practical Paper VII-C
Plant Tissue Culture & Plant Biotechnology

SEMESTER- VI

BOT – 601(GE) P

Total hours of teaching 30hrs @ 2hrs per week

Credits: 2

Q1. Project report (A) -	10M
Viva-voce on study project.....	02M
Q2. Identify and write notes on B, C and D (3x3).....	09 M
B- Tool/instrument/container used in sterilization	
C- Tool/instrument/container used in gene transfer	

D- GM crops (Photographs)

Q3. Construct restriction map of circular and/ or linear DNA from the data
Provided.....06M

Q 4. Field report.....03M

Total.....30 Marks

Internal Assessment

a. Record -05M

b. Attendance.....05M

e. Internal practical exam.....10M

Total... 20Marks

Total ----- 50M

Books for Reference:

1. Pullaiah. T. and M.V.Subba Rao. 2009. Plant Tissue culture. Scientific Publishers, New Delhi.
2. Bhojwani, S.S. and Razdan, M.K., (1996). Plant Tissue Culture: Theory and Practice. Elsevier Science Amsterdam. The Netherlands.
3. Glick, B.R., Pasternak, J.J. (2003). Molecular Biotechnology- Principles and Applications of recombinant DNA. ASM Press, Washington.
4. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms. VikasPublicationHouse Pvt. Ltd., New Delhi. 5th edition.

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Title of the Paper: **Plant diversity and Human welfare**

Semester: **VI**

Course Code	BOI - 602	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2017-18	Year of Offering: 2019- 20	Year of Revision: ---	Percentage of Revision: ---

Course Objectives:

1. To study plant diversity and its scope
2. To study the loss of biodiversity
3. To study contemporary practices
4. To study the conservation of biodiversity
5. To study the role of plants in relation to human welfare

Course Outcomes: At the end of this course, students should be able to: CO1: Distinguish the levels of biodiversity.

CO2: Explain the loss of biodiversity at different levels.

CO3: Demonstrate contemporary practices in resource management.

CO4: Discuss the conservation of biodiversity.

CO5: Elucidate the role of plants in relation to human welfare.

SYLLABUS

Unit – 1	Plant diversity and its scope: (12hrs) Genetic diversity, Species diversity, Plant diversity at the ecosystem level, Agro biodiversity and Vavilov Crop centers. Values and uses of biodiversity: Ethical and aesthetic values, Uses of plants.
Unit – 2	Loss of biodiversity: (12hrs) Loss of genetic diversity, Loss of species diversity, Loss of ecosystem diversity, Loss of agro biodiversity, projected scenario for biodiversity loss. Management of plant biodiversity: Organizations associated with biodiversity Management-Methodology for execution-IUCN, UNEP, UNESCO, WWF, NBPGR; Biodiversity legislation and conservations, Biodiversity information management and Communication.
Unit – 3	Contemporary practices in resource management: (12hrs) Environmental Impact Assessment (EIA), Geographical Information System GIS, Solid and liquid waste management.
	Conservation of biodiversity (12hrs)

Unit – 4	Conservation of genetic diversity, species diversity. Social approaches to conservation, Biodiversity awareness Programmes, Sustainable development.
Unit – 5	Role of plants in relation to Human Welfare (12hrs) Importance of forestry, their utilization and commercial aspects- a) Avenue trees, b) ornamental plants of India. Fruits and nuts: Important fruit crops their commercial importance. Wood, fiber and their uses.

III B. Sc – BOTANY Model paper (2019-2020)

SEMESTER- VI

Paper – VIII-A-1

PAPER – VIII

PLANT DIVERSITY AND HUMAN WELFARE

Time: 3 Hours

Max. Marks: 70

SECTION-A

Answer any FOUR of the following question

4x5=20M.

1. Species Diversity.
2. Wild Taxa.
3. NBPGR.
4. Biodiversity and its Conservation.
5. EIA.
6. Geographical information system (GIS).
7. Sustainable Development.
8. Fiber and their uses.

SECTION-B

Answer any Five of the following questions.

5 x10=50M.

9. Give a Note on Plant Diversity and its Scope.
10. Write about Values and Uses of Biodiversity.
11. What is Biodiversity? Discuss about the Loss of Biodiversity?
12. Explain the Various Types Organizations in Biodiversity?
13. Write an essay on EIA?
14. Write essays an Solid and Liquid Waste Management?
15. What is Conservation? Explain the In-situ and Ex-situ conservation?
16. What are Fruit crops? Explain their Commercial importance?

Guide lines for paper setter: (for Paper VIII -BOT-602) W.e.f. 2021-22

1. In Section A: Unit I, II, III, must carry Two question from each unit. Unit IV, V must carry one question.
2. In section-B: Set minimum two questions from Unit I, II & III and Set One Question from IV, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in Marks
	Questions	Marks	Questions	Marks	
Unit – I	2		2		
		10		20	30
Unit – II	2		2		

		10	20	30	
Unit – III	1		2		
		05	20	25	
Unit-IV	1		1		
		5	10	15	
Unit-V	2		1		
		10	10	20	
Max. Q & marks	8	(x 5) = 40	8	(x 10) = 80	(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		
		(4 x 5) = 20		(5 x 10) = 50	70

INTERNAL EXAMS – 30 Marks

(20 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc)

Paper – VIII-A-1: Practicals:

PLANT DIVERSITY AND HUMAN WELFARE

SEMESTER- VI

BOT-602-A-1(CL)P

Time: 3hrs

Max. Marks: 50

- 1) Study of plant diversity (flowering plants).
- 2) Study of exotic species- Identification and morphological characteristics.
- 3) Identification of forest trees through bark, wood, flowers, leaves and fruits.
- 4) Maceration, Study of wood (Tracheary elements, fibres).
- 5) Methods of preservation and canning of fruits.
- 6) Visit to the local ecosystem to study the plants.
- 7) Study of Solid and Liquid waste management systems in rural/urban areas.

SCHEME OF PRACTICAL EXAMINATION

- I. Assign the plants **A, B and C** to their respective families, giving reasons, family name and classification-1marks, important diagrams- 2 marks.....**09 marks**
- II. Give the protocol of **D****04marks**
- III. Comment on specimens **E, F and G****3x3 = 09 marks**
- IV. Report on Field visit..... **4 marks**

To study sources of firewood (10 plants), timber-yielding trees (10trees) and bamboos.

V. Viva-Voce **04marks**
Total..... **30 Marks**

Internals

a. Record -05M
b. Attendance.....05M
c. Internal practical exam.....10M
Total..... **20 Marks**

Total -----50M

KEY

A-Cultivated Plant

B- Wild Plant

C –Exotic plant

D- Preservation and canning of fruits, solid and liquid waste management systems in rural/urban areas

E. Bark/wood/fruit yielding plant

F. Nuts/ Alcoholic beverage plant

G. wood /Fibre yielding plant

Paper – VIII-A-1: Practical's:

PLANT DIVERSITY AND HUMAN WELFARE

SEMESTER- VI

BOT-602-A-(CL) P

SCHEME OF PRACTICAL EXAMINATION

Time: 3hrs

Max. Marks: 50

I. Assign the plants **A, B and C** to their respective families, giving reasons, family name and classification-1marks, important diagrams- 2 marks..... **09 marks**

II. Give the protocol of **D** **04marks**

III. Comment on specimens **E, F and G** **3x3= 09 marks**

IV. Report on Field visit..... **4 marks**
To study sources of firewood (10 plants), timber-yielding trees (10trees) and bamboos.

V. Viva-Voce **4marks**

Total ---- 30marks

Internals:

a. Record - .....	.05M
b. Attendance.....	.05M
c. Internal practical exam.....	10M

Total --- 20marks

Total -----50M

KEY

A-Cultivated Plant

B- Wild Plant

C –Exotic plant

D- Preservation and canning of fruits, solid and liquid waste management systems in rural/urban areas

E. Bark/wood/fruit yielding plant

F. Nuts/ Alcoholic beverage plant

G. wood /Fibre yielding plant

Suggested Readings:

1. Krishnamurthy, K.V. (2004). An Advanced Text Book of Biodiversity - Principles and Practices. Oxford and IBH Publications Co. Pvt. Ltd. New Delhi.
2. Singh, J. S., Singh, S.P. and Gupta, S. (2006). Ecology, Environment and Resource Conservation. Anamaya Publications, New Delhi.
3. Rogers, P.P., Jalal, K.F. and Boyd, J.A. (2008). An Introduction to Sustainable Development. Prentice Hall of India Private Limited, New Delhi.

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Title of the Paper: **Ethno Botany and Medicinal Botany**

Semester: **VI**

Course Code	BOT - 603	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2017-18	Year of Offering: 2019- 20	Year of Revision: --	Percentage of Revision: --

Course Objectives:

1. To learn about ethnobotany
2. To learn about the role of ethnobotany in modern medicine
3. To learn the ethnobotany as a tool to protect interests of ethnic groups
4. To study the history, scope and importance of medicinal plants in indigenous medicinal sciences
5. To study the conservation of endangered and endemic medicinal plants

Course Outcomes: At the end of this course, students should be able to:

CO1: Analyze the concept, scope and objectives.

CO2: Explain the role of ethnobotany in modern medicine.

CO3: Demonstrate ethnobotany as a tool to protect interests of ethnic groups.

CO4: Discuss the history scope and importance of medicinal plants in indigenous medicinal sciences.

CO5: Elucidate the conservation of endangered and endemic medicinal plants

SYLLABUS

Unit – 1	<p>Ethnobotany (12hrs) Introduction, concept, scope and objectives Major and minor ethnic groups or Tribal's of India, and their lifestyles. Plants used by the tribal populations: a) Food plants, b) Intoxicants c) Beverages, d) Resins and oils and miscellaneous uses.</p>
Unit – 2	<p>Role of ethnobotany in modern Medicine (12hrs) Role of Ethnobotany in modern medicine with special example; Rauwolfia serpentina, Artemisia annua, Withania somnifera. Significance of the following plants in ethno botanical practices (along with their habitat and morphology) a) Azadirachta indica, b) Vitex negundo, c) Ocimum sanctum, d) Phyllanthus niruri Medico-Ethnobotanical Sources of India.</p>
Unit – 3	<p>Ethnobotany as a tool to protect interests of ethnic groups (12hrs) Sharing of wealth concept with few examples from India. Biopiracy, Intellectual Property Rights and Traditional Knowledge</p>
	<p>History, Scope and Importance of Medicinal Plants, Indigenous Medicinal Sciences (12hrs) Definition and Scope-Ayurveda: History, origin, panchamahabhutas, saptadhatu and</p>

Unit – 4	tridosha concepts, Rasayana, plants used in ayurvedic treatments. Homeopathy: Origin of Homeopathy medicinal systems, Basis of Homeopathy, plants used in Homeopathy medicine.
Unit – 5	Conservation of endangered and endemic medicinal plants (12hrs) Definition: endemic and endangered medicinal plants. 2. Red list criteria In situ conservation: Sacred groves, National Parks. Ex situ conservation: Botanical Gardens, Seed Banks.

III B. Sc – BOTANY Model paper (2021-2022)

Title of the Paper: **ETHNOBOTANY AND MEDICINAL BOTANY**

SEMESTER- VI PAPER – VIII Cluster – A **Paper – VIII-A-2**

Time: 3 Hours

Max. Marks: 70

SECTION-A

Answer any FOUR of the following question

4x5=20M.

1. Intoxicants.
2. Withania somnifera.
3. Phyllanthus niruri
4. Curcuma langa.
5. Biopiracy
6. Saptdhatu and Tridosha.
7. Tumors treatments.
8. Red list criteria.

SECTION-B

Answer any Five of the following questions.

5x10 =50M.

9. Explain the Relevance of Ethno-Botany in the present Context.

10. Discuss about Major and Minor Ethnic groups of India.
11. Write about Botanical name, Family, Active principle and medicinal uses of Rauvolfia serpentina, Artemisia annua.
12. Write about the Medico-Ethnobotanical Sources of India.
13. Write about the Intellectual property rights and Traditional knowledge.
14. Write an Essay on Basic concepts of Ayurveda.
15. What is Siddha System of Medicine? Explain their Basic Concepts?
16. Give an account of Endemic and Endangered Medicinal plants ?

Guide lines for paper setter: (for Paper VIII-BOT-603(CE)) W.e.f. 2021-22

1. In Section A: Unit I, IV, must carry two questions from each unit. Unit II must carry Two Question. Unit III, V must carry one question.
2. In section-B: Set minimum Two questions from Unit I, II & IV and Set One Question from III, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
		10		20	30
Unit – II	2		2		
		10		20	30

Unit – III	1	1	
	05	10	15
Unit-IV	2	2	
	10	20	30
Unit-V	1	1	
	5	10	15
Max. Q & marks	8 (x 5) = 40	8 (x 10) = 80	(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions
	4		5
	(4 x 5) = 20		(5 x 10) = 50
			Max. marks
			70

INTERNAL EXAMS - 30Marks

(20 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.).

**III B. Sc – Practical Paper
ETHNOBOTANY AND MEDICINAL BOTANY**

**SEMESTER- VI
Time: 3 Hours**

**BOT-VIII-603-A- 2(CL)P
Max. Marks- 50**

1. Ethno botanical specimens as prescribed in theory syllabus
2. Detailed morphological and anatomical study of medicinally important part(s) of locally available plants (Minimum 8 plants) used in traditional medicine.
3. Field visits to identify and collect ethno medicinal plants used by local tribes/folklore.

Practical Question Paper

- I. Identify the specimen A- Give reasons (morphological and anatomical) and draw Labeled sketches10marks
- II. Identify and write about the medicinal uses of B and C.....2x4 = 08 marks
- III. Comment on D and E.....2 x 2= 04 marks
- IV. Report on Field visit:.....04 marks
List to be prepared mentioning special features of plants used by tribal Populations as Medicinal Plants & Spices. Write their botanical and common names, Parts used and diseases/disorders for which they are prescribed.
- V. Viva-voce..... 04 marks

Total.....**30Marks**

Internals Assessment

a. Record -	05M
b. Attendance.....	05M
c. Internal practical exam.....	10M
Total.....	<u>20 Marks</u>

Total-----50Marks

KEY

- A-Plants given in unit II (i)
- B-Plants used in Ayurvedic preparations (Amla in Chyavanprash, Senna in Laxatives)
- C - - Do -
- D. Photographs of National parks, Biosphere reserves and Botanical gardens.
- E. Photograph of famous personalities in Ayurveda/Siddha medicine.

Suggested Readings:

- 1) S.K. Jain, Manual of Ethnobotany, Scientific Publishers, Jodhpur, 1995.
- 2) Glimpses of Indian. Ethnobotny, Oxford and I B H, New Delhi – 1981.
- 3) S.K. Jain (ed.) 1989. Methods and approaches in ethnobotany. Society of ethnobotanists, Lucknow, India.
- 4) S.K. Jain, 1990. Contributions of Indian ethnobotny. Scientific publishers, Jodhpur.
- 5) Colton C.M. 1997. Ethnobotany – Principles and applications. John Wiley and sons Chichester

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Title of the Paper: **Pharmacognosy and Phytochemistry**

Semester: **VI**

Course Code	BOT - 604	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2017-18	Year of Offering: 2019- 20	Year of Revision: --	Percentage of Revision: --

Course Objectives:

1. The study of pharmacognosy.

2. The study of organoleptic and microscopic studies.
3. Knowledge of secondary metabolites.
4. Study of phytochemistry
5. Knowledge of enzymes, proteins and amino acids.

Course Outcomes: At the end of this course, students should be able to:

CO1: Remember the importance of pharmacognosy.

CO2: Understand organoleptic and microscopic studies with reference to nature of active principles and common adulterants of certain species.

CO3: Apply detailed account of acetate pathway, mevalonate pathway and shikimate pathway.

CO4: Analyze the importance of phytochemicals.

CO5: Evaluate the biological importance of secondary metabolites.

CO6: Create enzymes proteins and amino acids as drugs.

SYLLABUS

Unit – 1	Pharmacognosy Definition, Importance Classification of drugs - Chemical and Pharmacological Drug evaluation methods	(12hrs)
Unit – 2	Organoleptic and microscopic studies: Organoleptic and microscopic studies with reference to nature of active principles and common adulterants of a) Adhatoda vasica(leaf) b) Strychnosnuxvomica (seed), c)Rauwolfia serpentina(root) d)Zinziberofficinalis e)Catharanthusroseus.	(12hrs)
Unit – 3	Secondary Metabolites Definition of primary and secondary metabolites and their differences, Major types - terpenes, Phenolics, alkaloids, terpenoids, steroids .A brief idea about extraction of alkaloids. Origin of secondary metabolites–detailed account of Mevalonate pathway, Shikimate pathway.	(12hrs)
Unit – 4	Phytochemistry: Biosynthesis and sources of drugs: Structural type biosynthesis importance of simple Phenolic compounds, coumarins, Flavonoids. Steroids, sterols: Biosynthesis, commercial importance. Alkaloids: Different groups, biosynthesis, bioactivity. Volatile oils, aromatherapy.	(12hrs)
Unit – 5	Enzymes, proteins and amino acids as drugs: Vaccines, toxins and toxoids, immune globulins, antiserums, Vitamins, Antibiotics – chemical nature, mode of action. Pharmacological action of plant drugs – tumor inhibitors, PAF antagonists, antioxidants,	(12hrs)

III B. Sc – BOTANY Model paper (2021-2022)

SEMESTER- VI

PAPER – VIII Cluster – A

Paper – VIII-A-3: Title of the Paper: Pharmacognosy and Photochemistry

Time: 3 Hours

Max. Marks: 75

SECTION-A

Answer any FOUR of the following question

4x5=20M.

1. Classification of Drugs.
2. Catharanthus roseus.
3. Difference between Primary and Secondary Metabolites.
4. Terpenoids.
5. Flavonoids.
6. Aromatherapy
7. Vaccines.
8. Vitamins.

SECTION-B

Answer any Five of the following questions.

5x10=50M.

9. Give an account on Pharmacognosy ?
10. Write an essay on Drug Evolution methods ?
11. Write about nature and Active principles of *Adhatda vasica*, *Rauwfia serpentine* ?
12. Write about common Adulteration of *Zanzibar officinalis*, *Strychnos nuxvomica* ?
13. Give an Brief note on Extraction of Alkalods ?
14. Give an account of Acetate pathway ?
15. Write about Bio-Synthesis and Commercial importance of Steroids, Sterols, Cucurbitacins ?
16. Explain the role of Different Enzyme inhibitors ?

Guide lines for paper setter: (for Paper VI-BOT-604) W.e.f. 2021-22.

1. In Section A: Unit III, IV, V must carry two questions from each unit. Unit I, II, must carry One question.
2. In section-B: Set minimum two questions from Unit I, II & III and Set One Question from IV, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	1		2		
		5		20	25
Unit – II	1		2		
		5		20	25

Unit – III	2	2			
		10	20	30	
Unit-IV	2	1			
		10	10	20	
Unit-V	2	1			
		10	10	20	
Max. Q & marks	8	(x 5) = 40	8	(x 10) = 80	(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Mark s	Max. marks
	4		5		
		(4 x 5) = 20		(5 x 10) = 50	70

INTERNAL EXAMS - 30Mark

(20 mark for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.)

Pharmacognosy and Phytochemistry

SEMESTER- VI
Time: 3 Hours

BOT-VIII-604-A- 3 (CL)P
Max. Marks- 50

1. Physical and chemical tests for evaluation of unorganized drugs- Asaphoetida. Honey, Castor oil. Acacia
2. Identification of bark drugs – cinchona, cinnamom
3. Identification of fruit drugs – Cardamom, Coriander
4. Identification of root and rhizome drugs- Ginger, Garlic, Turmeric
5. Identification of whole plant – Aloes, Vinca, Punarnava
6. Herbarium of medicinal plants (minimum of 20 platns)
7. Collection of locally available crude drugs from local venders (minimum of 20)

Practical Question Paper

- I. Identify the given crude drugs **A & B** by Anatomical study and Morphological Study.....**2X5 = 10marks**
- II. Perform suitable chemical test and identify the given phytochemical **C**.....**05marks**

III. Comment on D and E2x3= 06 marks

IV. Herbarium and submission of drugs -.....5 marks

IV. Viva-Voce04 marks

Total..... **30Marks**

Internals

a. Record -05M

b. Attendance.....05M

c. Internal practical exam.....10M

Total.....**20Marks**

Total -----50M

KEY

A-Flower/fruit drugs

B-Rhizome/whole plant drugs

C- Tannins/ phenolics/steroids/ isoprenoids /Asaphoetida/ Honey/ Castor oil/ Acacia

D. Column Chromatography/ Gas Chromatogram/HPLC (photograph/ instrument used for chemical analysis of drugs.

BOOKS FOR REFERENCE:

1. Wallis, T. E. 1946. Text book of Pharmacognosy, J & A Churchill Ltd. 2. Roseline, A. 2011. Pharmacognosy. MJP Publishers, Chennai.
2. Gurdeep Chatwal, 1980. Organic chemistry of natural productis. Vol.I.Himalaya Publishing house.
3. Kalsi, P. S. and Jagtap, S., 2012. Pharmaceutical medicinal and natural Product chemistry N.K. Mehra . Narosa Publishing House Pvt. Ltd. New Delhi.
4. Agarwal, O. P. 2002. Organic chemistry–Chemistry of organic natural products. Vol. II. Goel publishing house , Meerut.

A.G.& S.G. SIDDHARTHA DEGREE COLLEGE OF ARTS & SCIENCE

Vuyyuru - 521165.

NAAC reaccredited at 'A' level

Autonomous -ISO 9001 – 2015 Certified

Title of the Paper: Plant Nursery Management

Offered to: BSc. BZC,AQU

Course Type: SDC

Year of Introduction: 2021-22

Year of Revision: --

Percentage of Revision: ---

Semester: II

Credits: 02

Hours Taught: 30 hrs. Per Semester
Hours

Hours per week: 2

Course Prerequisites: Knowledge of herbarium methodology studied in intermediate. **Course Description:** This course will provide one with a basic and comprehensive understanding of herbarium. Enable the student with depth of topics and helps them to gain an appreciation in collection and processing of specimens. On the other hand, importance of understanding maintenance of herbarium, handling of specimens provides an extensive knowledge to the student.

Course Objectives:

1. To study importance of nursery.
2. To study the basic requirements for nursery.
3. To study the management of nursery.
4. To study seasonal activities and routine operations in a nursery.
5. To study vegetative propagation techniques.

Course Outcomes: At the end of this course, students should be able to:

CO1: Understand the importance of plant nursery, basic infrastructure to establish it. CO2: Explain the basic material, tools and techniques required for nursery.

CO3: Demonstrate expertise related to various practices in a nursery

CO4: Comprehend knowledge and skills to get an employment or to become an entrepreneur in plant nursery sector.

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	Introduction to Plant Nursery 1. Plant nursery: definition, importance. 2. Different types of nurseries on the basis of duration, plant parts used for propagation. 3. Basic facilities for a nursery: layout and components of a good nursery 4. Plant propagation structures in brief 5. Bureau of Indian standards (BIS-2008) related to nursery.	6
II	Basic Requirements for Nursery 1. Nursery beds – types and precautions to be taken during preparation. 2. Growing media, nursery tools and implements, containers for plant nursery in brief. 3. Outlines of vegetative propagation techniques to produce planting material. 4. Sowing methods of seeds and planting material.	6
III	Management of Nursery 1. Seasonal activities and routine operations in a nursery. 2. Nursery management- watering, weeding and nutrients: pests and diseases. 3. Common possible errors in nursery activities. 4. Economics of nursery development, pricing and record maintenance. Online nursery information and sales systems.	6

Recommended Reference book:

1. Ratha Krishnan, M., et al (2014) plant nursery management: principles and practices, Central arid Zone Research Institute (ICAR), Jodhpur, Rajasthan.

2. Kumar, N., (1997) Introduction to Horticulture, Rajalakshmi Publications Nagercoil.

3. Kumar Mishra, N.K. Mishra and Satish Chand (1994) Plant Propagation, John Wiley & Sons. New Jersey

Course Delivery method: Face-to-face / Blended.

Course has focus on: Foundation/Skill Development

Websites of Interest: <https://youtu.be/Y6BgWWPFGss>

<https://www.youtube.com/watch?v=9Dc-NYGz-9w>.

MODEL QUESTION PAPER

PLANT NURSERY MANAGEMENT

Time: 2hrs

Max. Marks: 40

SECTION- A

2x5M=10 M

**Answer any TWO questions. Each answer carries 5 marks
(At least 1 question should be given from each Unit)**

1. Write a short note on Nursery.
2. Soil sterilization
3. Bio pesticides
4. Seed Scarification

SECTION B

3x10M = 30 M

Answer any three questions. Each answer carries 10 marks

(At least TWO question should be given from each Unit)

1. Write an essay on components of Model nursery?
2. Write an essay on Bureau of Indian Standards related to nursery?
3. Write an essay on Growing media?
4. What is layering? Explain different types of layering?
5. Write about nursery management?
6. Explain about Nursery diseases and their management?

**A.G& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS &
SCIENCE**

VUYYURU-521165, KRISHNA Dt., A.P.(Autonomous)

Accredited by NAAC with "A" Grade

2021-2022



DEPARTMENT OF BOTANY

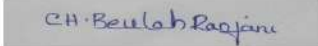


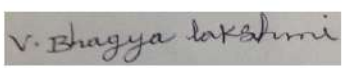


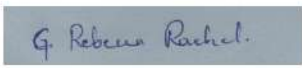
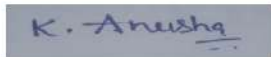
MINUTES OF BOARD OF STUDIES

ODD SEMESTER

27-10-2021

Minutes of the meeting of Board of studies in Botany for the Autonomous courses of AG & SG Siddhartha Degree College of Arts & Science, Vuyyuru, held at 10:30 A.M on 27-10-2021 in the Department of Botany through online.

Members Present:-

- 1)..........Chairman Head, Department of Botany
(Smt. CH. Beulah Ranjani) AG & SG S Degree College of Arts &
Science
Vuyyuru- 521165.
- 2)..........University Department of Botany &
(Sri. Dr. K. Ramesh) Nominee Head (I/c) Botany,
The Hindu College, Guntur .
- 3)..........Academic Lecture in Botany,
(Sri. Dr. Ch. Srinivasa Reddy) Council Nominee SRR& CVR Govt. Degree College,
Vijayawada, 520004.
- 4)..........Academic Head, Department of Botany
(Smt. V. Bhagya Lakshmi) Council Nominee SDMSK,
Vijayawada,
- 5)..........Industrialist. Natural farming.
(Sri. S. Krishna Suman) yakamuru
Vuyyuru, Krishna d.t
- 6)..........Member Ad hoc Lecturer in Botany
(Sri. N. Ramana Rao) AG & SGS Degree College of Arts &
Science (Autonomous),
Vuyyuru-521165.
- 7)..........Member Ad hoc Lecturer in Botany
(Ms. G. Rebecca Rachel) AG & SGS Degree College of Arts &
Science (Autonomous),
Vuyyuru-521165.
- 8)..........student representative Lecturer in chaitanya college,
(Ms K. Anusha MSc) Gudiwada

Agenda for B.O.S Meeting:

1. To recommend the syllabi (Theory & Practical), Model question paper for I Semester of I B.Sc (BZC, AQUA) in the academic year 2021-22.
2. To recommend the syllabi (Theory & Practical), Model question paper & Guide lines for III Semester of II B.Sc (BZC,AQUA) in the academic year 2021-22.
3. To recommend the syllabi (Theory & Practical), Practical syllabus, Model question paper & Guide lines for V Semesters of III B. Sc (BZC, AQUA) for the academic year 2021-22
4. To recommend the Blue print for the Semester –End exams for I, III & V Semesters of I, II & III B. Sc (BZC, AQUA) for the academic year 2021-22.
5. To recommend the teaching and evaluation methods to be followed under Autonomous statues.
6. Any other matter.

CH Beulah Rajan

Chairman

RESOLUTIONS

1. It is resolved to continue the same syllabi (Theory & Practical), model question paper & guide lines to be followed by the question paper setters of Botany of I semester of I B.Sc (B.Z.C, AQUA) under Choice Based Credit System (CBCS) approved by the Academic Council of 2021-22.
2. It is resolved to implement the syllabi (Theory & Practical), model question paper & guide lines to be followed by the question papers under Choice Based Credit System (CBCS) setters of Botany of III semesters of II B.Sc. (B.Z.C, AQUA) approved by the Academic Council of 2021 -22.
3. It is resolved to implement the same syllabi & model papers under Choice Based Credit System (CBCS) setters of Botany of V semesters of III B.Sc. (B.Z.C, AQUA) approved by the Academic Council of 2021-22.
4. It is resolved to continue the same Blue prints of I, III & V Semesters of B. Sc Botany for the Academic year 2021-22..
5. It is resolved to continue the following teaching and evolution methods for the Academic year 2021-22.
6. Any other matter.

Teaching methods:

- Besides the conventional methods of teaching, we use modern technology i.e. Using of OHP and LCD projector to display on U boards etc; for better understanding of concepts.

Evaluation of a student is done by the following procedure:

I. Internal Assessment Examinations:

- **Out of maximum 100 marks** in each paper for **II & III B.Sc** , **30 marks** shall be allocated for internal assessment.
- Out of these 30 marks, 20 marks are allocated for announced tests. Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks are allocated on the basis of candidate's percentage of attendance, 5 marks for seminars / assignments for the III & V semesters.
- It is resolved to continue the same as approved by Academic Council in 2021-22.
- There is no pass minimum for internal assessment for I,II,III B.Sc
- **Out of maximum 100 marks** in each paper for **I B.Sc**, **25marks** shall be allocated for internal assessment.
- Out of these 25 marks, 20 marks are allocated for announced tests. Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks are allocated on the basis of candidate's percentage of attendance / assignments for the I semester.

II. Semester-End Examinations:

- The maximum marks for I B.Sc (BZC, AQUA) Semester - End examinations shall be 75 marks and duration of the examination shall be 3 Hours.
- The maximum marks for II & III B.Sc (BZC, AQUA) Semester-End examinations shall be 70 marks and duration of the examination shall be 3 Hours. Even through the candidate is absent for two IA-EXAMS /obtain zero marks the external marks are consider (if the candidate gets 40/70) and the result shall be declared as "PASS"
- Semester-End examinations shall be conducted in theory papers at the end of every semester while in practical papers; these examinations are conducted at end of I, III, & V semesters.
- Discussed and recommended for organizing Seminars, Guest lectures, Work-shops to upgrade the Knowledge of students, for the approval of the Academic Council.

Note: Only for the semester I, we are following same syllabus, question paper, guidelines of P.B. Siddhartha degree college & SDMS Mahila kalasala .

Chairman

Course Structure of BZC, AQUA Syllabus

year	semester	Paper code	Title of the paper	Marks(100)		Credits
				Internal assessment	End semester	
I	I	BOTIIA	Fundamentals of Microbes and Non-vascular plants	25	75	4
			Practical-I	10	40	2
II	III	BOT-301	Anatomy of angiosperms, Plant Ecology and Biodiversity	30	70	3
			Practical-III	25	25	2
III	V	BOT-501	Cell Biology, Genetics and Plant Breeding.	30	70	3
			Practical-v – 501	15	35	2
III	V	BOT-502	Plant ecology and Phyto geography	30	70	3
			Practical-v- 502	15	35	2

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Vuyyuru- 521165.

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Title of the Paper: Fundamentals of Microbes and Non-vascular Plants

Semester : I

Course Code	BOT11A	Course Delivery Method	Class Room / Blended Mode - Both
Credits	4	CIA Marks	25
No. of Lecture Hours / Week	4	Semester End Exam Marks	75
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :	Year of Offering:	Year of Revision:	Percentage of Revision:

Learning Objectives:

On successful completion of this course, the students will be able to:

1. To understand origin of life on the earth and analyze structure, disease symptoms and transmission of plant viruses.
2. To understand the diversity and characteristics of Prokaryotes.
3. To understand the characteristics of Fungi and Lichens.
4. To understand the characteristics of Algae.
5. To understand the characteristics of Bryophyta.

PREREQUISITE

- Knowledge of microbes, thallophytes and Bryophytes at +2 level

COURSE OUTCOMES

By the end of the course students will be able to

CO 1	Explain origin of life on the earth.
CO 2	Illustrate diversity among the viruses and prokaryotic organisms and can categorize them.
CO 3	Analyze and ascertain the plant disease symptoms due to viruses, bacteria and fungi.
CO 4	Classify fungi, lichens, algae and bryophytes based on their structure, reproduction and life cycles.
CO 5	Evaluate the ecological and economic value of microbes, thallophytes and bryophytes.

SYLLABUS

UNIT – I	<p style="text-align: center;">Origin of life and viruses</p> <p>Origin of life, concept of primary Abiogenesis; Miller and Urey experiment. Five kingdoms classification of R.H. Whittaker. Discovery of microorganisms, Pasteur experiments, germ theory of diseases. Shape and symmetry of viruses; structure of TMV and Gemini virus; multiplication of TMV, a brief account of Prions and Viroids A general account on symptoms of plant diseases caused by Viruses. Transmission of plant viruses and their control. Significance of viruses in vaccine production, bio-pesticides</p>
UNIT – II	<p style="text-align: center;">Special groups of Bacteria and Eubacteria</p> <p>Brief account of Archaeobacteria, Actinomycetes and Cyanobacteria. Cell structure and nutrition of Eubacteria. Reproduction- Asexual (Binary fission and endospores) and bacterial recombination (Conjugation, Transformation, Transduction). Economic importance of Bacteria with reference to their role in Agriculture and industry (fermentation and medicine) A general account on symptoms of plant diseases caused by Bacteria; Citrus canker</p>
UNIT – III	<p style="text-align: center;">Fungi & Lichens</p> <p>General characteristics of fungi and Ainsworth classification (upto classes). Structure, reproduction and life history of (a) <i>Rhizopus</i> (Zygomycota) and (b) <i>Puccinia</i> (Basidiomycota). Economic uses of fungi in food industry, pharmacy and agriculture. A general account on symptoms of plant diseases caused by Fungi; Blast of Rice. Lichens- structure and reproduction.</p>
UNIT – IV	<p>General characteristics of Algae (pigments, flagella and reserve food material), Fritsch classification (upto classes). Thallus organization and life cycles in Algae. Occurrence, structure, reproduction and life cycle of a) <i>Spirogyra</i> (Chlorophyceae) and (b) <i>Polysiphonia</i> (Rhodophyceae). Economic importance of Algae</p>
UNIT – V	<p style="text-align: center;">Bryophytes</p> <p>5.1. General characteristics of Bryophytes; classification upto classes. 5.2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life cycle of (a) <i>Marchantia</i> (Hepaticopsida) and (b) <i>Funaria</i> (Bryopsida). General account on evolution of sporophytes in Bryophyta</p>

Text books:

1. Botany – I (Vrukshasastram-I) : Telugu Akademi, Hyderabad
2. Pandey, B.P. (2013) *College Botany, Volume-I*, S. Chand Publishing, New Delhi

Books for Reference:

1. Prescott, L. Harley, J. and Klein, D. (2005)*Microbiology, 6th edition*, Tata McGraw –Hill Co. New Delhi.
2. Alexopoulos, C.J., C.W.Mims&M.Blackwell (2007) *Introductory Mycology*, Wiley& Sons, Inc., New York
3. Fritsch, F.E. (1945)*The Structure & Reproduction of Algae (Vol. I & Vol.II)*Cambridge University Press Cambridge, U.K..

A .G & S .G. SIDDHARTHA DEGREE COLLEGE OF ARTS AND SCIENCE, VUYYURU

(An Autonomous college in the jurisdiction of Krishna University)

MODEL QUESTION PAPER- Theory Examination(s) at Semester end 2021-2022

TITLE OF THE PAPER: Fundamentals of Microbes and Non-vascular Plants (Viruses, Bacteria, Fungi, Lichens, Algae and Bryophytes) Course Code: BOTT11A

Max. Time: 3 Hrs.

Max. Marks: 75 M

SECTION – A

**Answer FIVE of the following questions. Draw labelled diagrams wherever necessary. 5 x 5=25M
ONE question should be given from each Unit in the syllabus.**

1. Five kingdom classification of Whittaker **CO1-L2**
2. Germ theory of diseases **CO1-L2**
3. Which groups of organisms are once considered as algae? Give an account of general characters of that group **CO2- L1**
4. What are the symptoms of citrus canker? Mention the causal organism of citrus canker. **CO2- L2.**
5. Ainsworth classification of fungi **CO-3 L2**
6. Why lichens are considered as unique and composite organisms? **CO-3 L1**
Why diplobiontic life cycle is called so? Mention an alga that shows diplobiontic life cycle. List out the phases exhibited in one such life cycle studied by you. **CO-4 L1**
8. Vegetative reproduction in Bryophytes. **CO5-L2**

SECTION – B

Answer the following questions.

5x10= 50 M

Two questions (A & B) are to be given from each Unit in the syllabus (internal choice in each unit). Student has to answer 5 questions by choosing one from a set of questions given from a Unit.

- 9 a) Give an account of structure and multiplication of TMV? **CO1- L2**
OR
b) Explain the significance of viruses in vaccine production, bio-pesticides . **CO1-L2**
10. a) Whether bacteria exhibit sexual reproduction or not ? Elucidate different methods of bacterial recombination. **CO2- L2**
OR
b) Explain the role of bacteria in agriculture and industry . **CO2- L2**
- 11 a) Why *Puccinia* is called as macro cyclic rust? Explain the stages of the fungus on Primary host. **CO3-L1.**
OR
b) Why lichens are considered as ‘pioneers of colonization’? Write about reproduction in Lichens. **CO3-L1**
- 12 a). What is thallus? Describe various types of thalli found in algae. **CO4-L2**
OR
b) Explain life cycle of *Spirogyra* . **CO-4 L2**
13. a) Describe morphological and anatomical features of *Marchantia*. **CO5- L2**
OR
b) What is the dominant phase in the life cycle of bryophytes?
Give account on of sporophyte evolution in Bryophytes. **CO5-L 2**

A .G & S .G. SIDDHARTHA DEGREE COLLEGE OF ARTS AND SCIENCE, VUYYURU

(An Autonomous college in the jurisdiction of Krishna University)

Practical Syllabus

SEMESTER- I

PAPER- I

CREDITS : 02

BOTANY	BOTT11A	WEF: 2021-2022	B. Sc (BZC), AQUA
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Title of the paper: Fundamentals of Microbes and Non-vascular Plants

(Viruses, Bacteria, Fungi, Lichens, Algae and Bryophytes)

NO OF HOURS: 30

Learning outcomes: On successful completion of this practical course, student shall be able to

- Demonstrate the techniques of use of lab equipment, preparing slides and identify the material and draw diagrams exactly as it appears.
- Observe and identify microbes and lower groups of plants on their own.
- Demonstrate the techniques of inoculation, preparation of media etc.
- Identify the material in the permanent slides etc.

Practical Syllabus:

1. Knowledge of Microbiology laboratory practices and safety rules.
2. Knowledge of different equipment for Microbiology laboratory (Spirit lamp, Inoculation loop, Hot-air oven, Autoclave/Pressure cooker, Laminar air flow chamber and Incubator) and their working principles. (In case of the non- availability of the laboratory equipment the students can be taken to the local college/clinical lab. with required infrastructural facilities or they can enter a linkage with the college/lab for future developments and it will fetch credits during the accreditation by NAAC).
3. Demonstration of Gram's staining technique for Bacteria.
4. Study of Viruses (Corona, Gemini and TMV) using electron micrographs/ models.
5. Study of Archaeobacteria and Actinomycetes using permanent slides/ electron micrographs/diagrams.
6. Study of *Anabaena* and *Oscillatoria* using permanent/temporary slides.
7. Study of different bacteria (Cocci, Bacillus, Vibrio and Spirillum) using permanent or temporary slides/ electron micrographs/ diagrams.
8. Study/ microscopic observation of vegetative, sectional/anatomical and reproductive structures of the following using temporary or permanent slides/ specimens/ mounts
 - a. Fungi : *Rhizopus*, *Penicillium* and *Puccinia*.
 - b. Lichens: Crustose, foliose and fruticose

c. Algae : *Volvox*, *Spirogyra*, *Ectocarpus* and *Polysiphonia*

d. Bryophyta : *Marchantia* and *Funaria*

9. Study of specimens of Tobacco mosaic disease, Citrus canker and Blast of Rice.

Suggested Manuals:

1. Vasista, B.R. (2018). Botany for degree students - Algae - S. Chand and company Ltd., New Delhi.

2. Dubey, H.C (2018). A text book of Fungi, bacteria and Viruses. Vikas publishing House, New Delhi.

3. Smith, G.M (1955). Cryptogamic Botany (Vol. I Algae, Fungi, & Lichens)

McGraw-Hill Book Co., New York

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(An Autonomous college in the jurisdiction of Krishna University)

MODEL QUESTION PAPER FOR PRACTICAL EXAMINATION

Semester – I/ Botany Core Course – I

**TITLE OF THE PAPER: Fundamentals of Microbes and Non-vascular Plants
(Viruses, Bacteria, Fungi, Lichens, Algae and Bryophytes)**

Max. Time: 3 Hrs.

Max. Marks: 40

1. Take the T.S. of material 'A' (Fungi), make a temporary mount and make comments about identification. 8M
2. Identify any 2 algae from the mixture (material 'B') given with specific comments about identification. 8M
3. Take the T.S. of material 'C' (Bryophyta), make a temporary mount and make comments about identification. 8M
4. Identify the following with specific reasons 4x2=8M
 - A. A laboratory equipment of Microbiology
 - B. B. Virus
 - C. Archaeobacteria /Ascomycete /Cyanobacteria/ Eu-Bacteria
 - D. Lichen
5. Record + Viva-voce 5+3 = 8 M

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Vuyyuru - 521165.

NAAC reaccruited at 'A' level

Autonomous -ISO 9001 – 2015 Certified

Title of the Paper: Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity

Semester: III

Course Code	BOT301C	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2017-18	Year of Offering: 2021 - 22	Year of Revision:2021 - 22	Percentage of Revision: 50 %

Learning Objectives:

On successful completion of this course, the students will be able to:

1. To understand Anatomy of Angiosperms - organization of tissues and tissue systems in plants..
2. To understand the various aspects of embryology.
3. To understand the basic concepts of plant ecology.
4. To understand the various parameters of population and community ecology.
5. To understand the importance of biodiversity

THEORY: Learning outcomes:

- On successful completion of this course, the students will be able to;
 - Understand on the organization of tissues and tissue systems in plants.
 - Illustrate and interpret various aspects of embryology.
 - Discuss the basic concepts of plant ecology, and evaluate the effects of environmental and biotic factors on plant communities.
 - Appraise various qualitative and quantitative parameters to study the population and community ecology.
 - Correlate the importance of biodiversity and consequences due to its loss.
 - Enlist the endemic/endangered flora and fauna from two biodiversity hot spots in India and assess strategies for their conservation.
-

SYLLABUS

Unit – 1	Anatomy of Angiosperms Organization of apical meristems: Tunica-carpus theory and Histogen theory. Tissue systems–Epidermal, ground and vascular. Anomalous secondary growth in <i>Boerhaavia</i> and <i>Dracaena</i> . Study of timbers of economic importance - Teak, Red sanders and Rosewood.
Unit – 2	Embryology of Angiosperms Structure of anther, anther wall, types of tapetum. Microsporogenesis and development of male gametophyte. Structure of ovule, megasporogenesis; monosporic (<i>Polygonum</i>), bisporic (<i>Allium</i>) and tetrasporic (<i>Peperomia</i>) types of embryo sacs. Outlines of pollination, pollen – pistil interaction and fertilization. Endosperm - Types and biological importance - Free nuclear, cellular, helobial and ruminant. Development of Dicot (<i>Capsella bursa-pastoris</i>) embryo.
Unit – 3	Basics of Ecology Ecology: definition, branches and significance of ecology. Ecosystem: Concept and components, energy flow, food chain, food web, ecological pyramids. Plants and environment: Climatic (light and temperature), edaphic and biotic factors. Ecological succession: Hydrosere and Xerosere.
Unit – 4	Population, Community and Production Ecology Population ecology: Natality, mortality, growth curves, ecotypes, ecads Community ecology: Frequency, density, cover, life forms, biological spectrum Concepts of productivity: GPP, NPP and Community Respiration Secondary production, P/R ratio and Ecosystems
Unit – 5	Basics of Biodiversity Biodiversity: Basic concepts, Convention on Biodiversity - Earth Summit. Value of Biodiversity; types and levels of biodiversity and Threats to biodiversity Biodiversity Hot spots in India. Biodiversity in North Eastern Himalayas and Western Ghats. Principles of conservation: IUCN threat-categories, RED data book Role of NBPGR and NBA in the conservation of Biodiversity.

Text books:

1. Botany – III (Vrukshasastram-I) : Telugu Akademi, Hyderabad
2. Botany – IV (Vrukshasastram-II) : Telugu Akademi, Hyderabad
3. Pandey, B.P. (2013) *College Botany, Volume-II*, S. Chand Publishing, New Delhi

Books for Reference:

- Esau, K. (1971) *Anatomy of Seed Plants*. John Wiley and Son, USA.
- Paula Rudall (1987) *Anatomy of Flowering Plants: An Introduction to Structure and Development*. Cambridge University Press, London
- Bhojwani, S. S. and S. P. Bhatnagar (2000) *The Embryology of Angiosperms (4th Ed.)*, Vikas Publishing House, Delhi.

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BOTANY	BOT- 301C	w.e.f. 2021-22	B. Sc. (BZC), AQUA
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II B. Sc – BOTANY

Model Question Paper

SEMESTER- III

PAPER-III: Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity

Time: 3 Hours

Max. Marks: 70

SECTION-A

Answer any **four** of the following questions.

4x 5 = 20Marks

(Draw diagrams wherever necessary)

1. Histogen theory.
2. Rosewood.
3. Ruminant endosperm
4. Energy flow
5. Significance of ecology.
6. Natality
7. GPP.
8. NBPGR

SECTION-B

Answer any **five** of the following questions.

5x10 = 50Marks

(Draw diagrams wherever necessary)

9. Explain about Organization of apical meristems:
10. Describe the Anomalous secondary growth in *Boerhaavia*?
11. Write an essay on ICBN.
12. Describe vegetative & floral characters of Asclepiadaceae.
13. Write an essay on ecological pyramids?
14. What is Ecological succession: Write an essay on Hydrosere?
15. Write the characteristics of population ecology?
16. Give an account of Value of Biodiversity?

Guide lines for paper setter: (for Paper III – BOT- 301) w.e.f 2021-22

1. In **section A**: Unit II, V must carry **one** question, Unit I,III & IV must carry **two** questions.
2. In **section- B**: Set minimum **two** questions from Unit I, II, III . **One** question each from Unit IV and Unit V.
3. See the following table and Model paper for marks distribution.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
	10		20		30
Unit - II	1		2		
	05		20		25
Unit – III	2		2		
	10		20		30
Unit – IV	2		1		
	10		10		20
Unit – V	1		1		
	05		10		15
Max. Q & marks	8	(x 5) = 40	8	(x 10) = 80	(Total questions =16) Total marks = 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4	(4 X 5M) = 20 M	5	(5 X 10M)= 50 M	70M

INTERNAL EXAMS - 30Marks

(20 marks for unit tests, 5marks for Attendance **5** marks for seminars)

Practical syllabus of Botany Core Course – 3 /Semester – III

Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity

(Total hours of laboratory exercises 30 Hrs. @ 02 Hrs./Week)

Course Outcomes:

On successful completion of this practical course students shall be able to:

1. Get familiarized with techniques of section making, staining and microscopic study of vegetative, anatomical and reproductive structure of plants.
2. Observe externally and under microscope, identify and draw exact diagrams of the material in the lab.
3. Demonstrate application of methods in plant ecology and conservation of biodiversity and qualitative and quantitative aspects related to populations and communities of plants.

Practical Syllabus

1. Tissue organization in root and shoot apices using permanent slides.
2. Anomalous secondary growth in stems of *Boerhavia* and *Dracaena*.
3. Study of anther and ovule using permanent slides/photographs.
4. Study of pollen germination and pollen viability.
5. Dissection and observation of Embryo sac haustoria in *Santalum* or *Argemone*.
6. Structure of endosperm (nuclear and cellular) using permanent slides / Photographs.
7. Dissection and observation of Endosperm haustoria in *Crotalaria* or *Coccinia*.
8. Developmental stages of dicot and monocot embryos using permanent slides / photographs.
9. Study of instruments used to measure microclimatic variables; soil thermometer, maximum and minimum thermometer, anemometer, rain gauge, and lux meter. (visit to the nearest/local meteorology station where the data is being collected regularly and record the field visit summary for the submission in the practical).
10. Study of morphological and anatomical adaptations of hydrophytes and xerophytes (02 each).
11. Quantitative analysis of herbaceous vegetation in the college campus for frequency, density and abundance.
12. Identification of vegetation/various plants in college campus and comparison with Raunkiaer's frequency distribution law.
13. Find out the alpha-diversity of plants in the area.
14. Mapping of biodiversity hotspots of the world and India

Model paper for Practical Examination

Semester – III/ Botany Core Course – 3

Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity

Max. Time: 3 Hrs.

Max. Marks: 50

1. Take T.S. of the material 'A' (Anatomy), prepare a temporary slide and justify the identification with specific reasons. 7M
2. Write the procedure for the experiment 'B' (Embryology) and demonstrate the same. 6M
3. Take T.S. of the material 'C', prepare a temporary slide and justify the identification with specific reasons. 4M
4. Identify the following with specific reasons. 4 x 2 = 8 M
D. Anatomy/Embryology
E. Ecology instrument
F. Mapping of Biodiversity hot spot
G. Endemic/endangered plant/animal

Total Marks: 25

Internals:

1. Record 10M
2. Viva-voce3M
3. Field trip4M
4. Internal practical exam 8M

Total Marks:25

Total marks: 50

Suggested co-curricular activities for Botany Core Course-3 in Semester-III:

A. Measurable :

a. Student seminars :

1. Anatomy in relation to taxonomy of Angiosperms.
2. Nodal anatomy
3. Floral anatomy
4. Embryology in relation to taxonomy of Angiosperms.
5. Apomictics and polyembryony.
6. Biogeochemical cycles- Carbon, Nitrogen and Phosphorous.
7. Deforestation and Afforestation.
8. Green house effect and ocean acidification.
9. The Montreal protocol and the Kyoto protocol.
10. Productivity of aquatic ecosystems.
11. Mangrove ecosystems in India.
12. Kollerulake – Ramsar site.
13. Biodiversity hotspots of the world.
14. Origin of Crop plants - Vavilov centers
15. Agrobiodiversity
16. International organizations working on conservation of Biodiversity
17. Nagoya protocol – ABS system.
18. Endemic and endangered plants in Andhra Pradesh.

b. Student Study Projects :

1. Stomata structure in plants from college campus/ their native place.
2. Report on xylem elements in plants using maceration technique.
3. Collection of information on famous herbaria in the world and preparation of a report.
4. Microscopic observations on pollen morphology from plants in college Campus/ their native locality.
5. Study report on germination and viability of pollen in different plants.
6. Observation of anthesis time in different plants and their pollinators.
7. A report on autecology and synecology of some plants in college campus or their native place.
8. Collection of photos of endemic/endangered plant and animal species to Make an album.

9. Biodiversity of the college or their own residential/ native area.
10. Collection of seeds/vegetative organs of rare plant species from their localities and to raise/grow in college garden

C .Assignments: Written assignment at home / during 'O' hour at college; preparation of charts with drawings, making models etc., on topics included in syllabus.

B. General :

1. Visit to an arboretum/silviculture station/Forest research institute to see the live timber yielding plants or to visit a local timber depot. to observe various woods.
2. Field visit to a nearby ecosystem to observe the abiotic-biotic relationships.
3. Visit to National park/Sanctuary/Biosphere reserve etc., to observe in-situ conservation of plants and animals.
4. Visit to a Botanical garden or Zoo to learn about ex-situ conservation of rare plants or animals.
5. Group Discussion (GD)/ Quiz/ Just A Minute (JAM) on different modules in syllabus of the course.

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Title of the Paper: Cell Biology, Genetics and Plant Breeding

Semester : V

Course Code	BOT-501	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2017-18	Year of Offering: 2017 - 18 2021-22	Year of Revision:2021 - 22 2021-22	Percentage of Revision: 50 %

Learning Objectives:

On successful completion of this course, the students will be able to:

1. To understand the Cell, Structure and functions
2. To understand the Genetic Material
3. To understand the basic concepts of plant ecology.
4. To understand the various parameters of population and community ecology.
5. To understand the importance of biodiversity

SYLLABUS

UNIT-I	Cell Biology Cell, Ultra Structure and functions of cell wall. Molecular Organization of cell membranes. Chromosomes; morphology, organization of DNA in a chromosome (Nucleosome model) Euchromatin and Heterochromatin.
UNIT-II	Genetic Material DNA as the Genetic Material: Griffith's and Avery's Transformation Experiment. Hershey - Chase Bacteriophage experiment. DNA Structure (Watson & crick model) and replication of DNA (SemiConservative). Types of RNA (mRNA, tRNA, rRNA), their structure and function.
UNIT- III	Mendelian Inheritance Mendelian Inheritance (Mono – Di-hybrid Crosses), Back cross and Text cross. Linkage: concept, complete and In-complete Linkage, Coupling and Repulsion; Linkage Maps Based on Two and Three Point cross. Crossing over concept and significance.
UNIT-IV	Gene Expression Organization of gene, Transcription and Translation. Mechanism and regulation of Gene Expression in Prokaryotes (Lac operon). Mutations: Chromosomal Aberrations, Gene Mutations and Transposable Elements
UNIT-V	Plant Breeding Introduction and objectives of Plant Breeding. Methods of Crop Improvement: Procedure, Advantages and limitations of Introduction, Selection and Hybridization (Out lines only).

B.Sc – BOTANY
SEMESTER -V. THEORY MODEL PAPER

Time: 3 Hours

Max. Marks: 70

SECTION-A

Answer any FOUR of the following question
(Draw diagrams wherever necessary)

4 x 5=20M.

1. Nucleosome
2. Griffith experiment.
3. t RNA
4. Back cross and test cross.
5. Transcription.
6. Three point test cross.
7. Hybridization.
8. Crossing over.

SECTION-B

Answer any FIVE of the following questions.
(Draw diagrams wherever necessary)

5 x 10 = 50M.

9. Describe the Ultra structure and functions of cell membrane.
10. What is cell theory? Write about eukaryotic cell components.
11. Write about structure and replication of DNA.
12. DNA as a genetic material proof with suitable experiments.
13. Explain the Mendel's law of inheritance.
14. Define linkage. Describe the different types of Linkage.
15. Write an essay on mechanism and Regulation of gene Expression in Prokaryotes.
16. Discuss about methods of Crop improvement.

Guide lines for paper setter: (for Paper V-BOT-501) W.e.f. 2021-22

1. In Section A: Unit I, III, V must carry one question from each unit. Unit II must carry 2 questions and Unit IV must carry three questions.
2. In section-B: Set minimum Two questions from Unit I, II & III
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section - A		Section - B		Weightage in Marks
	Questions	Marks	Questions	Marks	
Unit – I	1		2		
		5	20		25
Unit – II	2		2		
		10	20		30
Unit –III	1		2		
		5		20	25
Unit-IV	3		1		
		15		10	25
Unit-V	1		1		
		5		10	15
Max .Q & marks	8	(x 5) =40	8	(x 10) = 80	(Total questions =16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		
		(4 x 5) = 20		(5 x 10) = 50	70

INTERNAL EXAMS - 30Marks

(20 marks for unit tests, 5marks for Attendance 5 marks for seminars)

III B.SC-BOTANY Practical paper
Cell Biology, Genetics and Plant Breeding

SEMESTER-V

BOT-501-P

Time: 3hr

Total hours of teaching 30hrs @ 2 hrs per week

Max.marks:50

1. Study of the structure of cell organelles through photomicrographs.
2. Study of plant cell through temporary mounts.
3. Study of various stages of mitosis using cytological preparation of Onion root tips.
4. Study of DNA packing by micrographs.
5. Numerical problems solving Mendal's Laws of inheritance.
6. Chromosome mapping using 3 point test cross data.
7. Hybridization techniques –emasulation. Bagging (for demonstration only).
8. Field visit to a plant breeding research station.

III B.SC-SEMESTER-V, BOTANY PRACTICAL MODEL PAPER

PAPER –V: CELL BIOLOGY GENETICS AND PLANT BREEDING

1. Perform the Experiment A Squash technique.....12M
2. Give the experimental protocol of the experiments. B.....04M
3. Solving numerical problems on Mendelian inheritance....C, D.....2x7½=15M
4. Record.....05M
- Viva.....04M
- Internal Practical Exam.....10M

III B.SC-BOTANY Syllabus SEMESTER-V

Practical paper – V: Cell Biology, Genetics and Plant Breeding

Total hours of teaching 30hrs @ 2 hrs per week

1. Perform the Experiment A.

Squash technique	4M
Procedure.....	4M
diagram	2M =10

2. Give the experimental protocol of the experiments. B.....4M

3. Genetic problem C, D

Salvation of problem.....	5M
Reasoning.....	2\2M
	2X71\2=15M

Viva

Internal:

a) Record.....	5 M.
b)Internal Practical Exam.....	10M

Books for Reference:

1. Old, R.W. and Primrose S.B. 1994, Principles of Gene Manipulation Blackwell Science, 19 London 2. Grierson, D. and Convey S.N. 1989, Plant Molecular Biology, Blackie Publishers, New York.
2. Lea, P.J. and Leegood R.C. 1999, Plant Biochemistry and Molecular Biology, John Wiley and Sons, London.
3. Power C.B., 1984, Cell Biology, Himalaya Publishing Co. Mumbai
4. De. Robertis and De Robertis, 1998, Cell and Moleceular Biology, K.M. Verghese and Company .

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Vuyyuru - 521165.

NAAC recredited at 'A' level

Autonomous -ISO 9001 – 2015 Certified

Title of the Paper: PLANT ECOLOGY & PHYTOGEOGRAPHY

Semester : V

Course Code	BOT-502	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2017-18	Year of Offering: 2017 - 18 2021-22	Year of Revision:2021 - 22 2021-22	Percentage of Revision: 50 %

Learning Objectives:

On successful completion of this course, the students will be able to:

1. To understand the elements of ecology.
2. To understand the ecosystem
3. To understand the basic concepts of plant ecology.
4. To understand the various parameters of population and community ecology.
5. To understand the importance of biodiversity

SYLLABUS

UNIT-I	ELEMENTS OF ECOLOGY Ecology: Definition, branches and significance of ecology. Claimatic factors: Light, Temperature. Edaphic factor: Origin, formation, composition and soil profile. Biotic factor, Ecological adaptations of Plants.
Unit- II	Ecosystem Ecology Ecosystem: concept and components, energy flow, food chain, food web, Ecological Pyramids. Productivity of ecosystem-Primary, Secondary and Net productivity. Biogeochemical cycles- Carbon, Nitrogen and Phosphorous.
Unit - III	Population & Community ecology Population- defination, characteristics and importance (Density, Natality, Mortality, Growth Curves) outlines- ecotypes. Plant communities- characters of a community, outlines – Frequency, density, cover, life forms, Biological Spectrum. Ecological Succession: Hydrosere and Xerosere.
Unit-IV	Phytogeography Principles of Phytogeography, Distribution (Wides, Endemic, Discontinuous species). Phytogeography regions of India. Endemism – types and Causes.
Unit-V	Plant Biodiversity and its Importance Definition, Levels of Biodiversity – genetic, species and ecosystem. Biodiversity and Hot-spots of India: North Eastern, Himalayas and Western Ghats. Loss of Biodiversity-causes and Conservation (In-situ and Ex-Situ Methods).

B.Sc – BOTANY

SEMESTER –VI THEORY MODEL PAPER

PLANT ECOLOGY & PHYTOGEOGRAPHY

Time: 3 Hours

Max. Marks: 70

SECTION-A

Answer any FOUR of the following question.

4 x 5= 20M.

(Draw diagrams wherever necessary)

1. Soil profile.
2. Biotic factor.
3. Food web.
4. Energy Flow in Ecosystem.
5. Natality.
6. Biological Spectrum
7. Endemism.
8. Red-Data book.

SECTION-B

Answer any Five of the following questions.

5 x 10 = 50M.

(Draw diagrams wherever necessary)

9. Discusses the importance of Temperature Factor on Plant Growth.
10. Briefly Discuss the Ecological Adaptations of Xerophytes.
11. What are Ecological Pyramids? Describe the Pyramids of numbers, Biomass and Energy.
12. What are biogeochemical cycles? Give an account of Nitrogen cycle?
13. What is Plant Succession? Describe Hydrosere?
14. What are the Characters of Plant Communities?
15. What are Principles of Plant Phytogeography?
16. What is Biodiversity? Explain the Levels of Biodiversity.

Guide lines for paper setter: (for Paper V-BOT-502) W.e.f. 2021-22

1. In Section A: Unit I, II, III, must carry Two question from each unit. Unit IV, V must carry one question.
2. In section-B: Set minimum two questions from Unit I, II & III and Set One Question from IV, V.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section – A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
		10		20	30
Unit – II	2		2		
		10		20	30
Unit – III	2		2		
		10		20	30
Unit-IV	1		1		
		5		10	15
Unit-V	1		1		
		5		10	15
Max. Q & marks	8	(x 5) = 40	8	(x 10) = 80	(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Mark s	Max. marks
	4		5		
		(4 x 5) = 20		(5 x 10) = 50	70

INTERNAL EXAMS – 30 Marks

(20 marks for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.)

BOTANY PRACTICAL
PLANT ECOLOGY & PHYTOGEOGRAPHY

SEMESTER- V

BOT-502-P

Total hours of teaching 30 hrs @ 3 hrs per week

1. Study of instruments used to measure microclimatic variables; soil thermometer, maximum and minimum thermometer, anemometer, psychrometer, rain gauge, and lux meter.
2. Permeability (percolation; total capacity as well as rate of movement) of different soil samples.
3. Determination of soil pH
4. Study of morphological and anatomical adaptations of hydrophytes and xerophytes. (4each)
5. Determination of minimal quadrat size for the study of herbaceous vegetation in the college campus by species area curve method.
6. Study of Phytoplankton and macrophytes from water bodies.
7. Study of species diversity index of vegetation.
8. Estimation of Primary Productivity of an ecosystem.
9. To study field vegetation with respect to stratification, canopy cover and composition.
10. Study of plants included in agro forestry and social forestry.
11. To locate the hotspots, phyto geographical regions and distribution of endemic plants in the map of India.
12. The following practical should be conducted in the Field/lab with the help of Photographs, herbarium, Floras, Red data book- Study of endangered plants species, critically endangered plants species, vulnerable plant species and monotypic endemic genera of India.

**BOTANY PRACTICAL
PLANT ECOLOGY & PHYTOGEOGRAPHY**

SEMESTER- V

BOT-502-P

Total hours of teaching 30 hrs @ 3 hrs per week

1. Study Project under supervision.....12 Marks
2. Experiment A 07Marks
3. Anatomical adaptations of **B** (Section cutting)..... 07Marks
4. Spotters **C&D**(2x2 1/2) = 5 Marks
5. Record.....05Marks
6. Viva-Voc.....04Mrks
7. Internal practical exam.....10Marks

Total = 50 Marks

**BOTANY PRACTICAL
PLANT ECOLOGY & PHYTOGEOGRAPHY**

SEMESTER- V

BOT-502-P

Scheme of Valuation

1. Study Project under supervision
To study Honey Bees and Plants Yielding Honey 12 Marks
2. Experiment A -determination of soil porosity/PH..... 07Marks
3. Anatomical adaptations of **B** (Section cutting)
Xerophytes / Hydrophytes07Marks
4. Spotters **C&D** anemometer/rain gauze/lux meter (2x2 1/2) = 5 Marks
5. Viva-Voc.....04Mrks
6. Record..... 05Marks
7. Internal practical exam..... 10Marks

Total = 50 Marks

Books for Reference:

1. Daubenmire, R.F. (): Plants & Environment (2nd Edn.,) John Wiley & Sons.,
New York22
2. Puri, .G.S. (1960): Indian Forest Ecology (Vol.I & II) Oxford Book Co., New Delhi
&Calcutta.
3. Billings, W.B. (1965): Plants and the Ecosystem Wadsworth Publishing Co., Inc.,
Belmont.
4. Misra, R. (1968): The Ecology work Book Oxford & INH Publishing Co., Calcutta

**A.G& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS &
SCIENCE**

VUYYURU-521165, KRISHNA Dt., A.P.(Autonomous)

Accredited by NAAC with "A" Grade

2022-2023



DEPARTMENT OF BOTANY

MINUTES OF BOARD OF STUDIES

EVEN SEMESTER

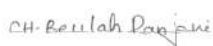





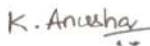
31-03-2022

ADUSUMILLI GOPALAKRISHNAIAH & SUGAR CANE GROWERS SIDDHARTHA DEGREE
COLLEGE OF ARTS & SCIENCE, VUYYURU-521165, KRISHNA Dt., A.P. (AUTONOMOUS).

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DEPARTMENT OF BOTANY
BOARD OF STUDIES MEETING: 31st March 2022

The Board of studies meeting of Department of Botany was convened at 3:00 pm on 31 /03/2023 under The chairmanship of Smt.Ch. Beulah Ranjani Head of the Department .The members present have discussed various aspects such as changes to be made in the syllabi, scheme of Evaluation and Blue print both for theory and practical papers, Departmental activities for 2022-2023, Estimated Budget proposals 2022 -2023 for implementing them effectively during the II, IV, & VI semester for the academic year 2022-2023 onwards.

The following members were present.

S.No	Name	Designation	signature
1.	Smt. Ch. Beulah Ranjani Head, Department of Botany A.G&S.G.S Degree College Vuyyuru.	Chair person	
2	prof. Avasan Maruthi Bio Sciences & Bio technology Krishna University Machilipatnam.	University Nominee	
3.	Sri Dr. Ch. Srinivasa Reddy Lecturer in Botany SRR & CVR Govt. Degree College, Vijayawada.	Subject Expert	
4.	P. Srinivasa Rao Department of Botany, P.B. Siddhartha College,	Subject Expert	
5.	Sri. S. Krishna Suman, Natural farmer, yakamuru Vuyyuru.	Industrialist	
6.	Sri. N. Ramana Rao Lecturer in Botany, A.G &S.G.S Degree College Vuyyuru.	Member	
	Miss. K. Anusha Lecturer in chaitnya college, Gudiwada.	Student Represent	

Agenda for B.O.S Meeting.

1. To recommend the syllabi (Theory & Practical), Model question paper for II Semester of I B.Sc (B.Z.C,Aqua) for the academic year 2022 - 2023.
2. To recommend the syllabi (Theory & Practical), Model question paper for IV Semester of II B.Sc (B.Z.C, Aqua) for the academic year 2022 - 2023.
3. To introduce Skill Enhancement Course the syllabi (Theory & Practical), Model question paper for V Semester of III B.Sc (Aqua) for the academic year 2022 - 2023.
4. To recommend the Blue print for the semester end exam for II, IV & VI semester of I,II, III B.Sc (B.Z.C, Aqua) for the academic year 2022 - 2023.
5. To recommend the teaching and evolution methods to be followed under Autonomous status.
6. Any other matter.

RESOLUTIONS

1. It is resolved to continue the same syllabi (Theory & Practical), model question paper & guide lines to be followed by the question paper setters of Botany of II semester of I B.Sc. (B.Z.C, Aqua) under Choice Based Credit System (CBCS) approved by the Academic Council of 2022 – 2023

2. It is resolved to implement the syllabi (Theory & Practical), model question paper & guide lines to be followed by the question papers under Choice Based Credit System (CBCS) setters of Botany of IV Semester of II B.Sc. (B.Z.C, Aqua) approved by the Academic Council of 2022 –2023.

3. It is resolved to implement the same syllabi & model papers under Choice Based Credit System (CBCS) Setters of Botany of V semester SEC 6C (Plant tissue culture) and SEC 7C (Mushroom cultivation) of III B.Sc. (B.Z.C, Aqua) approved by the Academic Council of 2022-2023.

4. It is resolved to Continue the same Blue prints of I, IV, & VI Semesters of B.Sc Botany for the Academic year 2022-2023.

5. It is resolved to continue the following teaching & evolution methods for the Academic year 2022-23.

6. Any other matter.

Teaching methods:

Besides the conventional methods of teaching, we use modern technology i.e. Using of OHP and LCD projector to display on U boards etc; for better understanding of concepts.

Evaluation of a student is done by the following procedure:

Internal Assessment Examination:

1. Out of maximum 100 marks in each paper for I, III B.Sc, 30 marks shall be allocated for internal assessment.
2. Out of these 30 marks, 20 marks are allocated for announced tests (i.e . IA-1 & IA-2). Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks are allocated on the basis of candidate's percentage of attendance and remaining 5 marks are allocated for the assignment for I, III B.Sc.
3. Out of maximum 100 marks in each paper for II B.Sc, 25 marks shall be allocated for internal assessment.
4. Out of these 25 marks, 15 marks are allocated for announced tests (i.e . IA-1 & IA-2). Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks allocated on the basis of candidate's percentage of attendance / assignment for II semester.
5. There is no pass minimum for internal assessment for I, II, III B.Sc.

• Semester – End Examination:

1. The maximum mark for II (BZC) semester – End examination shall be 75 marks and duration of the examination shall be 3 hours.
- 2 The maximum mark for I, III B.Sc semester- End examination shall be 70 marks and duration of the examination shall be 3 hours. Even through the candidate is absent for two IA exams / obtain zero marks the external marks are considered (if the candidate gets 40/70) and the result shall be declared as “PASS”
3. Semester – End examination shall be conducted in theory papers at the end of every semester, while in practical papers, these examinations are conducted at the end of I, III, & V semester for I, II & III B.Sc.
4. Discussed and recommended for organizing Seminars, Guest lectures, Work – Shops to upgrade the Knowledge of students, for the approval of the Academic Council.

Ch. Beulah Ranjani
Chairman

Course Structure of BZC, AQUA Syllabus

Year	Semester	Paper code	Title of the paper	Marks(100)		Credits
				Internal assessment	End semester	
I	II	BOT2IA	Basics of of vascular plants and Phyto geography	30	70	3
			Practical-I	10	40	2
II	IV	BOTT41A	Plant physiology and Metabolism	25	75	3
			Practical-III	25	25	2
	IV	BOTT42A	Cell biology ,Genetics and plant Breeding	30	70	3
			Practical-III	25	25	2
II	VI	BOT-501	Plant tissue culture.	30	70	3
			Practical-v – 501	25	25	2
II	VI	BOT-502	Mushroom Cultivation	30	70	3
			Practical-v- 502	25	25	2

Title of the Paper: Basics of Vascular plants and Phytogeography
(Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography)

Semester : II

Course Code	BOTT21A	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	25
No. of Lecture Hours / Week	4	Semester End Exam Marks	75
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2017-18	Year of Offering: 2021 - 22	Year of Revision: -	Percentage of Revision: -

Course Pre requisites: Knowledge of Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography studied in intermediate.

Course Description:

This course will provide one with a basic and comprehensive understanding of anatomical structure and functions. Enable the student with depth of topics and helps them to gain an appreciation in the embryology of Angiosperms. On the other hand, importance of understanding plant ecology and biodiversity provides an extensive knowledge to the student.

Course Objectives:

1. The study of Pteridophytes
2. The study of Gymnosperms
3. Knowledge of Basic aspects of Taxonomy
4. Study of Systematic Taxonomy
5. Knowledge of Phytogeography

Course Outcomes: At the end of this course, students should be able to:

CO1: Gain knowledge in the classification and comparison of Pteridophytes and Gymnosperms based on their morphology, anatomy, reproduction and life cycle.

CO2: Justify evolutionary trends in Tracheo phytes to adapt for land habitat. Evaluate the ecological, ethnic and economic value of different tracheophytes and summarize their good and services for human welfare

CO3: Explanation of the process of fossilization and compare the characteristics of extinct and extant plants.

CO4: Analyze the morphology of the most common Angiosperm plants of their localities and recognize their families.

CO5: Locate different Phytogeographical regions of the world and India and can analyze their floristic wealth.

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	<p>Pteridophytes General characteristics of Pteridophyta; classification of Smith (1955) upto divisions. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life history of (a) <i>Lycopodium</i> (Lycopsida) and (b) <i>Marsilea</i> (Filicopsida). Stelar evolution in Pteridophytes Heterospory and seed habit.</p>	12
II	<p>Gymnosperms General characteristics of Gymnosperms; Sporne classification upto classes. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life history of (a) <i>Cycas</i> (<i>Cycadopsida</i>) and (b) <i>Gnetum</i> (Gnetopsida). Outlines of geological time scale. A brief account on Cycadeoidea.</p>	12
III	<p>Basic aspects of Taxonomy Aim and scope of taxonomy; Species concept: Taxonomic hierarchy, species, genus and family. Plant nomenclature: Binomial system, ICBN–rules for nomenclature. Herbarium and its techniques, BSI herbarium and Kew herbarium; concept of digital herbaria. Bentham and Hooker system of classification Systematic description and economic importance of the following families : (a) Annonaceae (b) Curcubitaceae.</p>	12
IV	<p>Systematic Taxonomy Systematic description and economic importance of the following families: (a) Asteraceae (b) Ascleceae (c) Amaranthaceae, (d) Euphorbiaceae (e) Orchidaceae, (f) Arecaceae (i) Poaceae Outlines of Angiosperm Phylogeny Group (APG IV).</p>	12
V	<p>Phytogeography Principles of Phytogeography, Distribution (wides, endemic, discontinuous species) Endemism – types and causes. Phytogeographic regions of World. Phytogeographic regions of India. Vegetation types in Andhra Pradesh.</p>	12

Botany Textbook:

- (Vrukshasastram-I): Telugu Akademi, Hyderabad
2. Botany – II (Vrukshasastram-II): Telugu Akademi, Hyderabad
3. Acharya, B.C., (2019) Archchegoniates, Kalyani Publishers, New Delhi
4. Bhattacharya, K., G. Hait & Ghosh, A. K., (2011) A Text Book of Botany, Volume II, New Central Book Agency Pvt. Ltd., Kolkata
5. Hait, G., K. Bhattacharya & A.K. Ghosh (2011) A Text Book of Botany, Volume-I, New Central Book Agency Pvt. Ltd., Kolkata
6. Pandey, B.P. (2013) College Botany, Volume-I, S. Chand Publishing, New Delhi Pandey, B.P. (2013) College Botany, Volume-II, S. Chand Publishing, New Delhi

Recommended Reference book:

1. Smith, G.M. (1971) Cryptogamic Botany Vol. II., Tata McGraw Hill, New Delhi
 2. Sharma, O.P. (2012) Pteridophyta. Tata McGraw-Hill, New Delhi
 3. Kramer, K.U. & P. S. Green (1990) The Families and Genera of Vascular Plants, Volume –I: Pteridophytes and Gymnosperms (Ed. K. Kubitzki) .Springer-Verlag, New York
 4. Bhatnagar, S.P. & Alok Moitra (1996) Gymnosperms. New Age International, New Delhi Govil, C.M. (2007) Gymnosperms : Extinct and Extant. KRISHNA Prakashan Media (P) Ltd. Meerut & Delhi
 5. Sporne, K.R. (1971) The Morphology of Gymnosperms. Hutchinsons Co. Ltd., London
 6. Arnold, C.A., (1947) An introduction to Paleobotany McGraw –Hill Book Company, INC, New York
 7. Stewart, W.N., and G.W. Rothwell (2005) Paleobotany and the evolution of plants Cambridge University Press, New York Cambridge. London.
 8. Sambamurty, A.V.S.S. (2005) Taxonomy of Angiosperms I. K. International Pvt. Ltd., New Delhi
 9. Singh, G. (2012). Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi.
 10. Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego, CA, U.S.A.
 - Cain, S.A. (1944) Foundations of Plant Geography Harper & Brothers, N.Y.
 10. Mani, M.S (1974) Ecology & Biogeography of India Dr. W. Junk Publishers, The Hague
- Course Delivery method:** Face-to-face / Blended

Course has focus on: Foundation

Websites of Interest:

- <https://www.youtube.com/watch?v=VA2LNWkZNW0>
<https://www.youtube.com/watch?v=zDUCacewuAg>
<https://www.youtube.com/watch?v=sfFDOSM-EuA>
<https://www.youtube.com/watch?v=wKN0x2weqW4>

Co-curricular Activities:

A. Measurable:

1. Collection and identification of Pteridophytes from their native locality/ making an album by collecting photographs of Pteridophytes.
2. Collection and identification of Gymnosperms from their native locality/ making an album by collecting photographs of Gymnosperms.
3. Collection of information on famous herbaria in the world and preparation of a report.
4. Collection of information on famous botanic gardens in the world and preparation of a report.
5. Collection of data on plants of ethnic and ethnobotanical importance from their native locality.
6. Preparation of a local flora by enlisting the plants of their native place.

c. Assignments: Written assignment at home / during '0' hour at college;

Lycopodium - life cycle, Marselia-life cycle, Cycas-life cycle, Gnetum-life cycle, Bentham & Hooker classification, Stellar evolution in Pteridophytes, characteristics of Cycadeoidea, Asteraceae-taxonomy, Asclepiadaceae-taxonomy, Euphorbiaceae-taxonomy, Cucurbitaceae-taxonomy, Principles of phytogeography, Endemism types & causes, Phytogeographic regions of India.

Preparation of charts with drawings, making models etc., on topics included in syllabus. Five kingdom classification, Miller & Urey experiment, Shape and Symmetry of viruses.

B. General:

1. Quiz

Model Question Paper Structure for SEE

Max.: 70 Marks

Min. Pass : 30 Marks

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Answer all questions

Section-A

(20Marks)

1. (a) What is meant by heterospory? Justify the advantage of heterospory over homosporous CO1, L1
OR
(b) Write about Protocorm and its morphological nature. CO1, L6.
2. (a) Explain the characteristics of Cycadeoidea. CO2, L2.
OR
(b) Enumerate Geological time scale. CO2, L1.
3. (a) Describe ICBN rules for nomenclature. CO3, L2.
OR
(b) Binomial nomenclature
4. (a) Write a note on Angiosperms Phylogeny Group. CO4, L6
OR
Ray florate and disciflorate
5. (a) Discuss about the Vegetation types in Andhra Pradesh. CO5, L2.
OR
(b) Explain the causes and types of Endemism. CO5, L2.

Section-B

Answer the following questions

5 x 10M = 50Marks

1. (a) Describe diverse gametophytes present in the *Lycopodium* species. CO1, L2.
(Or) Unit I
(b) What is sporocarp? Describe the structure of *Marselia* Sporocarp. CO1, L2.
2. (a) Describe the anatomy of *Cycas* leaflet. Add a note on xerophytic features of it. CO2, L2.
(Or) Unit II
(b) Describe the structure of *Gnetum* male and female cones. CO2, L2.
3. (a) What is Natural System of Classification, Bentham and Hooker System of Classification? CO3, L1.
(Or) Unit III
(b) Describe vegetative and floral characters of Cucurbitaceae. Add a note on economic importance CO3, L1.
4. (a) Elucidate floral characters of Asteraceae. CO4, L1.
(Or) Unit IV
(b) Describe floral characters of Poaceae. Add a note on economic importance CO4, L1.
5. (a) What is Phytogeography? Explain principles of Phytogeography. CO5, L2.
(Or) Unit V
(b) Explain about Phytogeographic region of India. CO5, L1.

Title of the Paper: **Basics of vascular plants and** Phytogeography
(Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography)

SEMESTER - II	BOTT21A	2022-23	B.Sc, B.Z.C,A.B.C
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Total Number of Lecture Hours: 30

Course Prerequisites: Knowledge of Pteridophytes, Gymnosperms, Taxonomy of Angiosperms and Phytogeography studied in intermediate.

Course Description:

This course will provide one with a basic and comprehensive understanding of anatomical structure and functions. Enable the student with depth of topics and helps them to gain an appreciation in the embryology of Angiosperms. On the other hand, importance of understanding plant ecology and biodiversity provides an extensive knowledge to the student.

Course Objectives

1. The study of Pteridophytes
2. The study of Gymnosperms
3. Knowledge of Basic aspects of Taxonomy
4. Study of Systematic Taxonomy
5. Knowledge of Phytogeography

Course Outcomes: At the end of this course, students should be able to:

CO1: Demonstrate the techniques of section cutting, preparing slides, identifying of the material and drawing exact figures.

CO2: Compare and contrast the morphological, anatomical and reproductive features of vascular plants.

CO3: Identify the local angiosperms of the families prescribed to their genus and species level and prepare herbarium.

CO4: Exhibit skills of preparing slides, identifying the given twigs in the lab and drawing figures of plant twigs, flowers and floral diagrams as they are.

CO5: Prepare and preserve specimens of local wild plants using herbarium techniques.

1. Study/ microscopic observation of vegetative, sectional/anatomical and Reproductive structures of the following using temporary or permanent slides/ specimens/ mounts:
 - a. Pteridophyta: *Lycopodium* and *Marselia*
 - b. Gymnosperms: *Cycas* and *Gnetum*
2. Study of fossil specimens of Cycadeoidea and Pentoxylon (photographs /diagramscan be shown if specimens are not available).
3. Demonstration of herbarium techniques.
4. Systematic / taxonomic study of locally available plants belonging to the families prescribed in theory syllabus. (Submission of 30 number of Herbarium sheets of wildplants with the standard system is mandatory).
5. Mapping of phytogeographical regions of the globe and India.

Textbook:

1. A text book of Practical Botany-I Ashok Bendra and Ashok kumar
2. Practical manual of College Botany I and II- B.S..Reddy and S.M.Reddy

Course Delivery method: Face-to-

face / Blended. **Course has focus**

on: Skill Development **Websites of**

Interest:

<https://youtu.be/RJsOOhws5gI>

<https://youtu.be/9xtB1G4kISQ>

<https://youtu.be/2wFN9YmkBOQ>

Model Question Paper Structure for SEE

Time: 3hrs.

Max. Marks 40M

1. Take T.S. of the material 'A' (Pteridophyta), make a temporary slide and justify the identification with apt points.....**8M**
2. Take T.S. of the material 'B' (Gymnosperms), make a temporary slide and justify the identification with apt points.....**8M**
3. Describe the vegetative and floral characters of the material 'C' (Taxonomy of Angiosperms) and derive its systematic position.....**8M**
4. Identify the specimen 'D' (Fossil Gymnosperm) and give specific reasons.....**3M**

1. Locate the specified phytogeographical regions the world / India (E) map supplied to you

2X2=4 M

2. Record + Herbarium & amp; Field note book **5+4 = 9M**

NAAC reaccredited at 'A' level

Autonomous -ISO 9001 – 2015 Certified

Title of the Paper: **Plant Physiology and Metabolism**

Semester: IV

Course Code	BOTT 41A	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2021-22	Year of Offering: 2021 - 22	Year of Revision: --	Percentage of Revision: -

Course Prerequisites: Knowledge of Plant Physiology and Metabolism at +2 level.

Course Description:

This course will provide one with a basic and comprehensive understanding of plant water relations. Enable the student with depth of topics and helps them to gain appreciation of the mineral nutrition, enzymes and respiration. On the other hand, importance of understanding photosynthesis and photorespiration are also learnt. A part from these the student will be enhanced with the knowledge of nitrogen and lipid metabolism. The course provides a vast knowledge in plant growth development and stress physiology.

Course Objectives

On successful completion of this course, the students will be able to:

1. To understand the plant water relations.
2. To understand the mineral nutrition, enzymes and respiration.
3. To understand the photosynthesis and photorespiration.
4. To understand the nitrogen and lipid metabolism.
5. To understand the plant growth-development and stress physiology.

Course Outcomes:

At the end of this course, students should be able to:

CO1: Comprehend the importance of water in plant life and mechanisms for transport of water and solutes in plants.

CO2: Evaluate the role of minerals in plant nutrition and their deficiency symptoms, Interpret the role of enzymes in plant metabolism.

CO3: Critically understand the light reactions and carbon assimilation processes responsible for synthesis of food in plants.

CO4: Analyze the biochemical reactions in relation to Nitrogen and lipid metabolisms.

CO5: Evaluate the phytohormones that regulate growth and development in plants, examine the role of light on flowering and explain physiology of plants under stress conditions.

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	<p>Plant-Water relations</p> <p>1. Importance of water to plant life, physical properties of water, diffusion, imbibitions, osmosis. Water potential, osmotic potential, pressure potential.</p> <p>2. Absorption and lateral transport of water; Ascent of sap</p> <p>3. Transpiration: stomata structure and mechanism of stomatal movements (K⁺-ion flux).</p> <p>4. Mechanism of phloem transport; source-sink relationships.</p>	12
II	<p>Mineral nutrition, Enzymes and Respiration</p> <p>Essential macro and micro mineral nutrients and their role in plants; symptoms of mineral deficiency</p> <p>Absorption of mineral ions; passive and active processes.</p> <p>Characteristics, nomenclature and classification of Enzymes. Mechanism of enzyme action, enzyme kinetics.</p> <p>Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron transport system, Mechanism of oxidative phosphorylation, Pentose Phosphate Pathway (HMPshunt).</p>	12
III	<p>Photosynthesis and Photorespiration</p> <p>Photosynthesis: Photosynthetic pigments, absorption and action spectra; Red drop and Emerson enhancement effect</p> <p>Concept of two photosystems; mechanism of photosynthetic electron transport and evolution of oxygen; photo phosphorylation</p> <p>Carbon assimilation pathways (C₃, C₄ and CAM);</p> <p>Photorespiration-C₂ pathway</p>	12
IV	<p>Nitrogen and lipid metabolism</p> <p>Nitrogen metabolism: Biological nitrogen fixation– asymbiotic and symbiotic nitrogen fixing organisms. Nitrogenase enzyme system.</p> <p>Lipid metabolism: Classification of Plant lipids, saturated and unsaturated fatty acids.</p> <p>Anabolism of triglycerides, β-oxidation of fatty acids, Glyoxylate cycle.</p>	12
V	<p>Plant growth-development and stress physiology</p> <p>Growth and Development: Definition, phases and kinetics of growth.</p> <p>Physiological effect of Plant Growth Regulators(PGRs)- Auxins, Gibberellins, Cytokinins, ABA, Ethylene and Brassino steroids.</p> <p>Physiology of flowering: Photoperiodism, role of phytochrome in flowering.</p> <p>Seed germination and senescence; physiological changes.</p>	12

Textbook:

- Botany–IV(Vrukshasastram-II): Telugu Academy, Hyderabad
- Pandey,B.P. (2013)*CollegeBotany, Volume-III*,S. Chand Publishing, New Delhi

Recommended Reference book:

- Aravind Kumar&S.S. Purohit (1998) *Plant Physiology – Fundamentals and Applications*, Agro Botanica, Bikaner
- Datta, S.C. (2007) *Plant Physiology*, New AgeInternational (P)Ltd., Publishers, New Delhi

Course Delivery method: Face-to-face / Blended.

Course has focus on:Foundation

Websites of Interest:

https://youtu.be/4to_4guDx50

<https://youtu.be/j0BN8RfeqD0>

<https://youtu.be/Uc4lDTd1JXs>

<https://youtu.be/LVxdoH9MLU4>

<https://youtu.be/MSsVrzYibI8>

<https://youtu.be/YoNgSOIsk0A>

Co-curricular Activities:

Question and answer session at the end of class.

Observing animations.

Written assignments.

Group Discussion (GD)/ Quiz.

Power Point Presentations.

Max.: 75 Marks

Min. Pass: 30 Marks

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Section-A

Answer Any Five at least one from each unit

5 x 5M = 25Marks

1. Identify role of Water potential in plants **CO1L2**
2. Carrier concept **CO2L1**
3. Oxidative phosphorylation **CO2L1**
4. CAM plants **CO3L1**
5. Emerson enhancement effect **CO3L1**
6. Classification of plant lipids **CO4L4**
7. Brassino steroids. **CO5L1**
8. Phytochrome **CO5L1**

Section-B

Answer the following questions (5 x 10M = 50Marks)

9. (a) Explain osmosis, diffusion and imbibition with the help of experiments. **CO1L2**

or **Unit I**

- (b) Explain the various theories on mechanism of stomatal movements. **CO1L2**

10. (a) Define enzymes. Illustrate the properties and structure. Mention the mechanism of enzyme action. **CO2L1**

or **Unit II**

- (b) Explain the bio chemical reactions that occur in kreb's cycle. **CO2L1**

11. (a) Explain carbon assimilation how many methods of carbon assimilation are shown by plants explain carbon assimilation in C3 plants. **CO3L1**

or **Unit III**

- (b) What is photorespiration? Differentiate photorespiration and respiration in plants? Explain photorespiration. **CO3L1**

12. (a) what is biological nitrogen fixation? Explain types of biological nitrogen fixation. **CO4L2**

or **Unit IV**

- (b) what are lipids? Give an account of classification of plant lipids. **CO4L2**

13. (a) What are phyto hormones? Analyse the physiological effects of cytokinines. in plant growth. **CO5L4**

or **Unit V**

- (b) What is photo periodism? Distinguish the role of phytochrome in physiology of flowering. **CO5L4**

Course Prerequisites: Knowledge of Plant Physiology and Metabolism at +2 level

Course Description: This course will provide one with a basic and comprehensive skill in understanding plant water relations. Enable the student with depth of topics and helps them to gain appreciation of the mineral nutrition, enzymes and respiration. On the other hand, importance of understanding photosynthesis and photorespiration are also learnt. A part from these the student will be enhanced with the knowledge of nitrogen and lipid metabolism. The course provides a vast knowledge in plant growth development and stress physiology.

Course Objectives:

On successful completion of this course, the students will be able to:

1. To understand the plant water relations.
2. To understand the mineral nutrition, enzymes and respiration.
3. To understand the photosynthesis and photorespiration.
4. To understand the nitrogen and lipid metabolism.
5. To understand the plant growth-development and stress physiology.

Course Outcomes:

At the end of this course, students should be able to:

CO1: Comprehend the importance of water in plant life and mechanisms for transport of water and solutes in plants.

CO2: Evaluate the role of minerals in plant nutrition and their deficiency symptoms, Interpret the role of enzymes in plant metabolism.

CO3: Critically understand the light reactions and carbon assimilation processes responsible for synthesis of food in plants.

CO4: Analyze the biochemical reactions in relation to Nitrogen and lipid metabolisms.

CO5: Evaluate the phyto hormones that regulate growth and development in plants, examine the role of light on flowering and explain physiology of plants under stress conditions.

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	Determination of osmotic potential of plant cellsap by plasmolytic method using <i>Rhoeo</i> / <i>Tradescantia</i> leaves. Calculation of stomatal index and stomatal frequency of a mesophyte and a xerophyte. Determination of rate of transpiration using Cobalt chloride method / Ganong's potomete (at least for a dicot and a monocot). Effect of Temperature on membrane permeability by colorimetric method. Minor experiments– Osmosis, Arc-auxonometer, ascent of sap through xylem, cytoplasmic streaming.	
II	Study of mineral deficiency symptoms using plant material/photographs. Demonstration of amylase enzyme activity and study the effect of substrate and Enzyme concentration. Separation of chloroplast pigments using paper chromatography technique. Demonstration of Polyphenol oxidase enzymeactivity(Potato tuber or Apple fruit)	
III	Anatomy of C ₃ , C ₄ and CAM leaves Estimation of protein by biuret method/Lowry method	

Textbook:

1. Taiz, L., Zeiger, E., (2010). Plant Physiology. Sinauer Associates Inc., U.S.A. 5th Edition.
2. Hopkins, W.G., Huner, N.P., (2009). Introduction to Plant Physiology. John Wiley & Sons, U.S.A. 4th Edition.

Recommended Reference book:

1. Bajracharya, D., (1999). Experiments in Plant Physiology- A Laboratory Manual. Narosa Publishing House, New Delhi.

Course Delivery method: Face-to-face / Blended.

Course has focus on: Skill Development.

Websites of Interest:

- <https://youtu.be/VPwLN6U1spk>
<https://youtu.be/wBDC8gFuobo>
<https://youtu.be/Fi33E5sC0To>
<https://youtu.be/Hc3Mg0Yc7kI>
<https://youtu.be/IigeZ7PtWQU>
<https://youtu.be/q50VbVyWy6o>
<https://youtu.be/ug5p2CRqjDk>
<https://youtu.be/W56RHxu2Hpc>
<https://youtu.be/3PYdMaCIUmw>
<https://youtu.be/VyKsT6q1O-s>
<https://youtu.be/1kTbPx0WFIA>

Co-curricular Activities:

- Question and answer session at the end of class.
 Observing animations.
 Written assignments.
 Group Discussion (GD)/ Quiz.
 Power Point Presentations.

Model Question Paper Structure for SEE

Max. Time: 3Hrs.

Max. Marks: 40

1. Conduct the experiment 'A' (Major experiment), write aim, principle, material and apparatus/equipment, procedure, tabulate results and make conclusion. **15M**
2. Demonstrate the experiment 'B'(Minor experiment), write the principle, Procedure and give inference. **5M**
3. Identify the following with apt reasons. **3x4=12M**
 - C. Plant water relations /Mineral nutrition
 - D. Plant metabolism
 - E. Plant growth and development
4. Record +Viva-voce **5+3=8M**

**ADUSUMILLI GOPALAKRISHNAIAH & SUGAR CANE GROWERS SIDDHARTHA DEGREE COLLEGE OF
ARTS & SCIENCE, VUYURU-521165, KRISHNA Dt., A.P. (AUTONOMOUS).**

NAAC reaccredited at 'A' level
Autonomous –ISO 9001-2015 Certified

Title of the Paper: **Cell Biology, Genetics and Plant Breeding**

Course Code	BOT T42A	Course Delivery Method	Class Room / Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours / Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction :2021-22	Year of Offering: 2017 - 18	Year of Revision: -- 100%	Percentage of Revision: -

Course Prerequisites: Knowledge of Cell Biology, Genetics and Plant Breeding studied in intermediate.

Course Description: This course will provide one with a basic and comprehensive understanding of cell biology. Enable the student with depth of topics and helps them to gain an appreciation in the genetics. On the other hand, importance of understanding plant breeding provides an extensive knowledge to the student.

Course Objectives:

1. Knowledge of Cell Biology.
2. The study of Chromosomes.
3. The study of Mendelian and Non-Mendelian genetics.
4. Study of Structure and functions of DNA.
5. Knowledge of Plant breeding

Course Outcomes: At the end of this course, students should be able to:

CO1: Distinguish prokaryotic and eukaryotic cells and design the model of a cell.

CO2: Explain the organization of a eukaryotic chromosome and the structure of genetic material.

CO3: Demonstrate techniques to observe the cell and its components under a microscope.

CO4: Discuss the basics of Mendelian genetics, its variations and interpret inheritance of traits in living beings.

CO5: Elucidate the role of extra-chromosomal genetic material for inheritance of characters.

Evaluate the structure, function and regulation of genetic material.

CO6: Understand the application of principles and modern techniques in plant breeding.

Explain the procedures of selection and hybridization for improvement of crops.

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	<p>The Cell</p> <ol style="list-style-type: none"> 1. Cell theory; prokaryotic vs eukaryotic cell; animal vs plant cell; a brief account on ultra-structure of a plant cell. 2. Ultra-structure of cell wall. 3. Ultra-structure of plasma membrane and various theories on its organization. 4. Polymorphic cell organelles (Plastids); ultra structure of chloroplast. Plastid DNA. 	12
II	<p>Chromosomes</p> <ol style="list-style-type: none"> 1. Prokaryotic vs eukaryotic chromosome. Morphology of a eukaryotic chromosome. 2. Euchromatin and Heterochromatin; Karyotype and ideogram. 3. Brief account of chromosomal aberrations - structural and numerical changes 4. Organization of DNA in a chromosome (solenoid and nucleosome models). 	12
III	<p>Mendelian and Non-Mendelian genetics</p> <ol style="list-style-type: none"> 1. Mendel's laws of inheritance. Incomplete dominance and co-dominance; Multiple allelism. 2. Complementary, supplementary and duplicate gene interactions (plant-based examples are to be dealt). 3. A brief account of linkage and crossing over; Chromosomal mapping - 2 point and 3-point test cross. 4. Concept of maternal inheritance (Corren's experiment on <i>Mirabilis jalapa</i>); 	12
IV	<p>Structure and functions of DNA</p> <ol style="list-style-type: none"> 1. Watson and Crick model of DNA. Brief account on DNA Replication (Semi-conservative method). 2. Brief account on Transcription, types and functions of RNA. Gene concept and genetic code and Translation. 3. Regulation of gene expression in prokaryotes - Lac Operon. 	12
V	<p>Plant Breeding</p> <ol style="list-style-type: none"> 1. Plant Breeding and its scope; Genetic basis for plant breeding. Plant Introduction and acclimatization. 2. Definition, procedure; applications and uses; advantages and limitations of : (a) Mass selection, (b) Pure line selection and (c) Clonal selection. 3. Hybridization – schemes, and technique; Heterosis (hybrid vigour). 4. A brief account on Molecular breeding – DNA markers in plant breeding. RAPD, RFLP. 	12

Textbook:

1. Botany – III (Vrukshasastram-I): Telugu Akademi, Hyderabad
2. Pandey, B.P. (2013) *College Botany, Volume-III*, S. Chand Publishing, New Delhi
3. Ghosh, A.K., K. Bhattacharya & G. Hait (2011) *A Text Book of Botany, Volume-III*, New Central Book Agency Pvt. Ltd., Kolkata
4. Chaudhary, R. C. (1996) *Introduction to Plant Breeding*, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi

Recommended Reference book:

1. S. C. Rastogi (2008) *Cell Biology*, New Age International (P) Ltd. Publishers, New Delhi
2. P. K. Gupta (2002) *Cell and Molecular biology*, Rastogi Publications, New Delhi
3. B. D. Singh (2008) *Genetics*, Kalyani Publishers, Ludhiana
4. A. V. S. S. Sambamurthy (2007) *Molecular Genetics*, Narosa Publishing House, New Delhi
5. Cooper, G.M. & R.E. Hausman (2009) *The Cell – A Molecular Approach*, A.S.M. Press, Washington
6. Becker, W.M., L.J. Kleinsmith & J. Hardin (2007) *The World of Cell*, Pearson Education, Inc., New York
7. De Robertis, E.D.P. & E.M.F. De Robertis Jr. (2002) *Cell and Molecular Biology*, Lippincott Williams & Wilkins Publ., Philadelphia
8. Robert H. Tamarin (2002) *Principles of Genetics*, Tata McGraw – Hill Publishing Company Limited, New Delhi.
9. Gardner, E.J., M. J. Simmons & D.P. Snustad (2004) *Principles of Genetics*, John Wiley & Sons Inc., New York
10. Micklos, D.A., G.A. Freyer & D.A. Cotty (2005) *DNA Science: A First Course*, I.K. International Pvt. Ltd., New Delhi

Course Delivery method: Face-to-face / Blended.

Course has focus on: Foundation

Websites of Interest:

<https://youtu.be/LFyjJBiltFI>

<https://youtu.be/hUJZ4X3Hkbw>

<https://youtu.be/rBkE5SAL7IA>

Co-curricular Activities:**Suggested co-curricular activities for Botany Core Course- 5 in Semester-IV:****A. Measurable:****a. Student seminars:**

1. Light microscopy: bright field and dark field microscopy.
2. Scanning Electron Microscopy (SEM).
3. Transmission Electron Microscopy (TEM).
4. Mitosis and Meiosis
5. Cell cycle and its regulation.
6. Cell organelles bounded by single membrane.
7. Prokaryotic chromosomes
8. Special types of chromosomes: Polytene, Lamp brush and B-chromosomes.
9. Different forms of DNA.
10. Gene mutations.
11. DNA damage and repair mechanisms.
12. Reverse transcription.
13. Protein structure.
14. Modes of reproduction in plants.
15. Modes of pollination in plants

b. Student Study Projects:

1. Study of mitotic cell cycle in roots of *Allium cepa*
2. Study of mitotic cell cycle in roots of *Aloe vera*
3. Observation of chromosomal aberrations in *Allium cepa* root cells exposed to industrial effluent(s).
4. Observation of chromosomal aberrations in *Allium cepa* root cells exposed to heavy metal(s).
5. Observation of polyembryony in *Citrus* spp. and *Mangifera indica*.

c. Assignments: Written assignment at home / during '0' hour at college; preparation of charts with drawings, making models etc., on topics included in syllabus.

B. General:

1. Field visit to Agriculture/Horticulture University/ Research station to observe Plant breeding methods.
2. Group Discussion (GD)/ Quiz/ Just A Minute (JAM) on different modules in syllabus of the course. RECOMMENDED ASSESSMENT OF STUDENTS:

Recommended continuous assessment methods for all courses:

Some of the following suggested assessment methodologies could be adopted. Formal assessment for awarding marks for Internal Assessment in theory.

Formal:

1. Assessment of practical skills
2. Individual and group project reports
3. Seminar presentations

Model Question Paper Structure for SEE

Max.: 75 Marks

Min.Pass: 30 Marks

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Section-A

Answer Any Five at least one from each unit

5 x 5M = 25Marks

1. Distinguish the difference between eukaryotic cell and prokaryotic cell. **CO1, L4.**
2. Explain the ultra-structure of Chloroplast. **CO1, L2.**
3. State the difference between euchromatin and heterochromatin. **CO2, L1.**
4. Explain 2-point test cross. **CO2, L2.**
5. Describe incomplete dominance. **CO3, L2.**
6. Discuss about the semi conservative method of DNA replication. **CO4, L6.**
7. What is pure line selection? Explain. **CO5, L1.**
8. Elucidate the role of RAPD in molecular breeding. **CO5, L2.**

Section-B

Answer the following questions

5 x 10M = 50Marks

9. (a) Explain ultra structure of plasma membrane. **CO1, L2.**
or
Unit I
- (b) Explain the ultra structure of cell wall. **CO1, L2.**
10. (a) Write a detailed account of chromosomal aberrations. **CO2, L6.**
or
Unit II
- (b) Describe the organization of DNA in a chromosome (solenoid and nucleosome models). **CO2, L2.**
11. (a) Design a detailed account on Linkage. **CO3, L5.**
or
Unit III
- (b) Compose a detailed account on Crossing Over. **CO3, L5.**
12. (a) Discuss about the Watson and Crick model of DNA. **CO4, L6.**
or
Unit IV
- (b) Elucidate the regulation of gene expression in prokaryotes - Lac Operon. **CO4, L2.**
13. (a) Develop a note on advantages and limitations of : (a) Mass selection, (b) Pure line selection. **CO5, L3.**
or
Unit V
- (b) Explain the process of Hybridization, with respect to the schemes and techniques. **CO5, L2.**

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Title of the Paper: **Cell Biology, Genetics and Plant Breeding (practicals)**

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Semester: IV

Credits: 02

Hours Taught: 30 hrs. Per Semester

Max.Time: 3 Hours

Course Prerequisites: Knowledge of Cell Biology, Genetics and Plant Breeding studied in intermediate.

Course Description: This course will provide one with a basic and comprehensive understanding of cell biology. Enable the student with depth of topics and helps them to gain an appreciation in the genetics. On the other hand, importance of understanding plant breeding provides an extensive knowledge to the student.

Course Objectives:

1. Knowledge of Cell Biology.
2. The study of Chromosomes.
3. The study of Mendelian and Non-Mendelian genetics.
4. Study of Structure and functions of DNA.
5. Knowledge of Plant breeding.

Course Outcomes: At the end of this course, students should be able to:

CO1: Distinguish prokaryotic and eukaryotic cells and design the model of a cell.

CO2: Explain the organization of a eukaryotic chromosome and the structure of genetic material.

CO3: Demonstrate techniques to observe the cell and its components under a microscope.

CO4: Discuss the basics of Mendelian genetics, its variations and interpret inheritance of traits in living beings.

CO5: Elucidate the role of extra-chromosomal genetic material for inheritance of characters.

Evaluate the structure, function and regulation of genetic material.

CO6: Understand the application of principles and modern techniques in plant breeding.

Explain the procedures of selection and hybridization for improvement of crops.

Syllabus

1. Study of ultra-structure of plant cell and its organelles using Electron microscopic Photographs/models.
2. Demonstration of Mitosis in *Allium cepa*/*Aloe vera* roots using squash technique; observation of various stages of mitosis in permanent slides.
3. Demonstration of Meiosis in P.M.C.s of *Allium cepa* flower buds using squash technique; observation of various stages of meiosis in permanent slides.
4. Study of structure of DNA and RNA molecules using models.
5. Solving problems monohybrid, dihybrid, back and test crosses.
6. Solving problems on gene interactions (at least one problem for each of the gene interactions in the syllabus).
7. Chromosome mapping using 3- point test cross data.
8. Demonstration of emasculation, bagging, artificial pollination techniques for hybridization.

Course Delivery method: Face-to-face / Blended.

Course has focus on: Skill Development

Websites of Interest:

<https://youtu.be/LFyjJBiltFI>

<https://youtu.be/hUJZ4X3Hkbw>

<https://youtu.be/rBkE5SAL7IA>

Model Question Paper Structure for SEE

Time: 3hrs.

Max. Marks 40M

1. Make a cytological preparation of given material 'A' (mitosis or meiosis in Onion) by squash technique, report any two stages, draw labelled diagrams and write the reasons. **10M**
2. Solve the given Genetic problem (Dihybrid cross/ Interaction of genes/ 3-point test cross) 'B' and write the conclusions. **10M**
3. Identify the following and justify with apt reasons. **3x4 =12M**
 - C. Cell Biology (Cell organelle)
 - D. Genetics (DNA/RNA)
 - E. Plant Breeding
4. Record + Viva-voce **5 + 3 =8M**

**A.G& S.G.SIDDHARTHA DEGREE COLLEGE OF ARTS &
SCIENCE**

VUYYURU-521165, KRISHNA Dt., A.P.(Autonomous)

Accredited by NAAC with "A" Grade

2022-2023



DEPARTMENT OF BOTANY

MINUTES OF BOARD OF STUDIES

OOD SEMESTER

27-10-2022

ADUSUMILLI GOPALAKRISHNAIAH & SUGAR CANE GROWERS SIDDHARTHA DEGREE
COLLEGE OF ARTS & SCIENCE, VUYYURU-521165, KRISHNA Dt., A.P. (AUTONOMOUS).

NAAC recredited at 'A' level
Autonomous -ISO 9001-2015 Certified
DEPARTMENT OF BOTANY
BOARD OF STUDIES MEETING: 27th October 2022

The Board of studies meeting of Department of Botany was convened at 2:00 pm on 27/10/2022 under the chairmanship of Smt.Ch.Beulah Ranjani Head of the Department .The members present have discussed various aspects such as changes to be made in the syllabi, scheme of Evaluation and Blue print both for theory and practical papers, Departmental activities for 2022-2023 ,Estimated Budget proposals 2022-2023 for implementing them effectively during the I,III,& V semester for the academic year 2022-2023 onwards.

The following members were present.

S.No	Name	Designation	signature
1.	Smt. Ch. Beulah Ranjani Head, Department of Botany A.G&S.G.S Degree College Vuyyuru.	Chair person	<i>Ch. Beulah Ranjani</i>
2	prof. Avasan Maruthi Bio Sciences & Bio technology Krishna University Machilipatnam.	University Nominee	<i>J. Maruthi</i>
3.	Sri Dr. Ch. Srinivasa Reddy Lecturer in Botany SRR & CVR Govt. Degree College, Vijayawada.	Subject Expert	<i>Ch. Srinivasa Reddy</i>
4.	P. Srinivasa Rao Department of Botany, P.B. Siddhartha College,	Subject Expert	<i>P. Srinivasa Rao</i>
5.	Sri. S. Krishna Suman, Natural farmer, yakamuru Vuyyuru.	Industrialist	<i>S. Krishna Suman</i>
6.	Sri. N. Ramana Rao Lecturer in Botany, A.G &S.G.S Degree College Vuyyuru.	Member	<i>N. Ramana Rao</i>
7.	Miss. G. Rebecca Rachel Lecturer in Botany, A.G&S.G.S Degree College Vuyyuru.	Member	<i>G. Rebecca Rachel</i>
8.	Miss. K. Anusha Lecturer in chaitnya college, Gudiwada.	Student Represent	<i>K. Anusha</i>

Agenda for B.O.S Meeting.

1. To recommend the syllabi (Theory & Practical), Model question paper for I Semester of I B.Sc (B.Z.C, Aqua) for the academic year 2022 - 2023.
2. To recommend the syllabi (Theory & Practical), Model question paper for III Semester of II B.Sc (B.Z.C, Aqua) for the academic year 2022 - 2023.
3. To introduce Skill enhancement Course the syllabi (Theory & Practical), Model question paper for V Semester of III B.Sc (B.Z.C, Aqua) for the academic year 2022 - 2023.
4. To recommend the Blue print for the semester end exam for I, III & V semester of I,II, III B.Sc (B.Z.C, Aqua) for the academic year 2022 - 2023.
5. To recommend the teaching and evolution methods to be followed under Autonomous status.
6. Any other matter.

RESOLUTIONS

1. It is resolved to continue the same syllabi (Theory & Practical), model question paper & guide lines to be followed by the question paper setters of Botany of I semester of I B.Sc. (B.Z.C, Aqua) under Choice Based Credit System (CBCS) approved by the Academic Council of 2022 – 2023
2. It is resolved to implement the syllabi (Theory & Practical), model question paper & guide lines to be followed by the question papers under Choice Based Credit System (CBCS) setters of Botany of III Semester of II B.Sc. (B.Z.C, Aqua) approved by the Academic Council of 2022 –2023.
3. It is resolved to implement **changed** syllabi & model papers under Choice Based Credit System(CBCS) Setters of Botany of V semester SEC 6C (Plant tissue culture) and SEC 7C (Mushroom cultivation) of III B.Sc. (B.Z.C, Aqua) approved by the Academic Council of 2022-2023.
4. It is resolved to Continue the same Blue prints of I,III, &V Semesters of B.Sc Botany for the Academic year 2022-2023.
5. is resolved to continue the following teaching & evolution methods for the Academic year 2022-23.
6. Any other matter.

Teaching methods:

Besides the conventional methods of teaching, we use modern technology i.e. Using of OHP and LCD projector to display on U boards etc; for better understanding of concepts.

Evaluation of a student is done by the following procedure:

Internal Assessment Examination:

- Out of maximum 100 marks in each paper for I, III B.Sc, 30 marks shall be allocated for internal assessment.
- Out of these 30 marks, 20 marks are allocated for announced tests (i.e . IA-1& IA-2). Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks are allocated on the basis of candidate's percentage of attendance and remaining 5 marks are allocated for the assignment for I, III B.SC.
- Out of maximum 100 marks in each paper for II B.Sc, 25 marks shall be allocated for internal assessment.
- Out of these 25 marks, 15 marks are allocated for announced tests (i.e . IA-1& IA-2). Two announced tests will be conducted and average of these two tests shall be deemed as the marks obtained by the student, 5 marks allocated on the basis of candidate's percentage of attendance / assignment for II semester.
- There is no pass minimum for internal assessment for I, II, III B.Sc.

- **Semester – End Examination:**

- The maximum mark for II (BZC) semester – End examination shall be 75 marks and duration of the examination shall be 3 hours.
- The maximum mark for I, III B.Sc semester- End examination shall be 70 marks and duration of the examination shall be 3 hours. Even through the candidate is absent for two IA exams / obtain zero marks the external marks are considered (if the candidate gets 40/70) and the result shall be declared as “PASS”
- Semester – End examination shall be conducted in theory papers at the end of every semester, while in practical papers, these examinations are conducted at the end of I, III, & V semester for I, II & III B.Sc.
- Discussed and recommended for organizing Seminars, Guest lectures, Work – Shops to upgrade the Knowledge of students, for the approval of the Academic Council.

CH. Beulah Rajani
Chairman

Course Structure of BZC, AQUA Syllabus

year	semester	Paper code	Title of the paper	Marks(100)		Credits
				Internal assessment	End semester	
I	I	BOTIIA	Fundamentals of Microbes and Non-vascular plants	30	70	3
			Practical-I	10	40	2
II	III	BOTT31A	Anatomy of angiosperms, Plant Ecology and Biodiversity	25	75	3
			Practical-III	25	25	2
III	V	BOT-501	Plant tissue culture.	30	70	3
			Practical-v – 501	25	25	2
III	V	BOT-502	Mushroom Cultivation	30	70	3
			Practical-v- 502	25	25	2

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Title of the Paper: **Fundamentals of Microbes and Non-vascular Plants**

Semester: - I

Course Code	BOTT11A	Course Delivery Method	Class Room/Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours/ Week	4	Semester End Exam Marks	70
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction : 2021-22	Year of Offering 2021-2022	Year of Revision –	Percentage of Revision: 0%

Course Prerequisites: Knowledge of microbes, thallophytes and Bryophytes at +2 level

Course Description: This course emphasizes the student to understand origin of life on earth and analyze structure, disease symptoms and transmission of plant viruses. Enhance one with the knowledge in diversity and characteristics of prokaryotes, characteristics of fungi and lichens, algae and bryophytes.

Course Objectives:

On successful completion of this course, the students will be able to:

1. To understand origin of life on the earth and analyze structure, disease symptoms and transmission of plant viruses.
2. To understand the diversity and characteristics of Prokaryotes.
3. To understand the characteristics of Fungi and Lichens.
4. To understand the characteristics of Algae.
5. To understand the characteristics of Bryophyta.

Course Outcomes: At the end of this course, students should be able to:

CO1: Explain origin of life on the earth.

CO2: Illustrate diversity among the viruses and prokaryotic organisms and can categorize them.

CO3: Analyze and ascertain the plant disease symptoms due to viruses, bacteria and fungi.

CO4: Classify fungi, lichens, algae and bryophytes based on their structure, reproduction and life cycles.

CO5: Evaluate the ecological and economic value of microbes, thallophytes and bryophytes.

Syllabus

Course Details

Unit	Learning Units	Hours
I	<p>Origin of life and viruses Origin of life, concept of primary Abiogenesis; Miller and Urey experiment. Five kingdom classifications of R.H. Whittaker. Discovery of micro- organisms, Pasteur experiments, germ theory of diseases. Shape and symmetry of viruses; structure of TMV and Gemini virus; multiplication of TMV, a brief account of Prions and Viroids. A general account on symptoms of plant diseases caused by Viruses. Transmission of plant viruses and their control. Significance of viruses in vaccine production, bio-pesticides and as cloning vectors.</p>	12
II	<p>Special groups of Bacteria and Eubacteria Brief account of Archaeobacteria, Actinomycetes and Cyano bacteria. Cell structure and nutrition of Eubacteria. Reproduction- Asexual (Binary fission and endospores) and bacterial recombination.(Conjugation, Transformation, Transduction). Economic importance of Bacteria with reference to their role in Agriculture and industry (fermentation and medicine). A general account on symptoms of plant diseases caused by Bacteria; Citrus canker.</p>	12
III	<p>Fungi & Lichens General characteristics of fungi and Ainsworth classification (up to classes). Structure, reproduction and life history of (a)<i>Rhizopus</i> (Zygomycota) and (b)<i>Puccinia</i> (Basidiomycota). Economic uses of fungi in food industry, pharmacy and agriculture. A general account on symptoms of plant diseases caused by Fungi; Blast of Rice. Lichens- structure and reproduction; ecological and economic importance.</p>	12
IV	<p>Algae General characteristics of Algae (pigments, flagella and reserve food material), Fritsch classification (up to classes). Thallus organization and life cycles in Algae. Occurrence, structure, reproduction and life cycle of (a)<i>Spirogyra</i> (Chlorophyceae) and (b) <i>Polysiphonia</i>(Rhodophyceae). Economic importance of Algae.</p>	12
V	<p>Bryophytes General characteristics of Bryophytes; classification up to classes. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life cycle of (a) <i>Marchantia</i>(Hepaticopsida) and (b) <i>Funaria</i>(Bryopsida). General account on evolution of sporophytes in Bryophyta.</p>	12

Textbook:

1. Botany – I (Vrukshasastram-I): Telugu Akademi, Hyderabad
2. Pandey, B.P. (2013) *College Botany, Volume-I*, S. Chand Publishing, New Delhi

Recommended Reference book:

1. Prescott, L. Harley, J. and Klein, D. (2005) *Microbiology, 6th edition*, Tata McGraw –Hill Co. New Delhi.
2. Alexopoulos, C.J., C.W.Mims&M.Blackwell(2007)*Introductory Mycology*, Wiley& Sons, Inc., New York.
3. Fritsch, F.E. (1945) *The Structure & Reproduction of Algae (Vol. I &Vol.II)* Cambridge University Press Cambridge, U. K.

Course Delivery method: Face-to-face / Blended.

Course has focus on: Foundation.

Websites of Interest:

<https://www.youtube.com/watch?v=SkClCX9FfiY>

<https://www.youtube.com/watch?v=h57UuVdyyLk>

<https://www.youtube.com/watch?v=OBej7rFyN7U>

https://www.youtube.com/watch?v=7sZ5Nz8_cfc

Co-curricular Activities:

1. Question and answer session at the end of class.
2. Observing animations.
3. Written assignments.
4. Collection and identification of Algae from Fresh water.
5. Collection and identification of diseased plant parts.
6. Group Discussion (GD)/ Quiz.
7. Power Point Presentations.

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MODEL QUESTION PAPER- Theory Examination(s) at Semester end 2021-2022

TITLE OF THE PAPER: Fundamentals of Microbes and Non-vascular Plants

(Viruses, Bacteria, Fungi, Lichens, Algae and Bryophytes)

Max. Time: 3 Hrs.

Course Code: BOTT11A

Max. Marks: 70M

Section-A

1. (a) i) Give an account of structure and multiplication of TMV? **(10M) CO1- L2.**
ii) Five kingdom classification of Whittaker. **(4M) CO1-L2.**
OR
b) i) Explain the significance of viruses in vaccine production, bio-pesticides and as cloning vectors. **(10M) CO1-L2.**
ii) Germ theory of diseases. **(4M) CO1-L2.**
2. (a) i) whether bacteria exhibit sexual reproduction or not? Elucidate different methods of bacterial recombination. **(10M)CO2 - L2.**

ii) What are the symptoms of citrus canker? Mention the causal organism of citrus canker. . **(4M) CO2 - L2**
OR
b) i) Explain the role of bacteria in agriculture and industry. **(10M)CO2 - L2.**

ii) General characters of blue – green algae. . **(4M) CO-3 L2**
- 3(a) i) Why *Puccinia* is called as macro cyclic rust? Explain the stages of the fungus on Primary host. **(10M) CO3-L1.**

ii) Ainsworth classification of fungi **CO-3 L2 .(4M)**
OR
b) i) Why lichens are considered as ‘pioneers of colonization’? Give an account of ecological and economic Importance of lichens. **CO3 -L1. (10M)**

ii) Why lichens are considered as unique and composite organisms? **CO-3 L1. .(4M)**
- 4.(a)i) What is thallus? Describe various types of thalli found in algae. **(10M) CO4 -L2.**
ii) General characters of algae. **CO-3 L2.(4M)**

OR
b) i) Explain life cycle of *Spirogyra* .**CO-4 L2. (10M)**

ii) Explain about Cystocarp. **CO-4 L2. .(4M)**
- 5(a)i) Describe morphological and anatomical features of *Marchantia*.**CO5- L2. (10M)**

ii) Vegetative reproduction in Bryophytes. **CO5 - L2. .(4M)**

OR
b) i) Give account on of sporophyte evolution in Bryophytes. **CO5 -L 2 (10M).**
ii) Describe the gametophyte phase in *Funaria* **CO5- L2. .(4M)**

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Practical Syllabus

SEMESTER- I

PAPER- I

CREDITS : 02

BOTANY	BOTT11A	WEF: 2021-2022	B. Sc (BZC), AQUA
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Title of the paper: Fundamentals of Microbes and Non-vascular Plants

(Viruses, Bacteria, Fungi, Lichens, Algae and Bryophytes)

NO OF HOURS: 30

Course Prerequisites: Knowledge of microbes, thallophytes and Bryophytes at +2 level

Course Description: This course emphasizes the student to understand origin of life on earth, analyze and identify the structure, disease symptoms and transmission of plant viruses. Enhance one with the skill in identifying diversity and characteristics of prokaryotes, characteristics of fungi and lichens, algae and bryophytes.

Course Objectives:

On successful completion of this course, the students will be able to:

1. To understand origin of life on the earth and analyze structure, disease symptoms and transmission of plant viruses.
2. To understand the diversity and characteristics of Prokaryotes.
3. To understand the characteristics of Fungi and Lichens.
4. To understand the characteristics of Algae.
5. To understand the characteristics of Bryophyta.

Course Outcomes: At the end of this course, students should be able to:

CO1: Explain origin of life on the earth.

CO2: Illustrate diversity among the viruses and prokaryotic organisms and can categorize them.

CO3: Analyze and ascertain the plant disease symptoms due to viruses, bacteria and fungi.

CO4: Classify fungi, lichens, algae and bryophytes based on their structure, reproduction and life cycles.

CO5: Evaluate the ecological and economic value of microbes, thallophytes and bryophytes.

Syllabus

Course Details:

Unit	Learning Units	Lecture Hours
I	<p>Knowledge of Microbiology laboratory practices and safety rules. Knowledge of different equipment for Microbiology laboratory (Spirit lamp, Inoculation loop, Hot-air oven, Autoclave/Pressure cooker, Laminar air flow chamber and Incubator) and their working principles. (In case of the non- availability of the laboratory equipment the students can be taken to the local college/clinical lab. with required infrastructural facilities or they can enter a linkage with the college/lab for future developments and it will fetch credits during the accreditation by NAAC).</p> <p>Demonstration of Gram's staining technique for Bacteria.</p> <p>Study of Viruses (Corona, Gemini and TMV) using electron micrographs/ models.</p>	6
II	<p>Study of Archaeobacteria and Actinomycetes using permanent slides/ electron micrographs/diagrams. Study of <i>Anabaena</i> and <i>Oscillatoria</i> using permanent/temporary slides. Study of different bacteria (Cocci, Bacillus, Vibrio and Spirillum) using permanent or temporary slides/ electron micrographs/ diagrams.</p>	4
III	<p>Study/ microscopic observation of vegetative, sectional/anatomical and reproductive structures of the following using temporary or permanent slides/ specimens/ mounts: a. Fungi: <i>Rhizopus</i>, <i>Penicillium</i> and <i>Puccinia</i> Lichens: Crustose, foliose and fruticose.</p>	10
IV	<p>Algae: <i>Volvox</i>, <i>Spirogyra</i>, <i>Ectocarpus</i> and <i>Polysiphonia</i>. Bryophyta: <i>Marchantia</i> and <i>Funaria</i> Study of specimens of Tobacco mosaic disease, Citrus canker and Blast of Rice.</p>	10

Recommended Reference book:

1. Vasista, B.R. (2018). Botany for degree students - Algae - S. Chand and company Ltd., New Delhi.
2. Dubey, H.C (2018). A text book of Fungi, bacteria and Viruses. Vikas publishing House, New Delhi.
3. Smith, G.M (1955). Cryptogamic Botany (Vol. I Algae, Fungi, & Lichens) McGraw-Hill Book Co., New York.

Course Delivery method: Face-to-face / Blended.

Course has focus on:Skill Development.

Websites of Interest:

<https://youtu.be/KXtGkIXMCQU>

<https://youtu.be/u3BVke4C8Sc>

<https://youtu.be/q7vwDDKugN0>

<https://youtu.be/1VXSjF16KXg>

<https://youtu.be/xtf0suS4vek>

<https://youtu.be/o77dGAToV3U>

<https://youtu.be/Edmev8lQxLM>

https://youtu.be/ks8j2_iawVU

<https://youtu.be/n4jtCgpXZVI>

<https://youtu.be/2kY7uzeYWFc>

<https://youtu.be/fvEJpipMWUs>

https://youtu.be/KAlvzK_391s

Co-curricular Activities:

1. Question and answer session at the end of class.
2. Observing animations.
3. Collection and identification of Algae from Fresh water.
4. Collection and identification of diseased plant parts.
5. Group Discussion (GD)/ Quiz.
6. Power Point Presentations.

Model Question Paper Structure for SEE

Max: 40 Marks

Min. Pass: 16 Marks

-
1. Take the T.S. of material 'A' (Fungi), make a temporary mount and make comments about identification.....8M.
 2. Identify any 2 algae from the mixture (material 'B') given with specific comments about identification.....8M
 3. Take the T.S. of material 'C' (Bryophyta), make a temporary mount and make comments about identification.....8M
 4. Identify the following with specific reasons.....4X2=8M
 - A. laboratory equipment of Microbiology
 - B. Virus
 - C. Archaeobacteria /Ascomycete /Cyanobacteria/ Eu-Bacteria
 - D. Lichen
 1. Record + Viva-voce.....5+3 = 8M

CIA 10 M

**ADUSUMILLI GOPALAKRISHNAIAH & SUGAR CANE GROWERS SIDDHARTHA
DEGREE COLLEGE OF ARTS & SCIENCE, VUYURU-521165, KRISHNA Dt., A.P.
(AUTONOMOUS).**

Title of the Paper: **(Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity)**

Semester: - III

Course Code	BOTT31A	Course Delivery Method	Class Room/Blended Mode - Both
Credits	3	CIA Marks	25
No. of Lecture Hours/ Week	4	Semester End Exam Marks	75
Total Number of Lecture Hours	60	Total Marks	100
Year of Introduction : 2021-22	Year of Offering 2021-2022	Year of Revision –	Percentage of Revision: 0%

Course Prerequisites: Knowledge of Anatomy and Embryology of angiosperms, Plant Ecology and Biodiversity at +2 level.

Course Description: This course will provide one with a basic and comprehensive understanding of anatomical structure and functions. Enable the student with depth of topics and helps them to gain an appreciation in the embryology of Angiosperms. On the other hand, importance of understanding plant ecology and biodiversity provides an extensive knowledge to the student.

Course Objectives:

On successful completion of this course, the students will be able to:

1. To understand the Anatomy of Angiosperms.
2. To understand the Embryology of Angiosperms.
3. To understand the Basics of Ecology.
4. To understand the Population Community and Production Ecology.
5. To understand the Basics of Biodiversity.

Course Outcomes: At the end of this course, students should be able to:

CO1: Understand on the organization of tissues and tissue systems in plants.

CO2: Illustrate and interpret various aspects of embryology.

CO3: Discuss the basic concepts of plant ecology, and evaluate the effects of environmental and Biotic factors on plant communities.

CO4: Appraise various qualitative and quantitative parameters to study the population and community ecology.

CO5: Correlate the importance of biodiversity and consequences due to its loss and enlist the Endemic /endangered flora and fauna from two biodiversity hot spots in India and assess strategies for their conservation.

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	<p>Anatomy of Angiosperms Organization of apical meristems: Tunica-carpus theory and Histogen theory. Tissue systems–Epidermal, ground and vascular. Anomalous secondary growth in <i>Boerhavia</i> and <i>Dracaena</i>. Study of timbers of economic importance -Teak, Redsanders and Rosewood.</p>	12
II	<p>Embryology of Angiosperms History of embryology, Structure of anther, types of tapetum. Micro sporogenesis and development of male gametophyte. Structure of ovule, megaspore genesis; monosporic (<i>Polygonum</i>), bi sporic (<i>Allium</i>) and tetra sporic (<i>Peperomia</i>) types of embryo sacs. Outlines of pollination, pollen– pistil interaction and fertilization. Endosperm – Types and biological importance Free nuclear, cellular, helobial and ruminant. Development of Dicot (<i>Capsella bursa-pastoris</i>) embryo.</p>	12
III	<p>Basics of Ecology Ecology: definition, branches and significance of ecology. Ecosystem: Concept and components, energy flow, food chain, food web, ecological pyramids. Plants and environment: Climatic (light and temperature), edaphic and biotic factors. Ecological succession: Hydrosere and Xerosere.</p>	12
IV	<p>Population, Community and Production Ecology Population ecology: Natalty, mortality, growth curves, ecotypes, ecads. Community ecology: Frequency, density, cover, life forms, biological spectrum. Concepts of productivity: GPP, NPP and Community Respiration. Secondary production, P/R ratio.</p>	12
V	<p>Basics of Biodiversity Biodiversity: Basic concepts, Convention on Biodiversity-Earth Summit. Value of Biodiversity; types and levels of biodiversity and Threats to biodiversity. Biodiversity Hot spots in India. Biodiversity in Eastern Ghats and Western Ghats. Principles of conservation: IUCN threat-categories, RED data book. Role of NBPGR and NBA in the conservation of Biodiversity.</p>	12

Textbook:

- Botany–III(Vrukshasastram-I) : Telugu Akademi, Hyderabad
- Botany–IV(Vrukshasastram-II) : Telugu Akademi, Hyderabad
- Pandey,B.P. (2013)*CollegeBotany, Volume-II*, S. Chand Publishing, NewDelhi
- Pandey,B.P. (2013)*CollegeBotany, Volume-III*,S. Chand Publishing, New Delhi

Recommended Reference book:

- Esau, K. (1971) *Anatomyof Seed Plants*.JohnWileyand Son, USA.
- Fahn, A.(1990) *Plant Anatomy*, Pergamon Press,Oxford.
- Cutler, D.F., T.Botha& D. Wm. Stevenson (2008) *Plant Anatomy: An Applied Approach*, Wiley, USA.
- Paula Rudall(1987) *Anatomyof Flowering Plants: An Introduction to Structure and Development*.CambridgeUniversityPress,London.

Course Delivery method: Face-to-face / Blended.

Course has focus on: Foundation Websites of Interest:

<https://byjus.com/biology/tissues-anatomy-of-angiosperms/>

https://onlinecourses.swayam2.ac.in/cec21_bt22/preview

<https://explorenaturalcommunities.org/ecology-basics#:~:text=Ecology%20is%20the%20science%20of,and%20with%20their%20physical%20environment.>

[https://en.wikipedia.org/wiki/Community_\(ecology\)](https://en.wikipedia.org/wiki/Community_(ecology))

https://ec.europa.eu/environment/basics/natural-capital/biodiversity/index_en.htm#:~:text=%22Biodiversity%22%20is%20a%20word%20we,their%20habitats%20and%20their%20genes.&text=Much%20food%20production%20is%20only,that%20pollinate%20plants%20and%20trees.

Co-curricular Activities:

Question and answer session at the end of class. Observing animations.

Written assignments.

Preparation of models.

Making charts

Group Discussion (GD) /

Quiz.

Power Point

Presentations.

A .G & S .G. SIDDHARTHA DEGREE COLLEGE OF ARTS AND SCIENCE, VUYYURU

(An Autonomous college in the jurisdiction of Krishna University)

TITLE OF THE PAPER: Anatomy and Embryology of Angiosperms, Plant Ecology and Biodiversity.

Model Question Paper Structure for SEE

Max. Time: 3 Hrs.

Course Code: BOTT31A

Max. Marks: 75M

Section-A

Answer Any Five at least one from each unit

5 x 5M = 25Marks

1. Tunica corpus theory. **CO1L1**
2. Rose wood. **CO1L2**
3. Nemec phenomenon. **CO2L2**
4. Ruminant endosperm. **CO2L2**
5. Food chain & Food web. **CO3L1**
6. Ecads. **CO4L2**
7. Earth summit. **CO5L1**
8. Identify Biodiversity hot spots of India **CO5L3**.

Section-B

Answer the following questions

5 x 10M = 50Marks

9. (a) Describe the epidermal tissue system. **CO1L1**
or **Unit I**
(b) What is anomalous secondary growth? Describe the anomalous secondary growth in *Boerhavia* stem. **CO1L1**
10. (a) What is embryosac? How many types are there? Explain the development of embryosac studied by you. **CO2L2. Unit II**
or
(b) Explain the development of embryo **CO2L2**
11. (a) What is an ecosystem? Give an account of structure of an ecosystem studied by you. **CO3L1**
or **Unit III**
(b) What is succession? Give account of xerosere. **CO3L1**
12. (a) What is population ecology? Explain characters of a population studied by you. **CO4L2**
or **Unit IV**
(b) List out the quantitative and qualitative characters of community. Explain? Qualitative characters of a plant community. **CO4L2**
13. (a) Classify and analyse main values of biodiversity. **CO5L4**
or **Unit V**
(b) Analyse the major threats to biodiversity. **CO5L4**

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Practical Syllabus

SEMESTER- III

PAPER- III

CREDITS: 02

BOTANY	BOTT3IA	WEF: 2022-2023	B. Sc (BZC), AQUA
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Title of the paper: Anatomy and Embryology of Angio sperms, Plant Ecology and Biodiversity

NO OF HOURS: 30

Course Prerequisites: Knowledge of Anatomy and Embryology of angiosperms, Plant Ecology and Biodiversity at +2 level.

Course Description: This course will provide one with a basic and comprehensive understanding and skill of identifying anatomical structure and functions. Enable the student with depth of topics and helps them to gain an appreciation in the embryology of Angiosperms. On the other hand, importance of understanding plant ecology and biodiversity provides an extensive knowledge to the student.

Course Objectives:

On successful completion of this course, the students will be able to:

1. To understand the Anatomy of Angiosperms.
2. To understand the Embryology of Angiosperms.
3. To understand the Basics of Ecology.
4. To understand the Population Community and Production Ecology.
5. To understand the Basics of Biodiversity.

Course Outcomes:

On successful completion of this practical course students shall be able to:

1. Get familiarized with techniques of section making, staining and microscopic study of vegetative, anatomical and reproductive structure of plants.
2. Observe externally and under microscope, identify and draw exact diagrams of the material in the lab.
3. Demonstrate application of methods in plant ecology and conservation of biodiversity and Qualitative and quantitative aspects related to populations and communities of plants.

Syllabus

Course Details:

Unit	Learning Units	Lecture Hours
I	Tissue organization in root and shoot apices using permanent slides. Anomalous secondary growth in stems of <i>Boerhavia</i> and <i>Dracaena</i> .	4
II	Study of anther and ovules using permanent slides/photographs. Study of pollen germination and pollen viability. Dissection and observation of Embryo sac haustoria in <i>Santalum</i> or <i>Argemone</i> . Structure of endosperm (nuclear and cellular) using permanent slides / Photographs. Dissection and observation of Endosperm haustoria in <i>Crotalaria</i> or <i>Coccinia</i> . Developmental stages of dicot and monocot embryos using permanent slides /photographs.	12
III	Study of instruments used to measure microclimatic variables; soil thermometer, maximum and minimum thermometer, anemometer, rain gauge, and luxmeter. (Visit to the nearest/local meteorology station where the data is being collected regularly and record the field visit summary for the submission in the practical). Study of morphological and anatomical adaptations of hydrophytes and xerophytes (02 each).	6
IV	Quantitative analysis of herbaceous vegetation in the college campus for frequency, density and abundance. Identification of vegetation/various plants in college campus and comparison with Raunkiaer's frequency distribution law.	6
V	Find out the alpha- diversity of plants in the area.	2

Recommended Reference book:

1. Practical Botany volume II- Bendra and Kumar.
2. Practical Botany volume II-O.P.Sharma.
3. Practical Botany volume III-H.N.Srivastava.
4. Khasim SM., Botanical Microtechnique- Principles & Practice, Capital Publishing Company.

Course Delivery method: Face-to-face / Blended.

Course has focus on: Skill Development.

Websites of Interest:

<https://youtu.be/iA5EqQm3hqw>

https://youtu.be/_3K2qLw_z_U

<https://youtu.be/ZIF4NTDL14U>

<https://youtu.be/qPUPw7iS86Q>

https://youtu.be/qGLo_cUMlHU

<https://youtu.be/Sp19GWgXJPQ>.

<https://youtu.be/ifAdxMspJGY>

<https://youtu.be/K86XXQdwIB4>

<https://youtu.be/c83EtBUrWsk>

<https://youtu.be/enD2OwXBhCM>

<https://youtu.be/M-TczeGvCCg>

<https://youtu.be/dDrrTbi88zE>

<https://youtu.be/aX58F5jWxU8>

<https://youtu.be/rSsFn1GEuyw>

Co-curricular Activities:

Question and answer session at the end of class.

Observing animations.

Written assignments. Preparation of temporary slides. Group

Discussion (GD)/ Quiz.

Power Point Presentations.

Practical Model Question Paper

Max.: 40 Marks

Min. Pass: 16 Marks

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1. Take T.S of the given material 'A' (Anatomy), prepare a temporary slide and justify the identification with specific reasons.....**8M**
2. Write the procedure for the experiment 'B' (Embryology) and demonstrate the same...**8M**
3. Take T.S of the material 'C'. Prepare a temporary slide and justify the identification with specific reasons.....**8M**
4. Identify the following with specific reasons.....**4x2=8**

-
- D. Anatomy/Embryology
 - E. Ecology instrument
 - F. Mapping of Biodiversity hot spot.
 - G. Endemic/endangered plant/animal

-
5. Record +Viva-voce.....**5+3=8 M**

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(AUTONOMOUS).**

NAAC reaccredited at 'A' level
Autonomous –ISO 9001-2015 Certified

Title of the Paper: **Plant tissue culture**

Semester: - V

Course Code	BOT 501	Course Delivery Method	Class Room/Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours/ Week	3	Semester End Exam Marks	70
Total Number of Lecture Hours	50	Total Marks	100
Year of Introduction : 2022-23	Year of Offering 2022-2023	Year of Revision –	Percentage of Revision: 0%

Type of the Course: Skill Enhancement Course (Elective: Theory),

Course Outcomes: Students at the successful completion of the course will be able to:

CO1: Comprehend the basic knowledge and applications of plant tissue culture.

CO2: Identify various facilities required to set up a plant tissue culture laboratory.

CO3: Acquire a critical knowledge on sterilization techniques related to plant tissue culture.

CO4: Demonstrate skills of callus culture through hands on experience.

CO5: Understand the biotransformation technique for production of secondary metabolites.

- References/TextBook/ e-books/websites:

1. Razdan, M.K. (2005) Introduction to Plant Tissue Culture, Oxford & IBH Publishers, Delhi
2. Bhojwani, S.S. (1990) Plant Tissue Culture: Theory and Practical (a revised edition). Elsevier Science Publishers, New York, USA.

ReferenceMaterials ontheWeb/web links:

<https://www.youtube.com/watch?v=dFrX-t5JOPA>

<https://www.youtube.com/watch?v=A6qEgc6Jt3Q>

Co-CurricularActivities

(a) Mandatory:(Training of students by teacher in field related skills:(lab:10 + field: 05)

1. **For Teacher:** Training of students by teacher in the laboratory/field for a total of not less than 15 hours on the field techniques/skills of sterilization procedures, preparation of media, establishment of callus culture, growth measurements; morphogenesis and organogenesis; acclimatization and hardening of plantlets.

2. **For Student:** Students shall (individually) visit anyone of plant tissue culture laboratories in universities/research organizations/private facilities, write their observations on tools, techniques, methods and products of plant tissue culture; and submit a hand-written Fieldwork/Project work Report not exceeding 10 pages to the teacher in the given format.

3. Max marks for Fieldwork/Project work Report: 05

4. Suggested Format for Fieldwork/Project work Report: Title page, student details, index page, details of place visited, observations, findings and acknowledgements.

5. Unit tests (IE).

b) Suggested Co-Curricular Activities:

1. Training of students by related industrial experts.
2. Assignments (including technical assignments like identifying tools in plant tissue culture and their handling, operational techniques with safety and security, IPR)
3. Seminars, Group discussions, Quiz, Debates etc. (on related topics).
4. Preparation of videos on tools and techniques in plant tissue culture.
5. Collection of material/figures/photos related to products of plant tissue culture, writing and organizing them in a systematic way in a file.
6. Visits to plant tissue culture/biotechnology laboratories in universities, research organizations, private firms, etc.
7. Invited lectures and presentations on related topics by field/industrial experts.

TITLE OF THE PAPER: PLANT TISSUE CULTURE

Model Question Paper

Max. Time: 3 Hrs.

Course Code: BOT-501

Max. Marks: 70M

.....
SECTION – A

Answer any FOUR of the following questions.

4x5=20 Marks

(Draw diagrams wherever necessary)

1. What is totipotency? Explain.
2. Describe the method of dry sterilization.
3. Enumerate the somaclonal variations.
4. Discuss about the virus indexing.
5. Prepare a note on cryoprotectants.
6. State a note on UV sterilization
7. What is an explant? Describe.
8. Describe the synthetic seeds in detail.

SECTION - B

Answer any Five of the following questions.

5x10 =50M.

(Draw diagrams wherever necessary)

9. Enumerate an account of Infrastructure and equipment required to establish a tissue culture laboratory.
10. Explain various methods of sterilization.
11. Discriminate an account of the composition and preparation of MS media.
12. Summarize an account of callus culture.
13. Paraphrase various ways of surface sterilization of explants
14. Illustrate about somatic embryogenesis.
15. Memorize the gene transfer methods.
16. State an account on secondary metabolite production through Bioreactors

Guide lines for paper setter: (for Paper V-BOT-501) W.e.f. 2022-23

1. In Section A: Unit II, III, VI, must carry Two questions from each unit. Unit I, V must carry one question.
2. In section-B: Set minimum two questions from Unit II, III & V and Set One Question from I, IV.
3. See the following table and Model paper.
4. Please provide the scheme of valuation for the paper.
5. Question paper should be both in English and Telugu media.

Unit	Section – A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	1		1		
		5		10	15
Unit – II	2		2		
		10		20	30
Unit – III	2		2		
		10		20	30
Unit-IV	2		1		
		10		10	20
Unit-V	1		2		
		5		20	25
Max. Q & marks	8	(x 5) = 40	8	(x 10) = 80	(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		
		(4 x 5) = 20		(5 x 10) = 50	70

INTERNAL EXAMS – 30 Marks

(20 marks for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.)

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Practical Syllabus

SEMESTER- III

PAPER- II

CREDITS: 02

BOTANY	BOT- 501	WEF: 2022-2023	B. Sc (BZC), AQUA
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Title of the paper: PLANT TISSUE CULTURE

NO OF HOURS: 30

Type of the Course: Skill Enhancement Course (Elective: Practical),

I. Course Outcomes: Students at the successful completion of the course will be able to:

CO1: Demonstrate the applications of autoclave, laminar airflow, hot air oven.

CO2: Sterilize the glassware and tools used for tissue culturing.

CO3: Prepare different stock solutions, media.

CO4: Measure the growth of callus formed.

CO5: Demonstrate the hardening and acclimatization in green house.

II: Practical (Laboratory) Syllabus:(30Periods):Atleast8Practicals....

1. Principles and applications of- Autoclave, Laminar Airflow, Hot Air Oven.
2. Sterilization techniques for glass ware, tools etc.,
3. MS medium - Preparation of different stock solutions; media preparation
4. Explant preparation, inoculation and initiation of callus from carrot.
5. Callus formation, growth measurements.
6. Induction of somatic embryos, preparation of synthetic seeds.
7. Multiplication of callus and organogenesis.
8. Hardening and acclimatization in green house.

III. Lab References:

1. Reinert, J. and M.M. Yeoman, 1982. Plant Cell and Tissue Culture - A Laboratory
2. Manual, Springer-Verlag Berlin Heidelberg
3. Robert N. Trigiano and Dennis J. Gray, 1999. Plant Tissue Culture Concepts and Laboratory Exercises. CRC Press, Florida
4. Ashok Kumar, 2018. Practical Manual for Biotechnology, College of Horticulture & Forestry, Jhalawar, AU, Kota
5. Chawla, H.S., 2003. Plant Biotechnology: A Practical Approach, Nova Science Publishers, New York
6. Web sources suggested by the teacher concerned.

Practical Question Paper

Time : 3hrs

Max.Marks:50

-
- | | | |
|--|-----|--------------------|
| 1. Demonstration of a sterilization technique | 'A' | 5 M |
| 2. Preparation of MS medium | 'B' | 5 M |
| 3. Demonstration of callus culture technique/growth measurements | 'C' | 5M |
| 4. Scientific observation and data analysis | | 4 x 2 = 8 M |
| D. Tissue culture equipment /photograph | | |
| E. Morphogenesis or organogenesis - photograph | | |
| F. Bioreactor/Secondary metabolite | | |
| G. Transgenic plant/photograph | | |
| 5. Viva voce | | 2M |

Internals:

- | | |
|----------------------------|------|
| 1. Record | .05M |
| 2. Project work..... | 10M |
| 3. Field trip | .5M |
| 4. Internal practical exam | 05M |

Total Marks: 25

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(AUTONOMOUS).**

NAAC reaccredited at 'A' level
Autonomous –ISO 9001-2015 Certified

Title of the Paper: **mushroom cultivation (7C)**

Semester: - V

Course Code	BOT 501	Course Delivery Method	Class Room/Blended Mode - Both
Credits	3	CIA Marks	30
No. of Lecture Hours/ Week	3	Semester End Exam Marks	70
Total Number of Lecture Hours	50	Total Marks	100
Year of Introduction : 2022-23	Year of Offering 2022-2023	Year of Revision –	Percentage of Revision: 0%

Course Outcomes: Students at the successful completion of the course will be able to:

CO1: Comprehend the value of mushrooms.

CO2: Identify the methods of composting and the materials required.

CO3: Acquire a critical knowledge on spawning and casing.

CO4: Demonstrate skills in cultivation of various mushrooms.

CO5: Understand the Post-harvest technology.

Syllabus: (Total Theory Hours: 45 including Unit tests etc.)UNIT-I-Introduction and value of mushrooms .

Course Details:

Unit	Learning Units	Lecture Hours
I	<p>Mushrooms: Definition, structure of a mushroom and a brief account of life cycle; historical account and scope of mushroom cultivation; difference between edible and poisonous mushrooms.</p> <p>Morphological features of any four edible mushrooms, Button mushroom (<i>Agaricusbisporus</i>), Milky mushroom (<i>Calocybe indica</i>), Oyster mushroom (<i>Pleurotussajor-caju</i>) and Paddy straw mushroom (<i>Volvariellavolvacea</i>). Nutritional value of mushrooms; medicinal mushrooms in South India - Ganoderma lucidum, Phellinus rimosus, Pleurotus florida and Pleurotus pulmonaris – their therapeutic value; Poisonous mushrooms - harmful effects.</p>	10
II	<p>Basic requirements of cultivation system</p> <p>Small village unit and larger commercial unit; layout of a mushroom farm - location of building plot, design of farm, bulk chamber, composting, equipment and facilities, pasteurization room and growing rooms.</p> <p>Compost and composting: Definition, machinery required for compost making, materials for compost preparation.</p> <p>Methods of composting- long method of composting and short method of composting</p>	10
III	<p>Spawning and casing</p> <p>Spawn and spawning: Definition, facilities required for spawn preparation; preparation of spawn substrate. Preparation of pure culture, media used in raising pure culture; culture maintenance, storage of spawn.</p> <p>Casing: Definition, Importance of casing mixture, Quality parameters of casing soil, different types of casing mixtures, commonly used materials.</p>	10
IV	<p>Mushroom cultivation</p> <p>Raw material, compost, spawning, casing, cropping, and problems in cultivation (diseases, pests and nematodes, weed molds and their management strategies), picking and packing for any Four of the following mushrooms: (a) Button mushroom (b) Oyster mushroom (c) Milky mushroom and (d) Paddy straw mushroom</p>	10
V	<p>Post harvest technology</p> <p>Shelf life of mushrooms; preservation of mushrooms - freezing, dry freezing, drying and canning. Quality assurance and entrepreneurship - economics of different types of mushrooms; value added products of mushrooms.</p> <p>Management of spent substrates and waste disposal of various mushrooms.</p>	10

References/TextBook/ e-books/websites

1. Tewari Pankaj Kapoor, S. C. (1988). Mushroom Cultivation. Mittal Publication, New Delhi.
2. Pandey R.K, S. K Ghosh, (1996). A Hand Book on Mushroom Cultivation. Emkey Publications
3. Web resources suggested by the teacher concerned and the college librarian including reading material.

Reference Materials on the Web/web links:

<https://www.youtube.com/watch?v=DwMCw14khIU>

<https://www.youtube.com/watch?v=vggMIUelsoU>

IV Co-Curricular Activities

(a) Mandatory: (Training of students by teacher in field related skills: (lab: 10 + field: 05)

1. **For Teacher:** Training of students by teacher in the laboratory/field for not less than 15 hours on the field techniques/skills of identification of edible and poisonous mushrooms, basic facilities of a mushroom culture unit, preparation of compost and spawn, cultivation practices of edible mushrooms, storage and marketing of produce.

2. **For Student:** Students shall (individually) visit mushroom culture units in universities/research organizations/private sector write their observations on infrastructure, cultivation practices and products of a mushroom culture unit etc., and submit to the teacher a hand-written Fieldwork/Project work Report not exceeding 10 pages in the given format.

3. Max marks for Fieldwork/Project work Report: 05.

6. Suggested Format for Fieldwork/Project work Report: Title page, student details, index page, details of place visited, observations, findings and acknowledgements.

4. Unit tests (IE).

b) Suggested Co-Curricular Activities: 1. Training of students by related industrial experts.

2. Assignments (including technical assignments like identifying various mushrooms, tools and techniques for culture, identification and control of diseases etc.,

3. Seminars, Group discussions, Quiz, Debates etc. (on related topics).

4. Preparation of videos on tools and techniques in mushroom culture.

5. Collection of material/figures/photos related to edible and poisonous mushrooms, cultivation of mushrooms in cottage industries, writing and organizing them in a systematic way in a file.

6. Visits to mushroom culture units in universities, research organizations, private firms, etc.

7. Invited lectures and presentations on related topics by field/industrial experts.

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TITLE OF THE PAPER: Mushroom Cultivation

Model Question Paper Structure for SEE

Max. Time: 3 Hrs.

Course Code: BOT-502

Max. Marks: 70M

SECTION – B

Answer any FOUR of the following questions.

4x5=20 Marks

(Draw diagrams wherever necessary)

1. Extend the medicinal value of *Ganoderma*.
2. Describe the small village unit.
3. List the facilities required for spawn preparation.
4. Explain weed mold in mushroom cultivation.
5. Illustrate the Novel Value Added Products of Mushrooms.
6. Enumerate the Poisonous mushrooms.
7. Summarize Layout of a mushroom farm.
8. Explain about the Casing oil.

SECTION – B

5x10 =50M

Answer all questions.

(Draw diagrams wherever necessary)

9. Describe the life cycle of a mushroom.
10. Describe the morphological features of Paddy straw and oyster mushroom.
11. Explain various types of composting methods.
12. Point out basic requirements of mushroom cultivation.
13. What is casing? Explain different types of casing mixture and their Importance.
14. Summarize the process of cultivation of Milky mushroom.
15. Extend an account cultivation of Oyster mushroom.
16. What are the conditions required to improve shelf life of mushrooms?

Guide lines for paper setter: (for Paper V-BOT-502) W.e.f. 2022-23

6. In Section A: Unit I, II, III, must carry Two questions from each unit. Unit IV & V must carry one question.

7. In section-B: Set minimum two questions from Unit I, II & IV and Set One Question from III & V.

8. See the following table and Model paper.

9. Please provide the scheme of valuation for the paper.

10. Question paper should be both in English and Telugu media.

Unit	Section – A		Section - B		Weightage in
	Questions	Marks	Questions	Marks	Marks
Unit – I	2		2		
	10		20		30
Unit – II	2		2		
	10		20		30
Unit – III	2		1		
	10		10		20
Unit-IV	1		2		
	5		20		25
Unit-V	1		1		
	5		10		15
Max. Q & marks	8 (x 5) = 40		8 (x 10) = 80		(Total questions = 16) Marks 120
Max. Q and marks for Valuation	Questions	Marks	Questions	Marks	Max. marks
	4		5		
	(4 x 5) = 20		(5 x 10) = 50		70

INTERNAL EXAMS – 30 Marks

(20 marks for unit tests, 5 marks for assignments and remaining 5 marks for seminar etc.)

A .G & S .G. SIDDHARTHA DEGREE COLLEGE OF ARTS AND SCIENCE, VUYYURU
(An Autonomous college in the jurisdiction of Krishna University)

Practical Syllabus

SEMESTER- V (7C)

PAPER- V

CREDITS: 02

BOTANY	BOT-502	WEF: 2022-2023	B. Sc (BZC), AQUA
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MUSHROOM CULTIVATION

Type of the Course: Skill Enhancement Course (Elective: Practical),

I. Course Outcomes: Students at the successful completion of the course will be able to:

- CO1: Identify different types of mushroom.
- CO2: Demonstrate preparation of pure culture of an edible mushroom.
- CO3: Prepare compost and casing mixture.
- CO4: Crop and harvest mushrooms.
- CO5: Prepare value-added products.

II: Practical (Laboratory) Syllabus :(30Periods):Atleast8Practicals....

1. Identification of different types of mushrooms.
2. Preparation of pure culture of an edible mushroom.
3. Preparation of mother spawn.
4. Production of planting spawn and storage.
5. Preparation of compost and casing mixture.
6. Demonstration of spawning and casing.
7. Hands on experience on cropping and harvesting.
8. Demonstration of storage methods.
9. Preparation of value-added products.

III. Lab References:

1. Sushma Sharma Sapna Thakur Ajar NathYadav, 2018. Mushroom Cultivation: A Laboratory Manual, Eternal University, Sirmour, H.P.
2. Kadhila -Muandingi, N.P., F. S. Mubiana and K. L. Halueendo, 2012. Mushroom Cultivation: A Beginners Guide, The University of Namibia
3. Gajendra Jagatap and UtpalDey, 2012. Mushroom Cultivation:Practical Manual, LAMBERT Academic Publishing, Saarbrücken, Germany
4. Deepak Som, 2021. A Practical Manual on Mushroom Cultivation, P.K.Publishers& Distributors, Delhi
5. Web sources suggested by the teacher concerned.

Question Paper Pattern: Practicals

Time: 3 hrs

Max.Marks:50

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1. Demonstration of preparing pure culture/mother spawn 'A' 5 M
 2. Preparation method for planting spawn and storage/compost and casing material 'B' 5 M
 3. Demonstration of spawning and casing/storage and making a value- added product 'C' 5 M

4. Scientific observation and data analysis

4 x 2 = 08M

- D. Edible/poisonous mushroom specimen/photograph
 - E. Infrastructure/tool used in mushroom cultivation
 - F. Material for compost/casing
 - G. Storage practice/ a value-added product
5. Viva Voce 2M

Internals:

1. Record .05M
2. Project work..... 10M
3. Field trip .5M
4. Internal practical exam 05M

Total Marks: 25
