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

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) CH. Beulah Ranjani .....Chairman — Head, Department of Botany
(Smt. CH. Beulah Ranjani) — A. G & S.G 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) Ch. Srinivasa Reddy .....Academic — Lecture in Botany,
(Sri. Dr.Ch. Srinivasa Reddy) Council Nominee — SRR& CVR Govt. Degree College Vijayawada, 520004 ,

4) V. Bhagya lakshmi .....Academic — Head, Department of Botany
(Smt.V. Bhagya Lakshmi) Council Nominee — SDMSK,Vijayawada,

4) .....Industrialist. Naturalfarming.
(Sri. S. Krishna Suman) — yakamuru
Vuyyuru, Krishna d.t

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

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

7) K. Anusha .....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 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.

CH. Beulah Ranjani

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 Botanyof 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 ofVascularplants 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 ofVascularplants and Phytogeography

(Pteridophytes, Gymnoperms, 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 structureand functions. Enable the student with depth of topics and helps them to gain an appreciation in theembryology 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 comparision 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 summari ze their good and services for human welfare

CO3: Explaination of the process of fossilization and compare the characteristics ofextinct and extant plants.

CO4: Analyze the morphology of the most common Angiosperm plants of theirlocalities and recognize their families.

CO5: Locate different Phytogeographical regions of the world and India and cananalyze their floristic wealth.

Syllabus

Course Details

Unit	Learning Units	Lecture Hours
I	**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) *Lycopodium* (Lycopsida) and (b) *Marsilea* (Filicopsida). Stelar evolution in Pteridophytes Heterospory and seed habit.	12
II	**Gymnosperms** General characteristics of Gymnosperms; Sporne classification upto classes. Occurrence, morphology, anatomy, reproduction (developmentaldetails are not needed) and life history of (a) *Cycas (Cycadopsida)* and (b) *Gnetum* (Gnetopsida). Outlines of geological time scale. A brief account on Cycadeoidea	12
III	**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) Curcurbitaceae	
IV	**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).	12
V	**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	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 CentralBook Agency Pvt. Ltd., Kolkata
5. Hait, G., K. Bhattacharya & A.K. Ghosh (2011) A Text Book of Botany, Volume-I, New CentralBook 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 Vascul Plants, Volume –I: Pteridophytes and Gymnosperms (Ed.K.Kubitzki) .Springe-Verlag, New York
6.Bhatnagar, S.P. &AlokMoitra (1996)Gymnosperms. New Age International, New Delhi Govil, C.M. (2007)Gymnosperms : Extinct and Extant. KRISHNA PrakashanMedia (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 PaleobotanyMcGraw –Hill BookCompany,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.
1 0 . Sambamurty, 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., NewDelhi.12. Simpson, M.G. (2006). Plant Systematics. Elsevier Academic Press, San Diego,CA,U.S.A.
Cain, S.A . (1944)Foundations of Plant GeographyHarper& Brothers, N.Y.
13. Mani, M.S (1974)Ecology & Biogeography of IndiaDr. W. Junk Publishers, The Haque

Course Delivery method: Face-to-face / Blended

Course has focus on: Foundation

Websites of Interest:

https://www.youtube.com/watch?v=VA2LNWkZNWo
https://www.youtube.com/watch?v=zDUCacewuAg
https://www.youtube.com/watch?v=sfFDOSM-EuAhttps://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 fromTheir 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, Stelar 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 homospory. **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 AndhraPradesh.**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 ofit. **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 ofClassification? **CO3, L1**.

(Or) **Unit III**

(b) Describe vegetative and floral characters of Cucurbitaceae. Add a note on andeconomic 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.**

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Title of the Paper: **Basics ofVascularplants and Phytogeography**
(Pteridophytes, Gymnoperms, Taxonomy of Angiosperms and Phytogeography)
Total Number of Lecture Hours: 30

SEMESTER - II	BOTT21A	2021-22	B.Sc, B.Z.C,A.B.C

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 structureand functions. Enable the student with depth of topics and helps them to gain an appreciation in theembryology 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, prep aring slides, identifying ofthe material and drawing exact figures.
CO2: Compare and contrast the morphological, anatomical and reproductive featuresof vascular plants.
CO3: Identify the local angiosperms of the families prescribed to their genus andspecies level and prepare herbarium.
CO4: Exhibit skills of preparing slides, identifying the given twigs in the lab anddrawing figures of plant twigs, flowers and floral diagrams as they are.
CO5: Prepare and preserve specimens of local wild plants using h erbariumtechniques.

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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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	**Plant - water relations** **10HRS** Importance of water to plant life, physical properties of water, diffusion, Imbibition, Osmosis. Water potential, osmotic potential, pressure potential. Absorption and lateral transport of water; Ascent of sap Transpiration: stomata structure and mechanism of stomatal movements (K^+ ion flux). Mechanism of phloem transport; source-sink relationships.
Unit – 2	**Mineral nutrition, Enzymes and Respiration** **14 HRS** Essential macro and micro mineral nutrients and their role in plants; symptoms of mineral deficiency. Absorption of mineral ions; passive and active processes. Characteristics, nomenclature and classification of Enzymes. Mechanism of enzyme action, enzyme kinetics. Respiration: Aerobic and Anaerobic; Glycolysis, Krebs cycle; electron transport system, mechanism of oxidative phosphorylation, Pentose Phosphate Pathway (HMP shunt).
Unit – 3	**Photosynthesis and Photorespiration** **12 HRS** Photosynthesis: Photosynthetic pigments, absorption and action spectra; Red drop and Emerson enhancement effect Concept of two photosystems; mechanism of photosynthetic electron transport and evolution of oxygen; photophosphorylation Carbon assimilation pathways (C3,C4 and CAM);Photorespiration - C2 pathway
Unit – 4	**Nitrogen and lipid metabolism** **12 HRS** Nitrogen metabolism: Biological nitrogen fixation – asymbiotic and symbiotic nitrogen fixing organisms. Nitrogenase enzyme system. Lipid metabolism: Classification of Plant lipids, saturated and unsaturated fatty acids. Anabolism of triglycerides, β-oxidation of fatty acids, Glyoxylate cycle.
Unit – 5	**Plant growth – development and stress physiology** **12 HRS** Growth and Development: Definition, phases and kinetics of growth. Physiological effects of Plant Growth Regulators (PGRs) - auxins, gibberellins, cytokinins, ABA, ethylene and brassinosteroids. Physiology of flowering: Photoperiodism, role of phytochrome in flowering. Seed germination and senescence; physiological changes.

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, Austalia&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

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

An autonomous college in the jurisdiction of Krishna University

BOTANY	BOT- 401C	w.e.f. 2021-22	B. Sc. (BZC), AQUA

II B. Sc – BOTANY **Model Question Paper** **SEMESTER- IV**

PAPER-IV: Time: 3 Hours **Max. Marks: 70**

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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

(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. 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

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

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. Record ……..10M
2. Assignments……..05 M
3. Project work……..05 M
4. Internal practical exam…….05 M

Suggested co-curricular activities for Botany Core Course-4 in Semester-IV:

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.

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 geneticmaterial.
- 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:**	**12 Hrs.**
	Cell theory; prokaryotic vs eukaryotic cell; animal vs plant cell; a brief account on ultra-structure of a plant cell.	

	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.
Unit – 2	**Chromosomes:** **11Hrs.** Prokaryotic vs eukaryotic chromosome. Morphology of a eukayotic chromosome. Euchromatin and Heterochromatin; Karyotype and ideogram. Brief account of chromosomal aberrations - structural and numerical changes Organization of DNA in a chromosome (nucleosome models).
Unit – 3	**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.
Unit – 4	**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.
Unit – 5	**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.

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. Cell Theory
2. karyotype.
3. Rho - factor
4. Back cross and test cross.
5. supplymentary 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		
		5	20		25
Unit – II	1		1		
		05	10		15
Unit –III	2		2		
		10		20	30
Unit-IV	2		2		
		10		20	30
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 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 structureof plant cell and its organelles using Electron microscopic Photographs/models.
2. Demonstration of Mitosis in *Allium cepa*/*Aloe vera* roots using squashtechnique; 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. Record ……10M
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 mitoticcell cycle in roots of *Aliumcepa*
2. Study of mitoticcell 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 *Mangiferaindica.*

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.

(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,

Course Code	**BOT - 601**	Course Delivery Method	Class Room / Blended Mode - Both

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 ofplant tissue culture. Enable the student with depth of topics and helps them to gain an appreciation inthe 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 t issue 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	**PLANT TISSUE CULTURE – 1** **(12hrs)** History of plant tissue culture research - basic principles of plant tissue callus culture, m Meristem culture, organ culture, Totipotency of cells. Sterilization procedures, culture media mcomposition and preparations of explanats. 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).
Unit – 2	**Plant Tissue culture -2** **(12hrs)** **En**dosperm culture – Embryo culture -culture requirements – applications, embryo rescue technique. .Cryopreservation; Germ plasm conservation.

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**

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SECTION-A

Answer any FOUR of the following question **4x5=20M.**

(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. **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
	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		
	(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**

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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 ofrecombinant DNA. ASM Press, Washington.

4. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms. VikasPublicationHouse Pvt. Ltd., New Delhi. 5th edition.

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 diversity and Human welfare**

Semester: **VI**

Course Code	**BOT - 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
	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 – 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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Vuyyuru - 521165.

NAAC reaccredited at 'A' level

Autonomous -ISO 9001 – 2015 Certified

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 sciences5.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	**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.
Unit – 2	**Role of ethnobotany in modern Medicine** (12hrs) Role of Ethnobotany in modern medicine with special example; Rauvolfiasepentina, Artemisia annua, Withaniasomnifera. 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 Medico-Ethnobotanical Sources of India.
Unit – 3	**Ethno botany 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
	History, Scope and Importance of Medicinal Plants, Indigenous Medicinal Sciences (12hrs) Definition and Scope-Ayurveda: History, origin, panchamahabhutas, saptadhatu and

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. Disscus 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 Ayurvada.
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	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.).

III B. Sc – Practical Paper
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 sketches ……..……10marks

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 prearations (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 principlesand 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** **(12hrs)** Definition, Importance Classification of drugs - Chemical and Pharmacological Drug evaluation methods
Unit – 2	**Organoleptic and microscopic studies:** **(12hrs)** 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.
Unit – 3	**Secondary Metabolites** **(12hrs)** 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.
Unit – 4	**Phytochemistry:** **(12hrs)** 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.
Unit – 5	**Enzymes, proteins and amino acids as drugs**: **(12hrs)** Vaccines, toxins and toxoids, immune globulins, antiserums, Vitamins, Antibiotics – chemical nature, mode of action. Pharmacological action of plant drugs – tumor inhibitors, PAF antagonists, antioxidants,

	phytoestrogens and others.

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. 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, 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	Marks	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 — BOT-VIII-604-A- 3 (CL)P

Time: 3 Hours — 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 Anatamical 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 -**……..……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.

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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 per week: 2
Hours

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 collectionand 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 anentrepreneur 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 andpractices, Central arid Zone Research Institute (ICAR), Jodhpur, Rajasthan.
2.Kumar, N., (1997) Introduction to Horticulture, Rajalakshmi PublicationsNagercoil.
3.Kumar Mishra.,N.K. Mishra and Satish Chand (1994) Plant Propogation, JohnWiley & Sons. New Jersy

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?