SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
(AFFILIATED TO MADURAI KAMARAJ UNIVERSITY, MADURAI
RE-ACCREDITED WITH 'A' GRADE (THIRD CYCLE) BY NAAC WITH CGPA 3.11)

Programme Scheme, Scheme of Examination and Syllabi

(From 2021-2022 Batch onwards)

Department of Botany

UG Programme

Approved in the Academic Council-XIII held on 11/08/2021

Curriculum Design and Development Cell
Annexure 0

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Curriculum Design and Development Cell

HOD	Dean of Pure Science	Dean of Academic Affairs	Principal

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
MEMBERS OF BOARD OF STUDIES

S. No.	Board Members	Name and Designation
1.	Chairman of the Board	**Dr. M. Sujatha**, Head and Assistant Professor, Department of Botany, Sri Kaliswari College, Sivakasi.
2.	University Nominee	**Dr. P. Gopal** Assistant Professor Department of Plant Biotechnology Madurai Kamaraj University, Madurai -625021
3.	Academic Expert 1.	**Dr. R. Ramasubbu,** Assistant Professor, Department of Biology, The Gandhigram Rural Institute (Deemed to be University) Gandhigram, Dindigul District.
4.	Academic Expert 2.	**Dr. M. Venkatesan** Assistant Professor, Department of Botany, Sourashtra College, Madurai
5.	Industrialist	**Mr. R. Govindaraj** Sri Marutham Agro Biotech, Madurai.
6.	Alumnus	**Mr. V. Sakkamuthu** Field Assistant, DST Project Kalasalingam School of Agriculture and Horticulture Kalasalingam Academy of Research and Education (Deemed to be University), Anand Nagar, Krishnankovil.
Members		
7.	Dr. R. Narayana Prakash	Guest Faculty in Botany
8.	Dr. G. Manikandan	Assistant Professor of Botany
9.	Dr. M. Murugan	Assistant Professor of Botany
10.	Dr. A. Sarvalingam	Assistant Professor of Botany
11.	Dr. S. Jeyakumar	Assistant Professor of Botany
12.	Dr. V. Muniappan	Assistant Professor of Botany
13.	Mr. G. Varatharaju	Assistant Professor of Botany
14.	Dr. C. Divya	Assistant Professor of Botany

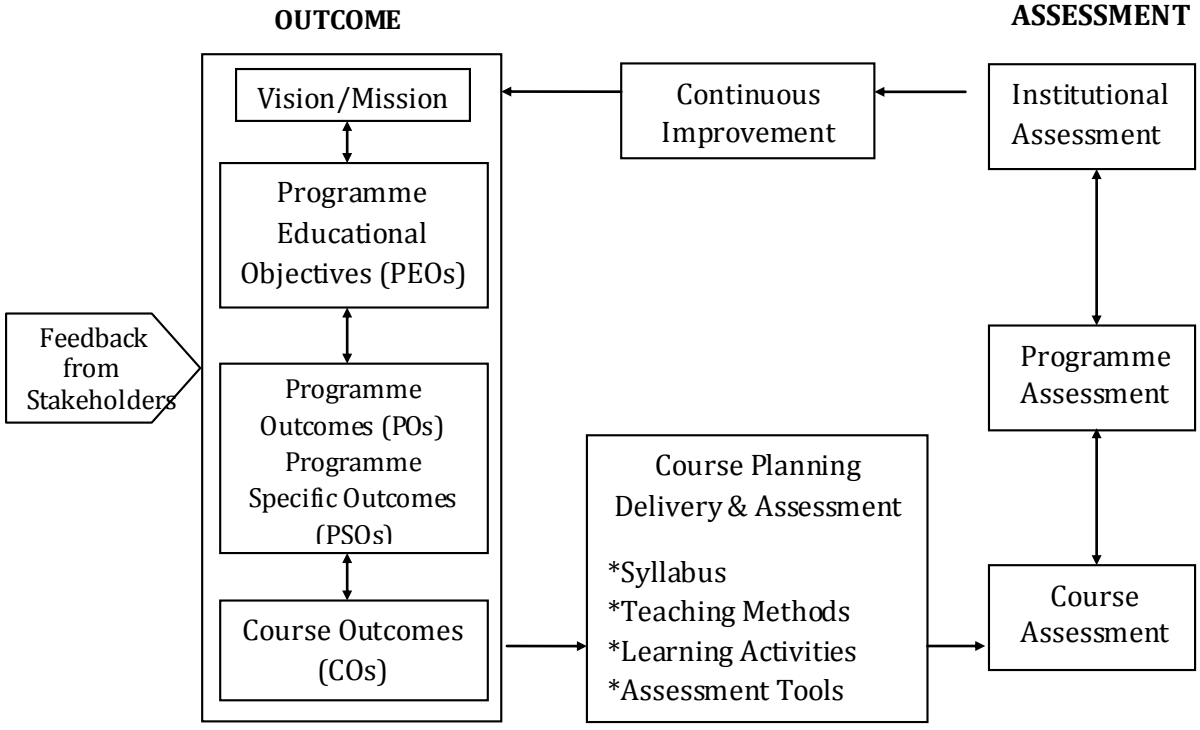
SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
(Affiliated to Madurai Kamaraj University, Re-accredited with A Grade (CGPA 3.11) by NAAC)
DEPARTMENT OF BOTANY
UG Programme - B.Sc. Botany
GUIDELINES FOR OUTCOME BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
(From 2021-2022 Batch onwards)

INTRODUCTION

Sri Kaliswari College in its pursuit of imparting quality education has marked a remarkable growth in terms of academic excellence, infrastructure, student strength, ICT facilities, library and placement records since its establishment in 2000-2001. This institution constitutes an academic community that is committed to encourage the student community to experience and share knowledge, identify their potential, enhance the employability skills and enable them to pursue their goals. After the conferment of autonomous status in the year 2012, the college has so far gone for revision of the syllabi three times and is continually updating the syllabi to meet the needs and demands of the student community.

The institution in its success journey of imparting quality education has been Re-Accredited with A grade with CGPA (3.11) in its third cycle of accreditation by NAAC. As an added feather to its cap, the institution has taken a giant leap to embrace the Outcome-Based Education system to enable the student community to develop their knowledge, skill and attitude simultaneously through a focused learning and help the graduates to compete with their global counterparts and prepare them for life.

I. OUTCOME BASED EDUCATION (OBE) FRAMEWORK



II. VISION OF THE INSTITUTION

- To impart quality higher education to produce highly talented youth capable of developing the nation

III. MISSION OF THE INSTITUTION

- Ensuring quality in all aspects of the activities
- Developing the latent skills of the rural youth
- Providing value - based education to instill courage and confidence
- Nurturing the entrepreneurial skills of the rural youth
- Creating competency to meet global challenges
- Imbibing social awareness and social responsibilities

IV. VISION OF THE DEPARTMENT

- To impart fundamental and modern knowledge of plant science and to create an environment to carryout innovative research work and conserve nature.

V. MISSION OF THE DEPARTMENT

- To develop the Department as a leading centre of Plant science at Local, Regional & National level
- To provide a student-centred and profession-oriented higher education and promote research work in the field of Plant Science
- To encourage rural youth to become competent and socially responsible professionals and entrepreneurs in the field of Plant Science

VI. PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

The graduates will

PEO1: demonstrate in-depth theoretical knowledge and practical skills in Plant Science and be sufficiently competent in the field to undertake further discipline-specific higher studies.

PEO2: display knowledge in understanding research and addressing practical problems, possess critical skill and analytical reasoning in solving problems in workplace and in day to day life.

PEO3: imbibe moral, ethical and professional values to preserve nature for a better life in the society.

PEO4: demonstrate communication skills and digital skills to interpret scientific concepts and display professional skills to take up a career in industry or agricultural field.

PEO5: adopt new technologies and constantly upgrade their skills and possess the critical acumen to be responsive to the societal needs through independent and life-long learning.

VII. PROGRAMME OUTCOMES (POs)

Programme Outcomes are narrower statements that describe what students are expected to know and be able to do upon the graduation. These relate to the skills, knowledge and behaviour that students acquire in their study through the programmes.

PO1: Disciplinary knowledge
Acquire comprehensive and scientific knowledge in the field of Science.

PO2: Critical thinking, Problem solving and Analytical reasoning
Develop students' ability of critical observation and capacity to apply the principles/facts of science to identify, analyse, evaluate and solve problems in order to draw realistic conclusions.

PO3: Scientific reasoning and Research related skills
Capability to involve in planning and conducting experiments, analyze the scientific research field, interpret and draw conclusions from experiments and investigate practically.

PO4: Communication skills and Digital literacy
Communicate effectively and articulate clearly the scientific ideas in written and oral form and make use of appropriate software for scientific computations and gain ICT skills to disseminate knowledge.

PO5: Ethics, Values and Multicultural competence
Embrace moral and ethical values and apply it with a sense of responsibility in the workplace and community and adopt objective, unbiased and truthful actions in all aspects of work.

PO6: Team Work, Leadership and Employability skills
Work effectively and respectfully in groups with enhanced inter-personal skills and exhibit qualities associated with leadership to build a team and achieve the vision and show proficiency in professional, employability and soft skills required for placements and higher education.

PO7: Self-directed and Life-long learning
Recognize the need and have the ability to engage in independent learning and be self-motivated and acquire knowledge through lifelong learning in the broadest context of technological change.

VIII. PROGRAMME SPECIFIC OUTCOMES (PSOs) – B.Sc. BOTANY

On the successful completion of B.Sc. Botany, the students will

PSO1: obtain fundamental and advanced knowledge of plant science

PSO2: acquire practical skills to gather information, analyze and propose new ideas to solve problems and develop entrepreneurial skills.

PSO3: obtain knowledge and technical skill through various botanical field research that develop critical and independent thinking.

PSO4: communicate effectively and articulate clearly the scientific ideas by applying statistical skills and Bioinformatics tool and make use of appropriate software to analyze the biological data.

PSO5: imbibe Bio safety and bio-ethical values with a sense of responsibility in the field of Plant Recombinant DNA Technology and genetically modified crops.

PSO6: acquire inter-personal skills and leadership skills to build a team and become an entrepreneur in the field of Mushroom cultivation, Horticulture farms, Biofertilizer, *Azolla* and *Spirulina* production and in other fields.

PSO7: recognize the need of self learning through Internship programme, group Project, courses by NPTEL, MOOC and to acquire knowledge through self-directed and lifelong learning.

IX. PO-PSO Mapping Matrix – B.Sc. BOTANY

PSO / PO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7
PO1	✓						
PO2		✓					
PO3			✓				
PO4				✓			
PO5					✓		
PO6						✓	
PO7							✓

X. PO-PEO Mapping Matrix – B.Sc. BOTANY

PEO / PO	PEO1	PEO2	PEO3	PEO4	PEO5
PO1	✓			✓	
PO2		✓		✓	✓
PO3		✓		✓	✓
PO4		✓			
PO5		✓	✓		✓
PO6		✓		✓	✓
PO7				✓	✓

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
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DEPARTMENT OF BOTANY
UG Programme - B.Sc. Botany

REGULATIONS

Duration of the Programme **:** Three years (equivalent to six semesters)

Eligibility

A Candidate who have passed the Higher Secondary Examinations (10 +2) conducted by the Board of Higher Secondary Education, Government of Tamil Nadu or any other state board examinations accepted as Equivalent thereto by the Syndicate of the Madurai Kamaraj University, Madurai subject to such conditions.

a) Biology or Botany/Physics/Chemistry as subjects in the higher education
b) Candidate should have secured at least 60% in the above subjects and above aggregates
c) A relaxation of 10% marks in the aggregate will given to SC/ST candidates

Medium of Instruction : English

Age Limit

Maximum age limit : 21 Years

Age Relaxation

SC/ SCA/ST/BC/BCM/MBC/DNC & Women : 3 years age relaxation
Differently-Abled Students : 5 years age relaxation

Transitory Permission

Students joined from 2021 - 2024 may be permitted to write their examinations in this pattern up to April 2029.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme - B.Sc., Botany/M.Sc. Botany
SCHEME OF EXAMINATION

For both UG and PG Programmes, the internal and external marks are distributed as follows:

For all Theory Courses : Internal Marks: 40; External Marks: 60

For all Practical Courses, Project and Internship : Internal Marks: 50; External Marks: 50

Internal Mark Distribution for Theory Courses

Assessment Type	Marks	Scheme of Assessment
Internal Test	15 marks	Two Internal Tests and 1 Model Exam will be conducted and average of the best two will be considered
Written Assignment	5 marks	One Written Assignment will be given
E-Assignment/ Case Studies/ Reviews/ Field Assignments/ Poster Presentations/ Portfolios	5 marks	Any one of the Assignments will be given
Quiz	5 marks	One Quiz Test will be conducted
Viva/ Oral Exam/ Group Discussion/ Role Play	10 marks	Test will be conducted in any one of the Oral Mode

Internal Mark Distribution for Practical Courses

Assessment Type	Marks	Scheme of Assessment
Lab work /Program Execution	40 marks	Two Internal Tests will be conducted and the average of the two will be considered
Observation/Record Notebook	5 marks	Assessment will be done during every practical class
Viva –Voce / Lab Quiz	5 marks	Two Lab Quiz Tests/viva-voce will be conducted and the average of the two will be considered

External Mark Distribution for Practical Courses

Assessment Type	Marks	Scheme of Assessment
Lab work/Program Execution	40 marks	End result of the Practical
Viva –Voce	10 marks	Oral Mode Test

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme - B.Sc., Botany/M.Sc. Botany
QUESTION PAPER PATTERN

Internal Test – 30 Marks – 1 hr Duration

S.No	Type of Questions	Marks
1.	Objectives type Questions: Multiple Choice – 4 questions Answer in a Word/Sentence – 4 questions	 04 04
2.	Short Answer–3 questions –either or type	3x4=12
3.	Long Answer–1 question – either or type	1x10=10

Summative Examinations – 60 Marks -3 hrs Duration

S.No	Type of Questions	Marks
1.	Objective type Questions: Multiple Choice – 5 questions Answer in a Word/Sentence – 5 questions	 05 05
2.	Short Answer 5 questions – either or type	5x4=20
3.	Long Answer 3 questions – either or type	3x10=30

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme - B.Sc. Botany

Attainment of Course outcomes

Attainment of Course outcomes is computed using Direct and Indirect assessment methods. Direct Method of Assessment is based on performance of the students in the Continuous Internal Assessment Tests, Summative Examinations and supporting activities such as Seminar, Assignment, Case study, Group Discussion, Quiz, etc., and Indirect Method of Assessment is based on periodical feedback from the students at the end of each course.

Weightage of Direct and Indirect Assessment in computation of attainment of each course is 70% for Direct Assessment and 30% for Indirect Assessment.

Direct Assessment of Course outcome attainment

i) **Rubrics**:

Internal Assessment contributes 60% and Summative Examinations Assessment contributes 40% to the Direct Assessment of a course outcome for Theory Courses. For the Practical Courses, Internal Assessment contributes 70% and Summative Examinations Assessment contributes 30% to the Direct Assessment of a course outcome.

ii) **Setting of Target:**

50% of the maximum mark is set as target of Internal Assessment tools and the average mark of the class is set as target of Summative Examinations Assessment.

Formula for calculating percentage attainment of each course outcome

Based on the result of Summative Examinations and Internal Assessment tools, the number of students scoring more than the target is found out.

For each Internal Assessment Tools,

$$\text{Percentage attainment of each course outcome} = \frac{\text{No. of. Students who scored more than the target in the concerned course outcome}}{\text{Total Number of Students}} \times 100$$

Percentage attainment of each Course outcome for Internal Assessment tools = Average of percentage attainment of all Internal Assessment tools

For Summative Examinations,

$$\text{Percentage attainment of each Course outcome} = \frac{\text{No. of. Students who scored more than the target in the concerned co}}{\text{Total Number of Students}} \times 100$$

Formula for calculating Attainment Percentage of Course outcome of a course

Percentage Attainment of Course outcome for Internal Assessment tools	=	Average of percentage attainment of all COs
Percentage Attainment of Course outcome for Summative Examinations	=	Average of percentage attainment of all COs

Final Direct Assessment of Course outcome Attainment

For Theory Courses

Percentage Attainment of Course outcome through Direct Assessment	=	(0.6 x percentage attainment of CO for internal assessment tool) + (0.4 x percentage attainment of CO for summative examinations)

For Practical Courses

Percentage Attainment of Course outcome through Direct Assessment	=	0.7 x percentage attainment of CO for Internal Assessment tools + 0.3 x percentage attainment of CO for Summative Examinations

Indirect Assessment of CO Attainment

The course outcome feedback is conducted at the end of every semester by distributing structured feedback questionnaire to the students. The analysis of this feedback questionnaire is done on the following score. The feedback forms will be sorted with various scores and feedbacks with a score more than 5.5 are considered as satisfactory level for calculations for indirect attainment.

A: 10-8.5 **B:** 8.4-7.0 **C:** 6.9-5.5 **D:** 5.4-4.0 **E:** 3.9-0

$$\text{Percentage attainment for each CO} = \frac{\text{Satisfaction Number}}{\text{Response Received}} \times 100$$

Percentage Attainment of CO of a course = Average of percentage attainment of all COs

Final Assessment of CO attainment

Average course attain = 0.7 x Direct assessment of CO attainment + 0.3 x Indirect assessr

Expected Level of Attainment for each of the Course Outcomes

CO	Level of Attainment
Above 70%	Excellent
60 -70 %	Very good
50-60 %	Good
40 – 50 %	Satisfactory
Below 40%	Not Satisfactory

Assessment of PO attainment

At the end of the each programme, the Direct PO Assessment is done from the CO Attainment of all courses. The Direct PO Attainment for a particular course is determined from the attainment values obtained for each course outcome related to that PO and the CO-PO mapping values.

$$\text{Weighted contribution of the course in attainment of each PO} = \frac{\text{Weighted Percentage of contribution of the course in attainmentof each PO}}{\text{average course attainment}} \times 100$$

Expected Level of Attainment for each of the Programme Outcomes

PO	Level of Attainment
Above 70%	Excellent
60 - 70 %	Very good
50 - 60 %	Good
40 - 50 %	Satisfactory
Below 40%	Not Satisfactory

Attainment of Programme Educational Objectives (PEO)

PEOs are assessed after 3 to 4 years of graduation. Attainment is measured based on the Feedback from Stakeholders

1. Alumni
2. Parents
3. Employer

The analysis of this feedback questionnaire is done on the following score. The feedback forms will be sorted with various scores and feedbacks with a score more than 5.5 are considered as satisfactory level for calculations for Indirect Attainment.

A: 10-8.5 **B:** 8.4-7.0 **C:** 6.9-5.5 **D:** 5.4-4.0 **E:** 3.9-0

$$\text{Percentage attainment of PEOs} = \frac{\text{Satisfaction number}}{\text{Response Received}} \times 100$$

Expected Level of Attainment for each of the Programme Educational Objectives

PEO	Level of Attainment
Above 70%	Excellent
60 - 70 %	Very good
50 - 60 %	Good
40 - 50 %	Satisfactory
Below 40%	Not Satisfactory

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DEPARTMENT OF BOTANY
UG Programme - B.Sc. Botany
CURRICULUM STRUCTURE
OUTCOME-BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
(From 2021-2022 Batch onwards)

S. No	Courses	Sem I	Sem II	Sem III	Sem IV	Sem V	Sem VI	Credits
I	Tamil / Hindi / French	6 (3)	6 (3)	6 (3)	6 (3)	-	-	12
II	English	6 (3)	6 (3)	6 (3)	6 (3)	-	-	12
III	Core Courses	4 (4) 4P (3)	4 (4) 4P (3)	4 (4) 4P (3)	4 (4) 4P (2)	5 (5) 5 (5) 5 (4) 5P (4)	5(5) 5 (5) 5 (5) 5P(4) 4P(3)	67
	Allied Courses	4(4) 2P(1)	4(4) 2P(1)	4(4) 2P(1)	4(4) 2P(1)	-	-	20
	Major Elective Courses	-	-	-	-	4(3) 4(3)	4(3)	9
	Self-paced Learning (Swayam Course)	-	-	-	(2)			2
IV	Ability Enhancement Compulsory Course AECC 1. Environmental Studies	2(1)	-	-	-	-	-	1
	2. Value Education	-	1(1)	-	-	-	-	1
	Non-Major Elective Courses	-	-	2 (1)	2 (1)	-	-	2
	Skill Enhancement Courses	2 (1)	2(2)	2 (2)	2(2)	2(2)	2 (2)	11
	Internship					(1)		1
	Disaster Management		1(1)					1
V	Extension	-	-	-	(1)	-	-	1
Total Hours (Per Week)/ Credits		30 (20)	30 (22)	30 (21)	30 (23)	30 (27)	30 (27)	140 180

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DEPARTMENT OF BOTANY
UG Programme - B.Sc. Botany
CURRICULUM PATTERN
OUTCOME-BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
(From 2021-2022 Batch onwards)
PROGRAMME CODE – UBY

Semester	Part	Course code	Course Name	Hours	Credits
I	I	21UTAL11	Tamil/Hindi-I	6	3
	II	21UENL11	Communicative English – I	6	3
	III	21UBYC11	**Core Course - I:** Algae, Fungi, Lichens, and Bryophytes	4	4
		21UBYC1P	**Core Course - II:** Practical: Algae, Fungi, Lichens, and Bryophytes	4	3
		21UBYA11	**Allied Course - I:** Chemistry-I	4	4
		21UBYA1P	**Allied Course - I:** Practical: Volumetric analysis	2	1
	IV	21UESR11	**Ability Enhancement Compulsory Course I:** Environmental Studies	2	1
		21UBYS11	**Skill Enhancement Course - I:** Nursery and Landscape Management	2	1
Total				**30**	**20**
II	I	21UTAL21	Tamil/Hindi-II	6	3
	II	21UENL21	Communicative English-II	6	3
	III	21UBYC21	**Core Course - III:** Pteridophytes, Gymnosperms and Palaeobotany	4	4
		21UBYC2P	**Core Course - IV:** Practical: Pteridophytes, Gymnosperms and Palaeobotany	4	3
		21UBYA21	**Allied Course - II:** Chemistry-II	4	4
		21UBYA2P	**Allied Course - II:** Practical: Organic analysis	2	1
	IV	21UVED21	**Ability Enhancement Compulsory Course II:** Value Education	1	1
		21UBYS21	**Skill Enhancement Course - II:** Biofertilizer Technology	2	2
		21UDMG21	**Disaster Management**	1	1
Total				**30**	**22**

III	I	21UTAL31	Tamil/Hindi – III	6	3
	II	21UENL31	Communicative English – III	6	3
	III	21UBYC31	**Core Course - V:** Plant Anatomy and Embryology	4	4
		21UBYC3P	**Core Course - VI:** Practical: Plant Anatomy and Embryology	4	3
		21UBYA31	**Allied Course - III:** Invertebrata	4	4
		21UBYA3P	**Allied Course - III:** Practical: Zoology – I	2	1
	IV	21UBYN31	**Non Major Elective course - I**: Horticulture	2	1
		21UBYS31	**Skill Enhancement Course - III:** Mushroom Cultivation Technology	2	2
Total				**30**	**21**
IV	I	21UTAL41	Tamil/Hindi – IV	6	3
	II	21UENL41	Communicative English – IV	6	3
	III	21UBYC41	**Core Course - VII:** Microbiology and Plant Pathology	4	4
		21UBYC4P	**Core Course - VIII:** Practical: Microbiology and Plant Pathology	4	2
		21UBYA41	**Allied Course - IV:** Chordata	4	4
		21UBYA4P	**Allied Course - IV:** Practical: Zoology – II	2	1
		21UBYM41 21UBYM42	**Self paced learning** (Swayam courses) 1. Cell culture Technologies 2. Computer Aided Drug Designing	-	2
	IV	21UBYN41	**Non Major Elective course - II**: Herbal Medicine	2	1
		21UBYS41	**Skill Enhancement Course - IV:** Biology for Entrepreneurship Development	2	2
	V		**Extension**	-	1
Total				**30**	**23**
V	III	21UBYC51	**Core Course - IX:** Taxonomy of Angiosperms	5	5
		21UBYC52	**Core Course - X:** Plant Physiology and Biochemistry	5	5
		21UBYC5P	**Core Course - XI:** Practical: Taxonomy of Angiosperms	5	4
		21UBYC5Q	**Core Course - XII:** Practical: Plant Physiology and Biochemistry	5	4
		21UBYO51 21UBYO52	**Major Elective Course – I** 1. Reproductive Biology of Angiosperms 2. Recent Trends in Plant Systematics	4	3

		21UBYO53	3. Emerging Molecular Techniques		
		21UBYO54 21UBYO55 21UBYO56	**Major Elective Course - II** 1. Economic Botany 2. Plant Resources and Utilization 3. Prospective of Medicinal Plants	4	3
	IV	21UBYS51	**Skill Enhancement Course - V:** Bioinstrumentation and Biostatistics	2	2
		21UBYJ51	**Internship**	--	1
Total				**30**	**27**
VI	**III**	21UBYC61	**Core Course - XIII:** Plant Ecology and Phytogeography	5	5
		21UBYC62	**Core Course - XIV:** Cell and Molecular Biology	5	5
		21UBYC63	**Core Course - XV:** Genetics and Plant Breeding	5	5
		21UBYC6P	**Core Course - XVI:** Practical: Plant Ecology and Phytogeography	5	4
		21UBYC6Q	**Core Course - XVII:** Practical: Cell and Molecular Biology and Genetics	4	3
		21UBYO61 21UBYO62 21UBYO63	**Major Elective Course - III** 1. Biodiversity and Conservation 2. Forest Botany 3. Recent Advances in Botany	4	3
	IV	21UBYS61	**Skill Enhancement Course - VI:** Techniques in Plant Biotechnology	2	2
Total				**30**	**27**
Grand Total				**180**	**140**

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DEPARTMENT OF BOTANY
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OUTCOME-BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
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PROGRAMME ARTICULATION MATRIX (PAM) - WEIGHTAGE OF COURSE CONTRIBUTING TO PO

Semester	Part	Course code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7
I	I	21UTAL11	Tamil/Hindi-I	10	7	2	8	2	2	2
	II	21UENL11	Communicative English-I	10	7	2	8	2	2	3
	III	21UBYC11	**Core Course - I:** Algae, Fungi, Lichens, and Bryophytes	15	13	9	7	2	4	2
		21UBYC1P	**Core Course - II:** Practical: Algae, Fungi, Lichens, and Bryophytes	15	13	9	4	2	6	2
		21UBYA11	**Allied Course - I:** Chemistry-I	15	10	5	4	2	3	2
		21UBYA1P	**Allied Course - I:** Practical: Volumetric analysis	15	10	5	2	2	4	3
	IV	21UESR11	**Ability Enhancement Compulsory Course I:** Environmental Studies	8	5	1	7	8	5	5
		21UBYS11	**Skill Enhancement Course - I:** Nursery and Landscape Management	10	10	5	5	3	5	2
II	I	21UTAL21	Tamil/Hindi-II	10	8	2	8	2	2	2
	II	21UENL21	Communicative English-II	10	8	2	8	2	2	3
	III		**Core Course - III:**	15	12	9	10	2	1	2

		21UBYC21	Pteridophytes, Gymnosperms and Palaeobotany							
		21UBYC2P	**Core Course - IV:** Practical: Pteridophytes, Gymnosperms and Palaeobotany	15	12	15	5	3	3	2
		21UBYA21	**Allied Course - II:** Chemistry-II	15	10	5	4	2	3	2
		21UBYA2P	**Allied Course - II:** Practical: Organic analysis	15	10	5	2	2	4	3
	IV	21UVED21	**Ability Enhancement Compulsory Course II:** Value Education	8	5	1	5	9	4	7
		21UBYS21	**Skill Enhancement Course - II:** Biofertilizer Technology	10	8	9	6	3	3	1
		21UDMG21	**Disaster Management**	7	8	2	5	2	4	8
III	**I**	21UTAL31	Tamil/Hindi – III	10	8	2	8	2	2	2
	II	21UENL31	Communicative English – III	10	8	3	9	3	3	2
	III	21UBYC31	**Core Course - V:** Plant Anatomy and Embryology	15	10	10	7	5	3	1
		21UBYC3P	**Core Course - VI:** Practical: Plant Anatomy and Embryology	15	10	7	6	6	3	2
		21UBYA31	**Allied Course - III:** Invertebrata	15	12	9	5	5	4	3
		21UBYA3P	**Allied Course - III:** Practical: Zoology-I	15	9	10	3	4	6	3
	IV	21UBYN31	**Non Major Elective course - I**: Horticulture	10	10	5	5	2	6	2
			Skill Enhancement	10	8	9	5	3	3	2

		21UBYS31	**Course - III:** Mushroom Cultivation Technology							
IV	I	21UTAL41	Tamil/Hindi – IV	10	8	2	9	2	2	2
	II	21UENL41	Communicative English – IV	10	9	3	8	2	3	3
	III	21UBYC41	**Core Course - VII:** Microbiology and Plant Pathology	15	11	11	5	5	3	2
		21UBYC4P	**Core Course - VIII:** Practical: Microbiology and Plant Pathology	15	13	9	5	3	4	2
		21UBYA41	**Allied Course - IV:** Chordata	15	12	8	5	5	4	2
		21UBYA4P	**Allied Course - IV:** Practical: Zoology – II	15	10	5	4	3	5	3
		21UBYM41 21UBYM42	**Self paced learning** (Swayam courses) 1. Cell culture Technologies 2. Computer Aided Drug Designing	13	10	5	9	1	2	7
	IV	21UBYN41	**Non Major Elective course - II**: Herbal Medicine	11	9	4	5	2	7	2
		21UBYS41	**Skill Enhancement Course - IV:** Biology for Entrepreneurship Development	10	8	8	4	2	5	3
	V		**Extension**	8	2	1	7	9	8	5
V	III	21UBYC51	**Core Course - IX:** Taxonomy of Angiosperms	15	10	11	7	3	5	2
		21UBYC52	**Core Course - X:** Plant Physiology and Biochemistry	14	12	10	5	3	4	2
		21UBYC5P	**Core Course - XI:**	15	8	12	8	2	6	2

			Practical: Taxonomy of Angiosperms							
		21UBYC5Q	**Core Course - XII:** Practical: Plant Physiology and Biochemistry	15	13	9	5	4	4	2
		21UBYO51 21UBYO52 21UBYO53	**Major Elective Course – I** 1. Reproductive Biology of Angiosperms 2. Recent Trends in Plant Systematics 3. Emerging Molecular Techniques	13	11	12	7	3	4	2
		21UBYO54 21UBYO55 21UBYO56	**Major Elective Course - II** 1. Economic Botany 2. Plant Resources and Utilization 3. Prospective of Medicinal Plants	13	11	12	7	3	4	2
	IV	21UBYS51	**Skill Enhancement Course - V:** Bioinstrumentation and Biostatistics	10	10	09	5	2	2	2
		21UBYJ51	**Internship**	8	12	3	6	1	5	5
VI	**III**	21UBYC61	**Core Course - XIII:** Plant Ecology and Phytogeography	13	12	8	10	2	5	2
		21UBYC62	**Core Course - XIV:** Cell and Molecular Biology	15	8	8	7	5	5	4
		21UBYC63	**Core Course - XV:** Genetics and Plant Breeding	15	10	10	9	4	5	2
		21UBYC6P	**Core Course - XVI:** Practical: Plant Ecology and	15	12	8	10	2	6	2

			Phytogeography							
		21UBYC6Q	**Core Course - XVII:** Practical: Cell and Molecular Biology and Genetics	13	8	10	8	7	7	2
		21UBYO61 21UBYO62 21UBYO63	**Major Elective Course - III** 1. Biodiversity and Conservation 2. Forest Botany 3. Recent Advances in Botany	13	11	12	7	3	4	2
	IV	21UBYS61	**Skill Enhancement Course - VI:** Techniques in Plant Biotechnology	8	10	10	5	2	3	2
Total Weightage of all Courses Contributing to PO				**620**	**481**	**343**	**313**	**160**	**199**	**134**

SRI KALISWARI COLLEGE (AUTONOMOUS), Sivakasi
(Affiliated to Madurai Kamaraj University, Re-accredited with A Grade (CGPA 3.11) by NAAC)
DEPARTMENT OF BOTANY
UG Programme - B.Sc. Botany
OUTCOME-BASED EDUCATION WITH CHOICE BASED CREDIT SYSTEM
(From 2021-2022 Batch onwards)

PROGRAMME ARTICULATION MATRIX – WEIGHTED PERCENTAGE OF COURSE CONTRIBUTION TO POS

Semester	Part	Course code	Course Name	PO1	PO2	PO3	PO4	PO5	PO6	PO7
I	I	21UTAL11	Tamil/Hindi-I	1.61	1.45	0.58	2.56	1.25	0.99	1.49
	II	21UENL11	Communicative English-I	1.61	1.45	0.58	2.56	1.25	0.99	2.24
	III	21UBYC11	**Core Course - I:** Algae, Fungi, Lichens, and Bryophytes	2.42	2.69	2.62	2.24	1.25	1.97	1.49
		21UBYC1P	**Core Course - II:** Practical: Algae, Fungi, Lichens, and Bryophytes	2.42	2.69	2.62	1.28	1.25	2.96	1.49
		21UBYA11	**Allied Course - I:** Chemistry-I	2.42	2.07	1.45	1.28	1.25	1.48	1.49
		21UBYA1P	**Allied Course - I:** Practical: Volumetric analysis	2.42	2.07	1.45	0.64	1.25	1.97	2.24
	IV	21UESR11	**Ability Enhancement Compulsory Course I:** Environmental Studies	1.29	1.04	0.29	2.24	5	2.46	3.73
		21UBYS11	**Skill Enhancement Course - I:** Nursery and Landscape Management	1.61	2.07	1.45	1.6	1.88	2.46	1.49
II	I	21UTAL21	Tamil/Hindi-II	1.61	1.66	0.58	2.56	1.25	0.99	1.49
	II	21UENL21	Communicative English-II	1.61	1.66	0.58	2.56	1.25	0.99	2.24

	III	21UBYC21	**Core Course - III:** Pteridophytes, Gymnosperms and Palaeobotany	2.42	2.48	2.62	3.19	1.25	0.49	1.49
		21UBYC2P	**Core Course - IV:** Practical: Pteridophytes, Gymnosperms and Palaeobotany	2.42	2.48	4.36	1.6	1.88	1.48	1.49
		21UBYA21	**Allied Course - II:** Chemistry-II	2.42	2.07	1.45	1.28	1.25	1.48	1.49
		21UBYA2P	**Allied Course - II:** Practical: Organic analysis	2.42	2.07	1.45	0.64	1.25	1.97	2.24
	IV	21UVED21	**Ability Enhancement Compulsory Course II:** Value Education	1.29	1.04	0.29	1.6	5.63	1.97	5.22
		21UBYS21	**Skill Enhancement Course - II:** Biofertilizer Technology	1.61	1.66	2.62	1.92	1.88	1.48	0.75
		21UDMG21	**Disaster Management**	1.13	1.66	0.58	1.6	1.25	1.97	5.97
III	I	21UTAL31	Tamil/Hindi – III	1.61	1.66	0.58	2.56	1.25	0.99	1.49
	II	21UENL31	Communicative English – III	1.61	1.66	0.87	2.88	1.88	1.48	1.49
	III	21UBYC31	**Core Course - V:** Plant Anatomy and Embryology	2.42	2.07	2.91	2.24	3.13	1.48	0.75
		21UBYC3P	**Core Course - VI:** Practical: Plant Anatomy and Embryology	2.42	2.07	2.03	1.92	3.75	1.48	1.49
		21UBYA31	**Allied Course - III:** Invertebrata	2.42	2.48	2.62	1.6	3.13	1.97	2.24
		21UBYA3P	**Allied Course - III:** Practical: Zoology-I	2.42	1.86	2.91	0.96	2.5	2.96	2.24
	IV	21UBYN31	**Non Major Elective course - I**: Horticulture	1.61	2.07	1.45	1.6	1.25	2.96	1.49

		21UBYS31	**Skill Enhancement Course - III:** Mushroom Cultivation Technology	1.61	1.66	2.62	1.6	1.88	1.48	1.49
IV	**I**	21UTAL41	Tamil/Hindi – IV	1.61	1.66	0.58	2.88	1.25	0.99	1.49
	II	21UENL41	Communicative English – IV	1.61	1.86	0.87	2.56	1.25	1.48	2.24
	III	21UBYC41	**Core Course - VII:** Microbiology and Plant Pathology	2.42	2.28	3.2	1.6	3.13	1.48	1.49
		21UBYC4P	**Core Course - VIII:** Practical: Microbiology and Plant Pathology	2.42	2.69	2.62	1.6	1.88	1.97	1.49
		21UBYA41	**Allied Course - IV:** Chordata	2.42	2.48	2.33	1.6	3.13	1.97	1.49
		21UBYA4P	**Allied Course - IV:** Practical: Zoology – II	2.42	2.07	1.45	1.28	1.88	2.46	2.24
		21UBYM41 21UBYM42	**Self paced learning** (Swayam courses) 1. Cell culture Technologies 2. Computer Aided Drug Designing	2.1	2.07	1.45	2.88	0.63	0.99	5.22
	IV	21UBYN41	**Non Major Elective course - II**: Herbal Medicine	1.77	1.86	1.16	1.6	1.25	3.45	1.49
		21UBYS41	**Skill Enhancement Course - IV:** Biology for Entrepreneurship Development	1.61	1.66	2.33	1.28	1.25	2.46	2.24
	V		**Extension**	1.29	0.41	0.29	2.24	5.63	3.94	3.73
V	**III**	21UBYC51	**Core Course - IX:** Taxonomy of Angiosperms	2.42	2.07	3.2	2.24	1.88	2.46	1.49
		21UBYC52	**Core Course - X:** Plant Physiology and Biochemistry	2.26	2.48	2.91	1.6	1.88	1.97	1.49

		21UBYC5P	**Core Course - XI:** Practical: Taxonomy of Angiosperms	2.42	1.66	3.49	2.56	1.25	2.96	1.49
		21UBYC5Q	**Core Course - XII:** Practical: Plant Physiology and Biochemistry	2.42	2.69	2.62	1.6	2.5	1.97	1.49
		21UBYO51 21UBYO52 21UBYO53	**Major Elective Course – I** 1. Reproductive Biology of Angiosperms 2. Recent Trends in Plant Systematics 3. Emerging Molecular Techniques	2.1	2.28	3.49	2.24	1.88	1.97	1.49
		21UBYO54 21UBYO55 21UBYO56	**Major Elective Course - II** 1. Economic Botany 2. Plant Resources and Utilization 3. Prospective of Medicinal Plants	2.10	2.28	3.49	2.24	1.88	1.97	1.49
	IV	21UBYS51	**Skill Enhancement Course - V:** Bioinstrumentation and Biostatistics	1.61	2.07	2.62	1.60	1.25	0.99	1.49
		21UBYJ51	**Internship**	1.29	2.48	0.87	1.92	0.63	2.46	3.73
VI	**III**	21UBYC61	**Core Course - XIII:** Plant Ecology and Phytogeography	2.10	2.48	2.33	3.19	1.25	2.46	1.49
		21UBYC62	**Core Course - XIV:** Cell and Molecular Biology	2.42	1.66	2.33	2.24	3.13	2.46	2.99
		21UBYC63	**Core Course - XV:** Genetics and Plant Breeding	2.42	2.07	2.91	2.88	2.50	2.46	1.49
		21UBYC6P	**Core Course - XVI:** Practical: Plant	2.42	2.48	2.33	3.19	1.25	2.96	1.49

			Ecology and Phytogeography							
		21UBYC6Q	**Core Course - XVII:** Practical: Cell and Molecular Biology and Genetics	2.10	1.66	2.91	2.56	4.38	3.45	1.49
		21UBYO61 21UBYO62 21UBYO63	**Major Elective Course - III** 1. Biodiversity and Conservation 2. Forest Botany 3. Recent Advances in Botany	2.10	2.28	3.49	2.24	1.88	1.97	1.49
	IV	21UBYS61	**Skill Enhancement Course - VI:** Techniques in Plant Biotechnology	1.29	2.07	2.91	1.60	1.25	1.48	1.49
Total Weightage of all Courses Contributing to PO				**100**	**100**	**100**	**100**	**100**	**100**	**100**

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF TAMIL
UG Programme - B.A./B.SC./BCA
SEMESTER - I
பொதுத்தமிழ் - I (21UTAL11)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 6 **INT.MARKS : 40**
CREDITS : 3 **EXT.MARKS : 60**
DURATION : 90 hrs **MAX.MARKS : 100**

நோக்கம்

தற்கால இலக்கியவகைமைகளைஅறிமுகப்படுத்தும் நோக்கில் இத்தாள் வடிவமைக்கப்பட்டுள்ளது.

கற்றலின் பயன்கள்

இத்தாளைவெற்றிகரமாகமுடித்தவுடன் மாணவர்கள்,

CO1[K1]: நவீன இலக்கியவகைமைகளைஅடையாளம் காண்பர்.

CO2[K2]: மொழி இலக்கணஅறிவினைப் புரிந்துகொண்டுபிழை இன்றிஎழுதும் திறன்பெறுவர்.

CO3[K3]:இக்கால இலக்கியங்களின் கருத்தம்சங்களைதம் வாழ்நிலையோடு பொருத்திப்பார்ப்பர்.

CO4[K5]: நவீன இலக்கியங்கள் படைப்பதற்குஅடிப்படையாகஅமைந்தமுறைமை குறித்துமதிப்பீடுசெய்துஅவற்றைவிமர்சிப்பர்.

CO5[K6]: உலகளாவியகவிதைநாடகப் படைப்புகளைக் கற்றுப் படைப்பர்.

CO-PO Mapping Table (Course Articulation Matrix)

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	2	-	2	-	-	-
CO2[K2]	2	2	-	2	-	-	-
CO3[K3]	2	1	-	2	1	-	-
CO4[K5]	2	1	1	1	1	1	1
CO5[K6]	2	1	1	1	-	1	1
Weightage of the course	10	7	2	8	2	2	2
Weighted percentage of Course Contribution to Pos	1.61	1.45	0.58	2.56	1.25	0.99	1.49

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

கூறு I **(18hrs)**

மரபுக்கவிதை: மரபுக்கவிதையின் தோற்றமும் வளர்ச்சியும்,**பாரதியார்**:யாமறிந்தமொழிகளிலே,பகைவனுக்குஅருள்வாய்.**பாரதிதாசன்**:வீரத் தமிழன்,தொழிலாளர் விண்ணப்பம்.**கவிமணி**:ஒற்றுமையேஉயிர்நிலை. **நாமக்கல்**

கவிஞர்:பெண் மனம். **முடியரசன்**: தமிழ் தான் என் பேர்.**கண்ணதாசன்:**யாத்திரை.**பட்டுக்கோட்டை:**சின்னப்பயலே.....

கூறு II **(18hrs)**

புதுக்கவிதை:புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும் - ஹைக்கூவின் தோற்றமும் வளர்ச்சியும். **அப்துல் ரகுமான்** - பாருக்குள்ளேநல்லநாடு. **நா.காமராசர்:**கண்.**மு.மேத்தா:**கால்களால் நடந்தகதை.**வைரமுத்து:**ஐந்துபெரிது ஆறு சிறிது, **பா.விஜய்:**பேனாபேசுச்சு. **கனிமொழி**:கருவறைவாசனை.**ஹைக்கூ கவிதை:** இ.பரிமளம் -அமுதபாரதி - பா.உதயகண்ணன் - இ.ரா.இரவி - மணிவேலன்-புதுவைசீனு.தமிழ்மணி-புதுவைத்தமிழ்நெஞ்சன் - அறிவுமதி- ஸ்ரீரசா-தங்கம் மூர்த்தி - புதுக்கவிதை - ஹைக்கூ படைப்பதற்குப் பயிற்சிஅளித்தல்.

கூறு III **(18hrs)**

நாடகம்:நாடகத்தின் தோற்றமும் வளர்ச்சியும்,புராண இலக்கியநாடகங்கள் - **ஜெயந்திநாகராஜன்:**திருநாவுக்கரசர் - திருஞானசம்பந்தர்.

கூறு IV **(18hrs)**

நாடகம்:புராண இலக்கியநாடகங்கள் - ஜெயந்திநாகராஜன் 1. மாணிக்கவாசகர் 2. கண்ணப்பநாயனார் 3. மெய்ப்பொருள் நாயனார்,நாடகம் படைப்பதற்குப் பயிற்சிஅளித்தல்.

கூறு V **(18hrs)**

இலக்கணம் :முதல், சார்பெழுத்துக்கள் - மொழிமுதல், மொழி இறுதிஎழுத்துக்கள் - வல்லினம் மிகும், மிகா இடங்கள்.

பாடநூல்கள்

1. *தொகுப்பு நூல்*,தமிழியல்துறை,ஸ்ரீ காளீஸ்வரிகல்லூரி (தன்னாட்சி),சிவகாசி.
2. ஜெயந்திநாகராஜன்.*புராண இலக்கியநாடகங்கள்*,தாமரைபப்ளிகேஷன்ஸ்,சென்னை,2014.
3. வாசுதேவன்,கா.*பன்முகநோக்கில் தமிழ் இலக்கியவரலாறு*,தேவன் பதிப்பகம்,திருச்சிராப்பள்ளி,2017.

பார்வை நூல்கள்

1. சுதந்திரமுத்து, மு.*படைப்புக் கலை*,அறிவுப் பதிப்பகம்,சென்னை,2008.
2. பாக்கியமேரி.*தமிழ் இலக்கியவரலாறு*,நியூ செஞ்சுரி புக் ஹவுஸ்,சென்னை,2011.
3. ஸ்ரீதரன்,என்.*பிழையின்றித் தமிழ் எழுதுவோம்*,ஸ்ரீ நந்தினிபதிப்பகம்,சென்னை, 2008.

வலைப்பதிவுகள்(Web Sources)

1. https://youtu.be/6mrdbprILo8
2. https://youtu.be/QYizo6YwBXl
3. https://youtu.be/-oUmlDvHvQg
4. https://youtu.be/3sY76BTiqPQ
5. https://youtu.be/xLosPsqJ6W0

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF ENGLISH
UG Programme - B.A./B.Com./ B.B.A./B.SC./BCA
SEMESTER- I
COMMUNICATIVE ENGLISH - I (21UENL11)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 6 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 90 hrs **MAX. MARKS: 100**

Preamble

This course helps the learners to develop their communication skills in English through listening, speaking, reading, and writing practices.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: relate and state ideas by reading and listening to simple recorded conversations and fables

CO2[K2]: demonstrate communicative skills through simple Descriptions, Requests and Instructions

CO3[K3]: apply knowledge of word power and grammar rules in Formal and Informal letter writings

CO4[K4]: analyze fairy tales and folk tales to develop language skills through literature

CO5[K6]: construct grammatically correct and meaningful simple sentences in English

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	2	-	2	-	-	-
CO2[K2]	2	2	-	2	-	-	-
CO3[K3]	2	1	-	2	1	-	1
CO4[K4]	2	1	1	1	1	1	1
CO5[K6]	2	1	1	1	-	1	1
Weightage of the course	10	07	02	08	02	02	03
Weighted percentage of Course contribution to Pos	**1.61**	**1.45**	**0.58**	**2.56**	**1.25**	**0.99**	**2.24**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I - LISTENING AND SPEAKING **(18 hrs)**

A. Listening

Listening to simple conversations in everyday contexts

Listening to fables

Listening to News Bulletin

B. Speaking

Introducing oneself and others

Describing persons, places, things, daily routines, health and symptoms

Asking for time and date

Asking for directions and giving directions

Giving instructions and seeking clarifications

Making requests and responding to requests

Thanking someone and responding to thanks

UNIT II - READING AND WRITING **(18 hrs)**

A. Reading

Interpreting pictures/maps/pie-charts/tables/flow charts /diagrams

Skimming or scanning through the texts

B. Writing

Hints Developing

Story Completion/ completing the story based on given outline.

Letter Writing: Informal letters- Family, Friends and Relatives

Formal letters: Leave letters and Apology Letter

UNIT III - WORD POWER **18 hrs)**

Prefixes and Suffixes

Homophones and Homonyms

Words related to Parts of the Body & their functions, Cries of Animals, Young Ones of Animals

Connotative and Denotative words

Contextual Usage of words

Puzzles and Anagrams

UNIT IV - GRAMMAR **(18 hrs)**

Nouns-Kinds, Number and Gender

Pronouns-Kinds

Adjectives- Kinds

Verbs-Regular and Irregular verbs, Transitive and Intransitive Verbs

Adverbs- Kinds and Position of Adverbs

UNIT V - LANGUAGE THROUGH LITERATURE (18 hrs)

Fairy Tales, Folk Tales and Legendary Heroes

Fairy Tales

The Pied Piper of Hamelin

The Ugly Duckling

Hansel and Gretel

Folk Tales

Alibaba and the Forty Thieves

Aladdin and the Magic Lamp

The Town Mouse and the Country Mouse

Legendary Heroes

Chhatrapati Shivaji Maharaj- Shivaji's great escape

Mahatma Gandhi- Mohandas takes a spelling test

Tenali Raman- The Stolen Brinjal

Akbar and Birbal- Re-Union

TEXTBOOKS

1. Carthy Mc., and Felicity O'Dell. *English Vocabulary in Use (Upper intermediate)*. UK: Cambridge University Press, 2005.
2. Pillai, Radhakrishna, and K.Rajeevan. *Spoken English for You (Level One)*. Chennai: Emerald Publishers, 2009.
3. Sreelekshmi. *Folk Tales- A WonderWorld of 150 Stories for Children*. Kerala: SL Publishers, 2004.

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1. Babu, Sundara. *Leo's Tenali Raman Stories*. Chennai: Leo Book Publishers, 2015.
2. Kalyani V. *Fairy Tales 1*. Kerala: Sisco Publishers, 2004.
3. *Life Skills* (Jeevan Kaushal) *Facilitators' Guidelines*. New Delhi: University Grants Commission, 2021.
4. Sadanand, Kamalesh and Susheela Punitha. *Spoken English- A Foundation Course for Speakers of Tamil*. Mumbai: Orient Blackswan, 2009.
5. Taylor, Grant. *English Conversation Practice*. New Delhi: Tata McGraw Hill Publishers, 2001.

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1. https://kathakids.com/great-personalities/history-and-legends/shivajis-great-escape/
2. https://kathakids.com/great-personalities/stories-of-mahatma-gandhi/
3. https://www.infoplease.com/dictionary/brewers/animals-cries
4. https://www.zooborns.com/zooborns/baby-animal-names.html
5. https://learnenglish.britishcouncil.org/general-english/stories
6. https://www.talkenglish.com/lessonindex.aspx
7. https://www.englishhelper.com/
8. https://www.englishpage.com/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – I
(2021 – 2024)
CORE COURSE – I: ALGAE, FUNGI, LICHENS AND BRYOPHYTES (21UBYC11)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 4 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to morphological characters and reproduction of the cryptogams plant.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: define the salient features and general characters of cryptogams plant
CO2[K2]: illustrate the structure and life cycle of Algae, Fungi, Lichens and Bryophytes
CO3[K3]: utilize the economic importance of Algae, Fungi, Lichen and Bryophytes
CO4[K4]: examine the reproductive characters of different lower plants
CO5[K4]: differentiate the Algae, Fungi, Lichens and Bryophytes

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	2	2	-	-	-
CO2[K2]	3	3	2	1	-	1	1
CO3[K3]	3	3	2	1	2	2	1
CO4[K4]	3	3	1	2	-	-	-
CO5[K4]	3	2	2	1	-	1	-
Weightage of the course	15	13	09	07	02	04	02
Weighted percentage of Course contribution to Pos	**2.42**	**2.69**	**2.62**	**2.24**	**1.25**	**1.97**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

ALGAE: General Characters of Algae – Thallus Organization in Algae – Nutrition – Reproduction in Algae – Life Cycle Pattern –Outline Classification of Algae-Fritsch (1935) System (Characteristic feature Up to Class Level).Economic Importance of Algae.

UNIT II **(12 hrs)**

Brief account on Freshwater algae –Marine algae – Terrestrial algae – Symbiotic algae – Parasitic algae. Distribution, Structure, Reproduction and Life Cycle of the Following: Cyanophyceae – *Nostoc,* Chlorophyceae – *Oedogonium,* Bacillariophyceae – Diatoms, Phaeophyceae – *Sargassum,* Rhodophyceae - *Gracillaria.*

UNIT III **(12 hrs)**

FUNGI: General Characters of Fungi – Alexopoulous' (1962) System of Classification of Fungi (Outline Only) – Economic Importance of Fungi – Industry, Medicine, Agriculture and Food. Structure, Reproduction and Life Cycle of the Following classes: Oomycetes – *Pythium,* Zygomycetes – *Rhizopus,* Ascomycetes – *Penicillium,* Deuteromycetes – *Cercospora*.

UNIT IV **(12hrs)**

LICHENS: General features – classification (Miller, 1984) – Distribution – thallus organization – Structure and reproduction. Ecological and economic importance of Lichens. General characters and reproduction of three major types of Lichens: Crustose, Foliose and Fruticose.

UNIT V **(12 hrs)**

BRYOPHYTES: General Characters of Bryophytes – Proskaeur's (1957) System of Classification of Bryophytes. Ecological and economic importance of Bryophytes. Structure and Reproduction of the Following classes: Hepaticopsida - *Marchantia,* Anthocerotopsida – *Anthoceros,* Bryopsida - *Polytrichum.*

TEXTBOOKS

1. Pandey, P.B. *College Botany - 1: Including Algae, Fungi, Lichens, Bacteria, Viruses, Plant Pathology, Industrial Microbiology and Bryophyta*. S.Chand Publishing, New Delhi. 2014.
2. Bilgrami, K.S. *A Textbook of Algae*. CBS Publisher and Distributors, New Delhi, ISBN: 978-8123900490. 2010.
3. Thakur, A.K. and Bassi, S.K.*A Text Book of Botany*- Diversity of Microbes and Cryptogams, S.Chand and Co., New Delhi, 2007.

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1. Vashishta, B.R., Sinha, A.K. and Singh, V.P. *Algae*. 9th Edition S.Chand and Co., New Delhi, 2010.
2. Sharma, P.D. *Fungi and Allied Organisms*. Narosa Publishing House, New Delhi, 2005.
3. Johri, R.M., Lata, S. and Sharma, S. *A Text Book of Bryophyta.* Dominant Publishers and Distributors, New Delhi, 2004.

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1. https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_(OpenStax)/05%3A_The_Eukaryotes_of_Microbiology/5.04%3A_Algae.
2. https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Book%3A_General_Biology_(Boundless)/24%3A_Fungi/24.1%3A_Characteristics_of_Fungi/24.1A%3A_Characteristics_of_Fungi.
3. https://bio.libretexts.org/Bookshelves/Microbiology/Book%3A_Microbiology_(OpenStax)/05%3A_The_Eukaryotes_of_Microbiology/5.05%3A_Lichens

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – I
(2021 – 2024)
CORE COURSE – II: PRACTICAL: ALGAE, FUNGI, LICHENS AND BRYOPHYTES
(21UBYC1P)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 50**
CREDITS : 3 **EXT. MARKS : 50**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This practical course introduces the learners to internal and external morphological structure of lower groups of plant.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]:draw the internal structure of Algae, Fungi and Bryophytes

CO2[K2]: illustrate the external morphology of Algae, Fungi, Lichens and Bryophytes

CO3[K3]: prepare the permanent slide for Algae and Bryophytes

CO4[K4]: distinguish the various life forms of Algae, Fungi and Bryophytes

CO5[K5]: predict the identification key characters of cryptogam

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	2	1	-	1	-
CO2[K2]	3	3	2	-	-	1	1
CO3[K3]	3	3	2	-	2	2	-
CO4[K4]	3	3	1	2	-	1	-
CO5[K5]	3	2	2	1	-	1	1
Weightage of the course	15	13	09	04	02	06	02
Weighted percentage of Course contribution to Pos	**2.42**	**2.69**	**2.62**	**1.28**	**1.25**	**2.96**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

Micro Preparations, Observations, Identification and mounting the slides for Vegetative part of the following Specimens:

1. Algae : *Nostoc* – *Oedogonium* – Diatoms – *Sargassum* – *Gracillaria*.
2. Fungi : *Rhizopus* – *Penicillium* – *Puccinia* – *Cercospora*
3. Lichens : Thallus structure of *Usnea* and Foliose types
4. Bryophytes : *Marchantia* – *Anthoceros* – *Polytrichum* (T.S. of Thallus Only)

REFERENCES

Books

1. Vashishta, B.R. and Sinha, A.K. *Modern practical Botany.* Vol. II. 9th Edition. S.Chand and Co., New Delhi, 2010.
2. Bentray Kumar. *A Textbook of practical Botany.* Vol. I. Narosa Publishing House, New Delhi. 2011.
3. Sharma, P.D. *Algae, Fungi and Allied Botany.* Narosa Publishing House, New Delhi. 2008.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF CHEMISTRY
UG Programme – B.Sc. Botany
SEMESTER - I/III
ALLIED COURSE -I: ALLIED CHEMISTRY - I
(21UBTA11/21UBYA11/21UPHA31)
(From 2021 - 2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS: 40**
CREDITS : 3 **EXT. MARKS: 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course explains various types of adsorption, photochemistry and enable the students to gain knowledge on periodic properties.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1 [K1]: list out the types of adsorptions, chemical bonding and various kinds of oils and fats

CO2 [K2]: differentiate types of chemical bonding and photophysical processes

CO3 [K3]: present the concepts of adsorption, photochemistry, periodicity in properties and chemical bonding

CO4 [K4]: distinguish between soaps and detergents, oils and fats, photochemical and thermochemical reactions, absorption and adsorption

CO5 [K4]: analyze hybridization and structure of compounds and quality of soaps.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	2	1	-	-	1	-
CO2 [K2]	3	2	1	1	-	-	-
CO3 [K3]	3	2	1	1	1	1	1
CO4 [K4]	3	2	1	1	-	-	1
CO5 [K4]	3	2	1	1	1	1	-
Weightage of the course	15	10	05	04	02	03	02
Weighted percentage of Course contribution to Pos	**2.42**	**2.07**	**1.45**	**1.28**	**1.25**	**1.48**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I – ADSORPTION (12 hrs)

Adsorption - Adsorbent – Adsorbate - Definition with Illustration - Characteristics of Adsorption – Types of Adsorption – Physisorption – Chemisorption –Difference between Physisorption and Chemisorption – Factors Affecting Adsorption - Adsorption Isotherms – FreundlichAdsorption Isotherm – Application of Adsorption.

UNIT II – PHOTO CHEMISTRY (12 hrs)

Thermochemical Reactions – Photochemical Reactions – Difference between Photochemical Reaction and Thermochemical Reactions – Laws of Photochemistry, Grothus–Draper Law – Stark-Einstein Law - Quantum Efficiency – Causes of High and Low Quantum Efficiency - Determination of Quantum Efficiency – Photophysical Processes – Jablonski Diagram – Fluorescence – Phosphorescene – Chemiluminescence.

UNIT III – PERIODIC TABLE AND PERIODICITY IN PROPERTIES (12 hrs)

Long Form of Periodic Table – Division of Elements into s, p, d and f Blocks – Definition and Periodic Trends of Various Periodic Properties -Covalent Radius - Ionic Radius – Ionization Energy - Electron Affinity – Electronegativity – Factors Affecting Ionization Energy – Factors Affecting Electron Affinity – Determination of Electronegativity – Pauling Approach – Mullikan Approach – Application of Electronegativity.

UNIT IV – CHEMICAL BONDING (12 hrs)

Chemical Bonding – Types of Bonding –Covalent Bonding – Overlapping – s-s Overlapping – s-p Overlapping, p-p Overlapping - VB Theory and its Limitation – Hybridization – Definition, Characteristics and Determination – Hybridization of BeH_2, BF_3 andCH_4- MO Theory – Postulates – MOT of H_2, He_2, N_2, O_2.

UNIT V – FATS AND OILS (12 hrs)

Fats and Oils – Definition, Properties and Analysis of Fats and Oils – Difference between Fats and Oils –Manufacture of Vanaspati – Soaps – Definition – Manufacture of Soaps by – Kettle Process – Cleaning Action of Soaps – Synthetic Detergents – Synthetic Detergents verses Soaps.

TEXTBOOKS

1. Arun Bhal and B. S. Bhal. *A Text Book of Organic Chemistry*. New Delhi: S. Chand & Company, 2013.
2. Arun Bhal and B.S. Bhal. *Essential of Physical Chemistry.* New Delhi: S.Chand & Company, 2013.
3. B. R. Puri, L. R. Sharma and K. C. Kalia, *Principles of Inorganic Chemistry*. Milstones publishers & distributors, 2013.

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1. B. R. Puri, L. R. Sharma and Madan S. Pathania *Text Book of Physical Chemistry.* Jalandar: Vishal Publishing and Co, 2008.
2. P. L. Soni. *Text Book of Organic Chemistry*. New Delhi: S.Chand and Company, 2008.

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1. https://www.youtube.com/watch?v=8QH853ffG2U
2. https://www.youtube.com/watch?v=8VBs_xf7yLs
3. https://www.youtube.com/watch?v=NPvWSo0Us9A

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF CHEMISTRY
UG Programme – B.Sc. Botany
SEMESTER - I/III
ALLIED COURSE - I: ALLIED PRACTICAL - I: VOLUMETRIC ANALYSIS
(21UBTA1P/21UBYA1P/21UPHA3P)
(From 2021 - 2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS: 50**
CREDIT : 1 **EXT. MARKS: 50**
DURATION : 30 hrs **MAX. MARKS:100**

Preamble

This course enables the students to acquire practical skill in quantitative estimation of inorganic compounds by volumetric method.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1 [K2]: estimate oxalic acid by acidimetric and permanganometric method
CO2 [K3]: choose suitable indicator for carrying out volumetric estimation
CO3 [K4]: apply acidimetric and alkalimetric method for the quantitative volumetric estimation of acids and bases
CO4 [K5]: measure quantitatively the amount of inorganic compound accurately with the help of colour change of the indicator
CO5 [K6]: plan various volumetric procedures for the estimation of any inorganic compounds.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K2]	3	2	1	-	-	-	1
CO2 [K3]	3	2	1	1	-	1	-
CO3[K4]	3	2	1	-	-	1	-
CO4 [K5]	3	2	1	1	1	1	1
CO5 [K6]	3	2	1	-	1	1	1
Weightage of the course	15	10	05	02	02	04	03
Weighted percentage of course contribution to Pos	**2.42**	**2.07**	**1.45**	**0.64**	**1.25**	**1.97**	**2.24**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

VOLUMETRIC ANALYSIS

LIST OF EXPERIMENTS

I. ACIDIMETRY AND ALKALIMETRY

1. Estimation of Na_2CO_3
2. Estimation of NaOH / KOH
3. Estimation of Oxalic acid
4. Estimation of Hydrochloric acid

II. REDOX TITRATIONS

A. Permanganometry

5. Estimation of Oxalic acid
6. Estimation of Ferrous Ammonium Sulphate

B. Dichrometry

7. Estimation of Ferrous Ion
8. Estimation of Potassium Dichromate

REFERENCE

Book

1. G. H. Jeffery, J. Bassett, J. Mendham and R, C Denney, *Vogel's Quantitative Chemical Analysis*. England: Longman Scientific and Technical.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
UG PROGRAMME
SEMESTER- I
ABILITY ENHANCEMENT COMPULSORY COURSE: ENVIRONMENTAL STUDIES
(21UESR11)
(From 2021 - 2022 Batch onwards)

HOURS/WEEK : 2 **INT. MARKS: 40**
CREDIT : 1 **EXT. MARKS: 60**
DURATION : 30 hrs **MAX. MARKS :100**

Preamble

This course familiarizes the learners with the essentials of Environmental Studies by focusing on variety of environmental issues and factors **affecting environment.**

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: recognize the importance of environment and role of Individuals in its protection.

CO2[K2]: explain the key concepts of Ecosystem, Food Web and Bio geochemical.

CO3[K3]: apply the right measures for the sustainable use of natural resources.

CO4[K4]: analyse the ethical, cross-cultural, and historical context of environmental issues and the links between Human and Natural Systems.

CO5[K4]: examine the impact of human action on the biological environment

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	1	-	2	2	1	1
CO2 [K2]	2	1	-	2	1	1	1
CO3 [K3]	2	1	-	1	1	1	1
CO4 [K4]	1	1	1	1	2	1	1
CO5 [K4]	1	1	-	1	2	1	1
Weightage of the course	08	5	1	7	08	05	05
Weighted percentage of Course contribution to Pos	**1.29**	**1.04**	**0.29**	**2.24**	**5**	**2.46**	**3.73**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(6 hrs)**

Structure of earth and its components: Atmosphere – Lithosphere – Hydrosphere – Biosphere. Renewable and non-renewable resources – Forest, water and energy resources.

UNIT II **(6 hrs)**

Ecosystem: Concept of ecosystem – Terrestrial and aquatic. Structure and function – Energy flow in the ecosystem – Food chain and food web – Ecological pyramids – Bio-geo chemical cycle – carbon and nitrogen cycle.

UNIT III **(6 hrs)**

Biodiversity: Introduction – Definition: genetic, species and ecosystem diversity. Indian Biodiversity Hotspots. Threats to biodiversity – Conservation of Biodiversity – In-situ and Ex-situ conservation strategies. IUCN Red list Categories.

UNIT IV **(6 hrs)**

Pollution: Definition – causes – effects and control measures of Air – Water – Noise – soil – nuclear pollution. Global issues – Global warming – acid rain – Ozone layer depletion. Water conservation – rain water harvesting and water recycling – solid waste management.

UNIT V **(6 hrs)**

Human Population and Environment: Population growth, variation among nations. Road safety awareness. Environment and human health. Human Rights. HIV/AIDS. Women and Child Welfare. Role of Information Technology in Environment and human health. Contribution of students and teachers in adoption of villages and steps to be taken for green villages.

TEXTBOOKS

1. Dharmaraj,J. *Text book of Environmental studies*, S. Chand and Co. New Delhi, 1995.
2. Susila Appadurai. *Environmental Studies*, New Century Book House, 2012.

REFERENCES

Books

1. Agarwal, K.C.*Environmental Biology*, Nidi publication Ltd, Bikaner, 2001.
2. Odum, E.P. *Fundamentals of Ecology*, W.B. Saunders Co. USA, 1971.
3. Miller, T.G. *Environmental sciences*, Wadsworth Publishing Co, New Delhi. 2004.

Web Sources

1. https://www.adcidl.com/pdf/India-Road, Traffic-Signs.pdf.
2. https://www.youtube.com/watch?v=QewEi2U1jLs
3. https://byjus.com/biology/endemic-species/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – I
(2021 – 2024)
SKILL ENHANCEMENT COURSE – I: NURSERY AND LANDSCAPE MANAGEMENT (21UBYS11)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 40**
CREDIT : 1 **EXT. MARKS : 60**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This skill enhancement course enables learners to understand the nursery and landscaping and garden management.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to
CO1[K1]: define the Nursery and Landscaping.
CO2[K2]: demonstrate the propagation methods
CO3[K3]: use the ornamental and medicinal plants
CO4[K4]: simplify the home gardening methods
CO5[K4]: differentiate the various type of garden

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	2	1	1	-	1	-
CO2[K2]	2	2	1	1	1	1	1
CO3[K3]	2	2	1	1	1	1	-
CO4[K4]	2	2	1	1	1	1	-
CO5[K4]	2	2	1	1	-	1	1
Weightage of the course	10	10	05	05	03	05	02
Weighted percentage of Course contribution to POs	**1.61**	**2.07**	**1.45**	**1.60**	**1.88**	**2.46**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(6 hrs)**

Nursery: Introduction – Prospects and Scope of Nursery and landscaping. Climate factors – Edaphic factors – Nutritional need for Nursery cultivation – Pruning methods.

UNIT II **(6 hrs)**

Gardening: Types of Gardening – Formal garden – Informal garden – Vegetable garden – Landscaped layout designing – formation and maintenance of lawn.

UNIT III **(6 hrs)**

Structures of garden: Introduction – Green house – Shade house – Mist chamber – Topiary – Bonsai culture

UNIT IV **(6 hrs)**

Plant Propagation: Methods of Propagation – Cutting – Layering – Grafting - Budding. Floriculture: cultivation of Rose – Chrysanthemum – Jasmine.

UNIT V **(6 hrs)**

Nursery Management: Manures – composting – vermicomposting – use of Hormones – pest and disease management – storage and marketing.

TEXTBOOKS

1. Kumar, N. *Introduction to Horticulture*. Rajalakshmi Publishers, 2017.
2. Sundararajan, J.S. Muthuswamy, J. Shanmugavelu, K.G. and Balakrishnan, R. *A guide to horticulture*. Thiruvenkadam Printers, Coimbatore, 2005.
3. Jitendra Singh. *Basic Horticulture*. Kalyani Publishers, 2018.

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1. Bose, T. K. and Mukherjee, D. *Gardening in India*. Oxford and IBH Publishing Co., Kolkatta, Mumbai, New Delhi, 1972.
2. Sandhu, M. K. *Plant Propagation*. Wiley Eastern Ltd., New Delhi, 1989.
3. Edmond Musser and Andres. *Fundamentals of Horticulture*. McGraw Hill Book Co., Mumbai, 1988.

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2. https://www.ugaoo.com/knowledge-center/3-basic-styles-of-gardening//
3. https://byjus.com/biology/manure/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF TAMIL
UG Programme - B.A/B.SC/BCA
SEMESTER - II
பொதுத்தமிழ் - II (21UTAL21)
(From 2021-2022 Batch onwards)

HOURS / WEEK: 6 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 90 hrs **MAX. MARKS: 100**

நோக்கம்

சமய இலக்கியம் தோன்றியதற்கானகாலப்பின்னணிமற்றும் சமயம் சார்ந்த இலக்கியங்களைமாணவர்களுக்குஅறிவுறுத்தலும்,பல்வேறுகாலகட்டசிறுகதை இலக்கியங்களைஎடுத்துரைக்கும் நோக்கோடுஅமைக்கப்பட்டுள்ளது.

கற்றலின் பயன்கள்

இத்தாளைவெற்றிகரமாகமுடித்தவுடன் மாணவர்கள்,

CO1[K1]: பல்வேறுசமயம் சார்ந்த இலக்கியவரலாற்றினைஅறிவர்.
CO2[K2]: இறைஉருவங்களையும் புராணக்கருத்துக்களையும் கூறுவர்.
CO3[K3]: சமயப்பாடல்களின் அமைப்பினையும் நோக்கத்தினையும் தெளிவாக விளக்குவர்.
CO4[K4]: தமிழ்ச் சிறுகதைகளின் பொருண்மைகளைப்பாகுபடுத்துவர்.
CO5[K4]: சொல்லிலக்கணத்தைப் புரிந்துகொண்டுபிழையின்றிஎழுதும் திறனைப் பெறுவர்.

CO-PO Mapping Table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	-	1	-	-	-
CO2[K2]	2	1	-	1	1	-	-
CO3[K3]	2	2	-	2	-	1	-
CO4[K4]	2	2	1	2	1	-	1
CO5[K4]	2	2	1	2	-	1	1
Weightage of the Course	10	8	2	8	2	2	2
Weighted percentage of Course Contribution to Pos	1.61	1.66	0.58	2.56	1.25	0.99	1.49

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

கூறு I (18hrs)

சைவ இலக்கியவரலாறு - **திருஞானசம்பந்தர்**: முதல் திருமுறை- திருப்பிரமபுரம் - தோடுடையசெவியன் (10 பாடல்கள்). **திருநாவுக்கரசர்:**நான்காம் திருமுறை - திருவதிகைவீரட்டானம் - கூற்றாயினவாறுவிலக்ககலீர் (10 பாடல்கள்).**சுந்தரர்:**ஏழாம் திருமுறை - திருவெண்ணெய்நல்லூர் பதிகம் - பித்தாபிறைசூடி (10 பாடல்கள்). **மாணிக்கவாசகர்:**குயிற்பத்து (10 பாடல்கள்).

கூறு II **(18hrs)**

வைணவ இலக்கியவரலாறு - **ஆண்டாள்**: திருப்பாவைமுழுவதும் (30 பாடல்கள்) - **நம்மாழ்வார்**: நான்காம் திருமொழி - நான்காம் பத்து - மண்ணையிருந்துதுழாவி.

கூறு III **(18hrs)**

கிறிஸ்தவ, இஸ்லாமிய இலக்கியவரலாறு - **கண்ணதாசன்:**இயேசுகாவியம் - மலைப்பொழிவு (முழுவதும்) - **குணங்குடியார்:**நந்தீஸ்வரக்கண்ணி (51 பாடல்கள்).

கூறு IV **(18hrs)**

சிறுகதைதோற்றம் வளர்ச்சி (தேர்ந்தெடுக்கப்பட்ட 10 சிறுகதைகள்) - **புதுமைப்பித்தன்:**அகல்யை..பி.எஸ். ராமையா: நட்சத்திரக் குழந்தைகள் **த.ஜெயகாந்தன்:**அக்ரஹாரத்துப்பூனை. **வண்ணதாசன்**:ஒருசிறு இசை.**வண்ணநிலவன்:**கரையும் உருவங்கள்.. **கு.அழகிரிசாமி**: அன்பளிப்பு. **விஞ்ஞானி**: முன்னை இட்டதீ.**ஆதவன்:** கறுப்புஅம்பாகதை. **மேலாண்மைபொன்னுச்சாமி**: அன்பெழுத்து. **நாஞ்சில் நாடன்**: சூடியபூ சூடற்க

கூறு V **(18hrs)**

இலக்கணம்: சொல்விளக்கம்,சொற்பாகுபாடு (பெயர்ச்சொல்,வினைச்சொல், இடைச்சொல்,உரிச்சொல்) - அறுவகைவினா - எண்வகைவிடை - மொழிப்பயிற்சி: மயங்கொலிப்பிழைகள் (லகர,ளகர,ழகரவேறுபாடு,ரகர,றகரவேறுபாடு - ணகர,னகரவேறுபாடு).

பாடநூல்கள்

1. *தொகுப்புநூல்*,தமிழியல்துறை,ஸ்ரீ காளீஸ்வரிகல்லூரி (தன்னாட்சி),சிவகாசி.
2. வாசுதேவன்,கா.*பன்முகநோக்கில் தமிழ் இலக்கியவரலாறு*,தேவன் பதிப்பகம்,திருச்சிராப்பள்ளி,பன்னிரெண்டாம் பதிப்பு: 2017.

பார்வை நூல்கள்

1. அப்துல்ரகுமான் (குறிப்புரை).*குணங்குடியார்பாடற்கோவை*,மணிவாசகர்பதிப்பகம்,சென்னை, 2002.
2. பாக்கியமேரி. *தமிழ் இலக்கியவரலாறு*,நியூ செஞ்சுரி புக் ஹவுஸ்,சென்னை,நான்காம் பதிப்பு: 2011.
3. ஜெகத்ரட்சகன், எஸ்.*நாலாயிரதிவ்யப் பிரபந்தம்*,முல்லைநிலையம்,சென்னை,முதற்பதிப்பு: 1993.
4. ஸ்ரீமத் கந்தசாமித்தம்பிரான் சாமிகள் (பதி.ஆ.). *மூவர் தேவாரம்*,ஞானசம்பந்தம் பதிப்பகம்,மயிலாடுதுறை, இரண்டாம் பதிப்பு: 1997.

வலைப்பதிவுகள் (Web Sources)

1. https://youtu.be/FPlNGftQnAo
2. https://youtu.be/Rj0S6KOruvA
3. https://youtu.be/Z8xgO8ff44g
4. https://youtu.be/PxeeauHz5CQ
5. https://youtu.be/TLU6MO9YEkA
6. https://podhutamizh.blogspot.com/2017/09/blog-post_42.html
7. https://youtu.be/vZ1FrQuhn_w

DEPARTMENT OF ENGLISH
UG Programme - B.A./B.Com./ B.B.A./B.SC./BCA
SEMESTER- II
COMMUNICATIVE ENGLISH - II (21UENL21)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 6 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 90 hrs **MAX. MARKS: 100**

Preamble

This course helps the learners to develop their communication skills in English through listening, reading, speaking and writing practices.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: relate and state ideas by reading and listening to recorded interviews and news

CO2[K2]: demonstrate effective speaking skills by offering suggestions, seeking permission and reporting ongoing activities

CO3[K3]: apply knowledge of word power and grammar rules through proverb expansion and paragraph writings

CO4[K4]: analyze simple poems and short stories to develop language skills through literature

CO5[K6]: construct grammatically correct and logically coherent paragraphs

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	1	-	1	-	-	-
CO2 [K2]	2	2	-	1	1	-	1
CO3 [K3]	2	2	-	2	-	1	-
CO4 [K4]	2	2	1	2	1	-	1
CO5 [K6]	2	1	1	2	-	1	1
Weightage of the course	10	08	02	08	02	02	03
Weighted percentage of Course contribution to POs	**1.61**	**1.66**	**0.58**	**2.56**	**1.25**	**0.99**	**2.24**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I - LISTENING AND SPEAKING **(18 hrs)**

A. Listening

Listening to interviews

Listening to news reading

Listening to instructions-download apps in mobile handsets, cooking, sending e-mail

B. Speaking

Inviting person, offering suggestion and seeking permission

Making complaints and asking apology

Expressing likes, dislikes, hopes, wishes, regrets, sympathy, offering condolences, compliments and praising

Reporting conversations, facts, meetings/interviews, ongoing activities and future plans

Talking about the weather, past &future events, interesting plans and arrangements

UNIT II - READING AND WRITING **(18 hrs)**

A. Reading

Reading advertisements

Reading notices

Reading short passages

B. Writing

Proverb Expansion

Paragraph Writing

Essay writing

UNIT III - WORD POWER **(18 hrs)**

Synonyms & Antonyms

Misspelt words

Words related to- House, Clothing, Food, Education, Speaking, Holidays and Sports

UNIT IV - GRAMMAR **(18 hrs)**

Preposition and its kinds

Conjunction and its kinds

Articles

Tenses

UNIT V - LANGUAGE THROUGH LITERATURE **(18 hrs)**

A. Poetry

Sarojini Naidu	-	The Queen's Rival
John Masefield	-	Laugh and be Merry
Alfred Noyes	-	The Highwayman

B. Short Story

Somerset Maugham	-	The Ant and the Grasshopper
Katherine Mansfield	-	A Cup of Tea

TEXTBOOKS

1. Carthy Mc., and Felicity O'Dell. *English Vocabulary in Use (Upper intermediate)*. UK: Cambridge University Press, 2005.
2. Pillai, Radhakrishna and K.Rajeevan. *Spoken English for You (Level One)*. Chennai: Emerald Publishers, 2009.
3. Pillai, Radhakrishna. *Emerald English Grammar and Composition.* Chennai: Emerald Publishers, 2016.

REFERENCES

Books

1. *Life Skills (Jeevan Kaushal) Facilitators' Guidelines*. New Delhi: University Grants Commission, 2021.
2. Radha, Alamelu et.al. *Situational Grammar and Composition.* Chennai: New Century Book House Pvt. Ltd,2008.
3. Sadanand, Kamalesh and Susheela Punitha. *Spoken English- A Foundation Course for speakers of Tamil*. Mumbai: Orient Blackswan, 2009.
4. Subramanian A.E. *Gifts to Posterity.* Chennai*: Anu Chitra Publications*, 2003.
5. Taylor, Grant. *English Conversation Practice*. New Delhi: Tata McGraw Hill Publishers, 2001.
6. Tilak, Raghukul. *Sarojini Naidu Selected Poems.* New Delhi: Educational Publishers, 2009.

Web Sources

1. https://allpoetry.com/Laugh-and-be-Merry
2. https://lincolnprep.wildapricot.org/resources/Reading%20Selections%20for%20Reading%20Competion/The%20Highwayman.pdf
3. https://learnenglish.britishcouncil.org/general-english/stories
4. https://www.talkenglish.com/lessonindex.aspx
5. https://www.englishhelper.com/
6. https://www.englishpage.com/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – II
(2021 – 2024)
CORE COURSE – III: PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY
(21UBYC21)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 4 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course enables the learners to gain knowledge on salient features, morphology, reproduction and life cycle of Pteridophytes, Gymnosperms and Palaeobotany

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: define the general characters of phanerogams plant
CO2[K2]: illustrate internal morphology of Pteridophytes and Gymnosperms
CO3[K3]: discover the structure and reproduction of phanerogams plant
CO4[K4]: classify the phanerogams plant groups.
CO5[K5]: appraise the economic importance species from Pteridophytes and Gymnosperms

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	2	2	1	-	-
CO2[K2]	3	2	1	2	-	-	1
CO3[K3]	3	3	2	2	-	-	-
CO4[K4]	3	3	2	2	1	-	-
CO5[K5]	3	2	2	2	-	1	1
Weightage of the course	15	12	09	10	02	01	02
Weighted percentage of Course contribution to Pos	**2.42**	**2.48**	**2.62**	**3.19**	**1.29**	**0.49**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Pteridophytes: General Characters of Pteridophytes – Classification of Pteridophytes according to G.M. Smith (1955) – Stelar system in Pteridophytes – Economic importance of Pteridophytes. Structure and Reproduction of following Pteridophytes: *Psilotum* and *Selaginella* (Development of Sex Organs, Gametophyte and Sporophyte excluded).

UNIT II **(12 hrs)**

Structure and Reproduction of following Pteridophytes: *Equisetum, Marsilea, Pteris* and *Cyathaea* (Development of Sex Organs, Gametophyte and Sporophyte excluded).

UNIT III **(12 hrs)**

Gymnosperms: General Characters of Gymnosperms – Classification of Gymnosperms according to K.R. Sporne (1965) – Economic importance of Gymnosperms. External and Internal Structure and Reproduction following Gymnosperms: *Cycas* and *Ginkgo* (Developmental aspects need not be discussed).

UNIT IV **(12 hrs)**

Structure and Reproduction of following Gymnosperms: *Pinus, Araucaria* and *Gnetum* (Developmental aspects need not be discussed).

UNIT V **(12 hrs)**

Palaeobotany: Geological Era – Fossil – Types of Fossils – Process of Fossilization. Structure and Reproduction: *Rhynia – Lepidodendron – Lepidocarpon – Lyginopteris – Williamsonia.*

TEXTBOOKS

1. Vashishta, P.C., Sinha, A.K., and Kumar, A. *Pteridophyta*. Multicolour Illustrative Revised Edition, S.Chand and Co., Ltd. New Delhi, 2016.
2. Pandey, B.P. *College Botany.* Vol.II. S.Chand and Co., New Delhi, Eighth Edition, 2011.
3. Vashishta, P.C., Sinha, A.K., and Kumar, A. *Gymnosperm*. Multicolour Illustrative Revised Edition, S.Chand and Co., Ltd. New Delhi, 2016.
4. Sambamurthy, AVSS. *A Textbook of Bryophytes, Pteridophytes, Gymnosperms and Palaeobotany*. Wiley India, Reprint 2020.

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Books

1. Sharma, O.P. *Pteridophyta.* Tata McGraw-Hill, New Delhi. 2012.
2. Sporne, K.R. *The Morphology of Angiosperm.* United Book Print, 2015.
3. Mishra, S.R. *Text Book of Palaeobotany*. Discovery Publishing House, India 2010.

4. Pandey, B.P. *College Botany* Vol. II. VII Edition S. Chand &Co., New Delhi, 1996.
5. Bower, F.O. *The origin of Land Flora*. Macmillan Press, London. 1967.
6. Arnold, C.A. *An Introduction to Palaeobotany*. Academic Press, New York. 1947.
7. Stewart, W.N. and Rothwell, G.W. *Paleobotany and the evolution of plants*. 2nd Edition. Cambridge University Press, Cambridge 1999.

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1. https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Book%3A_General_Biology_(OpenStax)/5%3A_Biological_Diversity/26%3A_Seed_Plants/26.2%3A_Gymnosperms
2. https://bio.libretexts.org/Bookshelves/Botany/Book%3A_Introduction_to_Botany_(Shipunov)/06%3A_Growing_Diversity_of_Plants/6.02%3A_Pteridophyta_-_the_Ferns#:~:text=Lycophytes%20belong%20to%20microphyllous%20lineage,of%20pteridophytes%20and%20seed%20plants.
3. https://youtu.be/dNHPfuu0l0k
4. https://www.youtube.com/embed/54iNAYIWF80

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – II
(2021 – 2024)
CORE COURSE – IV: PRACTICAL: PTERIDOPHYTES, GYMNOSPERMS AND PALAEOBOTANY (21UBYC2P)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 50**
CREDITS : 3 **EXT. MARKS : 50**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the morphological and anatomical features of Pteridophytes, Gymnosperms and fossil plants

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K2]: demonstrate preparation of temporary and permanent mount slides.
CO2[K3]: find-out the structural organization of Pteridophytes & Gymnosperm
CO3[K4]: examine the internal anatomical features of Pteridophytes and Gymnosperms.
CO4[K5]: evaluate the anatomical variation among the Pteridophytes and Gymnosperms.
CO5[K6]: assess the suitable technique for the study of internal structure of Pteridophytes and Gymnosperms.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	3	1	1	-	1
CO2[K3]	3	3	3	1	-	1	-
CO3[K4]	3	3	3	1	2	-	-
CO4[K5]	3	2	3	1	-	1	-
CO5[K6]	3	2	3	1	-	1	1
Weightage of the course	15	12	15	05	03	03	02
Weighted percentage of Course contribution to Pos	**2.42**	**2.48**	**4.36**	**1.60**	**1.88**	**1.48**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

1. Micro preparation and Observation of Internal Structure of the following specimens:

i. *Psilotum* and *Selaginella*.
ii. *Equisetum* and *Marsilea*
iii. *Pinus, Araucaria* and *Gnetum*

2. Observation of the following macroscopic specimens:

i. *Psilotum*
ii. *Selaginella*
iii. *Equisetum*
iv. *Cycas*
v. *Pinus*
vi. *Araucaria*
vii. *Gnetum.*

3. Demonstration and Preparation of permanent slides

4. Submission of record note book.

5. Study tour (3 days)/Field visit report

REFERENCES

Books

1. Sharma, O.P. *Pteridophyta.* Tata McGraw-Hill, New Delhi 2012
2. Bendre, A. and Kumar, A. *A Text Book of Practical Botany* I. Rastogi Publication, 2009.
3. Pandey B.P. *Modern Practical Botany.* Vol. 2. S. Chand Publication, 2010
4. Santra. *The Practical Botany.* Vol. 1. NCBA Publication, 2015.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF CHEMISTRY
UG Programme – B.Sc. Botany
SEMESTER - II/IV
ALLIED COURSE - II: ALLIED CHEMISTRY - II
(21UBTA21/21UBYA21/21UPHA41)
(From 2021 - 2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS: 40**
CREDITS : 3 **EXT. MARKS: 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course enables the students to gain knowledge on catalyst, electrochemistry, acids, bases, polymers and dyes.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1 [K1]: describe catalysis, terms in electrochemistry, nuclear reactions, types of polymers and dyes

CO2 [K2]: illustrate the fundamental concepts of electrochemistry and nuclear chemistry

CO3 [K3]: make use of the various concepts of acids, bases and theory of dyes

CO4 [K4]: compare nuclear fission and fusion, homogeneous and heterogeneous catalysts

CO5 [K4]: classify polymers and dyes based on structure and properties of different types of polymers and its application.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	3	2	1	-	-	1	-
CO2 [K2]	3	2	1	1	-	-	-
CO3 [K3]	3	2	1	1	1	1	1
CO4 [K4]	3	2	1	1	-	-	1
CO5 [K4]	3	2	1	1	1	1	-
Weightage of the course	15	10	05	04	02	03	02
Weighted percentage of Course contribution to POs	**2.42**	**2.07**	**1.45**	**1.28**	**1.25**	**1.48**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I – CATALYSIS (12 hrs)

Catalysis – Definition- Characteristics of Catalysis – Types of Catalysis – Homogeneous Catalysis – Intermediate Formation Theory – Heterogeneous Catalysis – Adsorption Theory - Promotors – Auto Catalyst – Positive Catalyst - Negative Catalyst – Catalytic Poisons –Enzyme Catalysis – Mechanism of Enzyme Catalysis – Characteristics of EnzymeCatalysis -Michalies – MentonEquation.

UNIT II – ELECTRO CHEMISTRY (12 hrs)

Electrolysis – Definition –Faraday's Law of Electrolysis –Electrolytes – Conductance of Electrolytes – Specific Conductance –Equivalent Conductance – Molar Conductance – Equivalent Conductance on Infinite Dilution – Strong Electrolytes – Weak Electrolytes – pH – Buffer – Buffer Action – Henderson Equation to Determine the pH of Buffer.

UNIT III – NUCLEAR CHEMISTRY (12 hrs)

Fundamental Composition of Nucleus – Mass Defect – Binding Energy - Radioactivity – Comparison of α, β and γ rays – Nuclear Fission – Nuclear Reactor - Nuclear Fusion – Stellar Energy – Proton – Proton Cycle, Carbon – Nitrogen Cycle – Application of Radioactive Isotopes in Medicine – Industry – Agriculture – Radiocarbon Dating – Nuclear Waste Disposal Management.

UNIT IV – POLYMERS (12 hrs)

Polymers – Definition – Classification of Polymers – Addition and Condensation Polymers – Preparation, Properties and Uses of Polyethylene, Polystyrene, PVC, Teflon, Nylon 66 – Thermoplastics and Thermosetting Polymers - Definition - Preparation, Properties and Uses of Bakelite – Natural and Synthetic Rubbers - Preparation, Properties and Uses of Neoprene and Buna – S.

UNIT V – DYES (12 hrs)

Dyes - Definition – Characteristics of Dyes - Color and Constitution Theory of Dyes – Chromophore – Auxochrome Theory –Classification of Dyes Based on Structure and Applications – Preparation of Congo Red, Bismark Brown, Malachite Green , Alizarine and Indigo.

TEXTBOOKS

1. Arun Bhal and B.S. Bhal. *A Text Book of Organic Chemistry*. New Delhi: S.Chand & Company, 2013.
2. Arun Bhal and B.S. Bhal. *Essential of Physical Chemistry.* New Delhi: S.Chand & Company, 2013.
3. B. R. Puri, L. R. Sharma and K. C. Kalia, *Principles of Inorganic Chemistry*, Milstones publishers & distributors, 2013.

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1. B. R. Puri, L. R. Sharma and Madan S. Pathania. *Text Book of Physical Chemistry.* Jalandar: Vishal Publishing and Co, 2008.
2. P. L. Soni. *Text Book of Organic Chemistry*, NewDelhi: S.Chand and Company, 2008
3. H. I. Arnikar, Essentials of Nuclear Chemistry, 3rd Edition. Wiley Eastern Ltd., New Delhi.

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1. https://www.youtube.com/watch?v=lWVX2ofyOIY
2. https://www.youtube.com/watch?v=kOK_0dYr4S4
3. https://www.youtube.com/watch?v=vZ02XIyflJY

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF CHEMISTRY
UG Programme – B.Sc. Botany
SEMESTER - II/IV
ALLIED COURSE - II: ALLIED PRACTICAL - II: ORGANIC ANALYSIS
(21UBTA2P/21UBYA2P/21UPHA4P)
(From 2021 - 2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS: 50**
CREDIT : 1 **EXT. MARKS: 50**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This lab course enables the students to acquire practical skill on qualitative analysis of simple organic compounds.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1 [K2]: recognize the analytical procedure to identify the given organic compounds

CO2 [K3]: determine the saturation/unsaturation natureof given organic compounds

CO3 [K4]: inspect the aliphatic/aromatic and natureof given organic compounds

CO4 [K5]: predict elements (other than C, H and O) present in the given compound

CO5 [K6]: perform systematic analysis and report the functional groups present in the given organic compound.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K2]	3	2	1	-	-	-	1
CO2 [K3]	3	2	1	1	-	1	-
CO3 [K4]	3	2	1	-	-	1	-
CO4 [K5]	3	2	1	1	1	1	1
CO5 [K6]	3	2	1	-	1	1	1
Weightage of the course	15	10	05	02	02	04	03
Weighted percentage of course contribution to Pos	**2.42**	**2.07**	**1.45**	**0.64**	**1.25**	**1.97**	**2.24**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

ANALYSIS OF ORGANIC COMPOUNDS

1. Aromatic Mono and Bi carboxylic acids
2. Aromatic Phenol
3. Aromatic Ester
4. Aromatic Amines
5. Aromatic Aldehydes
6. Aromatic Ketones
7. Aliphatic Diamide, Diamide Containing Sulphur
8. Aliphatic Carbohydrate

REFERENCE

Book

1. B. S. Furniss, A.J. Hannford, P.W.G. Smith, A. R. Tatchell, *Vogel's Textbook of Practical Organic Chemistry,* Longman Scientific and Technical, England.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI

UG PROGRAMME

SEMESTER –II

ABILITY ENHANCEMENT COMPULSORY COURSE: II - VALUE EDUCATION

(21UVED21)

(From 2021 - 2022 Batch onwards)

HOURS/WEEK: 1 **INT. MARKS : 40**

CREDIT : 1 **EXT. MARKS : 60**

DURATION : 15 hrs **MAX. MARKS: 100**

Preamble

This course aims to promote the values of peace, non-violence, religious tolerance and secular thinking among the learners and equip the learners for a harmonious living in the multi-cultural pluralistic society.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: identify the basic human values and ethics necessary for harmonious Human relationship

CO2[K2]: explain the significance of social values and religious tolerance to live in Peace

CO3[K3]: articulate the life-changing principles of brotherhood, honesty, loyalty and community solidarity

CO4[K4]: analyse emotional, social, spiritual attribute to acquire well balanced Personality

CO5[K4]: examine the importance of harmonious living in the multi-cultural Pluralistic society.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	1	-	1	1	-	2
CO2 [K2]	2	1	-	1	2	1	2
CO3 [K3]	2	1	-	1	2	1	1
CO4 [K4]	1	1	1	1	2	1	1
CO5 [K4]	1	1	-	1	2	1	1
Weightage of the course	08	05	01	05	09	04	07
Weighted percentage of Course contribution to POs	**1.29**	**1.04**	**0.29**	**1.6**	**5.63**	**1.97**	**5.22**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I – VALUES AND INDIVIDUAL (3 hrs)

Meaning of values – classification of values – Need for value education – Personal values like adaptability, courage, cheerfulness, dignity of labour and self control – Self discipline - Self Confidence - Self initiative - Social values like sacrifice, forgiveness, Honesty, good manners, tolerance, friendship, hospitality, cooperation and civic sense – Moral values like purity, dedication, punctuality, loyalty, truthfulness and sense of duty.

UNIT II – VALUES AND SOCIETY (3 hrs)

Definition of society – democracy – secularism – socialism – Human rights – social integration – Social Justice – Role models: Akbar, Balagangadhar Tilak, Abdul Kalam, Mother Teresa.

UNIT III – VALUES AND RELIGIONS (3 hrs)

Values in Hinduism, Christianity, Islam and Buddhism – Need for religious harmony inter faith dialogue – Role Models: Vivekananda, Narayana Guru, Aravindar, Tagore, Vallalar Ramalingar, Gandhi.

UNIT IV – VALUES AND NATIONAL INTEGRATION (3 hrs)

Secularism and National Integration – Message from the life of Gandhiji, Nehru, Bharathi, Subash Chandra Bose, Sarojini Naidu etc.

UNIT V – VALUES AND SCIENCE (3 hrs)

Indian Gurus – Indian Scientists – Indian Universities – Indian Mathematicians and World Scientists – Science and Religion – Science, Technology development and values – Science and Human values.

TEXTBOOK

1. Pitchaikani Prabhaharan, A. Babu Franklin, M.Archanadevi, *Value education*, Sri Kaliswari college (Autonomous), Sivakasi, 2017.

REFERENCES

Books

1. Subramanyam, K. *Values in Education*, Ramana Publications, 1995
2. Swamy Chidbhavananda, *Indian National Education*, Publication by Ramakirshna Tapovanam.
3. அறிஞர் குழு (தொகுப்பு). *வாழ்வியல் விழுமியங்கள்*, உலக சமுதாய சேவா சங்கம், ஆழியாறு.

Web Sources

1. https://www.youtube.com/watch?v=ruKY3GqBvYQ.
2. https://www.republicworld.com/technology-news/science/15-famous-indian-scientists-list-know-what-were-their-innovations.html.
3. https://www.youtube.com/watch?v=M9_l9DDvEsw

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – II
(2021 – 2024)
SKILL ENHANCEMENT COURSE – II: BIOFERTILIZER TECHNOLOGY
(21UBYS21)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 40**
CREDITS : 2 **EXT. MARKS : 60**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to Soil Components and how to enrich soil fertility through organic fertilizers likes symbiotic and Non-symbiotic bacteria.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: describe the soil components and organic fertilizers.

CO2[K2]: classify the symbiotic and non-symbiotic bacterial inoculants in Agricultural field.

CO3[K3]: perform the isolation and identification of symbiotic and non-symbiotic bacteria.

CO4[K4]: inspect the importance of organic fertilizers in agricultural crops.

CO5[K5]: justify the mass multiplication of symbiotic and non-symbiotic bacteria.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	1	2	-	-	-
CO2[K2]	2	2	2	1	-	1	-
CO3[K3]	2	1	2	1	1	1	1
CO4[K4]	2	2	2	1	1	1	-
CO5[K5]	2	2	2	1	1		-
Weightage of the course	10	08	09	06	03	03	01
Weighted percentage of Course contribution to POs	**1.61**	**1.66**	**2.62**	**1.92**	**1.88**	**1.48**	**0.75**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(6 hrs)**

Soil: Soil Components – Soil Fertility - Loss of Soil Fertility - Consequences and Maintenance. Role of Organic Fertilizers. Biofertilizer: Bacterial and Algal biofertilizer – Importance and Advantages of Biofertilizer.

UNIT II **(6 hrs)**

Symbiotic bacterial inoculants: *Rhizobium* – Nitrogen Fixation. Isolation, Identification, Characterization and Mass Multiplication of *Rhizobium*. Agronomic Importance of *Rhizobium*.

UNIT III **(6 hrs)**

Non-symbiotic bacterial inoculants: *Azotobacter* and *Azospirillum* – Nitrogen Fixation. Isolation, Identification, Characterization and Mass Multiplication of *Azotobacter* and *Azospirillum*. Agronomic Importance of *Azotobacter* and *Azospirillum*.

UNIT IV **(6 hrs)**

Blue green algal inoculants: Isolation, Cultivation and Mass Multiplication of Blue Green Algae. Agronomic Importance of Blue Green Algae.

UNIT V **(6 hrs)**

Mycorrhizal inoculants: Types of Mycorrhizae - Ecto and Endo Mycorrhizae - Mass Multiplication. Role of Mycorrhizae in Agriculture. Phosphate Solubilizing Bacteria – Isolation and Mechanism of Phosphate Solubilization.

TEXTBOOKS

1. Subbarao, N.S. *Biofertilizers in Agriculture and Forestry*. Oxford & IBH. 1988.
2. Subbarao, N.S. *Recent Advances in Biological Nitrogen Fixation*. Oxford and IBH, New Delhi, 2001.
3. Rangaswami, G. and Bagyaraj, D.J. *Agricultural Microbiology*. 2nd Edition, Prentice Hall Pvt. Ltd. New Delhi, 2001.

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1. Tilak, K.V.B.R. *Bacterial Biofertilizers*. ICAR, New Delhi, 1991.
2. Gillings, M. and Holms, A. *Plant Microbiology*. Bios Scientific Publishers, NewYork, 2005.
3. Smith, S.E. & Read, D.J. *Mycorrhizal Symbiosis*. Academic Press, London, 2002.

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1. https://www.ctahr.hawaii.edu/mauisoil/a_comp.aspx#:~:text=The%20basic%20components%20of%20soil,and%2020%2D30%25%20air.
2. https://biologydictionary.net/mycorrhizae/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
UG PROGRAMME
SEMESTER – II
DISASTER MANAGEMENT (21UDMG21)
(From 2021-2022 Batch onwards)

HOURS/WEEK	**: 1**	**INT. MARKS**	**: 40**
CREDIT	**: 1**	**EXT. MARKS**	**: 60**
DURATION	**: 15 hrs**	**MAX. MARKS**	**: 100**

Preamble

This course introduces the learners to know the causes and impact of disasters and the agencies for disaster management in India.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: outline the causes and impact of disasters.

CO2[K2]: explain the features of national policy on disaster management.

CO3[K3]:present the issues in rehabilitation.

CO4[K4]:classify the mitigation measures.

CO5[K5]:assess the role of the agencies for disaster management.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	1	1	-	2	2
CO2[K2]	2	1	-	1	-	-	1
CO3[K3]	1	2	1	1	-	-	2
CO4[K4]	1	2	-	1	1	2	2
CO5[K5]	1	2	-	1	1	-	1
Weightage of the course	07	08	02	05	02	04	08
Weighted percentage of Course contribution to POs	**1.13**	**1.66**	**0.58**	**1.6**	**1.25**	**1.97**	**5.97**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(3 hrs)**

Introduction – Disaster – Hazards – Causes and Impact of Disasters – Levels ofDisaster – Casual Factors of Disaster – Phases of a Disaster.

UNIT II **(3 hrs)**

Disaster Mitigation – Risk Reduction Measures – Mitigation Actions – DisasterManagement Cycle – Classification of Mitigation Measures.

UNIT III **(3 hrs)**

Disaster Preparedness and Planning – Objectives – Strategies – Elements of DisasterPreparedness – Principles of Disaster Planning.

UNIT IV **(3 hrs)**

Disaster Rehabilitation – Issues in Rehabilitation – Objectives – Approaches –Elements of a Rehabilitation Programme.

UNIT V **(3 hrs)**

Framework Disaster Management in India – Features of National Policy on DisasterManagement – Primary and Secondary Relief Functions of Central Government – DisasterManagement Act 2005 – Agencies for Disaster Management: India Red Cross Society,NIDM – Bharat Scouts and Guides, India Paramilitary Forces.

TEXTBOOK

1. Satish Modh. *Introduction to Disaster Management*. New Delhi: Macmillan Publishers India Limited, 1st Edition, 2015.

REFERENCES

Books

1. Balamurugan P K and Ajith Kumar S. *Disaster Management*. Chennai: New Century Book House Private Limited, 1st Edition, 2020.
2. Dasgupta R.*Disaster Management and Rehabilitation.* New Delhi: Mittal Publications, 1st Edition, 2010.
3. NarayananB.*Disaster Management*. NewDelhi: A.P.H. Publishing Corporation,1st Edition, 2009.

Web Sources

1. https://nptel.ac.in/courses/105/104/105104183/
2. https://nidm.gov.in/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF TAMIL
UG Programme - B.A/B.Sc/BCA
SEMESTER - III
பொதுத்தமிழ் - III (21UTAL31)
(From 2021-2022 Batch onwards)

HOURS / WEEK : 6 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 90 hrs **MAX. MARKS: 100**

நோக்கம்

காப்பியம்,சிற்றிலக்கியம்,உரைநடைஉள்ளிட்ட இலக்கியவகைகளைஅறிமுகம் செய்து,அவற்றைச் சமூக,சமயச் சூழலில் விளங்கவைத்து,யாப்பு,அணிஉள்ளிட்டமொழிக் கட்டமைப்புகளைஉணர்த்தி,உரைநடை மூலம்படைப்பாளராகும் தகுதியைப் பெறவைத்து,பல்வேறுநிகழ்வுகளில் நடைபெறும் போட்டிகளில் பங்கேற்கச் செய்யும் வகையில் இத்தாள் வடிவமைக்கப்பட்டுள்ளது.

கற்றலின் பயன்கள்

இத்தாளைவெற்றிகரமாகமுடித்தவுடன் மாணவர்கள்,

CO1[K1]: காப்பியங்களில் கூறப்பட்டுள்ளவாழ்வியல் நெறிகளாகியஅறம்,பொருள், இன்பம்,வீடுஆகியவற்றைப் பற்றிஅறிவர்.

CO2[K2]: செய்யுட்களில் இடம்பெறும் அணிநலன்களைக் காண்பர்.

CO3[K3]: யாப்புமரபைக் கற்றுணர்ந்துகவிதையை இனம் காணும் ஆற்றலைப் பெறுவர்.

CO4[K4]: சிற்றிலக்கியங்கள் உணர்த்தும் சமூகத்தையும் விழுமியத்தையும் விவாதிக்கும் திறனைப் பெறுவர்.

CO5[K4]: சமயங்கள் உணர்த்தும் அறக்கருத்துக்களைப் பகுப்பாய்வுசெய்வர்.

CO-PO Mapping Table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	-	1	-	-	-
CO2[K2]	2	1	-	1	-	-	-
CO3[K3]	2	2	-	2	1	-	-
CO4[K4]	2	2	1	2	-	1	1
CO5[K4]	2	2	1	2	1	1	1
Weightage of the Course	10	8	2	8	2	2	2
Weighted percentage of Course Contribution to Pos	1.61	1.66	0.58	2.56	1.25	0.99	1.49

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

கூறு I **(18 hrs)**

காப்பியம்I:காப்பிய இலக்கியவரலாறு,சிலப்பதிகாரம் - அடைக்கலக்காதை (முழுவதும்) - மணிமேகலை - பளிக்கறைபுக்ககாதை (முழுவதும்) - சீவகசிந்தாமணி - காந்தர்வதத்தையார் இலம்பகம் (தேர்ந்தெடுக்கப்பட்ட 15 பாடல்கள்) - சிலைத்தொழிற் (657),கருங்கொடிப் புருவம் (658),திருமலர்க் கமலத் (662),விடுகணைவிசையின் (701),கழித்தவேலேறு (715),தடங்கணாள் பணியினால் (716),சுரந்துவானம் (717),நீர்நின் றளகிற் (718),கல்சேர் பூண்கொள் (719), இருநிலமடந்தை (720),தீந்தொடைநரம்பின் (721),பணிவரும் (722),விண்ணவர் வியப்ப (729),பருந்தும் நிழலும் (730),பண்ணொன்றுபாட (735)

கூறு II **(18 hrs)**

காப்பியம் II:திருவிளையாடற்புராணம் - கடல் சுவறவேல்விட்டபடலம் முழுவதும் - (19 பாடல்கள்) - கம்பராமாயணம் - ஆரணியகாண்டம் - சவரிபிறப்புநீங்குபடலம் முழுவதும் (9 பாடல்கள்) - பாரதிதாசன் - சஞ்சீவிபர்வதத்தின் சாரல் (முழுவதும்)

கூறு III **(18 hrs)**

சிற்றிலக்கியம்:சிற்றிலக்கியவரலாறு,காரைக்காலம்மையார் - அற்புதத் திருவந்தாதி - (1-15 பாடல்கள்) - மீனாட்சியம்மைபிள்ளைத்தமிழ்-வருகைப்பருவம் (10 பாடல்கள்) - முக்கூடற்பள்ளு - குடிமை - பெருமை (12-22 பாடல்கள்)

கூறு IV **(18 hrs)**

உரைநடை:உரைநடையின் தோற்றமும் வளர்ச்சியும்,சொல்லின்செல்வன் - க.நஞ்சையன்,படிப்பதுஎப்படி? - ம.திருமலை,தொல்காப்பியத்தில் கோளியல் நெறி - ச.பாரிஜாதம்,பாவேந்தரின் சமுதாயப் பார்வை - பாக்கியமேரி, இசையும் இயல்பும் - கி.ஈஸ்வரி,கம்பராமாயணத்தில் உறவுகள் - பெ.மகேஸ்வரி

கூறு V **(18 hrs)**

யாப்பு:பாவின் பொதுவிலக்கணமும் வகைகளும்(வெண்பா - ஆசிரியப்பா - கலிப்பா - வஞ்சிப்பா)**அணிகள்:**உவமையணி - உருவகஅணி - பிறிதுமொழிதல் அணி - வேற்றுமையணி - தற்குறிப்பேற்றஅணி - சிலேடைஅணி

பாடநூல்

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1. சீனிவாசன், ரா. *சீவகசிந்தாமணி*,அணியகம்,சென்னை, 2000.
2. தமிழண்ணல்.*புதியநோக்கில் தமிழ் இலக்கியவரலாறு*,மீனாட்சிபுத்தகநிலையம்,மதுரை,2008.
3. ஜகந்நாதன். கி.வா. *தமிழ்க் காப்பியங்கள் (ஆராய்ச்சி)*,அமுதநிலையம் லிமிடெட்,சென்னை, 1991.

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2. https://youtu.be/hmqTbZjrnu0
3. www.tamilvu.org/ta/courses-degree-c031-c0313-html-c03132I1-18030
4. https://ta.m.wikipedia.org/wiki/தமிழில்சிற்றிலக்கியங்கள்
5. https://youtu.be/Q7du9EglmBg

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF ENGLISH
UG Programme - B.A./B.SC./BCA
SEMESTER- III
COMMUNICATIVE ENGLISH - III (21UENL31)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 6 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 90 hrs **MAX. MARKS : 100**

Preamble

This course helps the learners to develop their communication skills in English through listening, speaking, reading and writing practices.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: relate and state ideas by reading simple poems and listening to telephonic conversations

CO2[K2]: demonstrate effective speaking skills by making speech presentations, discussing television programmes and sports events

CO3[K3]: apply knowledge of word power and grammar rules through diary writing, dialogue writing and writing newspaper reports

CO4[K4]: analyze short fiction to develop language skills through literature

CO5[K6]: construct grammatically correct and logically coherent essays on global problems and environmental issues

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	-	2	-	-	-
CO2[K2]	2	2	-	2	1	1	-
CO3[K3]	2	2	1	2	1	1	-
CO4[K4]	2	2	1	2	-	-	1
CO5[K6]	2	1	1	1	1	1	1
Weightage of the course	10	08	03	09	03	03	02
Weighted percentage of Course contribution to POs	**1.61**	**1.66**	**0.87**	**2.88**	**1.88**	**1.48**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I -LISTENING AND SPEAKING **(18 hrs)**

A. Listening

Listening to short speech

Listening to telephonic conversation

Listening to poetry

B. Speaking

Telephone etiquette in telephone conversation

Answering the Telephone and asking for someone

Making enquiries on the phone, Leaving messages

Presentation: Global Warming, Pollution, Women Empowerment, Communicable Diseases, System of Education, Economy, Industry, Government etc

Discussion: Television Programmes, Lessons, College facilities, Local facilities, Sports-watching or Playing, Types of food, Types of transport.

UNIT II - READING AND WRITING **(18 hrs)**

Reading: Comprehension Passages: Newspaper articles, Reports and Paraphrase Stories.

Writing: Diary Writing**,** Dialogue Writing**,** Report Writing: Newspaper Reports, Field visits, Meetings and Future Plans

UNIT III - WORD POWER **(18 hrs)**

Portmanteau words

Idioms & Phrases

Words related to- Work, Time, Distance and Dimension, Environment, The Natural World and Global Problems

UNIT IV - GRAMMAR **(18 hrs)**

Sentence-Subject and Predicate

Kinds of Sentences

Sentence Patterns

Question Words and Framing Questions

Question Tags

Degrees of Comparison

Voice

UNIT V - LANGUAGE THROUGH LITERATURE **(18 hrs)**

Abridged version of Fiction

Alexandre Dumas	- The Count of Monte Cristo
Charles Dickens	- Oliver Twist
R.M.Ballantyne	- The Coral Island

TEXTBOOKS

1. Dickens, Charles. *Oliver, Twist*. Chennai: Nesting Books Publishing and Distributors (p) Ltd, 2018.
2. Dumas, Alexandre. The *Count of Monte Cristo*. Chennai: Nesting Books Publishing and Distributors (p) Ltd, 2018.
3. Carthy Mc., and Felicity O'Dell. *English Vocabulary in Use (Upper intermediate)*. UK: Cambridge University Press, 2005.
4. Pillai, Radhakrishna and K.Rajeevan. *Spoken English for You (Level One)*. Chennai: Emerald Publishers, 2009.

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1. *Life Skills* (Jeevan Kaushal) *Facilitators' Guidelines*. New Delhi: University Grants Commission, 2021.
2. Dickens, Charles. *Oliver Twist*. Bangalore: Vasan Publications, 2011.
3. Sadanand, Kamalesh and Susheela Punitha. *Spoken English- A Foundation Course for speakers of Tamil*. Mumbai: Orient Blackswan, 2009.
4. Taylor, Grant. *English Conversation Practice*. New Delhi: Tata McGraw Hill Publishers, 2001.

Web Sources

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2. https://www.vappingo.com/word-blog/86-great-examples-of-portmanteau/
3. https://blog.hubspot.com/service/phone-etiquette
4. https://www.talkenglish.com/lessonindex.aspx
5. https://www.englishhelper.com/
6. https://www.englishpage.com/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – III
(2021 – 2024)
CORE COURSE – V: PLANT ANATOMY AND EMBRYOLOGY (21UBYC31)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 4 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course familiarizes the learners with plant anatomy of internal structures and the process of reproductive organs and embryo development.

Course Outcomes (CO)

On successful completion of the course, the learners will able to

CO1[K1]: describe the structure and functions of plant cell.

CO2[K2]: illustrate the fertilization and its types.

CO3[K3]: apply ICT Tools for Plant anatomical Studies.

CO4[K4]: distinguish the structures, functions and roles of apical versus lateral meristems in monocot and dicot .

CO5[K5]: appraise the mechanism of fertilization and embryo development

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	2	2	1	1	-
CO2[K2]	3	2	2	1	1	2	1
CO3[K3]	3	2	2	1	1	-	-
CO4[K4]	3	2	2	2	2	-	-
CO5[K5]	3	2	2	1	-		-
Weightage of the course	15	10	10	07	05	03	01
Weighted percentage of Course contribution to Pos	2.42	2.07	2.91	2.24	3.13	1.48	0.75

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Plant cell: Structure and functions of plant cell. Classification and function of meristems – Apical, lateral and intercalary meristem. Cell Theory – Tunica – Carpus and Histogen Theory. Growth and Chemical nature of the cell wall. Cell – Cell communication

UNIT II **(12 hrs)**

Structure and Function of Plant cells: Principles and Types of mechanical tissues. Structure and Function of Simple and Permanent Plant Tissues – Parenchyma – Collenchyma –Sclerenchyma. Complex Permanent Tissues- Xylem and Phloem. Primary and Secondary Growth of Dicot and monocot Stem – Root and leaves – Anomalous Secondary Growth in Dicot and Monocot Stem (*Boerhaavia* and *Dracaena*).

UNIT III **(12 hrs)**

Use of ICT tools: Artificial intelligence – Pattern Recognition – Image processing techniques for visualization plant cells. Applied plant anatomy: Brief account on the application of anatomical studies in climatology and archaeology. Microtomy: Chemical fixation – reagents and fixatives. Chemistry of fixation; Tissue dehydration – reagents – Infiltration and embedding – Sectioning and mounting for using microtome. Plant Ontogeny.

UNIT IV **(12 hrs)**

Embryology: Introduction and history of Embryology – Structure and Development of Anther and Embryo sac (Polygonum type). Types of Ovule. Pollen germination – Pollen tube formation – pollen tube entry – double Fertilization / triple fusion. Incompatibility – types – mechanism and methods to overcome incompatibility.

UNIT V **(12 hrs)**

Post pollination events: Types and function of Endosperms - Nuclear, Cellular, Helobial and Ruminate types. Embryogenesis – development of monocot and dicot embryo. Polyembryony and Parthenogenesis.

TEXTBOOKS

1. Bhojwani, S.S. and Bhatnagar,S.P. *Embryology of Angiosperms.* S.Chand and Co., New Delhi, 2016.
2. Tayal, M.S. *Plant Anatomy.* Rastogi publications, Meerut, 2017.
3. Yeung, E.C.T., Stasolla C., Sumner M. J. and Huang B. Q. *Plant Microtechniques and Protocols.* Springer Nature, 2015.

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Books

1. Ray E. Evert. *Esau's Plant Anatomy.* 3rd Edition, 2006.
2. Richard Crang*. Plant Anatomy*: *A Concept Based Approach to the Structure of Seed Plants.* Springer Nature Switzerland, John Wiley & Sons, Inc. New York. 2018.
3. Gewerbestrasse, AG., Cham, Switzerland Richard Crang and Andrey Vassilyev. *Plant Anatomy.* The McGraw-Hill Companies, Inc. USA., 2003.

Web Sources

1. https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/plant-anatomy
2. https://www.enchantedlearning.com/subjects/plants/plant/
3. https://www.youtube.com/embed/DRFuf_SVPyk

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – III
(2021 – 2024)
CORE COURSE – VI: PRACTICAL: PLANT ANATOMY AND EMBRYOLOGY
(21UBYC3P)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 50**
CREDITS : 3 **EXT. MARKS : 50**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This practical course introduces the learners to do dissection of plant tissues.

Course Outcomes (CO)

On successful completion of the course, the learners will able to

CO1[K2]: differentiate the monocot and Dicot Plants.
CO2[K3]: use sectioning techniques for dissecting of plants tissues.
CO3[K4]: analyze the different stages of Anther and Embryo development.
CO4[K5]: dissect the embryo through mounting method.
CO5[K6]: prepare the permanent specimen slides.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	1	2	1	1	-
CO2[K3]	3	2	2	1	2	2	1
CO3[K4]	3	2	2	1	1	-	-
CO4[K5]	3	2	1	1	2	-	1
CO5[K6]	3	2	1	1	-	-	-
Weightage of the course	15	10	07	06	06	03	02
Weighted percentage of Course contribution to Pos	**2.42**	**2.07**	**2.03**	**1.92**	**3.75**	**1.48**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

EXPERIMENTS

PLANT ANATOMY

1. Sectioning and differentiation of Dicot and monocot – Stem, Root and Leaf
2. Sectioning of Dicot and Monocot stem – Secondary and Anamolous secondary growth
3. Analyze the Microscopic and macroscopic specimens at sight with their illustration and its notes – *Cycas* and *Gnetum*
4. Permanent slide preparation techniques
5. Sectioning of the sample by microtome

EMBRYOLOGY

1. Observation and identification of plant reproductive parts of anther and ovule by using sectioning method
2. To observe and identify the developmental stages of anther and embryo using permanent slides.
3. To dissection and mounting embryo of *Cleome* and *Tridax*.
4. Observation of ovule and placentation types

REFERENCES

Books

1. Fahn, A., *Plant Anatomy*. 3rd Edition, Pergoman Press, Oxford, 1982.
2. Maheswari, P. *An Introduction to the Embryology of Angiosperms*. Tata McGraw Hill Publishing Co., Ltd., New Delhi, 1971.
3. Vashishta, P.C. *A text book of Plant Anatomy.* S.Chand and Co., New Delhi, 1996.
4. Bhojwani, S.S., and Bhatnagar, S.P. *Embryology of Angiosperms*. S.Chand and Co. New Delhi, 2016.
5. Tayal, M.S. *Plant Anatomy*. Rastogi publications, Meerut, 2017.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – III
(2021 – 2024)
ALLIED COURSE – III: INVERTEBRATA (21UBYA31)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 4 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course familiarizes the learners with the morphological and physiological characters of invertebrates.

Course Outcomes (CO)

On successful completion of the course, the learners will able to

CO1[K1]: detail the modern system of classification of invertebrate.

CO2[K2]: illustrate the structure and functions of Protozoa and Porifera

CO3[K3]: employ the vermicomposting technology and Prawn Culture

CO4[K4]: analyse the pathology and control measures of *Ascaris*

CO5[K4]: examine the morphological and reproductive features of invertebrates.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	2	1	-	1	1
CO2[K2]	3	3	2	-	2	1	-
CO3[K3]	3	2	2	1	2	1	1
CO4[K4]	3	3	1	2	-	-	-
CO5[K4]	3	2	2	1	1	1	1
Weightage of the course	15	12	09	05	05	04	03
Weighted percentage of Course contribution to Pos	**2.42**	**2.48**	**2.62**	**1.60**	**3.13**	**1.97**	**2.24**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Taxonomy: Definition – Principles of classification – Binomial nomenclature. General Characters of Invertebrate

UNIT II **(12 hrs)**

Protozoa: *Paramecium* – General organization and Conjugation only – Protozoan diseases and their control (*Plasmodium* Life cycle in detail). **Porifera**: *Olynthus* – General organization – Economic importance of sponges.

UNIT III **(12 hrs)**

Coelenterata: *Obelia* – Structure of *Obelia* colony, Medusa and Nematocyst. Coral reefs formation and its type. **Helminthes**: *Taenia solium* (Tape worm) – External characters – Reproductive system – Development (Life cycle). Structure, Pathology and control measures of *Ascaris*.

UNIT IV **(12 hrs)**

Annelida: Earthworm – External morphology. Vermicomposting Technology. **Arthropoda**: *Penaeus* (Marine Prawn) – External morphology. Prawn Culture.

UNIT V **(12 hrs)**

Mollusca: *Pilaglobosa* – External morphology – digestive system. **Echinodermata**: Star fish – External morphology – Water vascular system only.

TEXTBOOKS

1. Ekambaranatha Iyer, M. and Ananthakrishna, T.N. *A Manual of zoology*. Reprint S. Viswanathan publishers, Chennai, 2003.
2. Majupuria,T.C. *Invertebrate Zoology*. Pradeep Publications, Jalandar, 2001.
3. Dhami, P.S. and Dhami, J.K. *Invertebrate Zoology.* S.Chand and Company, New Delhi. 2003

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1. Jordon, E.L. and Verma, P.S. *Invertebrate Zoology*. S.Chand and Company, New Delhi, 2005.
2. Kotpal,R.L. *Invertebrate Zoology*. 3rd Edition, Rastogi publications, Meerat, 2008.
3. Robert D.Barnes. *Invertebrate Zoology*. Cengage publication, 2006.

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1. https://kidskonnect.com/animals/invertebrates/
2. https://www.britannica.com/animal/invertebrate
3. https://www.biologydiscussion.com/invertebrate-zoology/phylum-mollusca/pila-globosa-habitat-sense-organs-and-development/29154#:~:text=There%20is%20a%20distinct%20head,of%20much%20extension%20and%20contraction

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – III
(2021 – 2024)
ALLIED COURSE – III: PRACTICAL: ZOOLOGY – I (21UBYA3P)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 50**
CREDIT : 1 **EXT. MARKS : 50**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course enables the learners to understand the morphological and structural characters of vertebrate and chordates.

Course Outcomes (CO)

On successful completion of the course, the learners will able to

CO1[K2]: explain the morphological features of Protozoa.

CO2[K3]: use mounting techniques for dissecting honey bee.

CO3[K4]: distinguish vertebrate and invertebrate based on morphological characters.

CO4[K4]: dissect digestive and reproductive system of Cockroach.

CO5[K5]: assess the morphological features of invertebrates.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	1	1	-	1	1
CO2[K3]	3	2	1	-	1	1	1
CO3[K4]	3	2	1	1	1	2	1
CO4[K4]	3	3	1	1	-	-	-
CO5[K5]	3	-	6	-	2	2	-
Weightage of the course	15	09	10	03	04	06	03
Weighted percentage of Course contribution to Pos	**2.42**	**1.86**	**2.91**	**0.96**	**2.50**	**2.96**	**2.24**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

EXPERIMENTS AND SPOTTERS

DISSECTION – VIRTUAL:

1. **Mounting**: Mouth parts of Honey Bee
2. **Virtual Dissection**: Cockroach –Digestive system, Reproductive system

SPOTTERS- INVERTEBRATES:

1. Protoza: *Amoeba*, *Paramecium*, *Euglena* and *Plasmodium*
2. Coelenterata: *Obelia* colony, *Obelia* medusa, Jelly Fish, Sea anemone.
3. Helminthes: Tape worm, live fluke, redia and Cercaris.
4. Nematodes: *Ascaris* and *Wuchereria*
5. Annelida: Earthworm, Nereis, Leech.
6. Arthropoda: Prawn, Zoea larva, Mysis larva, Centipede.
7. Mollusca: *Pila*, Pearl oyster
8. Echindermata: Star fish – oral and aboral view.

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1. Jordon, E.L and Verma, P.S. *Invertebrate Zoology*. S.Chand and Company, New Delhi, 2005.
2. Kotpal,R.L. *Invertebrare Zoology*. 3rd Edition, Rastogi publications, Meerat, 2008.
3. Dhami, P.Sand Dhami, J.K. *Invertebrate Zoology.* S.Chand and Company, New Delhi. 2003

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1. https://www.notesonzoology.com/marine-animals/study-notes-on-pila-mollusca/1777
2. https://www.toppr.com/ask/en-in/question/which-one-of-the-following-is-a-matching-set-of-a-phylum-and-its-three-2/
3. https://www.pinterest.com/pin/216736419402596 43/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI

DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – III
(2021 – 2024)
NON MAJOR ELECTIVE COURSE – I: HORTICULTURE (21UBYN31)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 40**
CREDIT : 1 **EXT. MARKS : 60**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course familiarizes the learners with the various techniques used in horticulture.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: detail the propagation methods of Horticulture crops
CO2[K2]: explain the cultivation methods of ornamental plants
CO3[K3]: report the various diseases of ornamental plants.
CO4[K4]: analyse the garden, greenhouse and orchard for ornamental and economic importance plants.
CO5[K4]: examine the preservation and storage methods of fruits and vegetables

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	2	1	1	1	1	-
CO2[K2]	2	2	1	1	1	1	1
CO3[K3]	2	2	1	1	-	1	-
CO4[K4]	2	2	1	1	-	1	-
CO5[K4]	2	2	1	1	-	2	1
Weightage of the course	10	10	05	05	02	06	02
Weighted percentage of Course contribution to POs	**1.61**	**2.07**	**1.45**	**1.60**	**1.25**	**2.96**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(6 hrs)**

Horticulture: Scope - Importance – Classification of Horticultural Crops. Climate, Soil, Water and Nutritional Needs of Papaya and Lady's finger (Okra).

UNIT II **(6 hrs)**

Vegetative Propagation Methods: Cuttage: Leaf – Stem – Root Cutting. Layerage: simple layering – compound layering – air layering. Budding: T-Budding. Graftage: Approach – Whip Grafting.

UNIT III **(6 hrs)**

Gardening: Types of Gardens – Planning and Layout of Indoor Garden and Kitchen Garden. Designing and Preparation of Green House – Bonsai – Rockery.

UNIT IV **(6 hrs)**

Floriculture: Cultivation Methods of Jasmine and Rose. Arboriculture: Cultivation Methods of Apple and Mango. Planning and Lay Out of Orchards. Preservation and Storage Methods of Fruits and Vegetables.

UNIT V **(6 hrs)**

Plant Protection: General Account of Insecticides and Bio-Pesticides. Common Diseases of the following plants: Papaya Lethal Yellowing Virus in Papaya – Bhendi Yellow Vein Mosaic Virus (Okra).

TEXTBOOKS

1. Kumar, N. *Introduction to Horticulture*. Rajalakshmi Publ. 1997.
2. Sundararajan, J.S. Muthuswamy, J. Shanmugavelu, K.G. Balakrishnan, R. *A guide to horticulture*. Thiruvenkadam Printers, Coimbatore, 1995.
3. Edmond M & Andres. *Fundamentals of Horticulture*. McGraw Hill. 2008.

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1. Bose, T.K. and Mukherjee, D. *Gardening in India*. Oxford and IBH Publishing Co., Kolkatta, Mumbai, New Delhi, 1972.
2. Sandhu, M.K. *Plant Propagation*. Wiley Eastern Ltd., New Delhi, 1989.

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1. https://ncert.nic.in/textbook/pdf/ievs101.pdf
2. https://byjus.com/biology/vegetative-propagation/
3. https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/plant-protection

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – III
(2021 – 2024)
SKILL ENHANCEMENT COURSE – III: MUSHROOM CULTIVATION TECHNOLOGY (21UBYS31)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 40**
CREDITS : 2 **EXT. MARKS : 60**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course enables the learners to learn Mushroom Cultivation techniques.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: detail the general characters mushroom

CO2[K2]: explain spawn preparation techniques.

CO3[K3]: employ the mushroom cultivation techniques.

CO4[K4]: examine the control measurement against diseases and pests of mushroom.

CO5[K4]: differentiate the edible and poisonous Mushroom.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	1	1	-	-	-
CO2[K2]	2	2	2	1		1	-
CO3[K3]	2	2	2	1	1	1	1
CO4[K4]	2	2	2	1	1	1	-
CO5[K4]	2	1	2	1	1		1
Weightage of the course	10	08	09	05	03	03	02
Weighted percentage of Course contribution to POs	**1.61**	**1.66**	**2.62**	**1.60**	**1.88**	**1.48**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(6 hrs)**

Mushroom Biology: Introduction, characteristics and Economic importance of mushrooms. Key to differentiate between edible and poisonous mushroom. Basic Systematic Position – Morphology – Climatic Needs – Distribution and General Characters of *Agaricus, Calocybe* and *Pleurotus* Spp.

UNIT II **(6 hrs)**

Mushroom Cultivation Technology: Prospects of Tropical Mushroom Cultivation Technology (Include Pure Culture and Spawn Preparation): Oyster Mushroom (*Pleurotus florida*) – Milky Mushroom (*Calocybe indica*) – Button Mushroom (*Agaricus bisporus*). Post Harvest Technology. Mushroom Farming and Prospects.

UNIT III **(6 hrs)**

Diseases in Mushroom: Diseases - Common Pests. Disease prevention and Control Measures. **Processing** – Blanching – Steeping – Sun Drying – Canning – Pickling – Freeze Drying. Storage: Short Term and Long Term Storage.

UNIT IV **(6 hrs)**

Mushroom Economy: Production Level – Economic Return – Foreign Exchange from Mushroom Cultivating Countries and International Trade. Nutritional Composition and Medicinal uses of Mushrooms. Recipes of Mushroom.

UNIT V **(6 hrs)**

Mushroom Shed Construction and Cost of Cultivation – Oyster and Milky Mushroom. Factors affecting mushroom Cultivation. Mushroom Cultivation Training Units and Research Centres in India.

1. Field Visit to Mushroom Farms.
2. Demonstration on Various Stages of Mushroom Cultivation.
3. Interaction with Mushroom Farmers.
4. Mini Project Work and Report Submission.

TEXTBOOKS

1. Shu-Ting Chang and Philip G. Miles. *Mushrooms Cultivation, Nutritional Value, Medicinal Effect and Environmental Impact*. CRC Press Boca Raton London New York Washington, D.C. 2004.
2. Paul Stamets J.S., and Chilton. *The Mushroom Cultivator - A practical guide to growing mushrooms at home*. Agariikon Press Olyivipia, Washington, 1983.
3. Tripathi, D.P. *Mushroom Cultivation*. Oxford and IBH Publishing Co. Pvt. Ltd, New Delhi, 2005.

REFERENCES

Books

1. Kaul, T.N. *Biology and conservation of mushrooms.* Oxford and IBH publishing company New Delhi, 2001.
2. Harander Singh. *Mushrooms- The Art of Cultivation*. Sterling Publishers, 1991.
3. Peter. *Mushroom Cultivation.* 3rd Edition. Backhuyes Publisher USA, 2000.

Web Sources

1. https://www.slideshare.net/SyedaFari2/agaricus-131005247
2. https://agricoop.nic.in/sites/default/files/ICAR_8.pdf
3. https://agritech.tnau.ac.in/postharvest/pht_faq.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF TAMIL
UG Programme - B.A./B.SC./BCA
SEMESTER-IV
பொதுத்தமிழ் - IV (21UTAL41)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 6 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 90hrs **MAX. MARKS: 100**

நோக்கம்

சங்கஇலக்கியங்களின் மேன்மைகளையும் வாழ்வியல் அறங்களையும் மாணவர்களுக்குஎடுத்துரைப்பதையும் புதினஇலக்கியத்தைஅறிமுகப்படுத்துவதையும் நோக்கமாகக் கொண்டு இத்தாள் வடிவமைக்கப்பட்டுள்ளது.

கற்றலின் பயன்கள்

இத்தாளைவெற்றிகரமாகமுடித்தவுடன் மாணவர்கள்,

CO1[K1]: புதின இலக்கியவகைகளைஅடையாளம் காண்பர்.
CO2[K2]: சங்க இலக்கியங்களில் உள்ளஅறக்கருத்துக்களைஎடுத்துரைப்பர்.
CO3[K3]: அக,புற இலக்கணங்களைக் கற்பர்.
CO4[K4]: சங்க இலக்கியங்களின் வாயிலாகமக்களின் வாழ்க்கைமுறையினைப் பாகுபடுத்துவர்.
CO5[K5]: பண்டையதமிழ் இலக்கியஆளுமைகளைமதிப்பிடுவர்.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	-	1	-	-	-
CO2[K2]	2	1	-	2	-	-	-
CO3[K3]	2	2	-	2	1	-	1
CO4[K4]	2	2	1	2	1	1	-
CO5[K5]	2	2	1	2	-	1	1
Weightage of the course	10	8	2	9	2	2	2
Weighted percentage of Course contribution to Pos	1.61	1.66	0.58	2.88	1.25	0.99	1.49

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

கூறு I **(18 hrs)**

எட்டுத்தொகை இலக்கியவரலாறு - **குறிஞ்சித்திணை - நற்றிணை:**ஓங்குமலைநாட(55) - கழுதுகால்கிளர(255). **முல்லைத்திணை - குறுந்தொகை:**பெருந்தண் மாரிப்(94),மட வவாழிமஞ்ஞை(251). **மருதத்திணைகலித்தொகை:**அகன்துறைஅணிபெற(73), புள்இமிழ் அகல் வயல்(79). **நெய்தல் திணை -ஐங்குறுநூறு:**தாய்க்குஉரைத்தபத்து(10 பாடல்கள்).**பாலைத்திணை -**

அகநானூறு: வளம்கெழுதிருநகர்ப்(17),கடல்முகந்துகொண்டகமஞ்சூல்(43). **பரிபாடல்**: வையை - வளிபொருமின்னொடு(12).**புறநானூறு**: இரும்பனைவெண்தோடு(45) - எமக்கேகலங்கல் (298),**பதிற்றுப்பத்து:**ஐந்தாம்பத்தில் மாமலைமுழக்கின்.

கூறு II **(18 hrs)**

பத்துப்பாட்டு இலக்கியவரலாறு- **பத்துப்பாட்டு:**குறிஞ்சிப்பாட்டு (முழுவதும்)

கூறு III **(18 hrs)**

சங்கமருவியகால இலக்கியவரலாறு- **திரிகடுகம்:**தற்புகழ்ச்சிக்குக் கூடாதவை - தொல் அவையும்(8) -புகழுக்குரிய மூவர் - மண்ணின் மேல் வான்(16),வீடுபேறுஅடையும் வழிகள் - பற்று(22) -கற்றறிந்தார் கடமை -நுண்மொழிநோக்கிப்பொருள்(32),நல்லோர் நெறி- சான்றாருள் சான்றான் எனப்படுதல்(82). **நாலடியார்**: கூடாநட்பு (231-240).**இனியவைநாற்பது**: உடையான் வழக்கினிது(2) -மானம் அழிந்தபின்(13) - குழவிதளர்நடை(14) -பிறன்கைப் பொருள்வெளவான்(21) - வருவாய் அறிந்து (22). **இன்னாநாற்பது:** உண்ணாதுவைக்கும்(16) -மாரிநாள் கூவும்(20) - யானையில் மன்னாக்(22) - சிறையில்லா மூதூரின்(23) - ஏமம்இல் மூதூர்(24).**திருக்குறள்**:அறத்துப்பால் - புகழ், இன்பத்துப்பால் - குறிப்பறிதல் (அதிகாரங்கள் முழுவதும்).

கூறு IV **(18 hrs)**

புதின இலக்கியவரலாறு,கூட்டுக்குஞ்சுகள் - இராஜம் கிருஷ்ணன்.

கூறு V **(18 hrs)**

இலக்கணம் - தொல்காப்பியர் குறிப்பிடும் திணைக்கோட்பாடுகள் - அகப்பொருள் - புறப்பொருள் - உள்ளுறை - இறைச்சி - விண்ணப்பம் - புகார் - பாராட்டுக் கடிதங்கள் - அறிக்கை - செய்திஎழுதுதல்.

பாடநூல்கள்

1. *தொகுப்பு நூல்*,தமிழியல்துறை,ஸ்ரீ காளீஸ்வரிகல்லூரி (தன்னாட்சி),சிவகாசி.
2. இராஜம் கிருஷ்ணன். *கூட்டுக்குஞ்சுகள்*,நியூ செஞ்சுரிபுத்தகநிலையம்,சென்னை, 2011.
3. வாசுதேவன்,கா. *பன்முகநோக்கில் தமிழ் இலக்கியவரலாறு*,தேவன் பதிப்பகம்,திருச்சிராப்பள்ளி, 2017.

பார்வை நூல்கள்

1. சுப்பிரமணியன், க. *சங்ககாலச் சமுதாயம்*,ஜனசக்திஅச்சகம்,சென்னை, 1993.
2. பாலசுப்பிரமணியன் சிற்பி&நீலபத்மநாபன் (பதி.),*புதியதமிழ் இலக்கியவரலாறு.* மணமலர்ப் பதிப்பகம்,சென்னை,2000.
3. பாலசுப்பிரமணியன்,சி.*தமிழ் இலக்கியவரலாறு*,மண்மலர்ப் பதிப்பகம்,சென்னை,2003.
4. மோகன், இரா. *பத்துப்பாட்டு மூலமும் உரையும்*,நியூ செஞ்சுரிபுத்தகநிலையம்,சென்னை,2004.

வலைப்பதிவுகள்(Web Sources)

1. https://youtu.be/Gv84KCknV_g
2. https://youtu.be/B42bzKeb-aI
3. https://youtu.be/sLE4yH-7PeE
4. https://youtu.be/wdlw8CyEBP8

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF ENGLISH
UG Programme - B.A./B.SC./BCA
SEMESTER- IV
COMMUNICATIVE ENGLISH - IV (21UENL41)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 6 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 90 hrs **MAX. MARKS: 100**

Preamble

This course helps the learners to develop their communication skills in English through listening, reading, speaking and writing practices.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: relate and state ideas by listening to lectures and reading narratives

CO2[K2]: demonstrate effective speaking skills through group discussions and answering interview questions

CO3[K3]: apply knowledge of word power and grammar rules through drafting Memorandum, Minutes of the meetings and Agenda

CO4[K4]: analyze tales from Shakespeare to develop language skills through literature

CO5[K6]: construct grammatically correct and meaningful sentences for Covering letters and Resume Writing and thereby preparing students towards employability

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	-	1	-	-	-
CO2[K2]	2	1	-	1	-	-	-
CO3[K3]	2	2	1	2	1	1	1
CO4[K4]	2	2	1	2	1	1	1
CO5[K6]	2	3	1	2	-	1	1
Weightage of the course	10	09	03	08	02	03	03
Weighted percentage of Course contribution to POs	**1.61**	**1.86**	**0.87**	**2.56**	**1.25**	**1.48**	**2.24**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I - LISTENING AND SPEAKING **(18 hrs)**

LISTENING

Listening to lectures

Listening to commentaries

Listening to narratives

SPEAKING

Welcome address and Vote of Thanks

Role Play

Anchoring

Group discussion

Interview questions

UNIT II - READING AND WRITING **(18 hrs)**

Reading Newspaper- articles, letter to editor, sports and entertainment

WRITING

Drafting:

Memorandum

Minutes of the meeting

Agenda

Resume writing & Covering letter

UNIT III - WORD POWER **(18 hrs)**

Words often confused

Analogy

Words related to- Health and Medicine, Pleasant and Unpleasant feelings, Success and Failure, Science and Technology and Travel

UNIT IV - GRAMMAR **(18 hrs)**

Identify Phrases and Clauses

Transformation of Sentences: Reported speech, Simple, Compound and Complex Sentences

Error Spotting

UNIT V - LANGUAGE THROUGH LITERATURE **(18 hrs)**

TALES FROM SHAKESPEARE

Romeo and Juliet

A Midsummer Night's Dream

The Merchant of Venice

King Lear

Macbeth

TEXTBOOKS

1. Carthy Mc., and Felicity O'Dell. *English Vocabulary in Use (Upper intermediate)*. UK: Cambridge University Press, 2005.
2. Pillai, Radhakrishna G., and K.Rajeevan. *Spoken English for You (Level One)*. Chennai: Emerald Publishers, 2009.
3. Pillai, Radhakrishna G. *Emerald English Grammar and Composition.* Chennai: Emerald Publishers, 2016.

REFERENCES

Books

1. *Life Skills (Jeevan Kaushal) Facilitators' Guidelines*. New Delhi: University Grants Commission, 2021.
2. Radha, Alamelu and Kasthuri Bai. *Situational Grammar and Composition.* Chennai: New Century Book House Pvt. Ltd, 2008.
3. Sadanand, Kamalesh and Susheela Punitha. *Spoken English- A Foundation Course for speakers of Tamil*. Mumbai: Orient Blackswan, 2009.
4. Taylor, Grant. *English Conversation Practice*. New Delhi: Tata McGraw Hill Publishers, 2001.

Web Sources

1. https://www.litcharts.com/how-to-guides/shakespeare-research-resources
2. https://steffesziri.files.wordpress.com/2019/04/illustrated-stories-from-shakespeare-0.pdf
3. https://www.talkenglish.com/lessonindex.aspx
4. https://www.englishhelper.com/
5. https://www.englishpage.com/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – IV
(2021 – 2024)
CORE COURSE – VII: MICROBIOLOGY AND PLANT PATHOLOGY (21UBYC41)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 4 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to classification, characterization and application of microbes and also emphasize plant diseases and their control measurement.

Course Outcomes (CO)

On successful completion of the course, the learners will able to

CO1[K2]: classify microbes.
CO2[K2]: explain about the structure of Prokaryotic and Eukaryotic cell.
CO3[K3]: use microbes as a biofertilizer.
CO4[K4]: analyze the role of microbes in agriculture.
CO5[K5]: appraise the role of microbes in soil fertility.

CO-PO Mapping Table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	2	1	1	1	1
CO2[K2]	3	2	2	-	-	-	-
CO3[K3]	3	3	3	1	-	1	1
CO4[K4]	3	2	2	2	2	-	-
CO5[K5]	3	2	2	1	2	1	-
Weightage of the course	15	11	11	05	05	03	02
Weighted percentage of Course contribution to Pos	**2.42**	**2.28**	**3.2**	**1.60**	**3.13**	**1.48**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Microbiology Introduction: History – Development – Classification (Outline) of Microbiology. Ultra Structure of Prokaryotic and Eukaryotic Cell. Basics of Prokaryotic Cell: Size, Shape, Arrangement of Bacterial Cells. Basics of Eukaryotic Cell: Cilia, Flagella, Cytoskeleton, Cytomembrane Systems, Mitochondria and Chloroplast.

UNIT II **(12 hrs)**

Sterilization: Dry Heat – Moist Heat – Filtration – Tyndallization – Pasteurization – Radiation. Cultural Techniques: Pure Culture. Media - Types and Preparation. Preservation of Cultures - Aerobic and Anaerobic Culture Techniques. Growth of Bacteria: Methods to Study Microbial Morphology - Wet Mount and Hanging Drop Method. Staining techniques: Gram's, Acid Fast – Spore and Capsule Staining.

UNIT III **(12 hrs)**

Soil and Agricultural Improvement: Soil Microbes and Their Roles – Adaptation – Interaction. Improvements of Soil Fertility: Nitrogen Fixing Bacteria and Their Role in Nitrogen Cycle. Phosphate Solubilisation. Microbes as Biofertilizer and Biopesticides. Mycorrhizae: Plant-Microbes Interactions – Ectomycorrhizae and Endomycorrhizae - Root and Stem Nodules, Rhizosphere and Phyllosphere.

UNIT IV **(12 hrs)**

Plant Pathology: Principles of Plant infection – Infection – Dissemination of pathogen. Biotic casual agents of Plant Diseases (Bacteria, Fungi, Virus).Plant pathogen interaction. Methods of Plant Disease Management - Physical, Chemical and Biological Controls and Quarantine Methods.

UNIT V **(12 hrs)**

Plant Diseases: Classification of Plant Diseases. Symptoms, Causal Organisms and Disease Control Measure of following diseases: Tikka Disease of Groundnut – Red Rot of Sugarcane – Citrus Canker – Bunchy top of Banana.

TEXTBOOKS

1. Sharma P.D. *Microbiology and Plant Pathology*. 3rdEdition, Rastogi Publication, Meerut, 2016.
2. Rajan S. and Selvi Christy. *Experimental procedures in Life Sciences*. Anjanaa Book House, Chennai, 2012.
3. Ananthanarayanan and Panicker, J. *Text book of Microbiology*. Eighth edition, Orient Long Publishers, 2005.

REFERENCES

Books

1. Prescott L.M., Harley J.P and Klein D.A, *Microbiology*. Sixth edition, McGraw Hill, Boston. 2005.
2. Gerard J. Tortora, Berdell R. Funke, Christine and L. Case, *Microbiology- An Introduction.* Benjamin Cummings, U.S.A. 2001.
3. Michael Felczar, JR., Chan, ECS. and Noel R. Krieg. *Microbiology*. McGraw Hill Education, 2001.

Web Sources

1. https://onlinecourses.swayam2.ac.in/cec19_bt11/preview
2. www.nos.org/media/documents/dmlt/microbiology
3. www.columbia.edu/itc/hs/medical/pathophys/id/2009

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – IV
(2021 – 2024)
CORE COURSE – VIII: PRACTICAL: MICROBIOLOGY AND PLANT PATHOLOGY
(21UBYC4P)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 50**
CREDITS : 2 **EXT. MARKS : 50**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to Microbial culture techniques, Staining techniques and plant diseases.

Course Outcomes (CO)

On successful completion of the course, the learners will able to

CO1[K2]: illustrate the preparation of culture media.

CO2[K3]: perform the staining techniques.

CO3[K4]: differentiate the Gram positive and Gram negative bacteria.

CO4[K5]: assess the microbial population by serial dilution methods

CO5[K6]: elaborate symptoms of diseases related to local crops.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	2	1	-	1	1
CO2[K3]	3	3	2	-	-	1	-
CO3[K4]	3	3	2	1	2	1	1
CO4[K5]	3	3	1	2	-	-	-
CO5[K6]	3	2	2	1	1	1	-
Weightage of the course	15	13	09	05	03	04	02
Weighted percentage of Course contribution to Pos	**2.42**	**2.69**	**2.62**	**1.6**	**1.88**	**1.97**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

EXPERIMENTS

I. MICROBIOLOGY

1. Microbiology laboratory Rules and regulations of Safety measures
2. Culture techniques - Culture Media for Microorganisms.
3. Isolation of Pure Culture
4. Serial dilution techniques for the following methods
   i) Streak Plate method
   ii) Pour Plate method
   iii) Spread Plate method
5. Staining Techniques – Simple and Differential staining - Gram's staining, Endospore Staining
6. Bacterial motility by hanging drop method
7. Isolation and Identification of Rhizobium and Mycorrhizae fungi
8. Biochemical test IMViC

II. PLANT PATHOLOGY

1. Study the Symptoms of the following diseases related to local crops:
   a) Tikka Disease of Groundnut
   b) Red rot of sugarcane
   c) Citrus canker
   d) Bunchy top of Banana

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Books

1. Sharma, P.D. *Microbiology and Plant Pathology*. 3rd Edition. Rastogi Publication, Meerut, 2016.
2. Prescott L.M., Harley J.P. and Klein, D.A, *Microbiology*. Sixth edition, McGraw Hill, Boston. 2005.
3. Ananthanarayanan and Panicker, J. *Text book of Microbiology*. Eighth edition, Orient Long Publishers, 2005.

Web Sources

1. https://clinicalgate.com/microbiological-laboratory-techniques/
2. https://www.youtube.com/embed/kEbseWiISsA
3. https://www.youtube.com/watch?v=800uUVu0aY4

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – IV
(2021 – 2024)
ALLIED COURSE – IV: CHORDATA (21UBYA41)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 4 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course enables the learners to understand the structure and characters of vertebrates, anatomy of chordate, the biological importance and adaptation of Pisces, Reptiles, Amphibia, Aves and Mammalia and birds migration

Course Outcomes (CO)

On successful completion of the course, the learners will able to

CO1[K1]: describe about the classification of Chordata.

CO2[K2]: explain the characteristic features of Chordates.

CO3[K3]: determine the general and morphological characters of Aves, Mammals and Reptiles.

CO4[K4]: examine the structure of reproductive system of mammals.

CO5[K4]: differentiate the poisonous and non-poisonous snake.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	2	1	-	1	1
CO2[K2]	3	3	1	-	2	1	-
CO3[K3]	3	2	2	1	2	1	1
CO4[K4]	3	3	1	2	-	-	-
CO5[K4]	3	2	2	1	1	1	-
Weightage of the course	15	12	08	05	05	04	02
Weighted percentage of Course contribution to Pos	**2.42**	**2.48**	**2.33**	**1.60**	**3.13**	**1.97**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Chordata and Prochordates: General characters of Chordata and its outline classification up-to class level- General characters of Prochordates and its outline classification. Amphioxus- External features. Affinities of Prochordates

UNIT II **(12 hrs)**

Pisces and Amphibia: Shark – External features. Accessory respiratory organs in fishes. Parental care in amphibians

UNIT III **(12 hrs)**

Reptilia: General Characters of Reptiles. Poisonous and Non-poisonous snakes – Identification – Poison extraction – Uses. Snake bite and First aid.

UNIT IV **(12 hrs)**

Aves: General characters of class Aves**.** Flightless Birds and their distribution**.** Migration in birds

UNIT V **(12 hrs)**

Mammalia: Definition in mammals. Rabbit – External morphology, and Reproductive System only. Adaptation of aquatic mammals.

TEXTBOOKS

1. Jordan.E.L. *Vertebrate Zoology*. S.Chand Publication, New Delhi, 2010.
2. Ekambaranatha Iyar, M. *A manual of Zoology*. S.Chand Publication, 2005.
3. Dhami,P.S. and Dhami.J.K. *Chordata Zoology. S.*Chand and company. New Delhi. 2006.

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Books

1. Alexander, R. *The Chordata.* 2nd International Edition. Cambridge University press, New Delhi. 1981.
2. Kent. C. George. *Comparative anatomy of Vertebrates.* Mosby International Edition. Toppan printing, Japan, Library of Congress Catalogue, 1998.
3. Romer, R.S. and Parson, T.S. *The Vertebrate Body*. 7th Edition, W.B.Saunders, Philadelphia. 1986.
4. Jordon, E.L. and Verma, P.S. *Chordata Zoology.* S.Chand and Co. New Delhi. 2006.

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1. https://onlinesciencenotes.com/protochordates-general-characteristic-features/
2. https://www.britannica.com/animal/amphioxus
3. https://www.britannica.com/animal/cephalochordate

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – IV
(2021 – 2024)
ALLIED COURSE – IV: PRACTICAL: ZOOLOGY-II (21UBYA4P)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 50**
CREDIT : 1 **EXT. MARKS : 50**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to gain knowledge on internal and external structure of Vertebrates and Chordate

Course Outcomes (CO)

On successful completion of the course, the learners will able to

CO1[K2]: demonstrate the dissection of Arterial and Venous system of Frog.

CO2[K3]: apply mounting techniques.

CO3[K4]: distinguish vertebrate and invertebrates based on morphological features.

CO4[K4]: justify the adaptation of Pisces, Reptiles, Amphibia, Aves and Mammalia.

CO5[K6]: elaborate the characteristic features of Chordata.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	1	1	-	1	1
CO2[K3]	3	2	1	-	1	1	1
CO3[K4]	3	2	1	1	1	2	1
CO4[K4]	3	2	1	1	-	-	-
CO5[K6]	3	2	1	1	1	1	-
Weightage of the course	15	10	05	04	03	05	03
Weighted percentage of Course contribution to Pos	**2.42**	**2.07**	**1.45**	**1.28**	**1.88**	**2.46**	**2.24**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

EXPERIMENTS AND SPOTTERS

DISSECTION – VIRTUAL

1. **Virtual**: Arterial and Venous system of Frog
2. **Mounting**: Placoid scales of Shark.

CHORDATA- SPOTTERS

1. Prochordata - *Amphioxus*, *Balanoglossus*, *Asidian*.
2. Pisces -*Narcine*, *Echeneis*, *Hippocampus*, Eel, Catla, *Tilapia*
3. Amphibian - *Bufo*, *Rhacophorus*, *Salamander*.
4. Reptile - Cobra, Krait, Viper, *Dryophis* and Ptyas.
5. Aves - Pectoral and Pelvic girdle of Pigeon, Archaeopteryx.
6. Mammals - Bat and Loris.

REFERENCES

Books

1. Kent. C. George. *Comparative anatomy of Vertebrates.* Mosby International Edition. Toppan printing, Japan, Library of Congress Catalogue, 1998.
2. Jordan, E.L. *Vertebrate Zoology*. S.Chand Publication, New Delhi, 2010.
3. Dhami, P.S. and Dhami, J.K. *Chordata Zoology. S.*Chand and company. New Delhi. 2006.

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1. http://vlabs.iitb.ac.in/vlabs-dev/labs/zoology_lab/labs/exp4/procedure.php
2. https://vlabs.iitb.ac.in/vlabs-dev/labs/zoology_lab/labs/exp4/simulation.php
3. https://www.biologydiscussion.com/snakes-2/list-of-some-poisonous-and-non-poisonous-snakes-animal-kingdom/69877

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – IV
(2021 – 2024)
SELF PACED LEARNING (SWAYAM COURSE):
CELL CULTURE TECHNOLOGIES (21UBYM41)
(From 2021-2022 Batch onwards)

CREDITS : 2 **EXT. MARKS : 100**
DURATION: 8 Weeks **MAX. MARKS: 100**

Preamble

This course provides the learners with an opportunity for a lifelong learning by meeting the demand in terms of knowledge, skills, and competencies.

Course outcome (CO)

On successful completion of this course learners will be able to

CO1[K1]: identify the background and the key words in speaking effectively
CO2[K2]: demonstrate independent and self-paced learning for clear understanding of the concept
CO3[K3]: develop computer and communication skills to broaden their knowledge in the course
CO4[K3]: use high quality reading resources, communication tools and technology to assignments and to take up test
CO5[K4]: analyse critically and apply technical skills to comprehend the ideas prescribed

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	1	2	-	-	2
CO2[K2]	3	2	1	1	-	-	2
CO3[K3]	3	2	1	2	1	1	1
CO4[K3]	2	2	1	2	-	-	1
CO5[K4]	2	2	1	2	-	1	1
Weightage of the course	13	10	05	09	01	02	07
Weighted percentage of Course contribution to Pos	**2.1**	**2.07**	**1.45**	**2.88**	**0.63**	**0.99**	**5.22**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

Course layout

Week 1: Introduction and biology of cultured cells

Week 2: Equipments, aseptic techniques, safety protocols

Week 3: Culture vessels and media development

Week 4: Serum - free medium development and sterilization

Week 5: Primary culture, secondary culture, cloning and selection

Week 6: Cell separation, characterization, differentiation and transformation

Week 7: Contamination, cryo-preservation and cyto-toxicity

Week 8: Organo-typic culture & specialized cell culture techniques

REFERENCES

Books

1. Freshney, R. Ian. *Culture of animal cells: a manual of basic technique and specialized applications*. John Wiley & Sons, 2015.
2. Guy, Heather, *Cell culture technology: Recent advances and future prospects*. Biomedical Scientist, 2012.
3. Buckmann, A.F. *Vertebrate cell culture II and enzyme technology*. Springer-Verlag, 1989.
4. Butler, Michael. *Animal cell culture and technology*. Taylor & Francis, 2004.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – IV
(2021 – 2024)
SELF PACED LEARNING (SWAYAM COURSE):
COMPUTER AIDED DRUG DESIGNING (21UBYM42)
(From 2021-2022 Batch onwards)

CREDITS : 2 **EXT. MARKS : 100**
DURATION: 8 Weeks **MAX. MARKS: 100**

Preamble

This course provides the learners with an opportunity for a lifelong learning by meeting the demand in terms of knowledge, skills, and competencies.

Course outcome (CO)

On successful completion of this course learners will be able to

CO1[K1]: identify the background and the key words in speaking effectively
CO2[K2]: demonstrate independent and self-paced learning for clear understanding of the concept
CO3[K3]: develop computer and communication skills to broaden their knowledge in the course
CO4[K3]: use high quality reading resources, communication tools and technology to assignments and to take up test
CO5[K4]: analyse critically and apply technical skills to comprehend the ideas prescribed

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	1	2	-	-	2
CO2[K2]	3	2	1	1	-	-	2
CO3[K3]	3	2	1	2	1	1	1
CO4[K3]	2	2	1	2	-	-	1
CO5[K4]	2	2	1	2	-	1	1
Weightage of the course	13	10	05	09	01	02	07
Weighted percentage of Course contribution to Pos	**2.10**	**2.07**	**1.45**	**2.88**	**0.63**	**0.99**	**5.22**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

Course layout

Week 1: Introduction to drug discovery
Week 2: Structure and property
Week 3: ADME - rules
Week 4: Force field/MM/QM
Week 5: Boundary conditions/Conformation
Week 6: QSAR/Pharmacophore
Week 7: Enzymes/proteins structures/docking
Week 8: PK/PD

REFERENCES

Books

1. Voit, E. O. *A. first course in systems biology*. New York: Garland Science, 2012.
2. Klipp, Edda, et al. *Systems biology: a textbook*. John Wiley & Sons, 2016.
3. Sehgal, Sheikh Arslan. *Quick guideline for computational drug design*. Bentham Science Publishers, 2018.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – IV
(2021 – 2024)
NON MAJOR ELECTIVE COURSE – II: HERBAL MEDICINE (21UBYN41)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 40**
CREDIT : 1 **EXT. MARKS : 60**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to the importance of medicinal plant, conservation of floristic and cultural diversity and importance of plants used by tribal communities.

Course Outcomes (CO)

CO1[K1]: describe uses of medicinal plants of Tamilnadu.
CO2[K2]: explain the life style and traditional practices Tamil Nadu tribals.
CO3[K3]: develop the methods for conservation of floristic and cultural diversity.
CO4[K4]: analyse the importance of plants used by tribal communities.
CO5[K4]: examine the importance of medicinal plants in Human health care.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	-	1	-	1	-
CO2[K2]	2	2	1	1	1	2	1
CO3[K3]	2	2	1	1	-	1	-
CO4[K4]	2	2	1	1	1	1	-
CO5[K4]	2	2	1	1	-	2	1
Weightage of the course	10	09	04	05	02	07	02
Weighted percentage of Course contribution to Pos	**1.77**	**1.86**	**1.16**	**1.6**	**1.25**	**3.45**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Introduction: History and introduction of medicinal plants – Importance of Medicinal plants. Medical practices in India: Ayurvedha, Siddha, Unani, Homeopathy, Allopathy.

UNIT II **(12 hrs)**

An Overview of Selected Medicinal Plants: Botanical name, Family name, Vernacular name, useful part, active compounds and uses: Root (*Gloriosa superba*) – Leaf (*Azadirachta indica*) - Rhizome (*Curcuma longa*) – Seed (*Cuminum cyminum*).

UNIT III **(12 hrs)**

Ethnobotany and folklore medical practices: Ethnic communities in Tamil Nadu and their medicinal plant usage – Methods of documenting the ethnobotanical knowledge. Active Constituents and Medicinal uses of *Trichopus zeylanicus*

UNIT IV **(12 hrs)**

Medicinal plants: Harvesting – Processing – Packaging – Storage. Processing of medicinal plants: Decoction – Extraction – Infusion – Maceration. Active Constituents of medicinal plants – preparation of herbal remedies.

UNIT V **(12 hrs)**

Cultivation of medicinal plants: Propagation through Leaf, Stem, Seed and Rhizome. Cultivation of medicinal plants: *Aloe vera* and *Catharanthus roseus*.

TEXTBOOKS

1. Sharma, R. *Agro-techniques of medicinal plants.* Daya Publishing House, New Delhi. 2004
2. Mathur, N. *Medicinal plants of India*. RBSA publishers, New Delhi. 2010.
3. Azhar Ali Farooqi and Sreeramu, B.S. *Cultivation of medicinal and Aromatic Crops,* University press, India, 2001.
4. Purohit, S.S. and Vyas, S.P. *Medicinal Plant Cultivation-Scientific Approach.* Agrobios India, 2006.

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1. Akerele, O., Heywood, V. and Synge, H. *The conservation of medicinal plants.* Cambridge university press. Cambridge, 1991.
2. Chevallier, A. *The encyclopedia of medicinal plant.* D.K publishing, Michigan, 1996.
3. Cunningham, A.B. *Applied ethnobotany- people, wild plant use and conservation.* Earth scan publications limited, London, 2001.
4. Singh, M. *Medicinal plants of India.* New central book agency, New Delhi, 2009.
5. Wallis, T.E. *Textbook of Pharmacognosy.* 5th edition. CBS publishers, New Delhi, 1997.

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1. https://www.youtube.com/watch?v=Kt0Lgy17I78
2. https://www.youtube.com/watch?v=XOWufTZ0HGw
3. https://www.youtube.com/watch?v=mLUWchWzVng

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – IV
(2021 – 2024)
SKILL ENHANCEMENT COURSE – IV: BIOLOGY FOR ENTREPRENEURSHIP DEVELOPMENT (21UBYS41)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 40**
CREDITS : 2 **EXT. MARKS : 60**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to cultivation techniques of mushroom, *Spirulina*, *Azolla* and ornamental fish cultures.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to
CO1[K1]: describe cultivation methods of *Spirulina*.
CO2[K2]: explain the breeding techniques of egg layers.
CO3[K3]: determine the importance of *Azolla* and *Spirulina*.
CO4[K4]: analyse the role of microorganism in Biogas production.
CO5[K5]: assess the role of vermicomposting in Crop production.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	1	1	1	-	1	-
CO2[K2]	2	2	1	1	1	1	-
CO3[K3]	2	2	2	-	1	1	1
CO4[K4]	2	2	2	1	-	1	1
CO5[K5]	2	1	2	1	-	1	1
Weightage of the course	10	08	08	04	02	05	03
Weighted percentage of Course contribution to POs	**1.61**	**1.66**	**2.33**	**1.28**	**1.25**	**2.46**	**2.24**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(6 hrs)**

Biogas Technology: Introduction and History – Anaerobic Digestion – Microbes Involved. Factors Influencing Methane Production – Stages of Methane Generation – Wastes Used in Methanogenesis – Various Bioreactors Used for Methane Generation – Advantages and Disadvantages.

UNIT II **(6 hrs)**

Vermicompost preparation: Vermiculture Preparation: History – *Eisenia foetida* used for Vermicompost preparation – Life Cycle of Earthworm. Sources of Vermicomposting - Methods. Utilization of vermicompost for crop production.

UNIT III **(6 hrs)**

***Azolla* cultivation technology:** Characteristics of *Azolla* - Cultivation Methods of *Azolla pinnata* – Harvest Technology and Importance of *Azolla*.

UNIT IV **(6 hrs)**

***Spirulina* cultivation technology:** Biology of *Spirulina* - Cultivation Methods – Post Harvest Technology and Single Cell Protein Formulation.

UNIT V **(6 hrs)**

Ornamental fish culture: Introduction and importance – Popular Varieties of Ornamental fishes– Artificial and Live Feeds. Breeding Techniques of Egg Layers: Gold Fish and Angel Fish. Live Bearers: Guppy and Molly. Economic importance of ornamental fish culture.

Note: Field Visit to the respective Farms to explore the Knowledge.

TEXTBOOKS

1. Chawla O.P. *Advances in Biogas Technology.* ICAR, New Delhi. 1986.
2. Tripati, G. *Vermire sources technology.* 1st edition. Discovery Publication House, New Delhi. 2003.
3. Gaur, A.C. *Microbial technology for Composting of Agricultural Residues by Improved Methods*. 1st edition, ICAR, New Delhi. 1999.
4. Anita Saxena. *Aquarium management*. Daya Publishing House, New Delhi. 2003.

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1. Kumar, H.D. *A Text book on Biotechnology*. 2ndEdition, East-west Press Pvt.Ltd., New Delhi, 1991.
2. Chatwal, G.R. *Text book of Biotechnology*. Anmol Publications Pvt. Ltd.,New Delhi, 1995.

3. Jasra, O.P. *Environmental Biochemistry.* Sarup & Sons, New Delhi, India, 2002.
4. Srivastava, C.B.L. *Aquarium fish keeping*. Kitab Mahal, Allhabad. 2002.

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1. https://anaerobic-digestion.com/biogas-production-process/
2. https://byjus.com/biology/vermicomposting/
3. https://www.agrifarming.in/azolla-cultivation-information
4. https://www.techno-preneur.net/technology/project-profiles/food/Spirulina.htm
5. https://www.agrifarming.in/ornamental-fish-farming-beginners

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
UG Programme
SEMESTER III & IV
PART V – EXTENSION
(From 2021 -2022 Batch Onwards)

HOURS/WEEK: 2
CREDIT : 1
DURATION : 60 hrs **INT. MARKS: 100**

Preamble

This course aims to promote holistic development among the youth by defining their roles and responsibilities towards ones family and their society and enables them to acquire professional skills and ethics.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1 [K1]: recognize the importance of community service through training and education

CO2 [K2]: interpret ecological concerns, consumer rights, gender issues & legal protection

CO3 [K3]: develop team spirit, verbal/non verbal communication and organizational ethics by participating in community service

CO4 [K4]: examine the necessity of professional skills & community-oriented services for a holistic development

CO5 [K6]: create awareness on human rights, legal rights, First Aid, Physical fitness and wellbeing

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1 [K1]	2	-	-	2	2	1	1
CO2 [K2]	2	1	-	2	1	1	1
CO3 [K3]	2	-	-	1	2	2	1
CO4 [K4]	1	1	1	1	2	2	1
CO5 [K4]	1	-	-	1	2	2	1
Weightage of the course	08	02	01	07	09	08	05
Weighted percentage of Course contribution to Pos	**1.29**	**0.41**	**0.29**	**2.24**	**5.63**	**3.94**	**3.73**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

Details of the Courses

1. National Cadet Corps (NCC) – 190 hrs
2. National Service Scheme (NSS) – 240 hrs
3. Physical Education
4. Red Ribbon Club (RRC)
5. Youth Red Cross (YRC)
6. Fine Arts Club
7. Library and Information Service Club
8. Yoga Club
9. ECO Club
10. Consumer Club
11. Human Rights Club
12. Women Empowerment Cell
13. Legal Awareness League

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – V
(2021 – 2024)
CORE COURSE – IX: TAXONOMY OF ANGIOSPERMS (21UBYC51)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 5 **INT. MARKS : 40**
CREDITS : 5 **EXT. MARKS : 60**
DURATION : 75 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to morphological characters of Angiosperms and Herbarium and Family wise key preparation.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to
CO1[K1]: identify the morphological key characters of Angiosperms.
CO2[K2]: explain the economic importance of Angiosperm families
CO3[K4]: classify the Angiosperms based on the morphology characters.
CO4[K5]: justify the new plant species.
CO5[K6]: prepare the herbarium and key for Angiosperm families.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	2	1	-	2	-
CO2[K2]	3	2	2	2	1	-	1
CO3[K4]	3	2	2	1	-	-	-
CO4[K5]	3	2	3	2	1	1	-
CO5[K6]	3	2	2	1	1	2	1
Weightage of the course	15	10	11	07	03	05	02
Weighted percentage of Course contribution to POs	**2.42**	**2.07**	**3.20**	**2.24**	**1.88**	**2.46**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(15 hrs)**

Characteristic of Angiosperms: Brief History – Scope and Importance of Plant Taxonomy. Botanical Nomenclature: Binomial Systems. ICBN and ICN: Principles of ICBN – Rank of Taxa – Retention and Rejection of Names – Typifications – Effective and Valid Publication – Author Citation.

UNIT II **(15 hrs)**

Systems of Classification: Natural (Bentham and Hooker) – Artificial (Linnaeus) – Phylogenetic (C.E. Bessey system) – Brief account on APG [I-IV] system of Classification. Brief account on Numerical Taxonomy, Molecular Taxonomy and Chemotaxonomy.

UNIT III **(15 hrs)**

Herbarium: Herbarium Techniques – Virtual Herbarium – E-Flora and Importance – Centres of National and International Herbarium. Morphology of Angiosperms: Root and Root modification Shoot and Shoot modification– Leaf – Inflorescence – flower – fruit and seed.

UNIT IV **(15 hrs)**

Vegetative and Floral Features and Economic Importance of following Angiospermic Families: Brassicaceae (Cruciferae), Rutaceae, Leguminosae, Euphorbiaceae, Amaranthaceae, Balsaminaceae, Malvaceae, Myrtaceae, Apiaceae (Umbelliferae), Apocyanaceae

UNIT V **(15 hrs)**

Vegetative and Floral Features and Economic Importance following Angiospermic Families: Verbenaceae, Solanaceae, Rubiaceae, Cucurbitaceae, Asteraceae (Composite), Poaceae (Gramineae), Arecaceae (Palmae), Liliaceae, Musaceae, Orchidaceae.

TEXTBOOKS:

1. Sharma, O.P. *Plant Taxonomy.* Tata McGraw-Hill Publications Pvt. Ltd, 2006.
2. Panday, B.P. *Taxonomy of Angiosperms.* S.Chand and Company Pvt. Ltd, 2015.
3. Nair, R. *Taxonomy of Angiosperm.* APH Publishing Corporation. 2010.
4. Solanke, N.S. *Introduction to Taxonomy of Angiosperms*. Oxford Book Company, 2019.

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1. Naik, N. *Taxonomy of Angiosperms*. Tata McGraw Hill, New Delhi, 1984.
2. Pullaiah, T. *Taxonomy of Angiosperms*. Regency Publications, New Delhi, 1998.
3. Sivaranjan, V.V. *Introduction to Principles of Plant Taxonomy*. Kalyani Publishers, New Delhi, 1984.
4. Sambamurthy. *Taxonomy of Angiosperms*. I K International Pvt. Ltd., New Delhi, 2005.
5. Cronquist, A. *The Evolution and classification of flowering plants*. Thomas Nelson and Sons Ltd., London, 1968.
6. Jeffrey C. *An Introduction to Plant Taxonomy*. Cambridge Uni. Press. 2nd edn.1982.
7. Jhori, B.M. and Bhatacharjee, S.P. *Taxonomy of Angiosperms*. Narosa Publishers, New Delhi, 1994.
8. Lawrence, GHM. *Taxonomy of Vascular Plants*. MacMillan, London, 1951.

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1. https://www.brainkart.com/article/Bentham-and-Hooker-s-classification-of-plants---Dicotyledonae,-Gymnospermae-and-Monocotyledonae_1000/
2. https://www.yourarticlelibrary.com/pharmacognosy/plant-taxonomy/rutaceae-position-vegetative-and-floral-characters/49514#:~:text=Corolla%3A-,ADVERTISEMENTS%3A,anthers%20dorsifixed%2C%20introse%2C%20inferior
3. https://www.slideshare.net/BijuCherupuzha/herbarium-10212042#:~:text=HERBARIUM%20TECHNIQUES%20It%20involves%20a,%2C%20labelling%2C%20filling%20and%20deposition.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER V
(2021 – 2024)
CORE COURSE – X: PLANT PHYSIOLOGY AND BIOCHEMISTRY (21UBYC52)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 5 **INT. MARKS : 40**
CREDITS : 5 **EXT. MARKS : 60**
DURATION : 75 hrs **MAX. MARKS: 100**

Preamble:

This course introduces the learners to the bond between soil and water, mineral absorption mechanism, photosynthesis and photorespiration, mechanism of enzymes and growth hormones.

Course Outcomes:

On successful completion of the course, the learners will able to

CO1[K1]: describe the physiological relationship of soil and water.
CO2[K2]: express the knowledge of C3 and C4 cycle pathway
CO3[K3]: utilize the knowledge of enzyme mechanism and protein classification
CO4[K4]: compare the photosynthesis and respiration process.
CO5[K5]: justify the biochemical importance and regulation.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	2	1	-	1	1
CO2 [K2]	3	2	2	1	2	1	1
CO3 [K3]	2	3	2	-	-	1	-
CO4[K4]	3	3	2	2	-	-	-
CO5[K5]	3	2	2	1	1	1	-
Weightage of the course	14	12	10	05	03	04	02
Weighted percentage of Course contribution to Pos	**2.26**	**2.48**	**2.91**	**1.60**	**1.88**	**1.97**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(15 hrs)**

Physico-Chemical Phenomena: Diffusion – Imbibitions. Osmosis: Cell as an Osmotic System. Absorption of Water and Minerals - Definition, Pathway, Mechanism, Factor, Significance. Translocation of Water-Definition, Theories related factor and Significance. Mineral Nutrition - Absorption Theories.Transpiration-Definition, Types, Factor, Significance.

UNIT II **(15 hrs)**

Photosynthesis: Principle of Light absorption. Light reactions: Cyclic and Non-Cyclic Photophosphorylation, Chemiosmotic theory. C3 and C4 Cycles – CAM Pathway and Photorespiration. Carbohydrate Metabolism – Glycolysis, EMP Pathway – Pentose-Phosphate Pathway – Krebs Cycle (TCA Cycle) – Electron Transport Chain and Oxidative Phosphorylation – Biochemical Importance and Regulation.

UNIT III **(15 hrs)**

Proteins and Lipids: Classification of Protein Based on structure and properties - Essential and Non-Essential amino acids - Biosynthesis of amino acids - Biological Nitrogen Fixation (Symbiotic). Lipids: Classification and Importance - Lipid Metabolism - β Oxidation and Glyoxalate Cycle.

UNIT IV **(15 hrs)**

Enzyme: Definition -Major Classes of Enzymes – Classification and Characters. Mechanism of Enzyme Action: Lock and Key theory, Induce Fit Hypothesis and Michaelis-Menten equation. Enzyme Inhibition.

UNIT V **(15 hrs)**

Hormones and Physiology of Flowering: Physiological Role of Growth Hormones: Auxin – Gibberlin – Ethylene – Cytokinin. Photochromic as Photoreceptor - Mode of Action.Photoperiodism – Vernalization - Fruit Set and Ripening - Seed Germination and Dormancy – General account on Biotic and Abiotic stress on plants.

TEXTBOOKS

1. Taiz, L. and Zeiger, E. *Plant Physiology*. 5th Edition, Sinauer Associates, Inc., Sunderland, 2010.
2. Jain J.L, Sunjay Jain and Nitin Jain. *Fundamentals of Biochemistry*. S. Chand and Company, New Delhi, 2007.
3. Nobel, P. S. *Physiochemical and Environmental Plant Physiology*. Fourth Edition. Academic Press, 2009.

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1. Pandey, S.N. and Sinha, B.K. *Plant Physiology.*4th Edition, Vikas Publishing Company, Noida, UP. 2009.
2. Sinha, S.K. *Modern Plant Physiology*. Narosa Publishing House, New Delhi, 2004.
3. Grisham, Charles M, Reginald H. Garrett. *Biochemistry*. Philadelphia: Saunders College Publication, 1999.

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1. https://onlinecourses.swayam2.ac.in/cec19_bt09/preview.
2. https://onlinecourses.swayam2.ac.in/cec20_bt01/preview.
3. https://onlinecourses.swayam2.ac.in/cec21_bt03/preview.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – V
(2021 – 2024)
CORE COURSE – XI: PRACTICAL: TAXONOMY OF ANGIOSPERMS (21UBYC5P)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 5 **INT. MARKS : 50**
CREDITS : 4 **EXT. MARKS : 50**
DURATION : 75 hrs **MAX. MARKS: 100**

Preamble

This practical course gives exposure to morphological characters of Angiosperms and Herbarium and family wise key preparation.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to
CO1[K1]: identify the morphological key characters of Angiosperms.
CO2[K2]: explain the economic importance of angiosperm families
CO3[K3]: draw the floral diagram of given plants.
CO4[K4]: dissect the floral parts for identification purpose.
CO5[K6]: prepare the herbarium and key for Angiosperm families.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	1	2	2	-	1	-
CO2[K2]	3	2	3	2	-	1	-
CO3[K3]	3	1	3	1	-	1	1
CO4[K4]	3	2	2	1	1	1	-
CO5[K6]	3	2	2	2	1	2	1
Weightage of the course	15	08	12	08	02	06	02
Weighted percentage of Course contribution to POs	**2.42**	**1.66**	**3.49**	**2.56**	**1.25**	**2.96**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

EXPERIMENTS

1. Observation of Vegetative and Floral Features of Families mentioned in the theory.
2. Dichotomous Key preparation
3. Field survey of local flora of SKC Campus.
4. Preparation of minimum 30 Herbaria.
5. Field Study: Plant collection Trip for Minimum Three days and submissions of report for evaluation.

REFERENCES

Books

1. Sharma, O.P. *Plant Taxonomy.* Tata McGraw-Hill Publications Pvt. Ltd, 2006.
2. Singh, R.K. *Practical Taxonomy of Angiosperms*. I K International Publishing House Pvt. Ltd; 2nd edition, 2020.
3. Sundara S. Rajan. *Practical Manual of Angiosperm Taxonomy*. Anmol Publications Pvt Ltd, 2003.
4. Pullaiah, T. *Taxonomy of Angiosperms*. Regency Publications, New Delhi, 1998.
5. Sivaranjan, V.V. *Introduction to Principles of Plant Taxonomy*. Kalyani Publishers, New Delhi, 1984.
6. Sambamurthy. *Taxonomy of Angiosperms*. I K International Pvt. Ltd., New Delhi, 2005.
7. Jhori, B.M. and Bhatacharjee, S.P. *Taxonomy of Angiosperms*. Narosa Publishers, New Delhi, 1994.
8. Lawrence, G.H.M. *Taxonomy of Vascular Plants*. MacMillan, London, 1951.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – V
(2021 – 2024)
CORE COURSE – XII: PRACTICAL: PLANT PHYSIOLOGY AND BIOCHEMISTRY
(21UBYC5Q)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 5 **INT. MARKS : 50**
CREDITS : 4 **EXT. MARKS : 50**
DURATION : 75 hrs **MAX. MARKS: 100**

Preamble

This practical course enables the learners to identify microbes, learn culture techniques and staining methods and plant pathogens.

Course Outcomes (CO)

On successful completion of the course, the learners will able to

CO1[K2]: explain the photosynthetic mechanism and related events of plants.
CO2[K3]: perform tests to identify the microbes
CO3[K4]: analyse the biochemical components of any plant samples.
CO4[K4]: resolve methods to isolate N2 fixing organisms
CO5[K5]: justify the various growth promoting substances and their action.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	2	1	1	1	1
CO2[K3]	3	3	2	-	-	1	-
CO3[K4]	3	3	2	1	2	1	1
CO4[K4]	3	3	1	2	-	-	-
CO5[K5]	3	2	2	1	1	1	-
Weightage of the course	15	13	09	05	04	04	02
Weighted percentage of Course contribution to Pos	**2.42**	**2.69**	**2.62**	**1.60**	**2.50**	**1.97**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

EXPERIMENTS

PLANT PHYSIOLOGY

1. Determination of osmotic potential of cell sap by plasmolytic method.
2. Quantification of photosynthetic pigments (Chlorophyll a, Chlorophyll b, and carotenoids).
3. Quantification of non photosynthetic pigments (anthocyanin and flavonoids) in plants.
4. Separation of anthocyanins by paper chromatography and thin layer chromatography.
5. Absorption spectrum of chlorophyll.
6. Ganong's Repirometer and Photometer.
7. Transpirometer
8. Ganong's Light screen

BIOCHEMISTRY

1. Estimation of carbohydrates in plant tissues (sugars / starch).
2. Estimation of protein in plant tissues.
3. Estimation of lipids in plant tissues.
4. Bioassay of IAA and GA3.
5. Identification of Amino acids by Chromatography

REFERENCES

Books

1. Pandey, S.N., and Sinha, B.K. *Plant Physiology*. 4th Edition. Vikas Publishing company, Noida, UP. 2009.
2. Sinha, S.K. *Modern Plant Physiology*. Narosa publishing House, New Delhi, 2004.
3. Verma, S.K. *A Text book of Plant Physiology and Biochemistry.* S. Chand and Company Ltd. New Delhi, 1995.
4. Taiz, L., and Zeiger, E. *Plant Physiology.*3rd Edition. Sinauer Associates, 2002.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – V
(2021 – 2024)
MAJOR ELECTIVE COURSE – I: REPRODUCTIVE BIOLOGY OF ANGIOSPERMS
(21UBYO51)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to flower types, plant reproduction, and pollination biology.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to
CO1[K1]: define the reproductive biology of Angiosperms
CO2[K2]: explain the pollen viability and pollen fertility
CO3[K3]: utilize the floral parts for reproduction
CO4[K4]: examine the pollination biology of Angiosperm plants
CO5[K4]: classify the breeding system of plants.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	3	1	1	1	-
CO2[K2]	2	3	2	2	1	1	1
CO3[K3]	3	2	2	1	-	1	1
CO4[K4]	3	2	2	1	-	-	-
CO5[K4]	2	2	3	2	1	1	-
Weightage of the course	13	11	12	07	03	04	02
Weighted percentage of Course contribution to POs	**2.10**	**2.28**	**3.49**	**2.24**	**1.88**	**1.97**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Floral Biology: Introduction and Importance of floral biology. Concepts of floral biology. Floral Biology of Tropical Plants. Role of Floral Biology in Conservation of RET (Rare, Endangered and Threatened) Plants.

UNIT II **(12 hrs)**

Sexuality of Plants: Staminated Flower – Pistillated Flower – Hermaphrodite Flower. Distribution of Flower Types among Species: Monoecious – Dioecious – Hermaphrodite – Gynomonoecious – Gynodioecious – Andromonoecious – Androdioecious – Polygamous Species.

UNIT III **(12 hrs)**

Pollen Biology: Phonological Events – Observation of Floral Biology. Protandrous and Protogynous. Pollen Productivity and Pollen - Ovule Ratio. Pollen Viability: FCR Test – TTC Test – DAB Test. Pollen Fertility: Acetocarmine Test. *In-Vitro* and *In-Vivo* Pollen Germination – Stigma Receptivity – Volume and Concentration of Nectar.

UNIT IV **(12 hrs)**

Pollination Biology: Plant-Pollinator System – Plant Strategies to Assure Pollination. Food Resources for Floral Visitors – Nectar, Pollen and Oils. Non-alimentary Resources, Extra Floral Nectaries (EFN): Flower Tissues – Resins and Scents. Pollination Syndromes – Type of Pollination.

UNIT V **(12 hrs)**

Fruit and Seed Biology: Introduction and Importance of plant breeding system. Various Pollination Experiments: Open Pollination - Self Pollination – Geitonogamous – Xenogamous – Apomixis. Fruit and Seed Biology: Flower-Fruit Ratio and Ovule–Seed Ratio. Seed Biology: Moisture Content of the Seeds – Viability of the Seeds – *In-Vivo* and *In-Vitro* Seed Germination.

TEXTBOOKS

1. Kishan G. Ramawat, Jean-Michel Mérillon. Shivanna, K.R. *Reproductive Biology of Plants*. CRC Press, 2014.
2. Claudia, I.D.S. and Helena, M.T.S. *Reproductive biology of Tropical plants in Tropical biology and Conservation management*. Kleber Del Claro, Paulo, S., Oliveria, Victor RicoGray (eds.). Encyclopedia of life support systems (EOLSS), Eolss publishers, Pairs, France, 2008.
3. Shivanna, K.R. *Pollen Biology and Biotechnology*. Science publisher, 2003.

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1. Johri, B.M. and Srivastava, P.S. *Reproductive Biology of Plants*. Springer, 2001.
2. Anwar Hussain. *Reproductive Biology of Plants*. Medtec Publisher, 2016.
3. Erdtman, G. *Pollen Morphology and Plant Taxonomy: Angiosperms.* Hafner Publishing Company, New York, 1966.
4. Nair, P.K.K. *Pollen Morphology of Angiosperms – A Historical and Phylogenetic study*. Barnes and Noble, New York, 1970.
5. Shivanna, K.R. and Johri, B.M. *The angiosperm pollen: Structure and Function*. John Wiley publication, 2016.

Web Sources

1. https://www.frontiersin.org/articles/10.3389/fpls.2019.01588/full#:~:text=The%20term%20%E2%80%9Cpollen%20viability%E2%80%9D%20will,Dafni%20and%20Firmage%2C%202000
2. https://www.sciencedirect.com/science/article/pii/S0254629911001360
3. https://bsapubs.onlinelibrary.wiley.com/doi/pdfdirect/10.3732/ajb.0800016
4. https://sfb.univie.ac.at/en/research/pollination-biology/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – V
(2021 – 2024)
MAJOR ELECTIVE COURSE – I: RECENT TRENDS IN PLANT SYSTEMATICS
(21UBYO52)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to Recent Trends in Plant Systematics like Taxonomic Evidence, Phylogenetics classification and Evolution of Angiosperms.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to
CO1[K1]: define the evolution of Angiosperms
CO2[K2]: explain the plant systematic and classification
CO3[K3]: compute the phylogenetic relationship among the plant groups
CO4[K4]: analyse the botanical nomenclature
CO5[K4]: inspect the taxonomic evidence

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	3	1	1	1	-
CO2[K2]	2	3	2	2	1	1	1
CO3[K3]	3	2	2	1	-	1	1
CO4[K4]	3	2	2	1	-	-	-
CO5[K4]	2	2	3	2	1	1	-
Weightage of the course	13	11	12	07	03	04	02
Weighted percentage of Course contribution to POs	**2.10**	**2.28**	**3.49**	**2.24**	**1.88**	**1.97**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Evolution of Angiosperms: Introduction to the Angiosperms. General characteristics of Angiosperms. Evolution: Basal angiosperms and Magnoliids. Basal monocots – Petaloid monocots – Commelinids – Basal Eudicots – Caryophyllids – Rosids – Asterids.

UNIT II **(12 hrs)**

Systematics and Classification: Plant systematic - Components of systematic – Major objectives of systematic – Relevance to society and science. Taxonomic History – Natural systems to cladistics – Natural systems – Phyletic systems – Phenetics – Cladistics.

UNIT III **(12 hrs)**

Botanical Nomenclature: Kinds of names – International Code of Nomenclature – Names according to rank – Citation of authors – Priority – Type method – Description and naming a new species – Legitimacy – Synonyms. The components of classification – Characters and their status – Sources of characters.

UNIT IV **(12 hrs)**

Taxonomic Evidence: Morphology – Anatomy– Embryology – Palynology – Cytology – Phytochemistry. Plant genomes – Nuclear – Mitochondrial – Chloroplast – Molecular markers – Generating molecular data – restriction site mapping – gene sequencing (Sangers Sequencing) – Analysis of molecular data – alignment of sequences – methods of phylogenetic tree construction.

UNIT V **(12 hrs)**

Phylogenetic Systematics: Taxon selection – character analysis – Character selection – Homology assessment – Character step matrix – Character × taxon matrix. Cladogram construction – Apomorphy – Parsimony analysis – Polytomy – taxon selection and polymorphic characters. Cladogram analysis – Phylogenetic classification – Character evolution – biogeography and ecology.

TEXTBOOKS

1. Stuessy, T.F. *Plant Taxonomy: The systematic Evaluation of Comparative Data*. Columbia University Press, New York, 2009.
2. Simpson, M.G. *Plant Systematics*. Elsevier, Amsterdam, 2006.
3. Semple, C. and M.A. Steel. *Phylogenetics*. Oxford University Press, Oxford, 2003.
4. Judd, W.S., Campbell,C.S., Kellogg, E.A., Stevens P.F. and Donoghue, M.J. *Plant Systematics: A phylogenetic Approach*. Sinauer Associates, Inc., Massachusetts. 2002.

5. Nei, M. and Kumar, S. *Molecular Evolution and Phylogenetics*. Oxford University Press, New York. 2000.

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1. Crawford, D.J. *Plant Molecular Systematics*. Cambridge University Press, Cambridge, UK. 2003.
2. Angiosperm Phylogeny Group. *An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG II*. Botanical Journal of the Linnaean Society 141: 399-436. 2003.
3. Nei, M. and S. Kumar. *Molecular Evolution and Phylogenetics*. Oxford University Press, New York, 2000.

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1. https://courses.lumenlearning.com/boundless-biology/chapter/evolution-of-seed-plants/#:~:text=Angiosperms%20evolved%20during%20the%20late,125%2D100%20million%20years%20ago.&text=Angiosperms%20did%20not%20evolve%20from,actually%20gave%20rise%20to%20angiosperms.
2. https://www.thoughtco.com/plant-systematics-419199#:~:text=Plant%20systematics%20is%20a%20science,evolutionary%20history%20of%20plant%20life.&text=Determining%20phylogeny%20%2D%20the%20evolutionary%20history,the%20primary%20goal%20of%20systematics.
3. https://www.biologydiscussion.com/angiosperm/taxonomy-angiosperm/taxonomy-evidences-in-relation-to-plants-angiosperms/34797

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – V
(2021 – 2024)
MAJOR ELECTIVE COURSE – I: EMERGING MOLECULAR TECHNIQUES
(21UBYO53)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to Chromatographic techniques, Molecular Techniques Electrophoresis and PCR techniques.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to
CO1[K1]: define the molecular techniques
CO2[K2]: demonstrate the chromatographic techniques
CO3[K3]: perform the electrophoresis
CO4[K4]: analyse DNA sequence by using PCR techniques
CO5[K4]: examine the genome sequence

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	3	1	1	1	-
CO2[K2]	2	3	2	2	1	1	1
CO3[K3]	3	2	2	1	-	1	1
CO4[K4]	3	2	2	1	-	-	-
CO5[K4]	2	2	3	2	1	1	-
Weightage of the course	13	11	12	07	03	04	02
Weighted percentage of Course contribution to POs	**2.10**	**2.28**	**3.49**	**2.24**	**1.88**	**1.97**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Spectrophometric Techniques: Principle and applications of UV-Vis spectrophotometry – IR spectrophotometer – Atomic Absorbance Spectra (AAS) and Mass Spctroscopy. Chromatographic Techniques: Principle and applications of Gas Chromatography (GC-MS) – High Performance Liquid Chromatography (HPLC).

UNIT I I **(12 hrs)**

Electrophoresis: Principle and application of Electrophoresis. Paper electrophoresis – Agarose Gel Electrophoresis – Polyacrylamide Gel Electrophoresis (Native PAGE and SDS- PAGE).

UNIT III **(12 hrs)**

PCR Techniques: Principle and applications of PCR techniques – Types of PCR – Enzymology – Primer types – methods. PCR amplification for Detection of mutation –Basics of Isothermal PCR.

UNIT IV **(12 hrs)**

Molecular Sequencing: Gene Sequencing and analysis, DNA sequencing – Enzymatic and chemical methods and new generation sequencing. Hybridization Techniques: Southern, Northern and Dot blots. Microarray Techniques: Oligonucleiotide array and cDNA array and its applications. Amino acid sequencing - Western - MALDI-TOF.

UNIT V **(12 hrs)**

Genome Analysis: Genome sequencing and Basics of Physical mapping and genome analysis. Restriction Fragment Length Polymorphism (RFLP) technique. Random Amplified polymorphic DNA (RAPD) technique.

TEXTBOOKS

1. James D.Watson, Michael Gilman, Jan Wit Koeski and Mark Zuller. *Recombinant DNA*. 2nd Ed. Scientific American Book, New York, 2001.
2. Lewin,B. *Genes VII.* Oxford University Press, 2000.
3. Gardener, E.J. *et al*. *Principles of Genetics.* 8thEdition. John Wiley & Sons, New York, 1991.

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Books

1. Glick, B.R. and Pasternak, J.J. *Molecular Biotechnology*. ASM Press, Washington DC., 1994.
2. Cooper, G.M., and Hausman, R.E., *The Cell: A Molecular Approach.* 5th edition. ASM Press and Sunderland, Washington, D.C.; Sinauer Associates, MA., 2009.
3. De Robertis, E.D.P., and De Robertis, E.M.F., *Cell and Molecular Biology*. 8th edition. Lippincott Williams and Wilkins, Philadelphia, 2006.

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1. https://www.labome.com/method/Current-PCR-Methods.html#:~:text=The%20Polymerase%20chain%20reaction%20(PCR,by%20a%20DNA%20Polymerase%20enzyme.
2. https://www.ncbi.nlm.nih.gov/Web/Search/entrezfs.html
3. https://www.yourgenome.org/facts/what-is-a-genome#:~:text=A%20genome%20is%20an%20organism's,it%20to%20grow%20and%20develop.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – V
(2021 – 2024)
MAJOR ELECTIVE COURSE – II: ECONOMIC BOTANY (21UBYO54)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

The course familiarizes the learners with ethnic communities and their importance in trade and conservation of local plant species.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: identify the core concepts and basic principles of economic botany and their importance.

CO2[K2]: explain the relationship between human and plants.

CO3[K3]: perform various methods of plant cultivation.

CO4[K4]: analyse the economic important plants and their uses.

CO5[K4]: classify the economic importance & medicinal applications of selected plants

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	3	1	1	1	-
CO2[K2]	2	3	2	2	1	1	1
CO3[K3]	3	2	2	1	-	1	1
CO4[K4]	3	2	2	1	-	-	-
CO5[K4]	2	2	3	2	1	1	-
Weightage of the course	13	11	12	07	03	04	02
Weighted percentage of Course contribution to POs	**2.10**	**2.28**	**3.49**	**2.24**	**1.88**	**1.97**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

History of economic botany – Introduction of Crop plants –Industrial Value of Food plants and Drugs. Drug Yielding Plants: *Cinchona, Coleus, Rauvolfia, Withania and Gloriosa.* Aromatic Plants: *Santalum*, *Jasminum* and *Artemesia*. Economic importance of Lower Plants.

UNIT II **(12 hrs)**

Botanical names, Family, part used and economic uses of cereals: Rice, Wheat, Maize and Barley. Millets: Sorghum, Pearl Millet, Foxtail Millet. Legumes: Soya Bean, Black Gram, Red Gram, Green Gram. Sugar Yielding Plants: Sugarcane, sugar beet.

UNIT III **(12 hrs)**

Botanical names, Family, part used and economic uses of spices And Condiments: Cardamom and Cinnamon. Nuts: Almond and Cashew Nut. Vegetables: Tomato and Brinjal. Fruit: Mango, Guava and Banana. Beverages: Cocoa and Coffee. Oil Yielding Plants: Ground nut and Sesame. Timber Wood: Teak and Rose wood.

UNIT IV **(12 hrs)**

Centre of Origin, cultivation methods and domestication of crop plants: Rice, Sugarcane, Brinjal, Ladies finger, Mango, Banana, Papaya, Cotton and Jute. Tubers – Borassus and Sweet Potato.

UNIT V **(12 hrs)**

Chemical Constituents and Uses of *Acacia* Gum, *Capsicum* and *Asafoetida* Resins. Systematic position, salient features, Chemical Constituents and Uses of the following species: *Tinospora*, *Adathoda* and *Pedalium*.

TEXTBOOKS

1. Singh, Panday and Jain, *Economic Botany*. Rastogi Publications, Meerut 2015.
2. Sunidhi Miglani. *Textbook of Economic Botany.* ABS Books, 2016
3. Sammbamurty A.V.S.S. *A Textbook of Modern Economic Botany*. CBS Publishers & Distributors, 2018.
4. Pande P.C. and Jain. D.K. *Economic Botany.* 3rd Edition, Rastogi Publications, 2018.

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1. Verma, V. *Textbook of Economic Botany*. Ane Book Pvt. Ltd., 2009.
2. Kumar, H.D. *Economic Botany*. MacMuth Publications, New Delhi, 2003.
3. Pandey, B.P.*A text of Botany Angiosperms*, S.Chand and Company PVT.LTD, New Delhi, 2015.
4. Gupta S.K. and Kaushik, M.P. *An Introduction to Economic Botany*. K. Nathabnd co., Meerut, India, 1973.

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1. https://www.routledge.com/Medicinal-Plants-Chemistry-and-Properties/Daniel/p/book/9781578083954
2. https://www.fs.fed.us/wildflowers/ethnobotany/medicinal/ingredients.shtml
3. https://www.researchgate.net/publication/326425995_Economic_Botany_and_Biotechnology.
4. https://www.dmapr.org.in/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – V
(2021 – 2024)
MAJOR ELECTIVE COURSE – II: PLANT RESOURCES AND UTILIZATION
(21UBYO55)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to various medicinal plants and its conservation and utilization of threatened plants.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: list the important medicinal plants
CO2[K2]: illustrate the characteristic features of the medicinal plants
CO3[K3]: organize the latex, fibres, timber, beverages, resin & gums yielding plants
CO4[K4]: inspect the production of biodiesel from plant
CO5[K4]: separate the oil, fibres, cotton and jute from the economic important plants

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	3	1	1	1	-
CO2[K2]	2	3	2	2	1	1	1
CO3[K3]	3	2	2	1	-	1	1
CO4[K4]	3	2	2	1	-	-	-
CO5[K4]	2	2	3	2	1	1	-
Weightage of the course	13	11	12	07	03	04	02
Weighted percentage of Course contribution to POs	**2.10**	**2.28**	**3.49**	**2.24**	**1.88**	**1.97**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Brief Study of the Following Economic Produces with Special References to Botanical Name, Family and Morphology of Useful Parts and Uses: Cereals- Paddy and Wheat, Pluses- Red Gram and Soya Beans, Vegetables- Tomato and Potato, Fruit-Apple and Mango.

UNIT II **(12 hrs)**

Brief Study of the Following Economic Produces With Special References to Botanical Name, Family and Morphology of Useful Parts and Uses: Drugs- Cinchona and Ashwagandha. Narcotic- Tobacco and Hasish (Canabis). Timber- Teak and Rose Wood. Resin and Gums- Oleoresin and Canada Balsam.

UNIT III **(12 hrs)**

Brief Study of the Following Economic Produces With Special References to Botanical Name, Family and Morphology of Useful Parts and Uses: Latex – Ruber Gutta Percha. Fibre-Cotton and Jute. Oil- Coconut Oil and Gingelly Oil, Beverages – Cocoa and Coffee.

UNIT IV **(12 hrs)**

Brief Study of the Following Economic Produces with Special References to Botanical Name, Family and Morphology of Useful Parts and Uses: Spices and Condiments: Garlic, Cardamom, Ginger and Pepper. Medicinal Plants: *Digitalis purpurea*, *Rauvolfia serpentine, Catharanthus roseus* and *Curcuma longa*. Essential Oil: Lemon Grass Oil and Sandal Wood Oil.

UNIT V **(12 hrs)**

Extraction & Processing: Methods of Processing of Tea and Eucalyptus Oil. Extraction of Biodiesel from *Jatropha Curcus* and *Pungamia Glabra.*

TEXTBOOKS

1. Pandey, B.P. *Economic Botany*. S.Chand and Company PVT.LTD, New Delhi, 2015.
2. Pandey. B.P. *A Text book of Economic Botany*. S.Chand and Company, New Delhi, 2017.
3. Dutta, A.C. *Botany for Degree learners*. Oxford University press, 2004.

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1. Pandey. B.P. *A Text book of Economic Botany*. S.Chand and Company, New Delhi, 1977.
2. Sambamurthy, A.V.S.S. *A Text Book of Economic Botany*. Wiley Eastern Private limited, 1989.

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1. https://www.sciencedirect.com/topics/pharmacology-toxicology-and-pharmaceutical-science/digitalis-purpurea
2. https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/catharanthus-roseus
3. https://patents.google.com/patent/EP2286678A1/en#:~:text=An%20essential%20oil%20constituent%20is,Macrocarpal%20A%2C%20Macrocarpal%20B%20and

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – V
(2021 – 2024)
MAJOR ELECTIVE COURSE – II: PROSPECTIVE OF MEDICINAL PLANTS
(21UBYO56)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners with basic knowledge in medicinal plants and their cultivation practices along with applications and processing techniques.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: identify the medicinal plants and describe its external morphology
CO2[K2]: demonstrate the process and storage of medicinal plants
CO3[K3]: perform various medical practices in ethno botany
CO4[K4]: classify the Indian system of medicine and commercialization of products
CO5[K4]: inspect the conservation process of medicinal plants

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	3	1	1	1	-
CO2[K2]	2	3	2	2	1	1	1
CO3[K3]	3	2	2	1	-	1	1
CO4[K4]	3	2	2	1	-	-	-
CO5[K4]	2	2	3	2	1	1	-
Weightage of the course	13	11	12	07	03	04	02
Weighted percentage of Course contribution to POs	**2.10**	**2.28**	**3.49**	**2.24**	**1.88**	**1.97**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low, '-' No Correlation)

UNIT I **(6 hrs)**

Ethnobotany: Introduction – Concept – Scope and Objectives of ethnobotany. History of Traditional Medicines and Ethnomedicine. Approaches in Ethnobotany. Ethnic Groups in Tamil Nadu. Conservation methods of RET medicinal plants.

UNIT II **(6 hrs)**

Ethnomedicinal Plants: Importance – Role in Human Health Care. Methodology of Ethnobotanical Studies: Data collection by Questionnaires. Field and Lab protocol for Ethanobotany. Contribution of AICRPE and FRLHD to Ethanobotany of India

UNIT III **(6 hrs)**

Ethnomedicobotanical sources in India. Traditional Knowledge and Utility of Some Medicinal Plants in Tamil Nadu: *Centella asiatica – Cissus quatrangularis – Solanum trilobatum – Cardiospermum halicacabum – Vitex negundo – Andrograpis paniculata – Eclipta alba.*

UNIT IV **(6 hrs)**

Plants Used by the Tribals: Food Plants – Tubers and Leafy Vegetables. Beverages – Tea and Cocao. Timber yielding plants - Teak and Sandal. Resins – Benzoin. Religious – Nagalingam and miscellaneous - Honey.

UNIT V **(6 hrs)**

Ethno-pharmacology: Classification and Source of Plant Crude drugs - Quality, Safety and its Efficacy. Herbal-medicine industry – land use development – agriculture – forestry – betterment of rural livelihoods and education.

TEXTBOOKS

1. Gokhale, S.B., Kokate, C.K. and Gokhale, A. *Pharmacognosy of Traditional Drugs*. 1st edition. Nirali Prakashan, Pune. 2016.
2. Joshi, S.G. *Medicinal Plants*. Oxford & IBH Publishing C., Pvt., Ltd., New Delhi. 2018.
3. Kumar, N. *A Textbook of Pharmacognosy*. AITBS Publishers, India. 2018.
4. Premendra Singh. *Medicinal Plants: Conservation, Cultivation and Utilization*. Daya Publishing House, New Delhi. 2013.

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1. Albuquerque, U.P., Ramos, M.A., Júnior, W.S.F., and De Medeiros, P.M. *Ethnobotany for beginners*. Springer International Publishing, US. 2017.

2. Qadry, J.S. *A textbook of Pharmacognosy Theory and Practical*s. 17th edition. CBS Publishers and Distributors, New Delhi. 2014.
3. Singh, V. *Ethnobotany and Medicinal Plants of India and Nepal* (Vol. 3). Scientific Publishers. New Delhi. 2009.

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1. https://shodhganga.inflibnet.ac.in/bitstream/10603/116454/7/07_chapter%201.pdf
2. https://libstore.ugent.be/fulltxt/RUG01/002/217/123/RUG01-002217123_2015_0001_AC.pdf
3. https://www.researchgate.net/publication/237405658_Ethnobotany_and_phytomedicine_of_the_upper_Nyong_valley_forest_in_Cameroon

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – V
(2021 – 2024)
SKILL ENHANCEMENT COURSE – V: BIOINSTRUMENTATION AND BIOSTATISTICS (21UBYS51)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 40**
CREDITS : 2 **EXT. MARKS : 60**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to microtome, separation techniques, and spectroscopic instruments.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to
CO1[K1]: define the principles microtome and spectrophotometer
CO2[K2]: compare the different biomolecules using instruments
CO3[K3]: acquire the knowledge of biomolecules
CO4[K4]: ensure the methods mounding media and slide preparations
CO5[K5]: knowledge of data collection and Biostatistics methods

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	2	2	2	1	-	-	-
CO2 [K2]	2	2	2	1	1	-	-
CO3[K3]	2	2	1	1	1	-	-
CO4[K4]	2	2	2	1	-	1	1
CO5[K5]	2	2	2	1	-	1	1
Weightage of the course	10	10	09	05	02	02	02
Weighted percentage of Course contribution to Pos	1.61	2.07	2.62	1.60	1.25	0.99	1.49

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(6 hrs)**

Microscopy and Microtomy: Principles and Applications of Compound, Phase contrast, Fluorescent Microscope, SEM and TEM. Principles, Types and applications of Microtome.

UNIT II **(6 hrs)**

Instrumentation: Principles, procedure and applications of pH meter, Centrifuge and its Types. Chromotogrphic techniques: Paper – Thin Layer – Gas Chromatography – HPLC.

UNIT III **(6 hrs)**

Analytical Instruments: UV/Vis Spectrophotometry – Infrared Spectroscopy – Atomic Absorption Spectroscopy – Principles and applications of Lyophilizer – Soxhlet apparatus for phytochemical isolation.

UNIT IV **(6 hrs)**

Biostatistics: Introduction to Biostatistics - Sources of biological data - Secondary and Primary sources - Data Collection - Classification and tabulation of data – Diagrammatic and Graphical representation of statistical data.

UNIT V **(6 hrs)**

Analysis of Data: Formation of Frequency Distribution – Mean – Median – Mode – Variations – Standard Deviation –Standard Error –*Chi-Square* ($\chi 2$) Test, Theory and applications of One way ANOVA and T-test – Basic Concept of Probability.

TEXTBOOKS

1. Gurumani, N. *Research Methodology for Biological Science.* MJP Publishers, Chennai, 2017.
2. Marimuthu. Microscopy and Microtechnique. MJP Publishers, Chennai, 2020.
3. Zimmermann. Botanical Microtechniques – A hand book of Methods for the preparation, staining and Microscopical investigations. Alpha Edition. 2021.

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1. Van Belle, G., Fisher, L. D., Heagerty, P. J., and Lumley, T. *Biostatistics: a methodology for the health science*. John Wiley & Sons. 2004.
2. Le, C. T., and Eberly, L. E. *Introductory biostatistics*. John Wiley and Sons. 2016.
3. Motulsky, H. *Intuitive biostatistics: a nonmathematical guide to statistical thinking*. Oxford University Press, USA. 2014.

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2. https://onlinecourses.nptel.ac.in/noc20_bt28/preview
3. https://nptel.ac.in/courses/102/106/102106051/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – V
(2021 – 2024)
INTERNSHIP (21UBYJ51)
(From 2021-2022 Batch onwards)

CREDIT : 1 **INT. MARKS : 50**
DURATION: 25 days **EXT. MARKS : 50**
MAX. MARKS: 100

Preamble

This course familiarizes the learners with real world experience through practice oriented and hands-on working experience in the industry and research laboratories to the learners

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K2]: demonstrate depth of expertise in coherent area of Biology

CO2[K3]: employ technical information using scientific communications, scientific operations and procedures

CO3[K3]: develop effective oral and written communication skills in the field of Biological science

CO4[K6]: develop hands on training experience and skill in Botany

CO5[K6]: create awareness on logistic and economic and realities of functioning in a work environment

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	2	2	-	1	1	1	1
CO2[K3]	2	3	-	1	-	1	1
CO3[K3]	2	2	-	2	-	1	1
CO4[K6]	1	2	1	-	-	1	1
CO5[K6]	1	3	2	2	-	1	1
Weightage of the course	08	12	03	06	01	05	05
Weighted percentage of Course contribution to POs	**1.29**	**2.48**	**0.87**	**1.92**	**0.63**	**2.46**	**3.73**

Based on the level of contribution ('3' - High, '2' - Medium, '1' - Low '-' no correlation)

Rules and Regulations

1. Each Student has to undergo minimum 25 days institutional/industry based training during the fourth semester summer vacation.
2. Internships could be undertaken in different organizations, industries and agencies approved by the department.
3. Learners should keep a detailed record of activities performed and hrs spent in training and report the same to the Faculty Coordinator every week.
4. The Internship report should be of minimum 20 pages.
5. Attendance certificate from the organization has to be submitted to the HOD.
6. Two copies of the Internship report should be submitted.
7. The Internship carries 100 marks out of which 50 marks for Internal Assessment and 50 Marks for External Examination.
8. The student has to appear for Viva-voce.
9. The viva voce board shall consist of the Head of the Department and the Internal Examiner

The following rubrics will be taken into account for the evaluation of the Training Programme:

Internal Assessment (50 Marks)	**External Examination(50 Marks)**
Training Report & Review : 40 Marks	Training Report : 20 Marks
Daily Log Report/Attendance : 5 Marks	Viva Voce : 30 Marks
PPT Presentation : 5 Marks	

Internship report must contain the following details:

- Title Page
- College Certificate Page
- Internship Certificate provided by the internship institution
- Declaration Page
- Acknowledgement
- Company Profile
- Organizational structure of the concern
- Weekly work plan
- List of figures, List of Tables
- Index
- Chapters

List of Chapters

1. Introduction
2. Nature of work
3. Role in the organization
4. Questionnaires and Observations about work
5. Operating Environment
6. Detailed Description of Technology used

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – VI
(2021 – 2024)
CORE COURSE – XIII: PLANT ECOLOGY AND PHYTOGEOGRAPHY (21UBYC61)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 5 **INT. MARKS : 40**
CREDITS : 5 **EXT. MARKS : 60**
DURATION : 75 hrs **MAX. MARKS: 100**

Preamble

This course familiarizes the learners with biotic and abiotic factors in our ecosystem, the types of ecosystems, vegetation and phytogeography.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K2]: explain the basics of ecology, ecosystem, vegetation & phytogeography

CO2[K3]: utilize the knowledge on function of ecosystem, plant succession and biogeochemical cycle of elements

CO3[K4]: examine the morphological adaptation of plants & primary production of an ecosystem

CO4[K4]: analyse the different groups of plants and their adaptations

CO5[K5]: evaluate the phytoremediation and distribution and succession of plants in an ecosystem

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	2	2	1	2	-	-	-
CO2[K3]	3	2	1	2	1	2	1
CO3[K4]	2	2	2	2	-	-	-
CO4[K4]	3	3	2	2	1	1	-
CO5[K5]	3	3	2	2	-	2	1
Weightage of the course	13	12	08	10	02	05	02
Weighted percentage of Course contribution to POs	**2.10**	**2.48**	**2.33**	**3.19**	**1.25**	**2.46**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(15 hrs)**

Ecology: Principles and significance – Autecology – Synecology – Climatic factors – Edaphic factors – Biotic factors. Productivity: Primary, Secondary and Gross productivity. Biogeochemical cycle: Water, Carbon, Nitrogen, Phosphorous.

UNIT II **(15 hrs)**

Ecosystem: Concept – Structure and Functions of Ecosystem – Components of ecosystem: Biotic and Abiotic. Types of Ecosystem: Terrestrial and aquatic. Energy flow in Pond and Grassland ecosystem. Food chain – Food web – Ecological pyramids.

UNIT III **(15 hrs)**

Vegetation analysis: Units of vegetation – Formation – Association – Consociation. Study of vegetation: Quadrate and transect method. Ecological Succession: Monoclimax, Polyclimax theories, Hydrosere and Xerosere. Brief account on Morphological and anatomical adaptations of plants: Hydrophytes, Xerophytes and Halophytes.

UNIT IV **(15 hrs)**

Ecological Niche: Habitat and niche – Ecological Concept of Species – Genecology – Ecotypes – Ecophene. Population ecology: Characteristics and Dynamics. Biodegradation – Phytoremediation – Bioindicators – Bioleaching.

UNIT V **(15 hrs)**

Phytogeography: Principles of Phytogeography. Distribution of plants: Wide, Endemic, Continuous, Discontinuous distribution. Continental drift – Endemism. Barriers on the distribution of plants. Phytogeographic regions in India – Brief account on Western Ghats of India. Vegetation types in Tamil Nadu.

TEXTBOOKS

1. Kumar, H.D. *Modern concepts of ecology*. Vikas publishing house, New Delhi 2010.
2. Sharma, P.D. *Plant Ecology and Phytogeography*. Rastogi Publication, Meerat 2015
3. Singh, J.S., Singh, S.P. and Gupta, S. *Ecology Environment Science and Conservation*. S. Chand Publications, 2017.
4. Sharma, P.D. *Ecology and Environment*. Rastogi Publications, Meerut. 2017.

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1. Odum, E.P. *Fundamentals of ecology*. 5th Edition. Cengage Learning India Pvt. Ltd., New Delhi, 2017.
2. Stiling, P. *Ecology: Theories and Applications.* 4th Edition. Pearson Education India, 2001.
3. Krebs, *Ecology- The Experimental Analysis of Distribution and Abundance*. 6th Edition. Pearson Education India, 2016.

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2. https://www.youtube.com/embed/yIxkjKnTzLw
3. https://www.youtube.com/embed/QggTyDI89UU
4. https://www.youtube.com/embed/rTt1ns8aJgY
5. https://www.youtube.com/embed/VNvvTpsmMD0
6. https://www.jagranjosh.com/general-knowledge/bio-geographic-classification-of-india-1440146538-1

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – VI
(2021 – 2024)
CORE COURSE – XIV: CELL AND MOLECULAR BIOLOGY (21UBYC62)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 5 **INT. MARKS : 40**
CREDITS : 5 **EXT. MARKS : 60**
DURATION : 75 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to cellular functions such as cell cycle, DNA replication, Protein synthesis and cell signalling mechanism.

Course Outcomes (CO)

On successful completion of the practical course, the learners will be able to
CO1[K1]: state the basics of Prokaryotic and Eukaryotic cell
CO2[K2]: explain the cytoplasmic organelles by their structure and functions
CO3[K3]: discover the cellular functions
CO4[K4]: analyse the molecules for different biological functions
CO5[K4]: examine the DNA damage and repair mechanism

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	-	-	-	-	-	-
CO2[K2]	3	2	2	1	1	2	1
CO3[K3]	3	2	2	2	1	1	1
CO4[K4]	3	2	2	2	2	1	1
CO5[K4]	3	2	2	2	1	1	1
Weightage of the course	15	08	08	07	05	05	04
Weighted percentage of Course contribution to POs	**2.42**	**1.66**	**2.33**	**2.24**	**3.13**	**2.46**	**2.99**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(15 hrs)**

Discovery of cell – Cell theory – Protoplasm theory. Overview of Prokaryotic and Eukaryotic Cells. Cell Size and Shape. Ultra structure of Plant Cell and Cell Wall. Plasma Membrane - Trilaminar Model, Fluid Mosaic Model and Chemical Composition. Membrane transport: Passive, Active and Facilitated transport. Endocytosis and Exocytosis. Cell-Cell communication by Plasmodesmata.

UNIT II **(15 hrs)**

Structure and Functions of following cell organelle: Endoplasmic Reticulum – Golgi complex – Lysosome – Ribosomes – Microbodies – Peroxisomes – Glyoxysomes – Nucleus. Cell cycle and cell division: Meiosis and Mitosis, Checkpoints. Historical perspective of DNA – Organization and packaging of DNA.

UNIT III **(15 hrs)**

Chromosomes: Types – Morphology – Giant Chromosomes – Polytene – Lamp Brush Chromosomes; Heterochromatin, Euchromatin - Constitutive and Facultative heterochromatin, repetitive DNA sequences.

UNIT IV **(15 hrs)**

Chloroplast and Mitochondrial genome – Semi autonomous organization.DNA as a genetic material.DNA replication and its types. Basics of Transcription Types (mRNA, rRNA, tRNA), Basics of Non Coding RNA (miRNA, siRNA and Circular RNA). Wobble hypothesis. Genetic code and Protein synthesis.

UNIT V **(15 hrs)**

DNA damage and Repair mechanism - Photoreactivation, direct repair of nicks, excision repair, mismatch repair, recombination repair, SOS repair mechanisms.

TEXTBOOKS

1. Ajay Paul, *Textbook of Cell and Molecular Biology*. Books and Allied Publisher, 2015.
2. Rastogi, S.C. *Cell Biology.* New Age International Publisher, 2005.
3. Gupta, P.K. *Cell Biology.* Rastogi Publications, 2018.
4. Harvey Lodish, Arnold Berk, Chris Kaiser et al. *Molecular Cell Biology*. W.H.Freeman and Co Ltd,2021
5. Lewis J. Kleinsmith, Valerie M. Kish. *Principles of Cell and Molecular Biology*, 2nd edition. Pearson, 1997

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1. De Robertis, E.D.P. and De Robertis, E.M.F. *Cell and Molecular Biology*. 8th Edition, Lippincott Williams and Wilkins, Philadelphia. 2006.
2. Cooper, G.M., and Hausman, R.E. *The Cell: A Molecular Approach*. 5th Edition. ASM Press and Sunderland, Washington, D.C.; Sinauer Associates, MA. 2009.
3. Karp, G. *Cell and Molecular Biology Concepts and Experiments*. John Wiley and Sons. Inc. 2015.

Web Sources

1. https://openstax.org/details/books/microbiology?Instructor%20resources
2. https://www.loc.gov/rr/scitech/tracer-bullets/biotechnologytb.html
3. https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Book%3A_Introductory_Biology_(CK-12)/04%3A_Molecular_Biology/4.02%3A_DNA%2C_the_Genetic_Material#:~:text=DNA%2C%20deoxyribonucleic%20acid%2C%20is%20the,parents%20and%20determines%20your%20characteristics.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – VI
(2021 – 2024)
CORE COURSE – XV: GENETICS AND PLANT BREEDING (21UBYC63)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 5 **INT. MARKS : 40**
CREDITS : 5 **EXT. MARKS : 60**
DURATION : 75 hrs **MAX. MARKS: 100**

Preamble

This course familiarizes the learners with Mendelian laws, gene inheritance, mutation, genetic recombination and evolution theory and types.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: define the principles and concepts of Mendelian laws

CO2[K2]: explain the gene inheritance

CO3[K3]: use the knowledge of plant breeding methods

CO4[K4]: examine the genetic basis of heterosis technique

CO5[K5]: evaluate the concept of plant genetic resources, gene bank and gene pool.

CO-PO Mapping table Course Articulation Matrix

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	2	2	2	1	-
CO2[K2]	3	2	2	2	-	2	-
CO3[K3]	3	2	2	3	-	-	1
CO4[K4]	3	2	2	1	2	-	-
CO5[K5]	3	2	2	1	-	2	1
Weightage of the course	15	10	10	09	04	05	02
Weighted percentage of Course contribution to Pos	**2.42**	**2.07**	**2.91**	**2.88**	**2.50**	**2.46**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(15 hrs)**

Genetics: Introduction to Genetics. Mendel's Experiments, Mendelian Laws of inheritance - Monohybrid – Dihybrid Cross - Back/Test Cross. Complete and Incomplete Dominance. Lethal gene, Complementary gene and Dominant and Recessive Epistasis.

UNIT II **(15 hrs)**

Gene Interaction: Allelic Gene Interaction- Multiple Alleles -ABO Blood Group Inheritance. Linkage and Crossing Over - Types and Mechanisms. Mapping of Genes on Chromosomes. Sex Determination in Plants, sex linked inheritance, Cytoplasmic Inheritance (Plastid Inheritance in *Mirabilis jalaba*, Male Sterility in Corn).

UNIT III **(15 hrs)**

Cytogenetics: cytogenetics of polyploids and aneuploids. Chromosomal Recombination: Types and their significances. Chromosomal Aberrations: Deletion, Duplication, Inversion, Translocation. Mutation - Gene Mutations: Induced and Spontaneous Mutations. Molecular Basis of Mutations in Relation to UV Light and Chemical Mutagens.

UNIT IV **(15 hrs)**

Plant Breeding: Introduction and objectives of Plant Breeding. Major International and National Plant Breeding Institutes/Centres. Significant achievements of plant breeding (Semi-dwarf wheat and rice, Hybrid Millets and Hybrid Cotton). Origin and domestication of major crop plants; Basics of Gene Banks, Gene Pool: Primary, Secondary and Tertiary Gene Pools.

UNIT V **(15 hrs)**

Methods of Plant Breeding: Introduction – Acclimatization – Domestication. Selection methods for: Self-pollinated, Cross-pollinated and vegetative and clonal propagation. Hybridization: For self, cross and vegetatively propagated plants – Basics of Procedure, advantages and limitations. Heterosis and Inbreeding depression: Dominance, Over-dominance and Epistasis hypothesis; Application of Heterosis

TEXTBOOKS

1. Ajay Paul, *Text book of Genetics*. 2nd Edition. Books & Allied Publisher, 2015.
2. Alice Marcus. *Genetics.* MJP Publishers, Chennai, 2009.
3. Singh, B.D. *Plant Breeding: Principles and Methods*. 9th edition. Kalyani Publishers. 2012.

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1. Glick, B.R., Pasternak, J.J. *Molecular Biotechnology - Principles and Applications of recombinant DNA.* ASM Press, Washington, 2003.
2. Gardner. *Principles of Genetics*. Wiley publications, 2006.
3. Gupta, P.K. *Genetics.* Rastogi Publication Meerut, 2000.

Web Sources

1. https://www.youtube.com/watch?v=qUSoy7Pn6To
2. https://www.youtube.com/watch?v=c1inxj14KU8
3. https://www.youtube.com/watch?v=-m_OM7cr8DI

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – VI
(2021 – 2024)
CORE COURSE – XVI: PRACTICAL: PLANT ECOLOGY AND PHYTOGEOGRAPHY
(21UBYC6P)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 5 **INT. MARKS : 50**
CREDITS : 4 **EXT. MARKS : 50**
DURATION : 75 hrs **MAX. MARKS: 100**

Preamble

This practical course facilitates the learners to understand biotic and abiotic factors in our ecosystem, the types of ecosystems, vegetation and phytogeography.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K2]: demonstrate the basics of ecosystem, vegetation and phytogeography
CO2[K3]: calculate the availability of vegetation and soil nutrients in given area
CO3[K4]: compare the local vegetation with soil nutrients
CO4[K5]: measure the morphological and physiological adaptation of vegetation in relation with various habitats
CO5[K5]: evaluate the adaptation of plants, availability of soil in given area

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	1	2	-	-	-
CO2[K3]	3	2	1	2	1	2	1
CO3[K4]	3	2	2	2	-	2	-
CO4[K5]	3	3	2	2	1	1	1
CO5[K5]	3	3	2	2	-	1	-
Weightage of the course	15	12	08	10	02	06	02
Weighted percentage of Course contribution to Pos	**2.42**	**2.48**	**2.33**	**3.19**	**1.25**	**2.96**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

EXPERIMENTS

PLANT ECOLOGY

1. Permeability (percolation; total capacity as well as rate of movement) of different soil samples.
2. Determination of soil pH and soil nutrients
3. Study of the morphological and physiological adaptations of locally available hydrophytes, xerophytes, halophytes, parasites and epiphytes to correlate to their particular habitat.
4. Analysis of local vegetation by Transect and Quadrate methods
5. Study of species diversity index of vegetation.

PHYTOGEOGRAPHY

1. To locate the phytogeographical regions, Biodiversity hotspots and endemic plants distribution in the map of India and World.
2. Field visit to Western Ghats to observe and acquire knowledge on the vegetation

REFERENCES

Books

1. Kumar, H.D. *Modern concepts of ecology*. Vikas publishing house, New Delhi 2010.
2. Sharma, P.D. *Plant Ecology and Phytogeography*. Rastogi Publication, Meerat 2015
3. Krebs. *Ecology- The Experimental Analysis of Distribution and Abundance*. 6th Edition. Pearson Education India, 2016.
4. Odum, E.P. *Fundamentals of Ecology*. 5th Edition. Cengage Learning India Pvt. Ltd., New Delhi. 2017.
5. Stiling, P. *Ecology: Theories and Applications.* 4thEdition. Pearson, 2001.

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – VI
(2021 – 2024)
CORE COURSE – XVII: PRACTICAL: CELL AND MOLECULAR BIOLOGY AND GENETICS (21UBYC6Q)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 50**
CREDITS : 3 **EXT. MARKS : 50**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course provides hands on techniques to observe mitosis and meiosis cell division. And also provides on isolation methods of different molecules from the bacterial and plant cells.

Course Outcomes (CO)

On successful completion of the practical course, the learners will be able to
CO1[K2]: infer the cell components and observation of cell organelles
CO2[K3]: demonstrate the different stages of mitosis and meiosis cell division
CO3[K4]: compare the sequence of plant gDNA & bacterial plasmid & gDNA
CO4[K5]: resolve the problems related to Genetics.
CO5[K5]: justify the Hardy Weinberg equilibrium.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K2]	3	2	2	2	-	1	-
CO2[K3]	3	1	2	1	2	2	1
CO3[K4]	3	2	2	2	1	2	-
CO4[K5]	2	1	2	2	2	1	1
CO5[K5]	2	2	2	1	2	1	-
Weightage of the course	13	08	10	08	07	07	02
Weighted percentage of Course contribution to POs	**2.10**	**1.66**	**2.91**	**2.56**	**4.38**	**3.45**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

EXPERIMENTS

CELL BIOLOGY

1. Cell Biology: Root tip squash for Mitosis
2. Meiosis in Anthers
3. Observation of Chromosomal structure by Acetocarmine in Rheo leaf
4. Observation of cystolith and raphides in plants

MOLECULAR BIOLOGY

1. Isolation of plant genomic DNA
2. Agarose gel electrophoresis for visualization of DNA
3. Isolation of Bacterial chromosomal DNA
4. Isolation of Bacterial plasmid.
5. Separation of Protein by SDS PAGE
6. Demonstration on PCR

GENETICS

1. Solving problem related to Monohybrid
2. Solving problem related to Dihybrid crosses
3. Solving problem related to test cross
4. Solving problem related to multiple gene interaction – Blood group.
5. Problem in Hardy Weinberg equilibrium.

REFERENCES

Books

1. Senthilkumar, B. and Senbagam, D. *Practical Microbiology - A Laboratory Manual*. Panima Publishing Corporation, New Delhi, 2013.
2. Dubey, R.C.*A Textbook of Biotechnology*. S. Chand Publishing, 2015
3. Bendre and Kumar. *A text book of Practical Botany II*. Rastogi Publications, 2010.

Web Sources

1. https://openstax.org/details/books/microbiology?Instructor%20resources
2. https://www.loc.gov/rr/scitech/tracer-bullets/biotechnologytb.html

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – VI
(2021 – 2024)
MAJOR ELECTIVE COURSE – III: BIODIVERSITY AND CONSERVATION
(21UBYO61)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to various medicinal plants and its conservation and utilization of threatened plants.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: state the vegetation and their relationship with the ecosystem

CO2[K2]: classify the environmental biology in ecosystem

CO3[K3]: develop the indigenous knowledge, biopiracy and bio prospecting

CO4[K4]: analyze the cause and consequences of loss of biodiversity, threats and conservations.

CO5[K4]: simplify the *In situ* conservation and *ex situ* conservation

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	3	1	1	1	-
CO2[K2]	2	3	2	2	1	1	1
CO3[K3]	3	2	2	1	-	1	1
CO4[K4]	3	2	2	1	-	-	-
CO5[K4]	2	2	3	2	1	1	-
Weightage of the course	13	11	12	07	03	04	02
Weighted percentage of Course contribution to POs	**2.10**	**2.28**	**3.49**	**2.24**	**1.88**	**1.97**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Biodiversity: Introduction, Definition and importance of biodiversity. Levels of Biodiversity: Genetic, Species and Ecosystem diversity. Biodiversity Hotspot in World and India. Role of Biodiversity in Ecosystem, Ecosystem Stability, Speciation and Extinction. Concept of Endemism, endemic species in India.

UNIT II **(12 hrs)**

Biodiversity Information and Communication: Biodiversity Act and Laws. International and Indian Initiatives of Biodiversity Conservation. Biodiversity Organization: UNESCO, WWF, UNEP and IPCC. IUCN Red list categories of threat. Biodiversity Communication tools.

UNIT III **(12 hrs)**

Bioprospecting: Introduction. Indigenous knowledge – Biopiracy – Intellectual property rights and its impact on biodiversity. Impact of Biotechnology and Genetic Engineering tools on Biodiversity.

UNIT IV **(12 hrs)**

Biodiversity loss: Cause and consequences of loss of biodiversity. Impact of exotic species on Local Biodiversity. Deforestation – Cause for the extinction of species. Red data Book and its importance. Keystone Species and their significance in an ecosystem function.

UNIT V **(12 hrs)**

Biodiversity Conservation: Conservation strategies. *In-situ* conservation: Biosphere reserves, National parks and Sanctuaries. *Ex-situ* conservation: Gene banks and Cryopreservation. Human- animal conflicts. Role of National and International Institutes/Centres in conservation of biodiversity.

TEXTBOOKS

1. Erica E. Benson. *Plant Conservation Biotechnology*. Taylor and Francis group, London, 2003.
2. Begon, M. Harper, J.L. and Townssend, C.R. *Ecology*. Blackwell Science, Cambridge, USA, 1996.
3. Krishnamurthy, K.V. An *Advanced Textbook on Biodiversity: Principles and Practice*. Oxford & IBH Publishing Co Pvt. Ltd, 2018
4. Kumar, U. *Biodiversity*, Agrobios, 2008
5. Mahanty, S and Srivastava, A. *Biodiversity And It's Conservation*, Disha International Publishing house,2016

REFERENCES

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1. Muller Dombosis. D and Ellenberg, H. *Aims and methods of vegetation Ecology*. Wiley, New York, 1974.
2. Odum, E.P. *Basic Ecology*. Saunders, Philadelphia, 1983.
3. Ludwing, J. and Reynolds, J.F. *Statistical Ecology* John Wiley and Sons, 1988.

Web Sources

1. https://byjus.com/biology/biodiversity-conservation/#:~:text=Biodiversity%20conservation%20is%20the%20protection,conservation%20has%20three%20main%20objectives%3A&text=Sustainable%20utilization%20of%20species%20and,systems%20and%20essential%20ecological%20processes.
2. https://byjus.com/biology/red-data-book/
3. https://www.iucnredlist.org/

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – VI
(2021 – 2024)
MAJOR ELECTIVE COURSE – III: FOREST BOTANY (21UBYO62)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course familiarizes the learners with the types, importance & conservation of forest, silvicultural practice, forest policy & wildlife of India.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: define the types of forest & their importance and silvicultural practices.

CO2[K2]: classify the knowledge on forestry, silviculture and forest conservation

CO3[K3]: articulate the types of Indian forest, utilization and conservation of forest biodiversity by using silvicultural practice and forest policies

CO4[K4]: analyse the forest climate, impact of deforestation, silviculture management and forest resource

CO5[K4]: inspect the recent scenario in forest biodiversity, wildlife wealth of India, silviculture practice and forest act of India.

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	3	1	1	1	-
CO2[K2]	2	3	2	2	1	1	1
CO3[K3]	3	2	2	1	-	1	1
CO4[K4]	3	2	2	1	-	-	-
CO5[K4]	2	2	3	2	1	1	-
Weightage of the course	13	11	12	07	03	04	02
Weighted percentage of Course contribution to POs	**2.10**	**2.28**	**3.49**	**2.24**	**1.88**	**1.97**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Forest: Introduction – Definition. Classification of World Forest and Indian Forests. Agroforestry: scope and necessity. Forest Climate – Forest Research Organizations – Importance of Forest Research on Conservation.

UNIT II **(12 hrs)**

Forest Resources and Utilization: Direct and indirect beneficial of Forest – Major and Minor Forest Products – Non-Timber Forest Products (NTFPs) – Forestry for Social and National Development.

UNIT III **(12 hrs)**

Forest and Biodiversity: Forest Ecosystem –Importance of Biodiversity conservation. Causes of deforestation - Forest fires, Urbanization, Mining, Commercial Plantation, Over grazing.

UNIT IV **(12 hrs)**

Silviculture: Concept and scope –Natural and Artificial regeneration of forests saplings. Methods of propagation: Grafting techniques. Management of silviculture systems of Temperate and tropical forests. Silvicultural practice of economically important species in India (*Dalbergia, Dipterocarpus* and *Pterocarpus*)

UNIT V **(12 hrs)**

Indian forest Policy and Wildlife Act: Indian Forest Policy – Indian Forest and Wildlife Act –Wildlife Protection Act and their amendments. People Biodiversity register – Vanakuzhu - Chipko movement – Role of Tribes in Forest Conservation

TEXTBOOKS

1. Parthiban, K.T. *Introduction to Forestry and Agroforestry*. Scientific Publishers, 2018.
2. Lal, J.B. *Forest Ecology*. Natraj Publishers 2012.
3. Reddy, S.R. and Nagamani C. *Introduction to Forestry.* Kalyani book publication, 2017.
4. Negi, S.S. *Textbook of Forestry and Wildlife Management.* International Book Distributos, 2009.

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1. Jürgen, P., Dietrich, D. and Holm, U. *Forestry and Rural Development*. Springer, 2016.
2. Marcus, B.A. *Tropical Forests.* Jones and Bartlett Publishers Inc, 2010.

3. Honnay, O. *Forest Biodiversity.* Illustrated Edition. CABI Publishing, 2004.
4. Bachmann, P. *Assessment of Biodiversity for Improved Forest Planning.* Springer, 1998.

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1. https://forestrypedia.com/ecology-forest-ecology/
2. http://www.frienvis.nic.in/KidsCentre/Types-of-Indian-Forest_1811.aspx
3. https://www.fs.fed.us/forestmanagement/vegetation-management/silviculture/index.shtml
4. https://www.environmentalpollution.in/forest/forest-policies-in-india-background-aims-and-organization/1203

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – VI
(2021 – 2024)
MAJOR ELECTIVE COURSE – III: RECENT ADVANCES IN BOTANY (21UBYO63)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 4 **INT. MARKS : 40**
CREDITS : 3 **EXT. MARKS : 60**
DURATION : 60 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to acquire knowledge on recent advances in Botany like Phytochemistry, Plant Genomes and Nanotechnology.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to
CO1[K1]: state the advances in Botany
CO2[K2]: explain the plant genomics
CO3[K3]: employ the bioinformatics and computational biology
CO4[K4]: analyze phytocomponents and nanoparticles in plants
CO5[K4]: simplify the pharmacology

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	3	2	3	1	1	1	-
CO2[K2]	2	3	2	2	1	1	1
CO3[K3]	3	2	2	1	-	1	1
CO4[K4]	3	2	2	1	-	-	-
CO5[K4]	2	2	3	2	1	1	-
Weightage of the course	13	11	12	07	03	04	02
Weighted percentage of Course contribution to POs	**2.10**	**2.28**	**3.49**	**2.24**	**1.88**	**1.97**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(12 hrs)**

Plant Genomics and Proteomics: Plant Genomics and Proteomics. Introduction – Plant Genome - Rice and Arabidopsis Genome Project- Introduction to proteomics – Applications to plant biology – General view of proteomics – Analytical tools in proteomics.

UNIT II **(12 hrs)**

Phytochemistry: Introduction to Phytochemicals. Alkaloids – Phenolic compounds – Anthocyanins –Carotenoids – Flavonoids – Tannins Hydroxycinnamic acids – Xanthophylls. Plants with Phytochemicals – Organic acids – Lipids and their related compounds. Plant acids, Fattyacids and Lipids. Sugars and their derivatives. Extraction of phytochemicals – Development of new drugs from Ethnomedicines.

UNIT III **(12 hrs)**

Computational Biology: Introduction to drugs – Difference between natural and semi-synthetic drugs. Validation of Drugs – Lipinski Rule of 5 – Concept of ADMETox property. Importance of Pharmacophore modelling. Advantages of natural drugs. Brief on Virtual screening.

UNIT IV **(12 hrs)**

Pharmacognosy: Phytoconstituents and their therapeutic values – Histochemical tests for phytochemicals – Drugs containing carbohydrates/ glycosides/ lipids/ Volatile oils/ Resin/ Alkaloids/ Tanninis – Analytical pharmacognosy.

UNIT V **(12 hrs)**

Nanobiotechnology: Overview of Nanobiotechnology – Biomaterial Science – Fabrication and Characterization of nanostructures –Synthesis and analysis of nanoparticle. Nanotechnology in Biomedical applications – Health and Environmental impacts of nanotechnology. Biological nanoparticles synthesis - plants and microbes.

TEXTBOOKS

1. Middha, S.K., Usha, T. and H.P. Prashanth Kumar. *Bioinformatics*. College Book House, Bangalore. 2012.
2. Sahu, P.K. *Research Methodology*: *A Guide for Researchers in Agricultural Science, Social Science and other related fields*. Springer, New Delhi. 2013.
3. Shah, B. and Seth. A. *Text book of Pharmacognosy and Phytochemistry*. Elsevier India Pvt. Ltd. New Delhi. 2010.
4. Thiagarajan, B. and Rajalakshmi, P.A. *Computational biology*. MJP Publishers, Chennai. 2009.

5. Agarwal, G.K. and Rakwal, R. *Plant Proteomics Technologies; Strategies and Applications*. John Wiley & Sons, Inc, USA. 2008.

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1. Roseline, A. *Pharmacognosy*. MJP Publishers, Chennai. 2011.
2. Bernard Rosner. *Fundamentals of Biostatistics*. Brooks, Boston, USA. 2010.
3. Balaji, S. *Nanobiotechnology*. MJP Publishers, Chennai. 2010.
4. RanjithaKumari, B.D. *Plant Proteomics*. APH Publishers, New Delhi. 2008.
5. Sanaj.J. and Thelen, J.J. *Plant proteomics*. Springer, New York. 2007.
6. Mahajan. B.K. *Methods in Biostatistics*. Jay Pee Brothers Medical Publishers (P) Ltd. New Delhi. 1997.

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2. https://pubs.acs.org/doi/full/10.1021/bk-2016-1220.ch001#:~:text=Nanotechnology%20can%20be%20defined%20as,and%20possibly%20produce%20new%20products.&text=A%20possible%20concern%20is%20the,of%20some%20of%20these%20products.
3. https://www.sciencedirect.com/topics/medicine-and-dentistry/pharmacognosy

SRI KALISWARI COLLEGE (AUTONOMOUS), SIVAKASI
DEPARTMENT OF BOTANY
UG Programme – B.Sc. Botany
SEMESTER – VI
(2021 – 2024)
SKILL ENHANCEMENT COURSE – VI: TECHNIQUES IN PLANT BIOTECHNOLOGY (21UBYS61)
(From 2021-2022 Batch onwards)

HOURS/WEEK: 2 **INT. MARKS : 40**
CREDITS : 2 **EXT. MARKS : 60**
DURATION : 30 hrs **MAX. MARKS: 100**

Preamble

This course introduces the learners to plant molecular biology and genetic engineering and tissue culture techniques and its applications in Plant Biotechnology.

Course Outcomes (CO)

On successful completion of the course, the learners will be able to

CO1[K1]: recognize the molecular biology of plasmid and plant genome
CO2[K2]: interpret the genetically modified DNA and gene transfer method
CO3[K3]: utilize the application of genetically modified plants
CO4[K4]: compare the tissue culture using different growth hormones
CO5[K4]: inspect the tissue culture media and culturing of organs through micropropagation

CO-PO Mapping table (Course Articulation Matrix)

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1[K1]	1	-	-	1	-	-	-
CO2[K2]	2	2	3	1	-	-	-
CO3[K3]	1	3	2	1	1	2	1
CO4[K4]	2	2	2	1	-	-	-
CO5[K4]	2	3	3	1	1	1	1
Weightage of the course	08	10	10	05	02	03	02
Weighted percentage of Course contribution to POs	**1.29**	**2.07**	**2.91**	**1.60**	**1.25**	**1.48**	**1.49**

Based on the level of contribution ('3'-High, '2'-Medium, '1'-Low '-' No Correlation)

UNIT I **(6 hrs)**

Plant Tissue Culture: Introduction – History – Principles and importance of Plant Tissue Culture. Preparation of Plant tissue culture media – Types of media. Sterilization. Role of vitamins and hormones. Concept of Totipotency – Organogenesis – Embryogenesis (somatic and zygotic) – Cell Suspension culture – Organ culture – Embryo culture – Anther and Callus culture.

UNIT II **(6 hrs)**

Micropropagation: Methods and Application of micropropogation. Protoplast Culture – Somatic Hybridization – Somaclonal Variation – Conservation of Germplasm. Secondary metabolite production from the Culture Cells – Production of Synthetic Seeds.

UNIT III **(6 hrs)**

Plant Biotechnology: Introduction to Plant Biotechnology. Genetic transformation of Plants, chemical methods and direct gene transfer method by Electroporation – Microinjection – Microprojectile – Bombardment.

UNIT IV **(6 hrs)**

Plant Vectors: Plant Expression vectors, Plant Genomic DNA and RNA extraction, PCR and cloning into binary vectors. *Agrobacterium* mediated plant transformation - Ti plasmid.

UNIT V **(6 hrs)**

Transgenic Technology: Biosafety concerns with transgenic technology. Applications as Pest resistant (Bt-cotton) – herbicide resistant plants (Round Up Ready soybean) – Transgenic crops with improved quality traits in major crops (Flavr Savr tomato, Golden rice) –Improved horticultural varieties (Moondust carnations) – Role of transgenics in bioremediation (Superbug) – Edible Vaccines.

TEXTBOOKS

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