SKR & SKR GOVT. COLLEGE FOR WOMEN (A), KADAPA

Re-Accredited with 'B' grade by NAAC

Nagarajet, Kadapa, Andhra Pradesh, India-516001

CURRICULUM AND SYLLABI
CHOICE BASED CREDIT AND SEMESTER SYSTEM
(CBCS)
As per APSCHE Syllabus(w.e.f 2020-2023)

UNDERGRADUATE PROGRAMME IN BOTANY

(I B.Sc. BOTANY)
B.Z.C (Botany/Zoology/Chemistry) (TM&EM) &
B.C,H (Botany/ /Chemistry/ Horticulture) (E.M)
(I & II Semesters)
w.e.f 2020-2021

DEPARTMENT OF BOTANY

BOARD OF STUDIES MEETING
ON
25-01-2021

CONTENTS

Constitution of Board of Studies in Botany

This Board of Studies in Botany has been constituted by the Principal SKR&SKR Govt. College for Women (A), Kadapa, as per UGC Autonomous guidelines of XII plan (2012-2017)

S.No.	Category	Name and Designation	Chairperson/ Member
1	In charge of the Dept. of Botany	Smt. B. Yuga Vani Lecturer in Botany SKR&SKR Govt. College for Women (A)-Kadapa	Chairperson
2	Subject expert Nominated by the Vice-Chancellor from Y.V.U. Kadapa	Prof. P.S. Shavalli Khan Professor, Dept. of Botany Y.V.University, Kadapa. 9441079002	University Nominee
3	Faculty Member	Smt. N. Rajeswari Lect. in Botany (G) SKR&SKR Govt. College for Women (A) - Kadapa	Member
4	Two Subject Experts from outside the college to be nominated by the Academic Council	Dr. P.V. Krishna Reddy Lecturer in Botany Govt. College for Men (A), Kadapa pattikrishnareddy@gmil.com	Subject Expert Member
		Smt. Y. Naga Ratnamma Lect. in Botany Govt. Degree College Mydukur, Kadapa 8374210309;	Subject Expert Member
5	One Representative from Industry/ Corporate Sector/Allied Area Relating to Placement	J.K. Singh., Industrialist.,JK. Industries. Manufacture of Bio fertilizers., Kadapa.	Member
6	One P.G. Meritorious Alumnus	Smt. N. Rajani Krishna P.G.T. Botany, A.P. Model School & Junior College, Ramapuram, Kadapa(Dist) Cell No: 9550662976 Mail: nrkrishnamd@gmail.com	Member

Principal
SKR&SKR Govt. College for Women (A), Kadapa

S.K.R & S.K.R GOVT. COLLEGE FOR WOMEN (A) - KADAPA

Re accredited by NAAC with "B" Grade

DEPARTMENT OF BOTANY- (BOS – 2020-2021)

Dr. P. Subba Lakshumma. M.Com, M.Phil., Ph.D.,
Principal
Mail.kadapaw.jkc@gmail.com

DATE: 23-01-2021

R. C. No. A-2/ GDCW (A)/BOS/Syllabi & Regulations/2020

To
The Chairman/Members
Board of Studies in Botany

Dear Sir/Madam

Sub: SKR&SKR Govt. College for Women (A), Kadapa, Conducting of Board of Studies Meeting in Department of Botany on 25-01-2021 at 11.00 P.M.- acceptance req.,reg.,

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I am happy to invite the Chairman/Members of Board of Studies in Botany meeting to be held in the Department of Botany on 25-01-2021 at 11.00 A.M. to discuss the pattern of I Year B.Sc with Botany Curriculum, I & II Semester wise syllabus, Question paper Pattern, Panel of Examiners (Examiners & Paper Setters) Skill Development Courses related with Botany Subject and other related issues.

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01	In charge of the Dept. of Botany	Smt. B. Yuga Vani Lecturer in Botany	Chair person
2	Subject expert Nominated by the Vice-Chancellor from Y.V.U. Kadapa	Dr. P.S. Shavalli Khan Professor, Dept. of Botany Y.V.University, Kadapa. 9441079002	University Nominee
3	Faculty Member	Smt. N. Rajeswari Guest Lecturer. in Botany (G) SKR&SKR Govt. College for Women (A) - Kadapa	Member
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		Smt. Y. Naga Rathnamma Lecturer. in Botany Govt. Degree College, Mydukur, Kadapa 8374210309;	Subject Expert
5	One Representative from Industry	J.K. Singh., Industrialist, JK. Industries. Manufacture of Bio fertilizers., Kadapa.	Member
6	One P.G. Meritorious Alumnus	Smt. N. Rajani Krishna, P.G.T. Botany, A.P. Model School & Junior College, Ramapuram, Kadapa(Dist) Cell No: 9550662976; nrkrishnamd@gmail.com	Member

Principal

Agenda & Minutes of Board of Studies in Botany held on 25.01.2021

The Board of Studies meeting in Botany held on 25.01.2021 at 9.00 A.M in the Department of Botany, SKR & SKR Govt. College for Women (A), Kadapa to discuss the agenda mentioned below:

Agenda for Board of Studies in Botany

- To Discuss on I & II Semesters of Botany syllabi for first Year B.Sc. Courses with Botany B.Z.C English & Telugu Medium, B.H.C. English Medium with CBCS Curriculum Structure based on APSCHE New Frame Work (w.e.f. 2020–2021).
- To discuss any modification in present syllabus to be included..
- To Discuss on SDC for I Semester and II Semester which are related to Dept. of Botany introduced for First Year B.Sc. (BZC & BCH) with regard to CBCS Curriculum based on APSCHE New Frame Work (w.e.f. 2020–2021)
- To Discuss Evaluation Procedure and Internal and External Ratio of Marks as 60:40

Minutes of the meeting

- Curricular Frame work & Credits : The following credit pattern implemented for Semester I & II for Academic year 2020-2021 admitted batch students.

Programme	Subject	Semester – I		Semester –II	
		Hours	Credits	Hours	Credits
B.Sc.	English	4	3	4	3
	Second Language (T/H/U)	4	3	4	3
	Life Skills Course	2	2	2	2
	Skill Development Course	2	2	2	2
	DSC Core 1: Botany (Theory)	4	3	4	3
	Botany (Practical)	2	2	2	2
	DSC Core 2 : Zoology(Theory)	4	3	4	3
	Zoology (Practical)	2	2	2	2
	DSC Core 3 : Chemistry(Theory)	4	3	4	3
	Chemistry(Practical)	2	2	2	2
Total		30	25	30	25

- # DSC Core 1: BOTANY : Fundamentals of Microbes and Non-vascular Plants
- # DSC Core 2: BOTANY : Basics of Vascular plants and Phytogeography

Revised Minutes as per Academic council resolution for CIA and SEE Marks ratio

- Evaluation Procedure and Internal and External Ratio of Marks pattern is revised as per suggestions and approvals made by 4th Academic Council members meeting held on 1-4-2021 relevant to Marks, Credits and Assessment of Theory IA and SEE & Practical Examinations with following pattern.
- Theory examination for 100 Marks, both External and Internal as Ratio of 75:25 (Approved in Academic Council meeting held on 26-03-2021 as per guidelines of APSCHE , CCE,A.P on 2020-2021) and both are compulsory assessed for Minimum Pass Percentage as 40.
- Core Subject Botany Practical Examination for 50 Marks which is conducted and evaluated for I Semester with internal examiners and II Semester with External examiners.
- Assessment of Theory examination for 50 Marks to Skill Development Courses, which is External only.
- To Discuss CIA Procedure for 25 Marks , which is approved in Academic Council Meeting for BOS, SKR & SKR Govt. College for Women(A), held on 25-01-2021

Written exam	15 Marks
Student Seminar(semester-I) / Study Project/Field Projects (Semester-II)	5 Marks
Assignment/ Co & Extra Curricular Activities	5 Marks

Note : Internal Assessment to be calculated by Average of I & II Internal Marks

- To discuss the pattern of question paper model and allotment of credits for the Core Subject Botany and Two Skill Development Courses.
- Suggesting panel of names for appointment of paper setters and examiners
- Any other matter relating to CBCS System for First Year B.Sc. Degree Courses

➢ The BOS committee also discussed and approved I & II Semester Botany frame work and External & Internal Evaluation for the Academic year 2020-2021.

The following procedure is adopted for Internal Assessment Evaluation for I year UG Programs for the Academic year 2020-2021.

Theory Marks : 75 Marks

Internal Marks : 25 Marks

Evaluation: In Theory and Practical Examination the evaluation pattern will be as follows.

S.No.	Assessment	Duration	Type
1	Continuous Theory Internal Examination	1 hour	Internal
2	Internal Practical Exams for Odd semesters (I,III &V)	3 hours	Internal

3	Semester End Theory Exam	3 hours	External
4.	Semester End External Practical Exams for Even Semesters. II, IV &VI)	3 hours	External

To pass, minimum score required in both Practical & Theory is 40%

Internal and External Assessment Pattern:

All the subjects carries 75 marks for external theory and 25 marks for Internal Assessment. The model question papers are enclosed in the curriculum designed and developed by the departments.

External Assessment Evaluation:

Section A : Consists of 10 questions from 5 units (Each unit has 2 questions) .Out of which the student has to answer any 5 questions. Each question carries 5 marks. Each question carries 5 marks. (**5X5=25 Marks**)

Section B : Section B covers 5 units. From each unit **2 questions** will be given with internal choice. Each question carries 10 marks. (**5X10=50 Marks**)

Internal Assessment Evaluation:

Evaluation Components for UG Programme (Semester I & II):

S.NO	Evaluation Components	*Marks*
1.	*Written Test (Average of 2 Tests each test carries 15 marks)*	*: 15 marks*
2.	**Seminars (Semester- I)** *(In each paper every student should given 1 Seminar and present the copy to concern department.)* **Study Project or Field project (Semester – II)** *(Study project may be individual or group)*	*: 05 marks*
3.	**Assignments** *(Every student should submit 1 Assignment in each paper)*	*: 05 marks*
	Total	*: 25 marks.*

Model Question Paper for Theory Examinations

Semester – I & II / Botany Core Course – 1 & 2

Max. Time: 3 Hrs. Max. Marks: 75

SECTION – A

Answer any FIVE questions. Each question carries 5 marks. 5x5=25 Marks

1
2
3
4
5
6
7
8
9
10

SECTION – B

Answer all questions. Each question carries 10 marks 5x10= 50 Marks

11 a)

(OR)

b)

12 a)

(OR)

b)

13 a)

(OR)

b)

14 a)

(OR)

b)

15 a)

(OR)

b)

Model Question Paper for INTERNAL

Semester – I&II / Botany Core Course – 1&2

Time: 1 hour Max. Marks: 15 marks

PART – A (1X5marks =5 Marks)

Answer any one question. Each question carries 5 marks. 1x5= 5 marks

1.

2.

3.

PART – B (1X10=10 Marks)

Answer the following question. Each question carries 10 marks. 1x10=10 Marks.

4. (A)

(OR)

(B)

Minimum Passing Percent:

Candidate shall be declared to have passed:

i) Minimum Pass Percent in Internal Examinations shall be 40% i.e.,10 marks out of 25 Marks in each paper or subject.

ii) Minimum Pass Percent in External Examinations shall be 40%i.e.,30 marks out of 75 Marks in each paper or subject.

iii) In aggregate (Internal +External), the Minimum Pass Percent shall be 40%.

- The BOS committee also discussed and approved the curriculum structure for I&II Semester of the Core Subject Botany, which consists of Five Units
- The BOS committee also discussed and approved the curriculum structure for Sill Development Courses proposed by APSCHE.

Skill Development Courses

1. Plant Nursery

2. Fruit & Vegetable Preservation

- which are newly introduced with 2 Credits with 50 Marks.

- Approved the Curriculum framed by APSCHE to be adopted for the College Curriculum
- The BOS committee also approved the Panel list of Question paper setters and Examiners.
- The committee also discussed and approved the Model Question Papers and Credits.
- The committee also discussed the involved the students various Skill & Knowledge enrichment programmes i.e On line Certificate Courses (SWAYAM-MOOCS) , Certificate Courses (Mushroom Cultivation – (commencing with Even Semester from the A.Y 2017 onwards for final year students) , Workshops etc.

Approved by BOS

S.No.	Category	Name and Designation	Chairperson/ Member	Signature
01	In charge of the Dept. of Botany	Smt. B. Yuga Vani Lecturer in Botany SKR&SKR Govt. College for Women (A)-Kadapa	Chairperson	
2	One expert Nominated by the Vice-Chancellor Y.V.U. Kadapa	Prof. P.S. Shavalli Khan Professor Dept. of Botany Y.V.University, Kadapa. 9441079002	University Nominee	
3	Faculty Member	Smt. N. Rajeswari Guest Lect. in Botany (G) SKR&SKR Govt. College for Women (Autonomous) - Kadapa	Member	
4	Two Experts from outside the college College to be nominated by the Academic Council	Dr. P.V. Krishna Reddy Lecturer in Botany Govt. College for Men (A), Kadapa pattikrishnareddy@gmil.com	Subject Expert Member	
		2. Y. Naga Ratnamma Lect. in Botany Govt. Degree College Mydukur, Kadapa 8374210309;	Subject Expert Member	
5	One Representative from Industry/ Corporate Sector	J.K.Singh Industrialist.,JK. Industries. Manufacture of Bio fertilizers., Kadapa	Member	
6	One P.G. Meritorious Alumnus	Smt. N. Rajani Krishna P.G.T. Botany, A.P. Model School & Junior College, Ramapuram, Kadapa(Dist) Cell No: 9550662976 Mail: nrkrishnamd@gmail.com	Member	

SKR&SKR GOVT. COLLEGE FOR WOMEN(A)-KADAPA

CBCS / Semester System (w.e.f. 2020-'21 Admitted Batch)

I Semester /Botany Core Course - 1

Fundamentals of Microbes and Non-vascular Plants

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

(Total hours of teaching – 60 @ 04 Hrs./ Week)

Theory Syllabus

Learning Outcomes:

On successful completion of this course, the students will be able to:

- Explain origin of life on the earth.
- Illustrate diversity among the viruses and prokaryotic organisms and can categorize them.
- Classify fungi, lichens, algae and bryophytes based on their structure, reproduction and life cycles.
- Analyze and ascertain the plant disease symptoms due to viruses, bacteria and fungi.
- Recall and explain the evolutionary trends among amphibians of plant kingdom for their shift to land habitat.
- Evaluate the ecological and economic value of microbes, thallophytes and bryophytes.

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

1. Origin of life, concept of primary Abiogenesis; Miller and Urey experiment. Five kingdom classification of R.H. Whittaker
2. Discovery of microorganisms, Pasteur experiments, germ theory of diseases.
3. Shape and symmetry of viruses; Structure 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.
5. Brief account on Significance of viruses in vaccine production,bio-pesticides and as cloning vectors.

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

1. Brief account of Archaebacteria, 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 following examples…..
   (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 Disease 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); and "Fritsch" Classification (Brief explanation up to classes).
2. Thallus organization and life cycles in Algae.
3. Occurrence, structure, reproduction and life cycle of following examples
   (a) *Spirogyra* (Chlorophyceae) and (b) *Polysiphonia* (Rhodophyceae).
4. Economic importance of Algae.

Unit – 5: Bryophytes **12 Hrs.**

1. General characteristics of Bryophytes; classification up to 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.

Text books:

- *Botany – I (Vrukshasastram-I) : Telugu Akademi, Hyderabad*
- *Pandey, B.P. (2013) College Botany, Volume-I, S. Chand Publishing, New Delhi*
- *Hait,G., K.Bhattacharya &A.K.Ghosh (2011) A Text Book of Botany, Volume-I, New Central Book Agency Pvt. Ltd., Kolkata*
- *Bhattacharjee, R.N., (2017) Introduction to Microbiology and Microbial Diversity, Kalyani Publishers, New Delhi.*

Reference Books:

- *Dubey, R.C. & D.K.Maheswari (2013) A Text Book of Microbiology, S.Chand & Company Ltd., New Delhi*
- *Pelczar Jr., M.J., E.C.N. Chan &N.R.Krieg (2001)Microbiology, Tata McGraw- Hill Co, New Delhi*

- *Presscott, L. Harley, J. and Klein, D. (2005) Microbiology, 6th edition, Tata McGraw –Hill Co. New Delhi.*
- *Alexopoulos, C.J., C.W.Mims&M.Blackwell (2007) Introductory Mycology, Wiley& Sons, Inc., New York*
- *Mehrotra, R.S. & K. R. Aneja (1990) An Introduction to Mycology. New Age International Publishers, New Delhi*
- *Kevin Kavanagh (2005) Fungi ; Biology and Applications John Wiley & Sons, Ltd., West Sussex, England*
- *John Webster & R. W. S. Weber (2007) Introduction to Fungi, Cambridge University Press, New York*
- *Fritsch, F.E. (1945)The Structure & Reproduction of Algae (Vol. I & Vol. II) Cambridge University Press Cambridge, U.K..*
- *Bold, H.C. & M. J. Wynne (1984) Introduction to the Algae, Prentice-Hall Inc., New Jersey*
- *Robert Edward Lee (2008)Phycology. Cambridge University Press, New York*
- *Van Den Hoek, C., D.G.Mann & H.M.Jahns (1996)Algae : An Introduction to Phycology. Cambridge University Press, New York*
- *Shaw, A.J.&B.Goffinet (2000)Bryophyte Biology. Cambridge University Press, New York.*

SKR&SKR GOVT. COLLEGE FOR WOMEN (A) - KADAPA

Model Question Paper for Theory Examinations

Semester – I / Botany Core Course – 1

Fundamentals of Microbes and Non-vascular Plants

Max. Time: 3 Hrs. Max. Marks: 75

SECTION – A

Answer any FIVE questions. Each question carries 5 marks. 5x5=20 Marks

1
2
3
4
5
6
7
8
9
10

SECTION – B

Answer all questions. Each question carries 10 marks 5x10= 50 Marks

11 a)

(OR)

b)

12 a)

(OR)

b)

13 a)

(OR)

b)

14 a)

(OR)

b)

15 a)

(OR)

b)

SKR&SKR GOVT. COLLEGE FOR WOMEN (A) - KADAPA

Core Course -1 Semester – I Practical Syllabus

Fundamentals of Microbes and Non-vascular Plants

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

(Total Hours of laboratory Exercises 30 Hours @ 02 Hours/ Week)

Practical syllabus

Course Outcomes:

On successful completion of this practical course, student shall be able to;

1. Demonstrate the techniques of use of lab equipment, preparing slides and identify the material and draw diagrams exactly as it appears.
2. Observe and identify microbes and lower groups of plants on their own.
3. Demonstrate the techniques of inoculation, preparation of media etc.
4. 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 Archaebacteria 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 fruiticose
   - *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.

SKR&SKR GOVT. COLLEGE FOR WOMEN (A) - KADAPA

Model Question Paper for **Practical** Examination

Semester – I/ Botany Core Course – 1

Fundamentals of Microbes and Non-vascular Plants

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

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

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1. Take the T.S. of material 'A' (Fungi), make a temporary mount and make comments about identification. 10 M
2. Identify any 2 algae from the mixture (material 'B') given with specific comments about identification. 10 M
3. Take the T.S. of material 'C' (Bryophyta), make a temporary mount and make comments about identification. 10 M
4. Identify the following with specific reasons. 4x 3 = 12 M

   D. A laboratory equipment of Microbiology

   E. Virus

   F. Archaebacteria /Ascomycete /Cyanobacteria/ Eu Bacteria

   G. Lichen
5. Record + Viva-voce 5+3 = 8 M

Suggested co-curricular activities for Botany Core Course-1 in Semester-I:

A. Measurable :

i. Student seminars :

1. Baltimore classification of Viruses.
2. Lytic and lysogenic cycle of T- even Bacteriophages.
3. Viral diseases of humans and animals.
4. Retroviruses
5. Bacterial diseases of humans and animals.
6. Significance of Bacteria in Biotechnology and Genetic engineering.
7. Fungi responsible for major famines in the world.
8. Poisonous mushrooms (Toad stools).
9. Algae as Single Cell Proteins (SCPs)
10. Parasitic algae
11. Origin of Bryophytes through : Algae vs Pteridophytes

12. Fossil Bryophytes
13. Evolution of gametophytes in Bryophyta.
14. Ecological and economic importance of Bryophytes.

ii. Student Study Projects :

15. Isolation and identification of microbes from soil, water and air.
16. Collection and identification of algae from fresh /estuarine /marine water.
17. Collection and identification of fruiting bodies of Basidiomycetes and Ascomycetes.
18. Collection and identification of Lichens from their native localities.
19. Collection of diseased plants/parts and identification of symptoms.
20. Collection and identification of Bryophytes from their native localities.

iii. 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 Agriculture and/or Horticulture University/College/Research station to learn about microbial diseases of plants.
2. Visit to industries working on microbial, fungal and algal products.
3. Group Discussion (GD)/ Quiz/ Just A Minute (JAM) on different modules in syllabus of the course.

SKR&SKR GOVT. COLLEGE FOR WOMEN (A) - KADAPA

II Semester / Botany Core Course – 2

Basics of Vascular plants and Phytogeography

(Pteridophytes, Gymnosperms,Taxonomy of Angiosperms and Phytogeography)

(Total hours of teaching – 60 @ 02 Hrs./Week)

THEORY SYLLABUS

Learning Outcomes:

On successful completion of this course, the students will be able to:

- Classify and compare Pteridophytes and Gymnosperms based on their morphology, anatomy, reproduction and life cycles.
- Justify evolutionary trends in tracheophytes to adapt for land habitat.
- Explain the process of fossilization and compare the characteristics of extinct and extant plants.
- Critically understand various taxonomical aids for identification of Angiosperms.
- Analyze the morphology of the most common Angiosperm plants of their localities and recognize their families.
- Evaluate the ecological, ethnic and economic value of different tracheophytes and summarize their goods and services for human welfare.
- Locate different phytogeographical regions of the world and India and can analyze their floristic wealth.

Unit – 1: Pteridophytes 12 Hrs.

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

Unit – 2: Gymnosperms 14 Hrs.

1. General characteristics of Gymnosperms; Brief explanation of "Sporne" classification up to classes.
2. Occurrence, morphology, anatomy, reproduction (developmental details are not needed) and life history of (a) Pinus (Coniferopsida) 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, its merits and demerits
5. Systematic description and economic importance of the following families:
   a) Annonaceae (b) Curcurbitaceae

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

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

Unit – 5: Phytogeography 08 Hrs.

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

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
- Hait,G., K.Bhattacharya & A.K.Ghosh (2011) *A Text Book of Botany, Volume-I,* New Central Book Agency Pvt. Ltd., Kolkata
- 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
- Rashid.A, A Text Book of Pteridophyta .Vikas Publishing House Pvt Ltd

Books for Reference:

- Smith, G.M. (1971) Cryptogamic BotanyVol. II., Tata McGraw Hill, New Delhi
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SKR&SKR GOVT. COLLEGE FOR WOMEN (A) - KADAPA

Model Question Paper for Theory Examinations

Semester II / Botany Core Course: II

Basics of Vascular plants and Phytogeography

Max. Time: 3 Hrs. Max. Marks: 75

SECTION – A

Answer any FIVE questions. Each question carries 5 marks. 5x4=25 Marks

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SECTION – B

Answer all questions. Each question carries 10 marks 5x10= 50 Marks

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13 a)

(OR)

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14 a)

(OR)

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15 a)

(OR)

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SKR&SKR GOVT. COLLEGE FOR WOMEN (A) - KADAPA

Core Course – 2/ Semester – II Practical Syllabus

Basics of Vascular plants and Phytogeography

(Pteridophytes, Gymnosperms,Taxonomy of Angiosperms and Phytogeography)

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

Practical syllabus

Course Outcomes:

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

- Demonstrate the techniques of section cutting, preparing slides, identifying of the material and drawing exact figures.
- Compare and contrast the morphological, anatomical and reproductive features of vascular plants.
- Identify the local angiosperms of the families prescribed to their genus and species level and prepare herbarium.
- 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.
- 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 : **Pinus** 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.

SKR&SKR GOVT. COLLEGE FOR WOMEN (A) - KADAPA

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)

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

1. Take T.S. of the material 'A' (Pteridophyta), make a temporary slide and justify the identification with apt points. 10 M
2. Take T.S. of the material 'B' (Gymnosperms), make a temporary slide and justify the identification with apt points. 10 M
3. Describe the vegetative and floral characters of the material 'C' (Taxonomy of Angiosperms) and derive its systematic position. 10 M
4. Identify the specimen 'D' (Fossil Gymnosperm) and give specific reasons. 5 M
5. Locate the specified phytogeographical regions (2x2M) in the world / India (E) map supplied to you. 4 M
6. Record + Herbarium & Field note book + Viva-voce 5 +4+3 = 12 M

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

A. Measurable :

I. 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

II. 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 and preparation of a report on their taxonomy.
6. Collection and identification of fresh and dry fruits plants in the market and 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.

III. 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

SKR&SKR GOVT. COLLEGE FOR WOMEN(A)-KADAPA

LIST OF THE PAPER SETTERS

Board of Studies Meeting in Botany

S.No.	Name of the Lecturer	Institutional Address	Mobile No.	Mail address
01	Dr. LMd. Bakshu Lect. in Botany	PVKN GDC(A) Chittoor	9985415439	bakshu@yahoo.com
02	Dr. P.Sujana Lect.in Botany	PVKN GDC(A) Chittoor	9490108622	sujanapapani@gmail.com
03	Dr. E.Sree Devi Lect. In Botany	Govt. Degree College Tadipatri	9441165268	bot.sreedevi@gmail.com
04	Dr. C.Aruna Lect. In Botany	Govt. Degree College, Peleru.	9963379681	Aruchittamuri@gmail.com
05	Dr.B.Manohar Reddy Lect. In Botany	Govt. Degree College (A), ATP	9908323948	bmreddythanuj@gmail.com
06	Dr.P.Prayaga Murthy	Govt. Degree College Yeleswaram	9885852068	
07	Dr. P.Madhu sudan	Govt.College for Men,Kurnool	9949301100	botanymadhu@gmail.com

LIST OF THE EXAMINERS

Boards of Studies Meeting in Botany

S.No	Name of the Lecturer	Institutional Address	Mobile No.
01	P.V. Krishna Reddy	Govt. College for Men(A)Kadapa	9493369454
02	S. Khadar Basha	Govt. College for Men(A)-Kadapa	9959348678
03	M. Sreekanth Reddy	Govt. Degree College (A)-Kadapa	9490606317
04	K. Ramesh	Govt. Degree College, Rajampet	9966791906
05	Dr. M.V. Suresh	Govt. Degree College, Rajampet	9966791906
06	Dr. B. Adinarayana	Govt. Degree College, Rajampet	9866894845
06	Rajasekhar Reddy	Govt.Degree College,Rayachoty	9440590805
07	Dr.K.Venkatarami Reddy	Govt.Degree College,Porumamilla	9440226020
08	Smt. N. Suguna	Govt. Degree College, Proddutur.	6300373750

SKR&SKR GOVT. COLLEGE FOR WOMEN (A) - KADAPA

Model Question Paper for Theory Examinations

Semester II / Botany Core Course II

Basics of Vascular plants and Phytogeography

(Pteridophytes, Gymnosperms,Taxonomy of Angiosperms and Phytogeography)

Max. Time: 3 Hrs. Max. Marks: 75

SECTION – A

Answer any FIVE questions. Each question carries 5 marks. 5x5=25 Marks

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SECTION – B

Answer all questions. Each question carries 10 marks 5x10= 50 Marks

11 a)

(OR)

b)

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14 a)

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15 a)

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& & &

Approved by

S.No.	Category	Name and Designation	Chairperson/ Member	Signature
01	In charge of the Dept. of Botany	Smt. B. Yuga Vani Asst. Professor in Botany SKR&SKR Govt. College for Women (A)-Kadapa	Chairperson	
2	One expert Nominated by the Vice-Chancellor Y.V.U. Kadapa	Dr. P.S. Shavalli Khan Professor Dept. of Botany Y.V.University, Kadapa. 9441079002	University Nominee	
3	Faculty Member	Smt. N. Rajeswari Lect. in Botany (G) SKR&SKR Govt. College for Women (Autonomous) - Kadapa	Member	
4	Two Experts from outside the college College to be nominated by the Academic Council	Dr. P.V. Krishna Reddy Asst. Professor in Botany Govt. College for Men (A), Kadapa pattikrishnareddy@gmil.com	Subject Expert Member	
		2. Y. Naga Ratnamma Lect. in Botany Govt. Degree College Mydukur, Kadapa 8374210309;	Subject Expert Member	
5	One Representative from Industry/ Corporate Sector		Member	
6	One P.G. Meritorious Alumnus	Smt. N. Rajani Krishna P.G.T. Botany, A.P. Model School & Junior College, Ramapuram, Kadapa(Dist) Cell No: 9550662976 Mail: nrkrishnamd@gmail.com	Member	

Principal
SKR&SKR GCW(A)-KDP

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A.P. STATE COUNCIL OF HIGHER EDUCATION B.A, B.Com & B.Sc. PROGRAMMES
Revised CBCS w.e.f. 2020-21

SKILL DEVELOPMENT COURSES SCIENCE STREAM

SYLLABUS OF **PLANT NURSERY**

Total 30 hrs (02h/wk), **02 Credits & 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 toestablish 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 structuresin 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 androutine 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.

Suggested Co-curricular activities 06 Hrs.

1. Assignments/Group discussion/Quiz/Model Exam.
2. Demonstration of nursery bed making.
3. Demonstration ofpreparation of media for nursery.
4. Hands on training on vegetative propagation techniques.
5. Hands on training on sowing methods of seeds and other material.
6. Invited lecture cum demonstration by local expert.
7. Watching videos on routine practices in plant nurseries.
8. Visit to an agriculture/horticulture /forest nursery.
9. Case study on establishment and success of a plant nursery

Suggested text books/reference books :

1. Ratha Krishnan, M., et.al. (2014) *Plant nursery management : Principles and practices*, Central Arid Zone Research Institute (ICAR), Jodhpur, Rjasthan
2. Kumar, N., (1997) *Introduction to Horticulture*, Rajalakshmi Publications, Nagercoil.
3. KumarMishra, K., N.K. Mishra and Satish Chand (1994) *Plant Propagation*, John Wiley & Sons, New Jersey.

SKR&SKR GOVT. COLLEGE FOR WOMEN (A) - KADAPA

SKILL DEVELOPMENT COURSES SCIENCE STREAM

CBCS w.e.f. 2020-21

PLANT NURSERY

MODEL QUESTION PAPER

Max. Marks: 50 *Time: 1½ hrs (90 Minutes)*

SECTION- A (4x5M=20 Marks)

Answer any four questions. Each answer carries 5 marks
(At least 1 question should be given from each Unit)

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SECTION B

Answer any three questions. Each answer carries 10 marks

(At least 1 question should be given from each Unit) (3x10M = 30 Marks)

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SKR&SKR GOVT. COLLEGE FOR WOMEN (A) - KADAPA
B.A, B.Com & B.Sc. PROGRAMMES
Revised CBCS w.e.f. 2020-21

SKILL DEVELOPMENT COURSES (SCIENCE STREAM)

SYLLABUS OF FRUITS AND VEGETABLES PRESERVATION

Total 30 hrs (02h/wk), 02 Credits & Max Marks: 50

Learning Outcomes:

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

1. *Identify various types of fruits and vegetables and explain their nutritive value.*
2. *Understand the fragile nature of fruits and vegetables and causes for their damage.*
3. *Explain various methods of preservation for fresh fruits and vegetables.*
4. *Get to know the value-added products made from fruits and vegetables.*

Syllabus:

Unit – 1 : Introduction to fruits and vegetables 06 Hrs.

1. Fruits: Definition, elementary knowledge on types of fruits (fleshy and dry) with local /common examples.
2. Vegetables: Definition, elementary knowledge on types of vegetables (root, leafy, stem, flower and fruit) with local/ common examples.
3. Importance of fruits and vegetables in human nutrition.
4. Concept of perishable plant products – maturation and spoilage, shelf life; preservation – definition and need for preservation of fruits and vegetables.

Unit – 2 :Preservation of Fruit 09 Hrs.

1. Fruits – ripening and biological aging; storage and preservation concerns.
2. Preservation of fresh fruits at room temperature and in cold storage.
3. Fruit preservation at room temperatue as juices, squashes and syrups.
4. Preservation of fruits by application of heat; making of fruit products (jams, jellies and fruit slices in processing factories).
5. Preservation by dehydration (Eg. banana chips), application of sugar (Eg. mango candy), application of salt (pickling).
6. Fruit preservation by freezing – storage at the lowest temperatures.

Unit -3 : Preservation of vegetables 09 Hrs.

1. Vegetables – losses after harvesting and causes; problems in handling and storage.
2. Modern methods of packaging and storage to reduce losses.
3. Trimming of vegetables and packing in cartons; dehydration technique -factory processing.
4. Making of vegetable products (flakes/chips of potato and onion; garlic powder).
5. Frozen vegetables – Carrots, Cauliflower, Okra and Spinach.
6. Preservation of sliced vegetables in factories by canning and bottling.

Unit-4: Suggested Co-curricular activities 06 Hrs.

1. Assignments/Group discussion/Quiz/Model Exam.
2. Invited lecture and demonstration by local expert
3. Exhibition of various types of locally available fruits and vegetables.
4. Hands on training on handling and packaging methods of fresh fruits and vegetables.
5. Hands on training on making fruit juices.
6. Display of various preserved fruit products available in local markets.
7. Hands on training on making of potato, yam, onion chips.
8. Display of various preserved vegetable products available in local markets.
9. Watching videos on preservation of fruits and vegetables.
10. Visit to Horticulture University or research station to learn about value added products of fruits and vegetables.

Suggested text books/reference books :

1. Giridharilal, G. S. Siddappa and G.L.Tandon(2007) *Preservation of Fruits and Vegetables,* Indian Council of Agri. Res., New Delhi
2. Srivastava, R.P., and Sanjeev Kumar (2019) *Fruit and Vegetable Preservation : Principles and Practices,* CBS Publishers & Distributors Pvt., Ltd., New Delhi
3. Thompson, A.K. (1995) *Post Harvest Technology of Fruits and Vegetables*. Blackwell Sci.,U.K.
4. Verma, L.R. and V.K. Joshi (2000) *Post Harvest Technology of Fruits and Vegetables.* Indus Publ., New Delhi

SKR&SKR GOVT. COLLEGE FOR WOMEN (A) - KADAPA

B.A, B.Com & B.Sc. PROGRAMMES Revised CBCS w.e.f. 2020-21

SKILL DEVELOPMENT COURSES (SCIENCE STREAM)

MODEL QUESTION PAPER

FRUITS AND VEGETABLES PRESERVATION

Time: 1½ hrs (90 Minutes) *Max. Marks: 50*

SECTION- A

Answer any four questions. Each answer carries 5 marks

(At least 1 question should be given from each Unit) **(4x5M=20 Marks)**

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SECTION B

Answer any three questions. Each answer carries 10 marks

(At least 1 question should be given from each Unit) (3x10M = 30 Marks)

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Approved by

S.No.	Category	Name and Designation	Chairperson/ Member	Signature
01	In charge of the Dept. of Botany	Smt. B. Yuga Vani Asst. Professor in Botany SKR&SKR Govt. College for Women (A)-Kadapa	Chairperson	
2	One expert Nominated by the Vice-Chancellor	Dr. P.S. Shavalli Khan Professor Dept. of Botany	University Nominee	

	Y.V.U. Kadapa	Y.V.University, Kadapa. 9441079002		
3	Faculty Member	Smt. N. Rajeswari Lect. in Botany (G) SKR&SKR Govt. College for Women (Autonomous) - Kadapa	Member	
4	Two Experts from outside the college College to be nominated by the Academic Council	Dr. P.V. Krishna Reddy Lecturer in Botany Govt. College for Men (A), Kadapa pattikrishnareddy@gmil.com	Subject Expert Member	
		2. Y. Naga Ratnamma Lect. in Botany Govt. Degree College Mydukur, Kadapa 8374210309;	Subject Expert Member	
5	One Representative from Industry/ Corporate Sector		Member	
6	One P.G. Meritorious Alumnus	Smt. N. Rajani Krishna P.G.T. Botany, A.P. Model School & Junior College, Ramapuram, Kadapa(Dist) Cell No: 9550662976 Mail: nrkrishnamd@gmail.com	Member	

Principal
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