

# **VIVEKANANDA COLLEGE**

College with Potential for Excellence

(Residential & Autonomous – A Gurukula Institute of Life-Training)

(Affiliated to Madurai Kamaraj University)

Reaccredited with 'A' Grade (CGPA of 3.59 out of 4.00) by NAAC

**TIRUVEDAKAM WEST, MADURAI DISTRICT – 625 234**



## **DEPARTMENT OF BOTANY**

**Programme: B.Sc. BOTANY**

**(Under CBCS and Outcome Based Education)**

**(For those students admitted during the Academic year  
2018 – 19 and after)**



# VIVEKANANDA COLLEGE

Tiruvadakam West, Madurai District-625234, Tamil Nadu

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## DEPARTMENT OF BOTANY

(Outcome Based Education Curriculum Framework)

(For those students admitted during the Academic year 2018 – 19 and after)

### VISION

To meet the growing global needs by educating students to excel in botany with a human touch.

### MISSION

The mission is to give very good learning experience in understanding basics of botany and lab techniques with professional excellence and also produce academically proficient, professionally competent and socially responsible graduates in Botany.

### ABOUT THE PROGRAMME

Botany is the subset of biology that specifically focuses on plants which are correspondingly the reservoir of novel natural products. Many of the natural products that they produce are useful to humans. Besides foodstuff, plants are the resources for other human requirement like medicines, papers, furniture, fabrics, etc. Therefore the study of plants is very significant for sustainable life. The visionaries of the college are met with the requirements of this peculiar subject in the higher educational institutions. Thus evergreen Botany department has come into existence in Vivekananda College.

The Botany Department started in the year 1982 with UG & Allied Botany. Since the beginning of the course the faculty members are experts in the fields of Botany viz. Mycology, Herbal Botany, Biotechnology, Microbiology, Tissue culture, etc.

The under graduate programme of Botany was started in the year 1982 with allied botany. Nearly 30 to 40 students were studying every academic year. This programme includes (a) Part I Tamil & Sanskrit (which can be chosen by the interest of the students) and Part II English (b) Core courses include Elective and Allied (c) Skill based courses (d) Value Education (e) Environmental studies and (f) Non Major Elective also. No course shall carry more than 5 credits. The student shall select any one of the Choice-based credit courses have offered by the department through their interest on studies.

The programme contains 43 courses in six semesters. The total credit of the programme is 140. The programme contains 3 core elective courses, allied courses and skill based courses from the relevant subjects for complementing the core of study. There should be 4 common courses that include the first and second language besides an environmental study and an extension activities course.

In order to create job opportunities and entrepreneurs moreover smart soft skills to the students, two separate well equipped microbiology and tissue culture laboratories with sufficient chemicals and sophisticated instruments such as *Students microscope, Binocular microscope, Laminar Air Flow, tissue/bacterial Culture chambers, Autoclave, Environmental shaker with incubator, Hot air oven, Colorimeter, pH meter, Digital balance, Smart class rooms, etc.* The department has sound stock of herbarium and collection of digital resources

for teaching and learning process. The department library facilitates the students to locate their reference materials. Till date, the library has nearly **2220** books with national & international standard. The learners get opportunities such as field visits and industrial trips to enrich their knowledge and meet their urge in this competitive learning environment.

The department provides zoology and chemistry as allied subjects. Undergraduate students have Non Major Elective courses in their programme. Apart from the core curriculum, the department also offers a number of extra certificate courses such as Horticulture and Medicinal Botany, etc.

Under the shadow of Swamy Botanical Association (SBA), students meet, expert lectures and various other student development programmes has been benefitted for the students. Several experts from national/regional institutions have frequently visit and deliver lectures on inevitable topics in the emerging fields of Botany and interdisciplinary streams. SBA, an association of students, is also functioning with following objectives:

- To maintain Herbal and Ornamental garden in the College Campus
- To train the students to prepare herbal formulations
- To exhibit the details of all flora in college campus

Prof S. RAJARAM served the dept. as founder HOD for the longest term (35 years) and retired in the year 2013. Prof G.SENTHILKUMAR rendered his service as Associate Professor for nearly three decades and retired in the year 2014. Dr P.T. MANOHARAN had elected to Madurai Kamaraj University as Academic Council, Senate and Syndicate Member and worked as an Additional Controller of Examination in DDE, MKU, earned name and fame to our Department and to the institution. Both Dr P.T. MANOHARAN and Dr. N. LAKSHMANAN were recognized supervisors for guiding PhD scholars and retired in the year 2016 and 2019 respectively. Dr. V. RAMESH, received Summer Research Fellowship from Indian Academies of Sciences viz. INSA, IASc and NASI, received Lecture workshop grant worth of Rs.149,000/- from Indian Academies of Sciences viz. INSA, IASc and NASI, and Best Young Faculty Award by Novel Research Academy. Recently he has selected for Young Scientist Fellowship from TNSCST, Chennai during the academic year of 2019-2020. The faculty members are contributing to the academic field by editing journals & Books. They have been on the editorial boards and acted as referees in the academic journals.

### Programme Educational Objectives (PEOs)

Under graduates of B.Sc. Botany program will be

<b>PEO 1</b>	Know the core concepts in plant kingdom and impart quality education to meet the demands of higher education and research in botany.
<b>PEO 2</b>	To take part in the sustainable use of natural resources especially from plant origin.
<b>PEO 3</b>	Use their entrepreneurial skills with botanical knowledge to shine in their profession.
<b>PEO 4</b>	Develop a competitive edge among the students to meet out their carrier in research.
<b>PEO 5</b>	Exhibit proficiency in general laboratory practices and apply the same in plant science.

### Programme Outcomes (POs)

On completion (after three years) of B.Sc. Botany Programme, the students are expected to

<b>P. No.</b>	<b>Programme Outcome</b>	<b>Description</b>
<b>PO1</b>	Disciplinary Knowledge and Critical Thinking	Take informed actions after identifying the assumptions that frame our thinking and actions, checking out degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from perspectives.
<b>PO2</b>	Effective Communication and Digital Literacy	Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people , ideas, books, media and technology.
<b>PO3</b>	Social Interaction and Problem Solving	Elicit views of others, mediate disagreements and help reach conclusions in group settings.
<b>PO4</b>	Effective Citizenship and Social Responsibility	Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering and life training.
<b>PO5</b>	Professional Ethics and Human Values	Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
<b>PO6</b>	Environment and Sustainability	Understand the issues of environmental contexts and Sustainable development.
<b>PO7</b>	Self –directed and life – long learning	Acquire the ability to engage in independent and life – long learning in the broadest context socio- technological changes

### Programme Specific Outcomes (PSOs)

<b>PSO 1</b>	To provide the knowledge of plant diversity from primitive to advance.
<b>PSO 2</b>	To inculcate the importance of biodiversity conservation and its sustainable uses.
<b>PSO 3</b>	To highlight the potential of plant science to become an entrepreneur.
<b>PSO 4</b>	To kindle and create the interest of higher studies and research culture in plant science.
<b>PSO 5</b>	To facilitate the students for taking up and shaping a successful career in botany.

#### **GRADUATE ATTRIBUTES (GA)**

<b>No.</b>	<b>Attribute</b>	<b>Description</b>
<b>GA 1</b>	Scientific Knowledge	Apply the knowledge of mathematics, science, arts and humanities fundamentals to the solution of complex problems in the day-to-day life.
<b>GA 2</b>	Problem Analysis	Identify, formulate, research literature, and analyse complex problems reaching substantiated conclusions using first principles of mathematics, natural sciences and social sciences by using research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
<b>GA 3</b>	Problem Solving	Design solutions for complex problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
<b>GA 4</b>	Modern Tool Usage	Create, select, and apply appropriate techniques, resources, and modern economics theories including principles and modelling to complex economic activities with an understanding of the limitations.
<b>GA 5</b>	Graduate and society	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the social practice.
<b>GA 6</b>	Environment and sustainability	Understand the impact of the solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
<b>GA 7</b>	Ethics and Values	Apply ethical principles, commit to professional ethics, responsibilities and norms of the life through value oriented life training.
<b>GA 8</b>	Leadership Quality	Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.
<b>GA 9</b>	Communication	Communicate effectively on complex economic activities with the economics community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
<b>GA 10</b>	Project management	Demonstrate knowledge and understanding of the economics and management principles and apply these to one's own

	and Finance	work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
<b>GA 11</b>	Life Long Learning	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
<b>GA 12</b>	Entrepreneurial Skills	Create confidence to become an entrepreneur by providing entrepreneurial skills and technical skills.
<b>GA 13</b>	Harmonious Development of Individual	Make an individual as perfect man through the harmonious development of physical, emotional and intellectual cultures.

- CO and PO Mapping

Course Code	Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7
P1LT11	Ikkalak Kavithaiyum Urainadaiyum	45	27	15	-	-	-	36
P1LS11	Fundamental Grammar & History of Sanskrit Literature – I	39	33	33	45	45	-	39
P2LE11	General English – I	45	27	15	-	-	-	36
08CT11	Algae and Bryophytes	45	39	39	45	33	33	39
08CT12	Fungi and Plant Pathology	45	45	33	17	23	18	21
07ATB1	Allied Paper I : Chemistry for Biologist – I	15	5	5	5	5	21	15
P1LT21	Ikkalak Kadhai Ilakkiyamum Makkal Thagavaliyalum	45	27	25	33	27	09	45
P1LS21	Poetry, Grammar & History of Sanskrit Literature – II	33	39	39	45	33	1	45
P2LE21	General English – II	45	27	27	1	-	1	-
08CT21	Pteridophytes, Gymnosperms and Paleobotany	45	31	15	15	25	45	15
08CT22	Plant Anatomy and Microtechniques	45	39	39	19	17	11	13
08CP23	Core Practical – I	45	39	39	21	27	21	27
07ATB2	Chemistry for Biologist - II	15	5	5	5	5	21	15
07APB3	Volumetric Estimation	19	5	39	5	15	15	5
P1LT31	Kappiyamum Pakthi Ilakkiyamum Nadagamum	45	21	21	33	33	9	45
P1LS31	Prose, Poetics & History of Sanskrit Literature – III	39	39	45	39	33	1	27
P2LE31	English for Academic and Professional Excellence–I	39	39	39	22	27	1	27
08CT31	Biochemistry, Biophysics & Biometrics	45	15	37	55	39	31	33
08CT32	Genetics & Bioinformatics	45	33	45	33	21	15	11

09AT01	Allied Paper I : Animal Organization	45	7	30	21	33	33	15
P1LT41	Sanga Ilakkiyamum Neethi Ilakkiyamum	45	27	39	45	45	33	45
P1LS41	Drama and History of Sanskrit Literature – IV	45	33	6	15	45	33	6
P2LE41	English for Academic and Professional Excellence - II	45	27	39	22	22	6	15
08CT41	Cell Biology and Embryology	45	5	5	33	39	19	45
08CT42	Plant Ecology	27	33	27	33	45	45	15
08CP43	Core Practical – II	27	33	27	33	45	45	15
09AT02	Biology and Human Welfare	15	0	33	11	9	21	8
09AP03	Allied : Practical	8	0	9	5	13	27	11
08CT51	Taxonomy of Angiosperms & Economic Botany	45	39	15	45	27	45	15
08CT52	Plant Physiology	39	33	21	21	15	27	21
08CT53	Microbiology	45	5	37	45	45	31	33
08EP5A	Elective – I : Medicinal Botany	45	21	33	33	33	39	33
08EP5B	Elective – II: Organic farming	21	27	39	39	39	39	39
08CT61	Biotechnology	45	45	15	45	33	45	15
08CP62	Core Practical – III	45	39	39	45	33	33	39
08EP6C	Biodiversity Conservation and Management	9	9	9	9	3	9	3
08EP6D	Botanical Entrepreneurship	45	45	39	33	27	45	27

### ASSESSMENT (Pattern – CIA & ESE)

Distribution of questions and marks

Bloom's Taxonomy	Sessional Examinations				Summative Examinations			
	Part-A	Part-B	Part-C	Total	Part-A	Part-B	Part-C	Total
Knowledge	10 (10)			17 (50 marks converted in	10 (10)			20 (Total
Understand		4 (a or				5 (a or		75

		b) (20)		to 20 marks + Assignment 5 marks)		b) (35)		marks)
Apply			2 out of 3 (20)	<b>Total 25 marks)</b>			3 out of 5 (30)	

Note: figures in the parenthesis are marks

**SCHEME OF EXAMINATION  
FIRST SEMESTER**

Part	Study Component	Subject Code	Title of the Paper	Hours	Credit	CIA Marks	ESE Marks	Total
I	Tamil	P1LT11	Ikkalak Kavithaiyum Urainadaiyum	6	3	25	75	100



	Sanskrit	P1LS11	Fundamental Grammar & History of Sanskrit Literature – I					
II	English	P2LE11	General English – I	6	3	25	75	100
III	Core	08CT11	Algae and Bryophytes	4	4	25	75	100
	Core	08CT12	Fungi and Plant Pathology	4	4	25	75	100
	Core	08CP23	Core Practical – I	2	-	-	-	-
	Allied	07ATB1	Allied Paper I : Chemistry for Biologist – I	4	4	25	75	100
	Allied		Allied: Volumetric Estimation	2	-	-	-	-
IV	Non Major	08NE11	Non Major Elective Paper I : Energy Resources	2	2	25	75	100
			<b>TOTAL</b>	<b>30</b>	<b>20</b>			

### SECOND SEMESTER

Part	Study Component	Subject Code	Title of the Paper	Hrs	Crd.	CIA Marks	ESE Marks	Total
I	Tamil	P1LT21	Ikkalak Kadhai Ilakkiyamum Makkal Thagavaliyalum	6	3	25	75	100
	Sanskrit	P1LS21	Poetry, Grammar & History of Sanskrit Literature – II					
II	English	P2LE21	General English – II	6	3	25	75	100
III	Core	08CT21	Pteridophytes, Gymnosperms and Paleobotany	4	4	25	75	100
	Core	08CT22	Plant Anatomy and Microtechniques	4	4	25	75	100
	Core	08CP23	Core Practical – I	2	4	40	60	100
	Allied	07ATB2	Chemistry for Biologist - II	4	4	25	75	100
	Allied	07APB3	Volumetric Estimation	2	2	40	60	100
IV	Non Major	08NE21	Non Major Elective Paper II : Gardening	2	2	25	75	100
			<b>TOTAL</b>	<b>30</b>	<b>26</b>			

### THIRD SEMESTER

Part	Study Component	Subject Code	Title of the Paper	Hours	Credit	CIA Marks	ESE Marks	Total
I	Tamil	P1LT31	Kappiyamum Pakthi Ilakkiyamum Nadagamum	6	3	25	75	100

I	Sanskrit	P1LS31	Prose, Poetics & History of Sanskrit Literature – III					
II	English	P2LE31	English for Academic and Professional Excellence–I	6	3	25	75	100
III	Core	08CT31	Biochemistry, Biophysics & Biometrics	4	4	25	75	100
	Core	08CT32	Genetics & Bioinformatics	4	4	25	75	100
	Core	08CP43	Core Practical – II	2	-	-	-	-
	Allied	09AT01	Allied Paper I : Animal Organization	4	4	25	75	100
	Allied		Allied: Practical	2	-	-	-	-
IV	Skill Based	08SB31	Skill Based Paper I: Bioinstrumentation	2	2	25	75	100
			<b>TOTAL</b>	<b>30</b>	<b>20</b>			

#### FOURTH SEMESTER

Part	Study Component	Subject Code	Title of the Paper	Hrs	Crd.	CIA Marks	ESE Marks	Total
I	Tamil	P1LT41	Sanga Ilakkiyamum Neethi Ilakkiyamum	6	3	25	75	100
	Sanskrit	P1LS41	Drama and History of Sanskrit Literature – IV					
II	English	P2LE41	English for Academic and Professional Excellence - II	6	3	25	75	100
III	Core	08CT41	Cell Biology and Embryology	4	4	25	75	100
	Core	08CT42	Plant Ecology	4	4	25	75	100
	Core	08CP43	Core Practical – II	2	4	40	60	100
	Allied	09AT02	Biology and Human Welfare	4	4	25	75	100
	Allied	09AP03	Allied : Practical	2	2	40	60	100
IV	Skill Based	08SB41	Skill Based Paper II: Horticulture	2	2	25	75	100
			<b>TOTAL</b>	<b>30</b>	<b>26</b>			

#### FIFTH SEMESTER

Part	Study Component	Course Code	Title of the Paper	Hours	Credit	CIA Marks	ESE Marks	Total
III	Core	08CT51	Taxonomy of Angiosperms	6	4	25	75	100

			& Economic Botany					
	Core	08CT52	Plant Physiology	5	4	25	75	100
	Core	08CT53	Microbiology	6	4	25	75	100
	Core	08CP62	Core Practical – III	4	-	-	-	-
	Elective	08EP5A	Elective – I : Medicinal Botany	5	5	25	75	100
		08EP5B	Elective – II: Organic farming					
IV	Skill Based	08SB51	Skill Based Course – III : Mushroom Cultivation	2	2	25	75	100
	ES	ESUG51	Environmental Studies	2	2	25	75	100
			<b>TOTAL</b>	<b>30</b>	<b>21</b>			

### SIXTH SEMESTER

Part	Study Component	Course Code	Course Title	Hrs	Credit	CIA Marks	ESE Marks	Total
III	Core	08CT61	Biotechnology	6	4	25	75	100
	Core	08CP62	Core Practical – III	6	4	40	60	100
	Elective	08EP6A	Tissue Culture	5	5	25	75	100
		08EP6B	Seed Science and Technology					
	Elective	08EP6C	Biodiversity Conservation and Management	5	5	25	75	100
		08EP6D	Botanical Entrepreneurship					
IV	Skill Based	08SB61	Plant Breeding	2	2	25	75	100
	Skill Based	08SB62	Remote Sensing and GIS	2	2	25	75	100
	Skill Based	08SB63	Nanobiology	2	2	25	75	100
	VE	VEUG61	Value Education	2	2	25	75	100
V	EA	EAUG61	Extension Activities		1	25	75	100
			<b>TOTAL</b>	<b>30</b>	<b>27</b>			
			<b>TOTAL</b>		<b>140</b>			

Note: Practical Examinations – 08CP23- 4Hrs; 08CP43 - 4Hrs ; 08CP62- 4Hrs; 08AP03-

**தமிழ்த்துறை,**  
**விவேகானந்த கல்லூரி, திருவேடகம் மேற்கு - 625 234.**  
 Programme : B.A., BSc., (CBCS and Outcome Based Education (OBE)  
 (For those students admitted during the Academic Year 2018 – 2021 and after)  
**பாடத்திட்டத்தின் கட்டமைப்பு** (PROGRAMME STRUCTURE)

UG Language PART – I TAMIL		SEMESTER : I
Subject Title : இக்காலக் கவிதையும் உரைநடையும்		
Course Code :P1LT11	Hours per week : 18	Credit : 03
CIA Marks : 25	ESE Marks : 75	Total Marks : 100

#### முன்னுரை(Preamble)

1. மரபின் பழம்பெருமையினை உணர்தல்.
2. புதுக்கவிஞர்களின் படைப்பாக்கங்கள் வழி பொருள், கட்டமைப்பு அறிவித்தல்.
3. தன் மனித ஒழுக்கம் கடைபிடித்தல்.
4. தமிழ் எழுத்துக்களின் வகைமைகளை அறிதல்.
5. தமிழிலக்கியத்தின் மரபு மற்றும் புதுக்கவிதையின் வரலாற்றினை அறிவித்தல்.

#### பாடத்திட்டத்தின் முடிவுகள்(Course Outcomes (COs))

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

NO.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	உரைநடை இலக்கியத்தின் வாயிலாகவும், மரபுக்கவிதை - புதுக்கவிதையின் வாயிலாகவும் தன் மனித மற்றும் சமூக ஒழுக்கங்கள் குறித்து வரையறை செய்தல்.	K <sub>1</sub> , K <sub>2</sub>
CO 2	உயிர் எழுத்துக்கள், மெய்யெழுத்துக்கள், உயிர்மெய்யெழுத்துக்கள், சார்பெழுத்துக்கள் ஆகியன குறித்தும் அவற்றை எழுதும் விதங்கள் குறித்தும் வகைப்படுத்தும் திறன் அறிதல்.	K <sub>2</sub> , K <sub>3</sub>
CO 3	மரபுக்கவிதை வாயிலாக படைப்பாளர்களின் காலகட்டத்தையும், படைப்பின் வழியாக அக்காலகட்ட மக்களின் வாழ்க்கை நகழ்வுகளின் வரலாற்றினையும் விவரித்தல்.	K <sub>2</sub> , K <sub>3</sub>
CO 4	தாய் மொழியின் சிறப்பு, பொதுவுடைமை சிந்தனை, அறியாமை நீக்கல், உண்மைத்துறவு நிலை குறித்த சமூக நிலைகளை கலந்துரையாடுதல்	K <sub>2</sub>
CO 5	மொழியினைப் பிழையின்றி எழுதுதல் -பேசுதல், ஒலி வேறுபாட்டினை அறிந்து மயக்கம் நீக்குதல் போன்ற ஒரு மொழியின் பயன்பாட்டுத் தன்மையைத் தெளிவுறுத்தல்.	K <sub>1</sub> , K <sub>2</sub> , K <sub>3</sub>

K<sub>1</sub>-Knowledge

K<sub>2</sub>-Understand

K<sub>3</sub>-Apply

#### பாடத்திட்டம் (Syllabus)

அலகு : 1	தமிழ்ச்செய்யுள் : மரபுக்கவிதைகள்	18மணிநேரம்
	1.பாரதியார் கவிதைகள் 1. தமிழ் (நான்கு பத்தி) 2. நடிப்புச் சுவைகள் 2. பாரதிதாசன் கவிதைகள் 1. நீங்களே சொல்லுங்கள் 2. புதியதோர் உலகம் செய்வோம் 3. நாமக்கல் கவிஞர் வெ.இராமலிங்கம் பிள்ளை	

	<p>1.குருதேவர் இராமக்ருஷ்ணர் (3 பாடல்கள்)</p> <p>4. கவிமணி தேசிய விநாயகம் பிள்ளை</p> <p>1.கோவில் வழிபாடு</p> <p>5. அரசஞ்சண்முகனார்</p> <p>1.மதுரை ஸ்ரீமீனாட்சியம்மைத் திருவடிப்பத்து (முதல் ஐந்து பாடல்கள்)</p>	
அலகு : 2	<p>தமிழ்ச்செய்யுள் : புதுக்கவிதைகள்</p> <p>6. அன்னை - கவிஞர் கண்ணதாசன்</p> <p>7. கழக்கு விழக்கும் நேரம் - கவிஞர் வைரமுத்து (கொடிமரத்தின் வேர்கள்)</p> <p>8. அவர்கள் வருகிறார்கள் - மு.மேத்தா (சுதந்திர தாகம்)</p> <p>9. புதுக்கவிதைகள் - க.நா.சுப்ரமணியம் (கவிதை)</p> <p>10. நாம் இருக்கும் நாடு - தமிழன்பன் (வாக்கு வரம் தரும் தெய்வம்)</p> <p>11. தீர்த்தக்கரையினிலே - முருகு சுந்தரம் (ஒன்பெருக்கி)</p> <p>12. ஹைக்கூ பூக்கள் - க.ராமச்சந்திரன்</p>	18மணிநேரம்
அலகு : 3	<p>தமிழ் உரைநடை இலக்கியம்</p> <p>சுவாமி சத்பவானந்தரின் சிந்தனைகள்</p>	18மணிநேரம்
அலகு : 4	<p>தமிழ் இலக்கணம் - எழுத்து</p> <p>1. முதல் எழுத்துக்கள்,சார் பெழுத்துக்கள்</p> <p>2. மொழி முதல் எழுத்துக்கள்,மொழி இறுதி எழுத்துக்கள்</p> <p>3. வல்லெழுத்து மீறும் இடங்கள்,வல்லெழுத்து மீறா இடங்கள்</p>	18மணிநேரம்
அலகு : 5	<p>தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத் தமிழும்</p> <p>அ) 1.புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்</p> <p>2.மரபுக்கவிதையின்தோற்றமும் வளர்ச்சியும்</p> <p>ஆ) மரபுப்பிறை நீக்குதல் - பிறமொழிச் சொற்களை நீக்குதல் - பிழையற்ற தொடரைத் தேர்ந்தெடுத்தல் - ஒருமை பன்மை மயக்கம் - ஓர் எழுத்து ஒரு மொழிக்குரிய பொருள் - ஒலி வேறுபாடுகளும் பொருள் வேறுபாடுகளும் - பொருத்தமான பொருள் - பொருத்தமான தொடர் அறிதல்.</p>	18மணிநேரம்

### Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	9	3	3	9	3	1	9
CO2	9	3	9	3	3	1	9
CO3	9	3	9	9	9	3	9
CO4	3	9	3	9	9	-	9
CO5	9	3	3	3	3	-	9
	39	21	27	33	27	03	45

### பாட நூல்கள்\* (Text books)

1. தமிழ்ச் செய்யுள் தொகுப்பு (தமிழ்த்துறை வெளியீடு)
2. சுவாமி சத்பவானந்தரின் சிந்தனைகள் (தமிழ்த்துறை வெளியீடு)

### பார்வை நூல்கள் (Reference Books)

1. தமிழ் இலக்கிய வரலாறு - பேரா.முனைவர் பாசியமேர், நியூ செஞ்சுரி புக் ஹவுஸ்(பி)லிட்.,

41-பி, சீட்கோ இண்டஸ்ட்ரியல் எஸ்டேட்,

அம்பத்தூர், சென்னை- 600 098.

2. தமிழ் இலக்கிய வரலாறு- மு.வரதராசனார்  
சாகித்திய அகாடமி,  
தலைமை அலுவலகம், ரவீந்திர பவன்,  
35, பெரோஸ்ஷா சாலை, புதுதில்.

### கற்பிக்கும் முறைகள்(Pedagogy)

விரிவுரை கொடுத்தல், கலந்துரையாடல், காட்சிப் பதிவுகளின் வழியாக  
புலப்படுத்துதல்.

### கற்பிக்க உதவுதல் (Teaching Aids)

கரும்பலகை பயன்படுத்துதல், காட்சி திரைவழியாகப் புலப்படுத்துதல்.

### Course Contents and Lecture Schedule

Module No.	TITLE	No. of Lectures	Content Delivery Method	Teaching Aids
<b>அலகு : 1 தமிழ்ச் செய்யுள் : மரபுக்கவிதைகள்(18மணிநேரம்)</b>				
1.	பாரதியார் கவிதைகள் தமிழ் (நான்கு பத்தி), நடிப்புச் சுதேசிகள்	5	விரிவுரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல், காட்சித் திரை வழியாக புலப்படுத்துதல்.
2.	பாரத்தாசன் கவிதைகள் நடிப்புச் சுதேசிகள், புதியதோர் உலகம் செய்வோம்.	4	விரிவுரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல், காட்சித் திரை வழியாக புலப்படுத்துதல்.
3.	நாமக்கல் கவிஞர் வெ.இராமலிங்கம் குருதேவர் இராமகிருஷ்ணர் (3 பாடல்கள்)	3	விரிவுரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல், காட்சித் திரை வழியாக புலப்படுத்துதல்.
4.	கவிமணி தேசிக விநாயகம் கோவில் வழிபாடு	3	விரிவுரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல்.
5.	அரசஞ்சண்முகனார் மதுரை ஸ்ரீமீனாட்சியம்மைத் திருவடிப்பத்து (முதல் ஐந்து பாடல்கள்)	3	விரிவுரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல்.
<b>அலகு : 2தமிழ்ச்செய்யுள் : புதுக்கவிதைகள் (18 மணிநேரம்)</b>				
6.	அன்னை - கவிஞர் கண்ணதாசன்	3	விரிவுரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல், காட்சித் திரை வழியாக புலப்படுத்துதல்.

7.	கீழ்க்கு விழக்கும் நேரம் (கொடிமரத்தின் வேர்கள்) - கவிஞர் வைரமுத்து	3	வீரவரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல், காட்சித் தரை வழியாக புலப்படுத்துதல்
8.	அவர்கள் வருகிறார்கள் (சுதந்திர தாகம்) - மு.மேத்தா	3	வீரவரைகொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல்.
9.	புதுக்கவிதைகள் (கவிதை) - க.நா.சுப்ரமணியம்	2	வீரவரைகொடுத்தல், கவிதை எழுத பயிற்றுவித்தல்.	கரும்பலகை பயன்படுத்துதல்.
10.	நாம் இருக்கும் நாடு (வாக்கு வரம் தரும் தெய்வம்) - தமிழன்பன்	2	வீரவரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல்.
11.	தீர்த்தக்கரையினிலே (ஒப்பெருக்கி) - முருகு சுந்தரம்	3	வீரவரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல்.
12.	வெறக்க கவிதைகள் - க.ரா.மச்சந்திரன்	2	வீரவரைகொடுத்தல், கவிதை எழுத பயிற்றுவித்தல்.	கரும்பலகை பயன்படுத்துதல்.
<b>அலகு : 3 தமிழ் உரைநடை இலக்கியம் (18 மணிநேரம்)</b>				
3.1	சுவாமி சித்பவானந்தரின் சிந்தனைகள்	18	வீரவரைகொடுத்தல், நன்னெறிக் கதைகள் மாணவர்கள் கூறக்கேட்டல்.	கரும்பலகை பயன்படுத்துதல்.
<b>அலகு : 4தமிழ் இலக்கணம் - எழுத்து(18 மணிநேரம்)</b>				
4.1	முதல் எழுத்துக்கள், சார்பெழுத்துக்கள்	6	வீரவரை கொடுத்தல்	கரும்பலகை பயன்படுத்துதல்.
4.2	மொழி முதல் எழுத்துக்கள், மொழி இறுதி எழுத்துக்கள்	6	வீரவரைகொடுத்தல், பயிற்சிகொடுத்தல் .	கரும்பலகை பயன்படுத்துதல், காட்சித் தரை வழியாக புலப்படுத்துதல்.
4.3	வல்லெழுத்து மீறும் இடங்கள், வல்லெழுத்து மீறா இடங்கள்	6	வீரவரைகொடுத்தல், பயிற்சிகொடுத்தல் .	கரும்பலகை பயன்படுத்துதல், காட்சித் தரை வழியாக புலப்படுத்துதல்.
<b>அலகு : 5தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத் தமிழும் (18மணிநேரம்)</b>				
5.1	அ) 1. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும் 2.மரபுக்கவிதையின் தோற்றமும் வளர்ச்சியும் - மரபு, புதுமை வேறுபாடு உணர்த்தல்	9	வீரவரைகொடுத்தல்	கரும்பலகை பயன்படுத்துதல்

5.2	ஆ) மரபுப்பிழை நீக்குதல் - பிறமொழிச் சொற்களை நீக்குதல் - பிழையற்ற தொடரைத் தேர்ந்தெடுத்தல் - ஒருமை பன்மை மயக்கம் - ஓர் எழுத்து ஒரு மொழிக்குரிய பொருள் - ஒன் வேறுபாடுகளும் பொருள் வேறுபாடுகளும் - பொருத்தமான பொருள் - பொருத்தமான தொடர் அறிதல்.	9	விரிவுரைகொடுத்த ல், பயிற்சி கொடுத்தல்.	கரும்பலகை பயன்படுத்துதல்,
	Total	90		

Course Designer  
(Name of the Course Teacher)

Head of the Department

முனைவர் கோ.பாலமுருகன்  
(உதவிப்பேராசிரியர்)

முனைவர் வ.க.ராமகிருஷ்ணன்  
(இணைப்பேராசிரியர்)

### DEPARTMENT SANSKRIT

Programme: B.A./ B.Sc. (CBCS and OBE)

(For those students admitted during the Academic Year 2018-19 and after)

PART – I : Sanskrit		SEMESTER - I
Course Title : FUNDAMENTAL GRAMMAR AND HISTORY OF SANSKRIT LITERATURE –I		
Course Code: PILS11	Hours per week: 6	Credits: 3
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

#### Preamble:

Sanskrit is offered as an alternative language under Part –I for B.A./ B.Sc. students during first four semesters the above column explains the scheme of the I semester.

#### Course Outcomes (COs)

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

Number	Statement	Knowledge Level
CO 1	Identifying Devanāgarī script, Describe modern literature and Illustrate	K1, K2
CO 2	Discriminate spirituality in Literature	K2
CO 3	Classify and discuss traditional names of Divine beings to animals in the world	K2
CO 4	Describe and defend history of early Sanskrit literature	K2
CO 5	Practice Creativity and Demonstrate various culture of world	K2, K3

K1-Knowledge

K2-Understand

K3-Apply

#### Syllabus

**Unit 1:** Introduction to Sanskrit script, Verbs, nouns and Pronouns. Introduction: Definitions and Scope of



Sanskrit. – Sanskrit (Devanāgarī) scripts. Formation of verbs and nouns. Characteristics of pronoun.

**Unit 2:** Introduction to History of early (vedic) Sanskrit literature. Classification of Vedas. Content of Vedas. Moral values inculcated through Vedas.

**Unit 3:** Introduction to Purāṇa literature. Origin of Purāṇa literature. Classification of Purāṇa. Mahāpurāṇa and Upapurāṇa. moral, social, environmental values inculcated through Purāṇas.

**Unit 4:** Introduction to Kāvya (poetry) literature. Definition of Kāvya. Types of Kāvya. Characteristics of Mahākāvya. Description of moral, social, environmental values inculcated through Kāvya

**Unit 5:** Introduction to Translation. Strategies adopted in translation. Translating Sanskrit verses into English. Translating English sentences into Sanskrit. Introducing International Phonetic code (IPC). Transliteration from Sanskrit (Devanāgarī) script to IPC. Transliterating from IPC to Sanskrit (Devanāgarī) script.

#### Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO 6	PO 7
CO1	9	9	3	9	9	-	9
CO2	3	3	9	9	9	-	9
CO3	9	3	9	9	9	-	3
CO4	9	9	9	9	9	-	9
CO5	9	9	3	9	9	-	9
	39	33	33	45	45	-	39

Strong -9 Medium -3 Low -1

#### Text Book(s)

Sāhityarasakāṇa, compiled by Dr. S. Jagadisan, Published by AMG Publications, Madurai -625010. Year of publication 1996.

A History of Sanskrit Literature, compiled by Dr. S. Jagadisan, Published by AMG Publications, Madurai

-625010. Year of publication 1996.

#### Reference Books

A Short History of Sanskrit Literature, by T.K. Ramachandra Aiyar, published by R.S. Vadhyar & Sons, Kalpathi, Palakkad -678003

A History of Sanskrit Literature, by A. Berriedale Keith, published by Mothilal Banarsidass Publishers Private Limited, Delhi, 2017.

#### Pedagogy

Chalk & Talk, Group Discussion, PPT

#### Teaching Aids

Green Board, LCD Projector, Interactive White Board

**Part -II English (CBCS-OBS) - SEMESTER I**  
(For those who join in June 2018 and after)

<b>PART II – Paper I</b>		
Subject Title : <b>General English - I</b>		
Subject Code: P2LE11/P2CE11	Hours per week: <b>6</b>	Credit: <b>3</b>
Formative Marks: <b>25</b>	Summative Marks: <b>75</b>	Total Marks: <b>100</b>

Total number of hours per semester: **75 Hrs**

**PREAMBLE**

To strength the basic English Grammar knowledge in order to utilize it for effective communication

**COURSEOBJECTIVES**

1. To acquire Basics of English Grammar for Communication
2. To form sentences with the help of Basic Grammar Knowledge
3. To familiarize with Tenses and their usages to form sentences
4. To understand Active & Passive Voices and Degrees of Comparison for effective communication
5. To frame different types of sentences and use it in communication

**Course Outcomes**

<b>No.</b>	<b>Course Outcomes</b>	<b>Knowledge Level (Bloom's Taxonomy)</b>
<b>CO 1</b>	Acquisition of Basics of English Grammar for Communication	K1
<b>CO 2</b>	Formation of Sentences with the help of Basis Grammar Knowledge	K3
<b>CO 3</b>	Familiarization of Tenses and their usages to form sentences	K3
<b>CO 4</b>	Understanding of Active & Passive Voices and Degrees of Comparison for effective communication	K2
<b>CO 5</b>	Ability to frame different types of sentences and use it in communication	K3

**K1**-knowledge

**K2**-Understand

**K3**-Apply

**Mapping of CO with PO**

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	9	3	3	-	-	-	9
CO2	9	3	3	-	-	-	9
CO3	9	3	3	-	-	-	9
CO4	9	9	3	-	-	-	9

CO5	9	9	3	-	-	-	9
	45	27	15	-	-	-	36

**STRONG-9**

**MEDIUM-3**

**LOW-1**

**UNIT 1: (15 Hours)**

- Noun, Proper Noun, Common Noun, Collective Noun, Material Noun, and Abstract Noun.
- Pronoun, First Person, Second Person, Third Person, Pronouns, Reflexive Personal Pronouns.
- Adjectives
- Number (Singular and Plural)
- Gender (Masculine, Feminine, Common and Neuter)
- Verb (Weak and Strong), Present/Past/Past Participle of Strong Verbs, Main verbs, Auxiliary Verbs
- Adverb of Time/Place/Manner

**UNIT 2: (15 Hours)**

- Articles
- Preposition
- Interjection
- Formation of Noun from Verbs, Adverb Formation
- Sentence Formation
- Formation of Sentences using Auxiliary Verbs

**UNIT 3: (15 Hours)**

- Tense
- Affirmative/Negative/Interrogative/Exclamatory Sentences
- Positive/Negative Sentence Formation
- Yes or No type and Information Question

**UNIT 4: (15 Hours)**

- Infinitive
- Conjunction
- Modal Auxiliaries
- Passive Voice
- Positive, Comparative and Superlative Degrees

**UNIT 5: (15 Hours)**

- Direct to Indirect Speech
- Idioms and Phrases
- Simple, Compound and Complex Sentences
- Agreement of Verb with the Subject

Text Book:

In-house Text book prepared by Department of English in consultation with experts.

Reference Books:

1. Swan, Michael. Practical English Usage, 4<sup>th</sup> Edition.OUP, 2018.
2. Quirk, Randolph. A Comprehensive Grammar of the English Language, Pearson, 2017.
3. Murthy, JD. Contemporary English Grammar for Scholars and Students.16<sup>th</sup> Edition.Book Palace, NewDelhi, 2013.
4. Karal, Rajeevan. English Grammar Just for You. OUP,2016.
5. Jospeh KV, English Grammar and Usage, McGraw Hill Education, 2<sup>nd</sup> Edition,2010.

### DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

PART – III : Core Theory		SEMESTER - I
Course Title: Algae and Bryophytes		
Course Code: 08CT11	Hours per week:4	Credit:4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

#### Preamble

- ❖ To acquire the basic knowledge of primitive plants kingdom, evolution plant kingdom and importance of algae and bryophytes

#### Course Outcomes (COs)

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

Number	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO1	Explain the general Characteristics and Classification based on Fritsch Class level only, and Economic aspects of importance of Algae	K1/K3
CO2	Discuss the importance of algae family Structure and reproduction	K2
CO3	Structure and reproduction of Algae	K2
CO4	Define the basic concepts and classification of Bryophytes based on Smith – Structure and reproduction	K1
CO5	Structure and reproduction of Musci - <i>Funaria</i>	K2

**K1**-knowledge

**K2**-Understand

**K3**-Apply

#### Mapping of CO with PO

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO 1	9	9	3	3	3	9	3

<b>CO 2</b>	9	9	3	3	9	9	3
<b>CO 3</b>	9	9	3	3	9	9	3
<b>CO 4</b>	9	1	1	3	3	9	3
<b>CO 5</b>	9	3	3	3	1	9	3
	45	31	13	15	25	45	15

**9-Strong**

**3-Medium**

**1-Low**

#### Mapping of CO with PSO

	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>
<b>CO 1</b>	9	9	9	9	9
<b>CO 2</b>	9	9	9	9	9
<b>CO 3</b>	9	9	9	9	9
<b>CO 4</b>	9	9	3	3	3
<b>CO 5</b>	9	9	3	3	3

**9-Strong**

**3-Medium**

**1-Low**

#### Syllabus

<b>Unit-I</b>	General Characteristics and Classification based on Fritsch (Class level only), Economic importance of Algae – Beneficial - Agriculture, Environment, Medicine and Industries	<b>12hrs</b>
<b>Unit- II</b>	Structure and reproduction of a. Chlorophyceae - <i>Oedogonium</i> b. Xanthophyceae - <i>Vaucheria</i> c. Bacillariophyceae - <i>Diatoms</i>	<b>12hrs</b>
<b>Unit- III</b>	Structure and reproduction of the following a. Phaeophyceae - <i>Sargassum</i> , b. Rhodophyceae - <i>Polysiphonia</i> , c. Cyanophyceae – <i>Nostoc</i>	<b>12hrs</b>
<b>Unit-IV</b>	Classification of Bryophytes based on Smith – Structure and reproduction of Hepaticae - <i>Marchantia</i> and <i>Anthoceros</i>	<b>12hrs</b>
<b>Unit- V</b>	Structure and reproduction of Musci - <i>Funaria</i>	<b>12hrs</b>

#### Text Books

1. Botany for Degree Students Algae – P.C. Vashishta, S.Chand& Company Ltd, Delhi, 2014 Ed.
2. Text Book of Botany – V. Singh, Rastogi Publications, Meerut, 2013 Ed.
3. Botany for Degree Students Bryophytes - P.C. Vashishta, S.Chand& Company Ltd, Delhi, 2014 Ed.

#### Reference Books

1. The structure and reproduction of Algae Vol. I & II - F.E.Fritsch, Cambridge University Press.
2. College Botany – Ganfule Hirendra (Chandra) Vol. I, New centre book agency, London, 2013 Ed.
3. An introduction to Embryophyta –Bryophytes - N.S. Parihar, Surjeet Publications, Delhi, 2014 Ed.

#### Pedagogy

Chalk & Talk, Group Discussion, PPT

**Teaching Aids**

Green Board, LCD Projector, Interactive White Board

**Course Content and Lecture Schedule**

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
<b>Unit -1</b>				
1.0	Introduction classical botany	1	Discussion	Green Board
1.1	General Characteristics of classification	1	Lecture	Green Board
1.2	About classification in biology	1	Lecture	Green Board
1.3	Binomial names	1	Discussion	Green Board
1.4	Algal classification	1	Lecture	Green Board
1.5	Fritsch classification	2	Chalk & Talk	Green Board
1.6	Economic importance of Algae	2	Chalk & Talk	Green Board
1.7	Beneficial - Agriculture, Environment, Medicine and Industries	3	Discussion	LCD
<b>Unit -2</b>				
2.0	General structure and reproduction of algae	1	Lecture	
2.1	About family of Chlorophyceae	1	Chalk & Talk	Green Board
2.2	Structure and reproduction of <i>Oedogonium</i>	3	Chalk & Talk	Green Board
2.3	About family of Xanthophyceae	1	Chalk & Talk	Green Board
2.4	Structure and reproduction of <i>Vaucheria</i>	3	Chalk & Talk	Green Board
2.5	About family of Bacillariophyceae	1	Chalk & Talk	Green Board
2.6	Structure and reproduction of <i>Diatoms</i>	3	Chalk & Talk	Green Board
<b>Unit -3</b>				
3.0	Introduce the family about Phaeophyceae	1	Chalk & Talk	Green Board
3.1	Structure and reproduction of <i>Sargassum</i>	3	Discussion	
3.2	About family of Rhodophyceae	1	PPT	LCD
3.3	Structure and reproduction of <i>Polysiphonia</i>	3	Chalk & Talk	Green Board
3.4	About family of Cyanaophyceae	1	Chalk & Talk	Green Board
3.5	Structure and reproduction of <i>Nostoc</i>	3	Chalk & Talk	Green Board

Unit -4				
4.0	Classification of Bryophytes	1	Discussion	
4.1	Discuss about Smith classification	2	Chalk & Talk	Green Board
4.2	Introduce the Hepaticae (Liverworts)	1	Chalk & Talk	Green Board
4.3	Structure and reproduction of <i>Marchantia</i>	2	Chalk & Talk	Green Board
4.4	Alternation generation of <i>Marchantia</i>	2		
4.5	Structure and reproduction of <i>Anthoceros</i>	2	Lecture	
4.6	Life cycle of <i>Anthoceros</i>	2		
Unit -5				
5.0	Structure and reproduction of Musci (moss)	1	Lecture	
5.1	Habit of <i>Funaria</i>	2	Chalk & Talk	Green Board
5.2	Vegetative structure of <i>Funaria</i>	3	Chalk & Talk	Green Board
5.3	Reproductive structure of - <i>Funaria</i>	3	Chalk & Talk	Green Board
5.4	Life cycle of - <i>Funaria</i>	3	Chalk & Talk	Green Board
	<b>Total</b>	<b>60</b>		

Course Designer (Name of the Course Teacher)	Head of the Department
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**Dr. T. SELLATHURAI**

**Dr. N. LAXMANAN**

### DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)

(For those students admitted during the 2018 -19 and after)

PART – III : Core Theory		SEMESTER - I
Course Title: Fungi and Plant Pathology		
Course Code: 08CT12	Hours per week:4	Credit:4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

#### Preamble

- ❖ To acquire the basic knowledge about primitive plants kingdom
- ❖ To understand the symptomology of diseases there by gaining knowledge on prevention of diseases
- ❖ To recognize the beneficial and harmful fungi for human life

#### Course Outcomes (CO)

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Classify the Fungi and know its economic importance	K, K2 & K3
CO 2	Knowledge about the fungi based on structure and reproduction	K1, K2
CO 3	Understand the fungal structure and reproduction	K1, K2
CO 4	Distinguish the Lichens and understand their economic importance	K1, K2 & K3
CO 5	Identify various plant pathogenesis (Virus, Bacteria, Fungi and Mycoplasma) and apply their control measures.	K2 & K3

K1-Knowledge

K2-Understand

K3-Apply

#### Mapping of CO with PO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CO 1	9	9	9	9	3	6	9



CO 2	9	9	3	1	9	3	1
CO 3	9	9	9	3	1	3	1
CO 4	9	9	3	1	9	3	1
CO 5	9	9	9	3	1	3	9
	45	45	33	17	23	18	21

9-Strong

3-Medium

1-Low

### CO-PSO Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	3	9	9	9
CO2	9	3	9	9	9
CO3	9	9	3	3	9
CO4	9	9	3	9	3
CO5	9	3	9	3	9

9-Strong

3-Medium

1-Low

### Syllabus

UNIT No.	CONTENT	HOURS
<b>FUNGI</b>		
<b>UNIT I</b>	Classification of Fungi based on Alexopoulos and Mims – Economic importance of Fungi – Beneficial aspects (Industries, Pharmaceuticals, Agriculture, Genetical Studies) – Harmfulness (Plant diseases, Human Diseases, Food Spoilages)	<b>12</b>
<b>UNIT II</b>	Structure and reproduction of the following: a. Myxomycetes : <i>Stemonitis</i> b. Oomycetes : <i>Albugo</i> c. Ascomycetes : <i>Penicillium</i>	<b>12</b>
<b>UNIT III</b>	Structure and Reproduction of the following: a. Basidiomycetes : <i>Puccinia</i> and <i>Agaricus</i> b. Deuteromycetes : <i>Cercospora</i>	<b>12</b>
<b>UNIT IV</b>	General Characteristics, Structure & Reproduction of Lichens – Crustose, Foliose & Fruticose, Economic importance of Lichens	<b>12</b>
<b>PLANT PATHOLOGY</b>		
<b>UNIT V</b>	Symptoms, causes and control of the following diseases a. Viral disease : Bunchy top of Banana b. Bacterial disease : Citrus Canker c. Fungal disease : Blast disease in Rice d. Mycoplasma : Little leaf of Brinjal	<b>12</b>

### Text Books

1. Fungi - B.R. Vashista, S.Chand & Company Ltd, Delhi, 2014 Ed.
2. Botany for Degree Students Fungi - P.C. Vashishta, S.Chand & Company Ltd, Delhi, 2014 Ed.
3. Plant pathology - B.P. Pandey, Chand & Company Ltd, Delhi, 2014 Ed.

### Reference Books

1. Introduction to Mycology - C.J.Alexopoulos, Willey Eastern Pvt. Ltd, 2013 Ed.
2. Microbiology - L.M.Prescott, J.P.Harley, D.A. Klein, McGraw Hill, 2010 Ed.

3. Introduction to fungi - Jhon Webster, Cambridge University Press, 2013 Ed.

### Pedagogy

Chalk & Talk, Group Discussion, Power point presentation (PPT)

### Teaching Aids

Green Board, LCD Projector, Interactive White Board

### Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
<b>UNIT I: FUNGI</b>				
	Classification of Fungi based on Alexopoulos and Mims	3	Discussion	
	Economic importance of Fungi	3	PPT	LCD
	Beneficial aspects (Industries, Pharmaceuticals, Agriculture, Genetical Studies)	3	Discussion	
	Harmfulness (Plant diseases, Human Diseases, Food Spoilages)	3	Discussion	
<b>UNIT II</b>				
	Structure and reproduction of Myxomycetes : <i>Stemonites</i>	4	Chalk & Talk	Green Board
	Structure and reproduction of Oomycetes : <i>Albugo</i>	4	Chalk & Talk	Green Board
	Structure and reproduction of Ascomycetes : <i>Penicillium</i>	4	Chalk & Talk	Green Board
<b>UNIT III</b>				
	Structure and reproduction of Basidiomycetes : <i>Puccinia</i>	4	Chalk & Talk	Green Board
	Structure and reproduction Basidiomycetes : <i>Agaricus</i>	4	Chalk & Talk	Green Board
	Structure and reproduction of Deuteromycetes : <i>Cercospora</i>	4	Chalk & Talk	Green Board
<b>UNIT IV</b>				
	General Characteristics of Lichens	2	Lecture	
	Structure of Lichens – Crustose, Foliose & Fruticose	4	Chalk & Talk	Green Board
	Reproduction of Lichens	4	Chalk & Talk	Green Board
	Economic importance of Lichens	2		
<b>UNIT V: PLANT PATHOLOGY</b>				
	Symptoms, causes and control of Viral disease - Bunchy top of Banana	3	Chalk & Talk	Green Board
	Symptoms, causes and control of Bacterial disease - Citrus Canker	3	Chalk & Talk	Green Board
	Symptoms, causes and control of	3	Chalk &	Green Board

	Fungal disease - Blast disease in Rice		Talk	
	Symptoms, causes and control of Mycoplasma - Little leaf of Brinjal	3	Chalk & Talk	Green Board
	<b>Total</b>	<b>60</b>		

**Course Designer**  
(Name of the Course Teacher)

**Head of the Department**

**Dr. C. SOUNDAR RAJU**

**Dr. N. LAXMANAN**

### DEPARTMENT OF CHEMISTRY

Programme: B.Sc. Chemistry, (CBCS and Outcome Based Education (OBE))  
(For those students admitted during the Academic Year 2018-19 and after)

<b>PART – III : Allied Theory</b>		<b>SEMESTER - I</b>
Course Title: <b>Chemistry for Biologist-I</b>		
Course Code: 07ATB1/ 07ATZ1	Hours per week: 2	Credits: 4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

#### Preamble

Students are enabled to

- ✓ Understand the basic organic principles study the principles of titrimetric elaborately.
- ✓ Acquire an idea about the catalysis and photochemistry
- ✓ Have a knowledge on general principles of titrimetry

#### Course Outcomes (CO)

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
<b>CO 1</b>	Relate the types of isomerism and understand the fundamentals of organic chemistry	K1 & K2
<b>CO 2</b>	Classify the types electrophiles and nucleophiles and understand the types of organic reactions	K2
<b>CO 3</b>	Understand the types of cleavage and have an idea about the formation and stability of intermediates	K2
<b>CO 4</b>	Define the laws of photochemistry and demonstrate the types of catalysis	K1 & K2
<b>CO 5</b>	Explain the basic concepts of titrimetric	K2

**K1-Knowledge**

**K2-Understand**

**K3-Apply**

### Mapping of CO and PO

	PO 1	PO 2	PO 3	PO 4	PO5	PO6	PO7
CO 1	3	1	1	1	1	1	3
CO 2	3	1	1	1	1	1	3
CO 3	3	1	1	1	1	1	3
CO 4	3	1	1	1	1	9	3
CO 5	3	1	1	1	1	9	3
	15	5	5	5	5	21	15

9-Strong

3-Medium

1-Low

### Mapping of CO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	3	3	3	3	1
CO 2	3	1	1	3	1
CO 3	1	1	1	3	1
CO 4	1	1	1	1	1
CO 5	1	1	1	1	3
	9	7	7	11	7

9-Strong

3-Medium

1-Low

## SYLLABUS

### UNIT-I: ORGANIC BASIC PRINCIPLES - I

Empirical formula – molecular formula – structural formula – calculation of empirical formula and molecular formula from percentage composition – isomerism – structural isomerism- chain isomerism, position isomerism, functional isomerism and metamerism – stereoisomerism - geometrical isomerism (cis & trans of alkenes), optical isomerism – optical isomerism in lactic acid.

### UNIT-II: ORGANIC BASIC PRINCIPLES - II

Electrophiles, nucleophiles and their types – types of organic reactions – substitution, addition, elimination, rearrangement, and polymerization (definition and examples only) – resonance and tautomerism – differences between resonance and tautomerism.

### UNIT- III: ORGANIC BASIC PRINCIPLES - III

Valency of carbon atom – hybridization of carbon in methane – tetrahedral arrangement of carbon in methane – fission of a covalent bond – homolytic and heterolytic fission – differences between homolytic and heterolytic cleavage – definition, formation and stability of carbocation, carbanion and free radical.

### UNIT- IV: CATALYSIS AND PHOTOCHEMISTRY

**Catalysis:** Definition – homogeneous and heterogeneous catalysis – characteristics of catalyst – catalytic promoters – catalytic poisoning – autocatalysis – acid-base catalysis – enzyme catalysis and its characteristics.

**Photochemistry:** Definition of photochemical reactions – comparison of thermal and photochemical reactions – Jablonski diagram – internal conversion, intersystem crossing, fluorescence and phosphorescence – chemiluminescence and bioluminescence (definition and examples only).

#### **UNIT- V: GENERAL PRINCIPLES OF TITRIMETRY**

Mole concept – molecular weight – formula weight – equivalent weight – concentrations terms – molarity, normality and weight percentage – indicator, analyte, titrant, end point – principle of titrimetry – primary and secondary standards – preparing standard solutions – standardizing the secondary standard solutions.

#### **Text Books**

1. Ancillary chemistry K. Ratinamuthu (Study material will be provided)  
Semester – I and II

#### **Reference Books**

1. Bahl & Arun Bahl, *Advanced Organic Chemistry* by S.Chand & Company Ltd, New Delhi, 2012 Edition.
2. Soni, P.L., Mohan Katyal, *Text book of Inorganic Chemistry* by P, Sultan Chand & Sons, New Delhi, 2010 Edition.
3. Arun Bahl, B.S.Bhal & G.D.Tuli *Essentials of Physical chemistry*, S.Chand Publishing Company, New Delhi, 2010 Edition.

### DEPARTMENT OF CHEMISTRY

Programme: B.Sc. Chemistry, (CBCS and Outcome Based Education (OBE))  
(For those students admitted during the Academic Year 2018-19 and after)

PART – III : Allied Lab		SEMESTER - I
Course Title : Volumetric Estimation		
Course Code:07APB3/ 07APZ3/07APP3	Hours per week: 2	Credits: 4
CIA Marks:	ESE Marks:	Total Marks:

#### Preamble

Students are enabled to

- ✓ Make solutions of different concentration and understand the principles behind volumetric analysis.
- ✓ Experience hands on training in volumetric titration

#### Course Outcomes (CO)

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Define and understand the various concentration terms	K1 & K2
CO 2	Understand the various terminology involved in volumetric estimation	K2
CO 3	Experiment with the acidimetry	K3
CO 4	Experiment with the alkalimetry	K3
CO 5	Experiment with the permanganometry titrations	K3

**K1-Knowledge****K2-Understand****K3-Apply****Mapping of CO with PO**

	PO 1	PO 2	PO 3	PO 4	PO5	PO6	PO7
<b>CO 1</b>	1	1	3	1	3	3	1
<b>CO 2</b>	9	1	9	1	3	3	1
<b>CO 3</b>	3	1	9	1	3	3	1
<b>CO 4</b>	3	1	9	1	3	3	1
<b>CO 5</b>	3	1	9	1	3	3	1
	19	5	39	5	15	15	5
<b>9-Strong</b>			<b>3-Medium</b>			<b>1-Low</b>	

**Mapping of CO with PSO**

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
<b>CO 1</b>	1	3	3	1	-
<b>CO 2</b>	-	1	3	3	-
<b>CO 3</b>	-	1	1	1	-
<b>CO 4</b>	3	3	3	1	-
<b>CO 5</b>	3	3	3	1	1
	7	11	13	7	1
<b>9-Strong</b>		<b>3-Medium</b>			<b>1-Low</b>

**Syllabus****UNIT-I:**

Concepts of molecular formula, molecular weight, equivalent weight, normality, molality, molarity and weight percentage – problems related to preparation of different concentrations of solutions – list of lab apparatus and their uses.

**UNIT-II:**

Principle of volumetric estimation – definitions of titration, standard solution, analyte, titrant, indicator, end point, equivalent point – primary standard and secondary standard – preparation of standard solution.

**UNIT- III:**

1. Estimation of sulphuric acid
2. Estimation of hydrochloric acid
3. Estimation of sodium carbonate

**UNIT- IV:**

1. Estimation of oxalic acid
2. Estimation of sodium hydroxide

**UNIT- V**

1. Estimation of ferrous sulphate
2. Estimation of Mohr's salt

### Text Books

1. Venkateswaran, V. Veerasamy, R. and Kulandaivelu, A.R., *Basic Principles of Practical Chemistry*, Sultan Chand & Sons, New Delhi, 2017.

### Reference Books

1. Thomas, A.O, *B.Sc. Main Practical Chemistry*, Scientific Book Centre, Cannanore, 2003.

## DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)

(For those students admitted during the 2018 -19 and after)

PART – IV : Non Major Theory		SEMESTER - I
Course Title: Energy Resources		
Course Code: <b>08NE11</b>	Hours per week:2	Credit:2
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

### Preamble

- ❖ To kindle the students to know the core value of natural resources
- ❖ To study various types of conventional and non-conventional energy resources including solid, liquid and gaseous fuels.
- ❖ To commemorate the diminish of natural resources

### Course Outcomes (CO)

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

CO Number	CO Statement	Knowledge Level (according to Bloom's Taxonomy)
CO1	To know the various kinds of renewable and non-renewable energy sources Remember the extinction of energy resources and understand the present world energy scenario To know the energy demand of world, nation and available resources to fulfill the demand	K1
CO2	To know the conventional energy resources and their effective utilization	K3
CO3	To Study of various non-conventional sources of energy and its applications in remote areas of the country. Ensuring ecologically sustainable renewable energy sources	K3
CO4	Evaluate methods for generation of wind power and production of wind energy.	K3



<b>CO5</b>	To know Knowledge of alternate energy sources To be able to identify available alternative energy resources and techniques to utilize them effectively.	<b>K2</b>
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**K1** – Knowledge

**K2** – Understand

**K3** – Apply

### Syllabus

<b>Unit – I</b>	Conventional energy- coal, oil, gas, thermal power and nuclear energy	<b>(6 Hrs)</b>
<b>Unit – II</b>	Conventional energy- coal, oil, gas, thermal power and nuclear energy	<b>(6 Hrs)</b>
<b>Unit – III</b>	Non-Conventional - Solar energy-advantages-solar gadgets available Solar energy utilization in India and Hydro power.	<b>(6 Hrs)</b>
<b>Unit – IV</b>	Wind energy – advantages and disadvantages -wind mills and Tidal energy.	<b>(6 Hrs)</b>
<b>Unit – V</b>	Biomass energy – Biogas production, bioethanol, biodiesel (from plant lipids and from hydrocarbons)	<b>(6 Hrs)</b>

### Text Books:

1. Environmental science engineering – Dr. A. Ravikrishnan Sri Krishna Hitech Pub Company Pvt. Ltd. Chennai, 2012 Ed.
2. Environmental science engineering - C.P. Venugopal Rao, PHI Learning New Delhi, 2010 Ed.
3. Environmental science engineering - Anuradha Publishers Chennai, 2010 Ed.

### Reference Books:

1. Renewable energy technologies for rural sector - Shyam, M, Pandey, K.C & A.K. Dubey, 2013 Ed.
2. Environmental studies – SK.Garg, Khanna Pub Delhi, 2012 Ed.
3. Environmental Geography – Alka Gautam, Sharada pustak bhavan, Alakabad, 2010 Ed.

### Pedagogy

Chalk & Talk and PPT

### Teaching Aids

Black Board and Green Board

<b>Course Designer</b> <b>(Name of the Course Teacher)</b>	<b>Head of the Department</b>
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**Dr. V. RAMESH**

**Dr. N. LAXMANAN**

**தமிழ்த்துறை,  
விவேகானந்த கல்லூரி, திருவேடகம் மேற்கு.**

Programme : B.A., BSc., (CBCS and Outcome Based Education (OBE)  
(For those students admitted during the Academic Year 2018 – 2021 and after)

**பாடத்திட்டத்தின் கட்டமைப்பு (PROGRAMME STRUCTURE)**

UG Language PART – I TAMIL		SEMESTER : II
Subject Title : இக்காலக் கதை இலக்கியமும் மக்கள் தகவலியலும்		
Course Code :P1LT21	Hours per week : 18	Credit : 03
CIA Marks : 25	ESE Marks : 75	Total Marks : 100

**Preamble**

1. சமூக வெளிப்பாடுகளை உணர்த்துதல்
2. தன்மனித நேர்மை உணர்த்துதல்
3. இதழ்கள் பற்றிய அடிப்படை அறிவை புகட்டுதல்
4. சொற்களின் வகைமை அறிதல்
5. சிறுகதை - புதின வரலாற்றினைத் தெளிவுபடுத்துதல்

**Course Outcomes (COs)**

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

NO.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	சிறுகதைகள் மற்றும் புதினத்தின் வாயிலாக தன் மனித மற்றும் சமூக ஒழுக்கங்கள் குறித்து தன்மையினை வரையறை செய்தல்.	K <sub>1</sub> , K <sub>2</sub>
CO 2	இதழ்கள், பேட்டி வகைகள், நிர்வாக அமைப்பு முறைகள் ஆகியன குறித்த செய்திகளை கலந்துரையாடுதல்.	K <sub>2</sub> , K <sub>3</sub>
	சிறுகதை, புதினம் போன்ற இக்கால	K <sub>2</sub> , K <sub>3</sub>

CO 3	இலக்கியத்தின் தன்மைகளையும், அதனைப் படைத்த படைப்பாளர்களின் வரலாற்றினையும் விவரித்தல்.	
CO 4	பெயர், வினை, இடை, உடர், வினா, விடை, வேற்றுமை, தொகைகள் ஆகியன குறித்த தெளிவும், அவற்றை வகைப்படுத்தும் திறன் குறித்தும் அறிதல்.	K <sub>2</sub>
CO 5	வாக்கியங்களைக் கண்டறிதல், சொற்களை ஒழுங்குபடுத்துதல், ஆங்கிலத்திற்கு நிகரான தமிழ்ச்சொற்களை கண்டறிதல், வழுவுச்சொற்களை நீக்குதல் போன்ற ஒரு மொழியின் பயன்பாட்டுத் தன்மையை தெளிவுறுத்தல்.	K <sub>1</sub> , K <sub>2</sub> , K <sub>3</sub>

K<sub>1</sub>-Knowledge

K<sub>2</sub>-Understand

K<sub>3</sub>-Apply

### பாடத்திட்டம்(Syllabus)

அலகு : 1	தமிழ்ச் சிறுகதை இலக்கியம் பு. மலரும் காலம் (ஜி.மீனாட்சி)	(18மணிநேரம்)
அலகு : 2	தமிழ் நாவல் இலக்கியம் வேரில் பழுத்த பலா (சு.சமுத்திரம்)	(18மணிநேரம்)
அலகு : 3	மக்கள் தகவலியல் 1. இதழ்கள் தொடங்குவதற்குரிய வழிமுறைகள் -செய்த நிறுவனம் தொடங்குவதற்கான முறைமை கூறல். 2. செய்தித்தாள் நிர்வாக அமைப்பு - நிர்வகிக்கும் முறை 3. பேட்டி - அதன் வகைகள் - செய்தி திரட்டும் கலையை அறிதல் 4. செய்தி - செய்தி விளக்கம் - செய்தியின் விளக்கம் மற்றும் வகைமை அறிதல் 5. பல்வேறு வகையான செய்திகள்	(18மணிநேரம்)
அலகு : 4	தமிழ் இலக்கணம் - சொல் 1 நான்கு வகைச் சொற்கள் 1. வினா - விடை வகைகள் 2. வேற்றுமைகள் 3. தொகைகள் வேற்றுமைத் தொகை, வினைத்தொகை, பண்புத்தொகை, உவமைத்தொகை, உம்மைத்தொகை, அன்மொழித்தொகை	(18மணிநேரம்)
அலகு : 5	தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத்தமிழும் அ) 1. சிறுகதையின் தோற்றமும் வளர்ச்சியும். 2. புதின இலக்கியத்தின் தோற்றமும் வளர்ச்சியும்.	(18மணிநேரம்)

	<p>ஆ) தொடரும் தொடர்பும் அறிதல் - பீர்த்து  எழுதுதல் பொருந்தாச் சொல்லைக்  கண்டறிதல் - வழுவுச்சொற்களை  நீக்கிய தொடரைக் குறிப்பிடுதல்-  சொற்களை அகர வர்சைப்படுத்தல்-  வேர்ச்சொல்லைத் தேர்வு செய்தல் -  எவ்வகை வாக்கியம் எனக் கண்டு  எழுதுதல் - சொற்களை  ஒழுங்குபடுத்திச் சொற்றொடர்  ஆக்குதல் - ஆங்கிலச்சொல்லுக்கு  நிகரான தமிழ்ச் சொல் அறிதல்.</p>	
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### Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	9	3	9	9	3	3	9
CO2	9	3	9	9	3	3	9
CO3	9	9	3	3	3	3	9
CO4	9	9	1	9	9	-	9
CO5	9	3	3	3	9	-	9
	45	27	25	33	27	09	45

### பாட நூல்கள்

1. சிறுகதைகள் பத்து - ஜி. மீனாட்சி  
நியூ செஞ்சுரி புக் ஹவுஸ்(பி)ல்ட்,  
41-பி, சிட்கோ இண்டஸ்ட்ரியல் எஸ்டேட்,  
அம்பத்தூர், சென்னை- 600 098.
2. நாவல் - வேரில் பழுத்த பலா - சு.சமுத்திரம்  
அறிவுப்பதிப்பகம் (பி) ல்ட்., 16(142),  
ஜான் ஜான்கான் சாலை,  
இராயப்பேட்டை, சென்னை - 600 014.
3. இதழியல் கலை (டாக்டர்.மா.பா.குருசாமி)  
தாயன்பகம்,  
6-வது தெரு, ஏ.கே.எம்.ஜி.நகர்,  
தண்டிக்குகல் - 624 001.
4. தமிழ் இலக்கிய வரலாறு - முனைவர்பாக்யமேர்  
நியூ செஞ்சுரி புக் ஹவுஸ்(பி)ல்ட்,  
41-பி, சிட்கோ இண்டஸ்ட்ரியல் எஸ்டேட்,  
அம்பத்தூர், சென்னை- 600 098.

## பார்வை நூல்கள்

1. மக்கள் தகவல் தொடர்பியல் அறிமுகம் (டாக்டர் கி. இராசா)
2. இதழியல் (ச.ஈஸ்வரன்)
3. இதழியல் (டாக்டர் இரா.கோதண்டபாணி)
4. இதழியல் ஓர் அறிமுகம் (டாக்டர் அந்தோணி இராசு)
5. தமிழ் இலக்கிய வரலாறு (மு.வரதராசனார்)

## Pedagogy

விரிவுரை கொடுத்தல், கலந்துரையாடல், காட்சிப் பதிவுகளின் வழியாக புலப்படுத்துதல், கதை எழுதப் பயிற்சி கொடுத்தல், இதழ் ஒன்றை உருவாக்கக் கற்றுக்கொடுத்தல்

## Teaching Aids

கரும்பலகை பயன்படுத்துதல், காட்சி திரைவழியாக புலப்படுத்துதல்.

## Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
<b>அலகு : 1 தமிழ்ச் சிறுகதை இலக்கியம் (18 மணிநேரம்)</b>				
1.	பூ மலரும் காலம்(ஜி.மீனாட்சி)	18	விரிவுரை கொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல்
<b>அலகு : 2தமிழ் நாவல் இலக்கியம் (18 மணிநேரம்)</b>				
1.	வேரில் பழுத்த பலா (சு.சமுத்திரம்)	18	விரிவுரைகொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல்
<b>அலகு : 3 மக்கள் தகவலியல் (18 மணிநேரம்)</b>				
3.1	இதழ்கள் தொடங்குவதற்குரிய வழிமுறைகள் செய்தி நிறுவனம் தொடங்குவதற்கான முறைமை கூறல்.	4	விரிவுரைகொடுத்தல்	கரும்பலகை பயன்படுத்துதல்
3.2	செய்தத்தான் நிர்வாக அமைப்பு	4	விரிவுரைகொடுத்தல்	கரும்பலகை பயன்படுத்துதல்
3.3	பேட்டி - அதன் வகைகள்	3	விரிவுரைகொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல்
3.4	செய்தி - செய்தி விளக்கம்	4	விரிவுரைகொடுத்தல்	கரும்பலகை பயன்படுத்துதல்
3.5	பல்வேறு வகையான		விரிவுரைகொ	கரும்பலகை

	செய்திகள்	3	குத்தல்	பயன்படுத்துதல்
<b>அலகு: 4தமிழ் இலக்கணம் - சொல் (18 மணிநேரம்)</b>				
4.1	நான்கு வகைச் சொற்கள்	8	விரிவுரைகொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன்படுத்துதல்
4.2	வினா - விடை வகைகள்	3	விரிவுரைகொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன்படுத்துதல்
4.3	வேற்றுமைகள்	3	விரிவுரைகொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன்படுத்துதல்
4.4	தொகைகள் வேற்றுமைத் தொகை, வினைத்தொகை, பண்புத்தொகை, உவமைத் தொகை, உம்மைத்தொகை, அன்மொழித்தொகை	4	விரிவுரைகொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன்படுத்துதல்
<b>அலகு : 5தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத் தமிழும்(18 மணிநேரம்)</b>				
5.1	சிறுகதையின் தோற்றமும் வளர்ச்சியும்.	5	விரிவுரைகொடுத்தல்	கரும்பலகை பயன்படுத்துதல்
5.2	புதின இலக்கியத்தின் தோற்றமும் வளர்ச்சியும்	5	விரிவுரைகொடுத்தல்	கரும்பலகை பயன்படுத்துதல்
5.3	தொடரும் தொடர்பும் அறிதல் - பிரத்து எழுதுதல் பொருந்தாச் சொல்லைக் கண்டறிதல் - வழுவுச்சொற்களை நீக்கிய தொடரைக் குறிப்பிடுதல் சொற்களை அகர வர்சைப்படுத்தல்- வேர்ச்சொல்லைத் தேர்வு செய்தல் - எவ்வகை வாக்கியம் எனக் கண்டு எழுதுதல் - சொற்களை ஒழுங்குபடுத்திச் சொற்றொடர் ஆக்குதல் - ஆங்கிலச்சொல்லுக்கு நிகரான தமிழ்ச் சொல் அறிதல்.	8	விரிவுரைகொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன்படுத்துதல்
	<b>Total</b>	<b>90</b>		

Course Designer  
(Name of the Course Teacher)

Head of the Department

முனைவர் கோ.பாலமுருகன்  
(உதவிப்பேராசிரியர்)

முனைவர் வ.க.நாமகிருஷ்ணன்  
(இணைப்பேராசிரியர்)

### DEPARTMENT SANSKRIT

Programme: B.A./ B.Sc. (CBCS and OBE)

(For those students admitted during the Academic Year 2018-19 and after)

PART – I : Sanskrit		SEMESTER – II
Course Title: <b>POETRY, GRAMMAR &amp; HISTORY OF SANSKRIT LITERATURE – II</b>		
Course Code: <b>P1LS21</b>	Hours per week: <b>6</b>	Credits: <b>3</b>
CIA Marks: <b>25</b>	ESE Marks: <b>75</b>	Total Marks: <b>100</b>

#### Preamble:

Sanskrit is offered as an alternative language under Part –I for B.A./ B.Sc students during first foursemesters the above column explains the scheme of the II semester.

#### Course Outcomes (COs)

Number	Statement	Knowledge Level
CO 1	To understand Sanskrit poetry literature	K1, K2
CO 2	Comparing literature with modern life	K2
CO 3	Classify and discuss the importance of Sanskrit literature	K2
CO 4	Describe and defend history of early Sanskrit literature	K2
CO 5	Practice Creativity and Demonstrate different aspects of life as portrayed in Sanskrit literature	K2, K3

**K1-Knowledge**

**K2-Understand**

**K3-Apply**

#### Syllabus

**Unit 2:** Kalividambanam- scholars - teachers- Astrologers.

**Unit 3:** Kalividambanam- Physicians - Relatives- Pseudo Monks.

**Unit 4:** Sabhārañjanaśatakam -Wisdom and its acquisition

**Unit 5:** Sabhārañjanaśatakam- Poetry

#### Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO 6	PO 7
CO1	3	9	9	9	9	1	9
CO2	9	9	3	9	9	-	9
CO3	3	3	9	9	9	-	9
CO4	9	9	9	9	3	-	9
CO5	9	9	9	9	3	-	9

	33	39	39	45	33	1	45
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Strong -9      Medium -3      Low -1

#### Text Book(s)

1. Kalividambanam and Sabhārañjanaśatakam of Nīlakṇṭhadīkṣita Translated into English by Dr. Srinivasa Sharma and Prof C.R. Anantaraman pub. Sri Sadguna Publication, Chidambaram- 2.Yr. 2014.
2. A Short History of Sanskrit Literature, by T.K. Ramachandra Aiyar, published by R.S. Vadhyar & Sons, Kalpathi, Palakkad -678003

#### Reference Books

*A History of Sanskrit Literature, compiled by Dr. S. Jagadisan, Published by AMG Publications, Madurai -625010. Year of publication 1996.*

#### Pedagogy

Chalk & Talk, Group Discussion, PPT

#### Teaching Aids

Green Board, LCD Projector, Interactive White Board

### Part -II English (CBCS-OBS) SEMESTER– II (For those who join in June 2018 onwards)

PART II – Paper II		
Subject Title : General English-II		
Subject Code: P2LE21/P2CE21	Hours per week: 6	Credit: 3
Formative Marks: 25	Summative Marks: 75	Total Marks: 100

Total number of hours per semester: 75 Hrs

#### PREAMBLE

To apply the basic English Grammar knowledge in personal and professional life

To learn different sentence structures in order to form different kinds of sentences and utilize it for effective communication

#### COURSE OBJECTIVES

1. To acquire the ability to communicate in English at personal and professional spheres of life
2. To frame statements and questions with *be* form verbs of past, present and future tenses
3. To use Modal verbs, Gerunds and to form statements and questions with helping verbs
4. To frame sentences with the help of different sentence structures
5. To form sentences with connecting words, prepositions and to report statements, questions and instructions

#### Course Outcomes

No.	Course Outcomes	Knowledge Level ( Bloom's Taxonomy)
CO 1	Ability to communicate in English at personal and professional spheres of life	K3
CO 2	Knowledge on framing statements and questions with <i>be</i> form verbs of past, present and future tenses	K1
CO 3	Ability to use Modal verbs, Gerunds and to form statements and questions with helping verbs	K3
CO 4	Ability to frame sentences with the help of different sentence structures	K3
CO 5	Framing sentences with connecting words, prepositions and to report statements, questions and instructions	K3



**K1-knowledge                      K2-Understand                      K3-Apply**  
**Mapping of CO with PO**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
<b>CO 1</b>	9	9	9	1	-	1	-
<b>CO 2</b>	9	9	3	-	-	-	-
<b>CO 3</b>	9	3	3	-	-	-	-
<b>CO 4</b>	9	3	3	-	-	-	-
<b>CO 5</b>	9	3	9	-	-	-	-
	45	27	27	1	-	1	-

Strong-9    Medium-3    Low- 1

**Unit I**

**(15 hours)**

Self-Introduction

Getting to Know

Expressing one's Interest

Talking about Places

Talking about your profession/organization

Speaking about your business

Activities at home

Likes and Dislikes

Giving directions/instructions

Saying 'Thank you'

Apologising

Asking for advice/ giving advice

Talking about the present

Talking about the past

Talking about the future

Asking for opinion/giving opinion

Making a request/ asking permission

Giving Message

Telephonic Conversation

News and Views

Narrating

General Enquiries

Short responses

Skills and Talents

Job Interviews

Short Speeches

Farewell

**Unit II (15 hours)**

Understanding the sentence pattern: **I am, We are, You are, He is, She is, They are and Who is**

Understanding the Question Pattern: **Who + am/is/are+ you/he/she/they**

Words that name relationship-Friend, colleague, neighbour

Singular and Plural forms

Speech Generating Drill: Who're you? Who's he? Who's She? Who're they?

Understanding the Sentence Pattern: **He/She/They/I + am/is/are + article + name (of a profession)**

Names of profession: eg. Advocate, homemaker, etc.

Understanding the structures **How is, How are** and the replies to such questions under the structures **I am, We are, He is, She is** and **They are**.

Location Words

Understanding the question pattern **where is/are/ + a location word**

Understanding the sentence pattern **I/You/He/She/They/It + am/is/are + location word**

Time words

Understanding the question pattern: When + is + naming word

Understanding the sentence pattern: It + is + a time word

Understanding the sentence pattern: There is..., There are... and It is...

Difference between It is... and There is...

Present tense forms of 'be': am, is, are

Past tense forms of 'be': was, were

Future tense forms of 'be': will be

Sentence Patterns associated with 'be'

Yes/No Questions with the 'be' words

Formation of negative questions with 'Be'

Wh-question structures with the be forms

### **Unit III**

**(15 hours)**

'Third person singular +s' rule

Sentence patterns using 'do not' and 'does not'

Question patterns using 'do' and 'does'

Giving instructions with the help of the present tense form of the action word

Asking questions about everyday activities using what, when, how, which, where, why, who and whom

Usage of 'have' and 'has'

Different meanings of 'have'

Usage of the past form of the action word

Usage of '*did not*'

Understanding how *questions* of the *past tense* are formed

Difference between *Yes/No questions* and the *Wh-questions*

Negative questions

Usage of '*will*'

Understanding how positive, negative and question sentences are made with '*will*'

Usage of *won't*

Difference between *don't, doesn't, didn't* and *won't*

The structure *am/is/are + -ing* words used in speaking about action going on now, planned future action and activities of temporary nature

The structure *was/were + -ing* action words

The structure *wh. words + was/were + ing* words

The connectives *when* and *while*

Difference between *am/is/are + ing* words and *was/were + ing* words

#### **Unit IV**

**(15 hours)**

Sentence pattern with '*will be + ing word*'

The structure employing '*going to*'

Question patterns with '*will be + ing words*'

Question patterns with '*going to*'

Difference between the future continuous for planned actions and the future continuous for a running action in the future

Sentence structure with *have/has + past participle* (ed/en action word) and its usage

Difference between *simple past* and *present perfect*

The structure employing *have not* and *has not*

Question patterns using *has/have + past participle*

Wh-questions with *has/have + past participle*

Difference between *did not* and *has not/ have not*

Usage of words such as *yet, so far, never, since, for ages and ever*

Sentence structure using *had+ past participle*

Difference between *did not* and *had not*

Sentence structure using *has been/have been + -ingverb*

Difference between the present continuous and the present perfect continuous

Usage of modals *can* and *could*

Difference between *can* and *could*

Difference between *I didn't* and *I couldn't*

Usage of *should, must* and *have to*

Usage of *had to, should be, must be* and *will have to*

Difference between *should* and *must*

Usage of *should not, must not, don't have to, doesn't have to* and *need not*

Difference between *need not* and *don't have to*

Usage of *shall I, can I, could I, should I, and may I*

Difference between *may* and *might*

Usage of *would, used to, supposed to* and *likely to*

Difference between *I used to* and *I am used to*

#### **Unit V**

**(15 Hours)**

Usage of *to+ present tense action word* in a sentence

Sentence structure: *It is too + adjective + to + present tense action word*

Usage of *-ing word* as a naming word

Other usages of the *-ing words*

How prepositions are used with '*ing*' words

Usage of *let* and *let us*

Usage of *let me, let him, let her, let them, and let it*

Exceptions of *let*

Difference between *shall we* and *let us*

Usage of connecting words such as *as if, because, till, unless, as, since*  
Types of sentences  
How sentences can be combined using connectives

Usage of prepositions such as *in, at, for, by, on*  
Common errors involving prepositions  
How the same prepositions can be used in various contexts

Sentence pattern using *get + adjectives*  
Sentence pattern using *get + nouns*  
Sentence pattern using phrasal verbs

Sentence pattern in which 'be' words are combined with the past participle  
Situations that call for this pattern  
How certain verbs cannot be used in the passive voice

Reported statements  
Reporting questions  
Types of Questions  
Usage of *that, whether* and *if*  
Where *if* or *whether* is not used  
Change of tenses when a reporting occurs

Reporting instructions  
Reporting someone's ideas or opinions  
Difference between *said* and *told*  
Difference between *asked me to* and *told me to*

Text Book:  
In-house text book would be prepared by the department in consultation with the experts.

Reference Books:

1. Swan, Michael. Practical English Usage, 4<sup>th</sup> Edition. OUP, 2018.
2. Quirk, Randolph. A Comprehensive Grammar of the English Language, Pearson, 2017.
3. Murthy, JD. Contemporary English Grammar for Scholars and Students. 16<sup>th</sup> Edition. Book Palace, New Delhi, 2013.
4. Karal, Rajeevan. English Grammar Just for You. OUP, 2016.
5. Joseph KV, English Grammar and Usage, McGraw Hill Education, 2<sup>nd</sup> Edition, 2010.

### DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)

(For those students admitted during the 2018 -19 and after)

<b>PART – III : Core Theory</b>		<b>SEMESTER - II</b>
Course Title: Pteridophytes, Gymnosperms & Paleobotany		
Course Code: 08CT21	Hours per week:4	Credit:4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

#### Preamble

- ❖ To acquire the basic knowledge about primitive terrestrial plants. After studying this paper Students will be able to identify in the field the forms prescribed in the syllabus and appreciate their ecological importance. Students will be able to understand the chronological events that have taken place in the earth.

#### Course Outcomes (CO)

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

Number	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO1	Explain the general Characteristics and Classification based on Sporne classification- Pteridophytes	K1
CO2	Discus the about life cycle of Pteridophytes	K2
CO3	Define the basic concepts and classification of Gymnosperm based on Chamberlain (1935) - Structure and reproduction	K2
CO4	Explain the geological era - Formation of fossils -	K1

	types of fossils	
CO5	Detailed study of the fossils plants	K2 & K3
<b>K1-knowledge</b>		<b>K2-Understand</b>
		<b>K3-Apply</b>

#### Mapping of CO with PO

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO 1	9	9	3	3	3	9	3
CO 2	9	9	3	3	9	9	3
CO 3	9	9	3	3	9	9	3
CO 4	9	1	3	3	3	9	3
CO 5	9	3	3	3	1	9	3
	45	31	15	15	24	45	15

9-Strong

3-Medium

1-Low

#### Mapping of CO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	9	9	3	3	3
CO 2	9	9	3	9	9
CO 3	9	9	9	9	9
CO 4	9	9	9	9	3
CO 5	9	9	3	3	3

9-Strong

3-Medium

1-Low

#### Syllabus

<b>Unit- I</b>	General classification based on Sporne - Structure and reproduction of the following a. Psilotales - <i>Psilotum</i> b. Lycopodiales - <i>Lycopodium</i>	<b>12hrs</b>
<b>Unit- II</b>	Structure and reproduction of the following a. a. Equisetales - <i>Equisetum</i> b. Filicales – <i>Marselia</i>	<b>12hrs</b>
<b>Unit- III</b>	Classification according to Chamberlain (1935) - Structure and reproduction of the following a. Cycadales - <i>Cycas</i> b. Gnetales – <i>Gnetum</i>	<b>12hrs</b>
<b>Unit-IV</b>	Geological era - Formation of fossils – types of fossils	<b>12hrs</b>
<b>Unit- V</b>	Detailed study of the following a. Psilopsida - <i>Rhynia</i> b. Phenopsida - <i>Calamites</i> c. Cycadofilicales – <i>Lyginopteris</i>	<b>12hrs</b>

#### Text Books

1. An introduction to Embryophyta –Pteridophytes - N.S. Parihar, Surjeet Publications, Delhi, 2012 Ed.
2. Text Book of Botany – V. Singh, Rastogi Publications, Meerut, 2013 Ed.
3. Botany for Degree Students Gymnosperms - P.C. Vashishta, S.Chand& Company Ltd, Delhi, 2014 Ed.

#### Reference Books

1. Morphology of Gymnosperms, Coulter, M.Jhon, Surjeet Publications, Delhi, 2014 Ed.

2. College Botany – Ganfule Hirendra (Chandra) Vol. I, New centre book agency, London, 2013 Ed.
3. An introduction to Embryophyta – Bryophytes - N.S. Parihar, Surjeet Publications, Delhi, 2013 Ed.

### Pedagogy

Chalk & Talk, Group Discussion, PPT

### Teaching Aids

Green Board, LCD Projector, Interactive White Board

### Course Content and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
<b>Unit -1</b>				
1.0	Introduction Pteridophytes	1	Discussion	Green Board
1.1	Classification of Pteridophytes	1	Lecture	Green Board
1.2	Classification of Sporne	1	Discussion	Green Board
1.3	Structure and reproduction of Pteridophytes	1	Lecture	Green Board
1.4	Discuss Psilotales	1	Chalk & Talk	Green Board
1.5	General charater of <i>Psilotum</i>	1	Chalk & Talk	Green Board
1.6	Structure and reproduction of <i>Psilotum</i>	2	Discussion	LCD
1.7	Discuss Lycopodiales	1	Lecture	Green Board
1.8	Structure of <i>Lycopodium</i>	1	Chalk & Talk	Green Board
1.9	Structure and reproduction of <i>Lycopodium</i>	2	Chalk & Talk	Green Board
<b>Unit – 2</b>				
2.0	Introduction about <i>Equisetum</i>	1	Lecture	Green Board
2.1	Sporophyte of <i>Equisetum</i>	1	Chalk & Talk	Green Board
2.2	Ultra structure of Equisetum stem and root	2	Chalk & Talk	Green Board
2.3	Reproduction of <i>Equisetum</i>	2	Chalk & Talk	Green Board
2.4	General studies about Filicales	1	Chalk & Talk	Green Board
2.5	Sporopyte of <i>Marsilea</i>	1	Chalk & Talk	Green Board
2.6	Internal structure of <i>Marsilea</i> stem	1	Chalk & Talk	Green Board
2.7	Ultra structure of sporocarp	1	Chalk & Talk	Green Board
2.8	Reproduction of <i>Marsilea</i>	2		
<b>Unit -3</b>				
3.0	Chamberlain (1935) classification	1	Chalk & Talk	Green Board
3.1	General character of Cycadals	1	Discussion	
3.2	Internal structure of <i>Cycas</i> stem, root and leaf	2	Chalk & Talk	Green Board

3.3	Structure of micro/megasporangium of <i>Cycas</i>	1	PPT	
3.4	Reproduction of <i>Cycas</i>	1	Discussion	Green Board
3.5	General character of <i>Gnetum</i>	1	Chalk & Talk	Green Board
3.6	Structure of <i>Gnetum</i>	1	Chalk & Talk	Green Board
3.7	Internal structure of <i>Gnetum</i> stem and root	2	Chalk & Talk	Green Board
3.8	Structure of micro/megasporangium of <i>Gnetum</i>	1	Lecture	Green Board
3.9	Reproduction of <i>Gnetum</i>	2	Chalk & Talk	Green Board
<b>Unit – 4</b>				
4.0	What is fossil	1	Discussion	Green Board
4.1	History of fossil	2	Chalk & Talk	Green Board
4.2	Geological time scale	3	Chalk & Talk	Green Board
4.3	Formation of fossil	3	Chalk & Talk	Green Board
4.4	Types of fossil	3	Lecture	Green Board
<b>Unit -5</b>				
5.0	What is Paleobotany	1	Lecture	Green Board
5.1	Structure of <i>Rhynia</i>	1	Chalk & Talk	Green Board
5.2	Sporophyte of <i>Rhynia</i>	2	Chalk & Talk	Green Board
5.3	Internal structure of <i>Rhynia</i> stem	2	Chalk & Talk	Green Board
5.4	Structure of Calamites and its sporophytes	2	Chalk & Talk	Green Board
5.5	Structure of <i>Lyginopteris</i>	2	Chalk & Talk	Green Board
5.6	Ultra structure of <i>Lyginopteris</i> stem	2	Lecture	
<b>Total</b>		<b>60</b>		

<b>Course Designer</b> <b>(Name of the Course Teacher)</b>	<b>Head of the Department</b>
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**Dr. T. SELLATHURAI**

**Dr. N. LAXMANAN**



**DEPARTMENT OF BOTANY**  
 Programme: B.Sc. BOTANY (CBCS and OBE)  
 (For those students admitted during the 2018 -19 and after)

<b>PART – III : Core Theory</b>		<b>SEMESTER - II</b>
Course Title: Plant Anatomy and Microtechniques		
Course Code: 08CT22	Hours per week:4	Credit:4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

**Preamble**

- ❖ To understand the knowledge about basic internal morphology of higher plants
- ❖ To familiarize the arrangement of cells, tissues within ground and vascular tissue system in vascular plants.
- ❖ To train the students in handling microscopes for taking sections

**Course Outcome**

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

<b>Number</b>	<b>Course Outcome</b>	<b>Knowledge Level ( According to Bloom's Taxonomy)</b>
<b>CO1</b>	Explain the unique features of cell wall To know the chemical nature of cell wall Acquire the basic knowledge about internal tissues of higher plants	K1
<b>CO2</b>	To compare the general and specific internal	K1 & K2

	characteristics of dicot & monocot stem and root	
<b>CO3</b>	To know the concept of secondary thickening and anomalous secondary growth in stem and roots	K2
<b>CO4</b>	To understand the internal structure of dicot leaf, node and root formation	K2
<b>CO5</b>	Training the students in various staining technique and handling of microscope To Make temporary microscopic slides	K3

**K1** – Knowledge

**K2** – Understand

**K3** – Apply

#### Mapping of CO with PO

	<b>PLO1</b>	<b>PLO2</b>	<b>PLO3</b>	<b>PLO4</b>	<b>PLO5</b>	<b>PLO6</b>	<b>PLO7</b>
<b>CO1</b>	9	9	9	3	1	3	3
<b>CO2</b>	9	9	3	9	3	1	3
<b>CO3</b>	9	9	9	3	9	3	3
<b>CO4</b>	9	3	9	1	3	3	3
<b>CO5</b>	9	9	9	3	1	1	1
	<b>45</b>	<b>39</b>	<b>39</b>	<b>19</b>	<b>17</b>	<b>11</b>	<b>13</b>

**9**-Strong

**3**-Medium

**1**-Low

#### CO-PSO Mapping

	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	9	3	9	9	9
<b>CO2</b>	9	3	9	9	9
<b>CO3</b>	9	9	1	3	9
<b>CO4</b>	9	9		9	3
<b>CO5</b>	9	3	9	3	9

**9**-Strong

**3**-Medium

**1**-Low

#### Syllabus

<b>Unit – I</b>	Cell wall – Chemical nature of cell wall – Ultra structure of cell wall – Plasmodesmata and pits – Tissue system: Meristems, Simple tissues, Complex tissues, Secretory Tissues & Trichomes	<b>(12 Hrs)</b>
<b>Unit – II</b>	Primary structures of dicot stem, monocot stem, Dicot root & Monocot root	<b>(12 Hrs)</b>
<b>Unit – III</b>	Normal secondary thickening in dicot stem and dicot root – Anomalous secondary growth in <i>Boerhaavia</i> and <i>Dracaena</i>	<b>(12 Hrs)</b>
<b>Unit – IV</b>	Internal structure of Dicot leaf – Nodal anatomy of <i>Justicia</i> , <i>Azadirachta</i> and <i>Aralia</i> – Lateral roots formation	<b>(12 Hrs)</b>
<b>Unit – V</b>	Microtechniques: Fixation of plant materials – Sectioning of plant materials (Hand section only) – Staining – Mounting and whole mount preparation	<b>(12 Hrs)</b>

#### Text Books

1. Plant anatomy - P.C.Vashista, S.Chand & Company Ltd, Delhi, 2012 Ed.
2. Plant anatomy - Kaatherine, Esau, Wiley Eastern Pvt. Ltd, 2013 Ed
3. Plant anatomy - A.Fahn, Pergamon Press, 2010 Ed.

#### Reference books

1. Introduction to Plant anatomy - Eames & Mac Daniels, Tata McGraw Hill Education in India, 2010 Ed.
2. Plant anatomy - M.S.Tayal, Rastogi Publications, Meerut, 2010 Ed.
3. Plant micro technique - Donald Alexander Johnson

#### Pedagogy

Chalk & Talk, PPT, Experiment

#### Teaching Aids

Black Board, Green Board, Chart, Specimen, Plant Material, Permanent Slide, LCD Projector, Online virtual Lab & Interactive White Board

#### Course Contents and Lecture Schedule

Module No.	Topic	No. of Class	Content Delivery method	Teaching Aids
<b>UNIT I</b>				
1.1	Introduction of Cell wall	1	Calk & Talk	Green Board
1.2	Chemical nature of cell wall	1	Calk & Talk	Green Board
1.3	Ultra structure of cell wall	1	Calk & Talk	Chart
1.4	Plasmodesmata and pits	1	Calk & Talk	Green Board
1.5	Introduction of tissues and cells	1	Calk & Talk	Chart & Green Board
1.6	Tissue system – Meristems	2	Calk & Talk	Chart & Green Board
1.7	Simple tissue system	1	Calk & Talk	Green Board
1.8	Complex tissues – Xylem & Phloem	3	Calk & Talk	Chart & Green Board
1.9	Secretory Tissues & Trichomes	1	Calk & Talk	Chart & Green Board
<b>Unit – II</b>				
2.1	Primary structures of dicot stem	3	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
2.2	Primary structures of monocot stem	3	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
2.3	Primary structures of dicot root	3	Calk & Talk	Chart, Online virtual Lab , Plant material

				& Green Board
2.4	Primary structures of monocot root	3	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
<b>Unit – III</b>				
3.1	Normal secondary thickening in dicot stem	3	Calk & Talk	Chart, Plant material & Green Board
3.2	Normal secondary thickening in dicot root	3	Calk & Talk	Chart, Plant material & Green Board
3.3	Anomalous secondary growth in <i>Boerhaavia</i>	3	Calk & Talk	Chart, Plant material & Green Board
3.4	Anomalous secondary growth in <i>Dracaena</i>	3	Calk & Talk	Chart, Plant material & Green Board
<b>Unit – IV</b>				
4.1	Internal structure of Dicot leaf	3	Calk & Talk	Chart, Plant material & Green Board
4.2	Nodal anatomy – Introduction	3	Calk & Talk	Green Board
4.3	Nodal anatomy in <i>Justicia</i> , <i>Azadirachta</i> and <i>Aralia</i>	3	Calk & Talk	Green Board
4.4	Lateral roots formation	3	Calk & Talk	Green Board
<b>Unit – V</b>				
5.1	Introduction of Microtechniques	2	Calk & Talk	Green Board
5.2	Fixation of plant materials	3	Calk & Talk	Green Board & Specimen
5.3	Hand section	3	Calk & Talk	Green Board & Plant material
5.4	Staining	3	Calk & Talk	Green Board
5.5	Mounting	1	Calk & Talk	Green Board
Total		60		

**Course Designer**  
(Name of the Course Teacher)

**Head of the Department**

**Dr. V. RAMESH**

**Dr. N. LAXMANAN**

### DEPARTMENT OF CHEMISTRY

Programme: B.Sc. Chemistry, (CBCS and Outcome Based Education (OBE))  
(For those students admitted during the Academic Year 2018-19 and after)

PART – III : Allied Theory		SEMESTER - II
Course Title : Chemistry for Biologist-II		
Course Code: 07ATB2/07ATZ2	Hours per week: 2	Credits: 4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

#### Preamble

Students are enabled to,

- ✓ understand the concept of acids and bases and chemical bonding
- ✓ acquire knowledge about aminoacid, proteins and vitamins and their functions
- ✓ study and assess the effect of selected pesticides, fungicides and polutions

#### Course Outcomes (CO)

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Learn the historical development for the definitions of acid and base.	K1
CO 2	Understand the different approaches to types of chemical bonding	K2
CO 3	Acquire knowledge of aminoacids, proteins and vitamins and their biological functions	K2&K3
CO 4	Learn and assess the effect of selected pesticides, fungicides and polutions	K1&K2

<b>CO 5</b>	Obtained the knowledge of different types of air pollution	K1& k2
<b>K1-Knowledge</b>		<b>K2-Understand</b>
		<b>K3-Apply</b>

#### Mapping of CO with PO

	PO 1	PO 2	PO 3	PO 4	PO 5	PO6	PO7
<b>CO 1</b>	3	1	1	1	1	1	3
<b>CO 2</b>	3	1	1	1	1	1	3
<b>CO 3</b>	3	1	1	1	1	1	3
<b>CO 4</b>	3	1	1	1	1	9	3
<b>CO 5</b>	3	1	1	1	1	9	3
	15	5	5	5	5	21	15
<b>9-Strong</b>		<b>3-Medium</b>			<b>1-Low</b>		

#### Mapping of CO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
<b>CO 1</b>	3	1	1	1	1
<b>CO 2</b>	3	1	1	1	1
<b>CO 3</b>	3	1	1	1	1
<b>CO 4</b>	3	1	1	1	1
<b>CO 5</b>	3	1	1	1	1
	15	5	5	5	5
<b>9-Strong</b>		<b>3-Medium</b>			<b>1-Low</b>

#### Syllabus

##### UNIT-I: ACIDS AND BASES

Introduction– Arrhenius concept – Bronsted-Lowry concept – Lewis concept – Cady, Elsey concept – Lux-Flood concept – Usanovich concept – pH concept.

##### UNIT-II: CHEMICAL BONDING

Ionic Bond – lattice energy – Born-Haber cycle – properties of ionic compounds - covalent bond, polar covalent bond – characteristics of covalent bond – Fajan's Rule – metallic bond – hydrogen bond and its types.

##### UNIT- III: AMINOACIDS, PROTEINS AND VITAMINS

Preparation (Gabriel Phthalimide and strucker synthesis) – properties of amino acids and glycine – zwitter ion – polypeptides – proteins, classification. Vitamins: classification and biological functions of vitamins A, B<sub>6</sub>, B<sub>12</sub>, C, D, E and K (Structural elucidation not required)

##### UNIT- IV: PESTICIDES AND FUNGICIDES

**Pesticides:** Introduction – classification – organic and inorganic pesticides – characteristics – safe handling of pesticides – impact of pesticides on and environment

**Fungicides:** Introduction – classification – sulfur, copper, mercury containing compounds

##### UNIT- V: POLLUTIONS

**Air pollution:** Introduction – composition of air – chemical reactions occurring in air due to sunlight – sources of air pollution – classification and effects of air pollutants – Effects of CFC – Ozone layer – depletion Greenhouse effect and its causes.

**Water pollution:** Types, sources, sewage, industrial effluents, inorganic pollutants – control – water treatment.

**Soil pollution:** Definition – importance of soil – pH of soil – acidity & alkalinity and their causes (6 causes – emphasis towards industrial waste).

#### Text Books

1. Ancillary chemistry K. Ratinamuthu (Study material will be provided) Semester – I and II

#### Reference Books

1. Bahl & Arun Bahl *Advanced Organic Chemistry* by, S.Chand & Company Ltd, NewDelhi, 2012 Edition.
2. Soni P.L. Mohan Katyal *Text book of Inorganic Chemistry* by, Sultan Chand & Sons, NewDelhi, 2010 Edition.
3. Arun Bahl, Bhal B.S & Tuli G.D *Essentials of Physical chemistry* S.Chand Publishing Company, New Delhi, 2010 Edition.

### DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

PART – III : Core Lab		SEMESTER - II
<b>Course Title:</b> Algae, Bryophytes, Fungi, Plant Pathology, Pteridophytes, Gymnosperms, Paleobotany and Plant Anatomy		
Course Code: 08CT23	Hours per week:2	Credit:4
CIA Marks: 40	ESE Marks: 60	Total Marks: 100

#### Preamble

- ❖ To understand the plant diversity, thallus construction of selected forms
- ❖ To get hands on knowledge on microbial culture and plant pathology techniques
- ❖ To learn about the internal structure of vascular plants, fossilized plant forms and Plant evolution.

#### Course Outcomes (CO)

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

CO Number	Course Outcome	Knowledge Level ( According to Bloom's Taxonomy)
CO1	To revise the morphology and reproductive structures in Algae, Fungi, Lichens, and Bryophyte	K2

<b>CO2</b>	To familiarize the internal structures, spore bearing parts of selected plant forms and fossils To identify macro micro algae, fungal colonies, lichen forms and fossil plants	K2 & k3
<b>CO3</b>	To compare the life cycles of Algae, Fungi, Lichens, Bryophytes Pteridophytes and Gymnosperms	K3
<b>CO4</b>	To prepare microsections and to professionally draw plant sketches	K3
<b>CO5</b>	To analyze bacterial, fungal, viral and mycoplasmal plant diseases	K4

**K2** – Understand

**K3** – Apply

**K4** - Analyze

### Mapping of CO with PO

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO1</b>	9	9	9	3	9	3	3
<b>CO2</b>	9	9	3	9	3	9	9
<b>CO3</b>	9	9	9	3	9	3	9
<b>CO4</b>	9	3	9	3	3	3	3
<b>CO5</b>	9	9	9	3	3	3	3
	45	39	39	21	27	21	27

**9-Strong**

**3-Medium**

**1-Low**

### CO-PSO Mapping

	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	9	3	9	9	9
<b>CO2</b>	9	3	9	9	9
<b>CO3</b>	9	9	3	3	9
<b>CO4</b>	9	9	9	9	3
<b>CO5</b>	9	3	9	3	9

**9-Strong**

**3-Medium**

**1-Low**

### Syllabus

<b>Unit – I</b>	A detailed study of thallus organization and reproductive structures of the following forms: <b>Algae:</b> <i>Oedogonium, Vaucheria, Diatoms, Sargassum, Polysiphonia, Nostoc</i> <b>Fungi :</b> <i>Penicillium, Albugo, Puccinia, Agaricus</i> and <i>Cercospora</i> <b>Lichen</b> – <i>Usnea, Parmelia</i>	<b>(6 Hrs)</b>
<b>Unit – II</b>	A detailed study of morphology, anatomy and structure of vegetative & spore bearing parts of the following genera: <b>Bryophytes:</b> <i>Marchantia, Anthoceros, Funaria</i>	<b>(6 Hrs)</b>
<b>Unit – III</b>	A detailed study of following diseases: Bunchy top of Banana, Citrus Canker, Blast disease in Rice and Little leaf of Brinjal	<b>(6 Hrs)</b>
<b>Unit – IV</b>	A detailed study of morphology, anatomy and structure of vegetative & spore bearing parts of the following genera: <b>Pteridophytes:</b> <i>Psilotum, Lycopodium &amp; Marselia</i>	<b>(6 Hrs)</b>



	<b>Gymnosperms : <i>Cyca &amp; Gnetum</i></b> <b>Fossils : <i>Rhynia, Calamites &amp; Lyginopteris</i></b>	
<b>Unit – V</b>	A detailed study of the internal morphology of dicot, monocot stem & root and dicot leaf – including anomalous secondary thickening.	<b>(6 Hrs)</b>

#### Text Books:

1. Plant anatomy - P.C.Vashista, S.Chand & Company Ltd, Delhi, 2012 Ed.
2. Text Book of Botany – V. Singh, Rastogi Publications, Meerut, 2013 Ed.
3. Botany for Degree Students Algae – P.C. Vashishta, S.Chand& Company Ltd, Delhi, 2014 Ed.

#### Reference books

1. Introduction to Plant anatomy - Eames & Mac Daniels, Tata McGraw Hill Education in India, 2010 Ed.
2. College Botany – Ganfule Hirendra (Chandra) Vol. I, New centre book agency, London, 2013 Ed.
3. The structure and reproduction of Algae Vol. I & II - F.E.Fritsch, Cambridge University Press.

#### Pedagogy

Chalk & Talk, Experiment

#### Teaching Aids

Black Board, Green Board, Chart, Specimen, Plant Material, Permanent Slide, Online virtual Lab & Interactive White Board

#### Course Contents and Lecture Schedule

Module No.	Topic	No. of Class	Content Delivery method	Teaching Aids
<b>UNIT I</b>				
1.1	<i>Oedogonium, Vaucheria, Diatoms, Sargassum</i>	2	Calk & Talk	Green Board, Plant material, Specimen & permanent slide
1.2	<i>Polysiphonia, Nostoc</i>	1	Calk & Talk	Green Board, Plant material, Specimen & permanent slide
1.3	<i>Penicillium, Albugo, Puccinia,</i>	1	Calk & Talk	Green Board, Plant material, Specimen & permanent slide
1.4	<i>Agaricus and Cercospora</i>	1	Calk & Talk	Green Board, Plant material, Specimen & permanent slide

1.5	<i>Usnea, Parmelia</i>	1	Calk & Talk	Green Board, Plant material, Specimen & permanent slide
<b>Unit – II</b>				
2.1	<i>Marchantia, Anthoceros,</i>	3	Calk & Talk	Chart, Green Board, Plant material, Specimen & permanent slide
2.2	<i>Funaria</i>	3	Calk & Talk	Chart, Green Board, Plant material, Specimen & permanent slide
<b>Unit – III</b>				
3.1	Bunchy top of Banana, Citrus Canker,	3	Calk & Talk	Plant material
3.2	Blast disease in Rice and Little leaf of Brinjal	3	Calk & Talk	Plant material
<b>Unit – IV</b>				
4.1	<i>Psilotum, Lycopodium &amp; Marselia</i>	2	Calk & Talk	Plant material & Green Board
4.2	<i>Cyca &amp; Gnetum</i>	3	Calk & Talk	Plant material
4.3	<i>Rhynia, Calamites &amp; Lyginopteris</i>	3	Calk & Talk	Plant material
<b>Unit – V</b>				
5.1	Primary structures of dicot & mono stem and dicot leaf	2	Calk & Talk	Chart & Plant material Green Board
5.2	Primary structures of dicot & mono root	2	Calk & Talk	Chart & Plant material Green Board
5.3	Anomalous secondary growth in <i>Boerhaavia &amp; Dracaena</i>	2	Calk & Talk	Chart & Plant material Green Board
Total		30		

**Course Designer**  
(Name of the Course Teacher)

**Head of the Department**

**Dr. V. RAMESH**

**Dr. N. LAXMANAN**

### DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)

(For those students admitted during the 2018 -19 and after)

<b>PART – IV : Non Major Theory</b>		<b>SEMESTER - II</b>
Course Title: Gardening		
Course Code: <b>08NE21</b>	Hours per week:2	Credit:2
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

#### Objectives:

- ❖ To acquire the basic knowledge about the improvement of hybrids of plant
- ❖ To know the various types of ecofriendly environment in front of homes
- ❖ To know the simple practice for the improvement of innovative garden

#### Syllabus

<b>Unit – I</b>	Introduction to gardening – types of garden - Advantages of gardening	<b>(6 Hrs)</b>
<b>Unit – II</b>	Propagation methods like cutting, layering, Grafting, budding, division and separation	<b>(6 Hrs)</b>
<b>Unit – III</b>	Garden operations: Transplanting methods (Bare rooted, shifting and balling and burlapping) - irrigation (surface, spray and drip) – manuring	<b>(6 Hrs)</b>
<b>Unit – IV</b>	Ornamental gardening, Indoor gardening, Rockery, Bonsai and Lawn making, Terrarium, Aquarium, Terrace garden, Veranda garden and Hanging baskets	<b>(6 Hrs)</b>

<b>Unit – V</b>	Kitchen gardening – importance, layout, suitable plants and advantages	<b>(6 Hrs)</b>
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#### Text Books:

1. Plant Breeding – SS. Sandhu, Black Prints, New Delhi, 2013 Ed.
2. A Guide to Horticulture - J.S. Sundararaj, Kalyani Pub, Chennai, 2012 Ed.
3. Horticulture – V.L. Sheela, MJ Publishers, 2013 Ed.

#### Reference Books:

1. A manual of Gardening – Arun zingare, Satyam Pub, Jaipur, 2013 Ed.
2. Horticulture at a glance – Amar Singh, Kalyani Publishers, Chennai, 2013 Ed.
3. Dry Land Horticulture in India – P.P. Deshmukh, Himalaya Publishing House, Mumbai, 2013 Ed.

#### Pedagogy

Chalk & Talk and PPT

#### Teaching Aids

Black Board and Green Board

<b>Course Designer (Name of the Course Teacher)</b>	<b>Head of the Department</b>
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**Dr. V. RAMESH**

**Dr. N. LAXMANAN**

**தமிழ்த்துறை,  
விவேகானந்த கல்லூரி, திருவேடகம் மேற்கு.**

Programme : B.A., BSc., (CBCS and Outcome Based Education (OBE)  
(For those students admitted during the Academic Year 2018 – 2021 and after)  
**பாடத்திட்டத்தின் கட்டமைப்பு (PROGRAMME STRUCTURE)**

UG Language PART – I TAMIL		SEMESTER : III	
Subject Title : கார்பியமும் பக்தி இலக்கியமும் நாடகமும்			
Course Code :P1LT31		Hours per week : 18	
CIA Marks : 25		ESE Marks : 75	
		Credit : 03	
		Total Marks : 100	

#### Preamble

1. வாழ்க்கையின் உறுதிப்பொருள்களான அறம், பொருள், இன்பம் வீடுபேறு ஆகியனவற்றை உணர்த்துதல்.
2. இறைவழிபாட்டு சிந்தனைகளை வளர்த்தல்.
3. புராண இதிகாச கருத்துக்களை நாடகம் வாயிலாக எளிமைப்படுத்தி தன்மனித நிலைகளை எடுத்துக்காட்டல்.
4. மரபுக்கவிதைகளின் வகைமைகளை அறிதல்.
5. காப்பியம்மற்றும் பக்தி இலக்கியத்தின் வரலாற்றினை அறிவித்தல்.

#### Course Outcomes (COs)

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

NO.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	கார்ப்பிய இலக்கியங்களின் வாயிலாக அறம், பொருள், இன்பம், வீடுபேறு என்ற வாழ்க்கையின் உறுதிப்பொருட்கள், எவ்வுயிரையும் தம்/முயிர் போல மதித்தல், பிறர் மனை நோக்கா நிலை, பகைமை பாராட்டாத தன்மை, ஆணவம் இல்லா வாழ்க்கை போன்றவைகளை வரையறை செய்த தன்மைகளை உணர்த்துதல்.	K <sub>1</sub> , K <sub>2</sub>
CO 2	மரபு இலக்கணங்களான அணிகள், பாவகைகளின் வாயிலாக மாணவர்களின் இலக்கியச்சுவை உணர்வினை வளர்த்து, கற்பனைத் திறன்களை அறிவித்தல்.	K <sub>2</sub> , K <sub>3</sub>
CO 3	பக்தி இலக்கியங்களின் வாயிலாக இறைவழிபாட்டுச் சிந்தனைகளை தனிமனித வாழ்க்கை நிகழ்வுகளின் வழி வெளிப்படுத்தி, உலக இயல்புகளை மொழிந்து, பரம்பொருளை அடையக்கூடிய வழிவகைகளையும், சமரச சன்மார்க்க நெறிகளையும் தெளிவுறுத்துதல்.	K <sub>2</sub> , K <sub>3</sub>
CO 4	புராண, இதிகாச நாடக கதைகளின் வழி அக்காலகட்டமக்களின் சமூக நிலைகளைக் கலந்துரையாட செய்தல்.	K <sub>2</sub>
CO 5	கார்ப்பியம் மற்றும் பக்தி இலக்கியம் தோன்றிய காலகட்ட வரலாற்றினை விவரித்தல். இதழ்கள் தொடர்பான சிந்தனைகள் வளர கற்றுக்கொடுத்தல்.	K <sub>1</sub> , K <sub>2</sub> , K <sub>3</sub>

K<sub>1</sub>-Knowledge

K<sub>2</sub>-Understand

K<sub>3</sub>-Apply

### Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	9	9	3	3	9	3	9
CO2	9	3	3	9	9	3	9
CO3	9	3	9	9	3	3	9
CO4	9	3	3	3	9	-	9
CO5	9	3	3	9	3	-	9
	45	21	21	33	33	9	45

### பாடத்திட்டம்(Syllabus)

அலகு : 1	தமிழ்க் கார்ப்பிய இலக்கியம் 1. சிலப்பதிகாரம் (வழக்குரை காதை) 2. மணிமேகலை (ஆபுத்திரன் திறம் அறிவித்த காதை) 3. கம்பராமாயணம் (வால் வதைப்படலம்) 4. வில்லிபுத்தூரார் பாரதம்(கண்ணன் தூதுச்சூக்கம்) 5. கந்த புராணம் (அயனைச் சிறை நீக்கும் படலம்)	18மணிநேரம்
	தமிழ் பக்தி இலக்கியம்	

அலகு : 2	1. தேவாரம் - திருஞானசம்பந்தர் (திருவேடகப் பதிகம்) 2. திருவாசகம் - மாணிக்கவாசகர்(பிடித்த பத்து) 3. திருமந்திரம் - திருமுலர் (10 பாடல்கள்) 4. திருப்பாவை - ஆண்டாள்(10 பாசுராங்கள் தெர்வு செய்யப்பெற்றவை) 5. பராபரக்கண்ணி - தாயுமானவர்(10 கண்ணிகள் தெர்வு செய்யப்பெற்றவை)	18மணிநேரம்
அலகு : 3	நாடகம் 1. வைகையில் வெள்ளம் வரும் - சேதுபதி	18மணிநேரம்
அலகு : 4	தமிழ் இலக்கணம் - அணிகள் 1.அணிகள் - உவமை - உருவகம் - பிறிது மொழிதல் - தற்குறிப்பேற்றம் வஞ்சப்புகழ்ச்சி - சிலைடை - வேற்றுமை அணி 2.பாவகைகள் - வெண்பா - ஆசிரியப்பா 3.கடிதம் வரைதல் - விண்ணப்பம் - புகார்க் கடிதம் - பாராட்டுக் கடிதம்	18மணிநேரம்
அலகு : 5	தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத் தமிழும் அ) 1. காப்பிய இலக்கிய வரலாறு 2. பக்தி இலக்கிய வரலாறு ஆ) பத்திரிக்கைச் செய்தி எழுதுதல் - நேர்காண எடுத்தல் - துணுக்குகள் எழுதுதல்.	18மணிநேரம்

### பாட நூல்கள்

1. தமிழ்ச் செய்யுட் தொகுப்பு - தமிழ்த்துறை வெளியீடு
2. நாடகம் - வைகையில் வெள்ளம் வரும் - சேதுபதி.  
பாவை பப்ளிகேஷன்ஸ் - சென்னை - 14.

### பார்வை நூல்கள்

- 1.தமிழ் இலக்கிய வரலாறு - பேரா.முனைவர் பாசியமேரீ, நயு செஞ்சுரீ புக ஹவுஸ்(பி)ல்ட், 41-பி, சீட்கோ இண்டஸ்டிரியல் எஸ்டேட், அம்பத்தூர், சென்னை- 600 098.
- 2.தமிழ் இலக்கிய வரலாறு- மு.வரதராசனார் சாகித்திய அக்காதெமி, தலைமை அலுவலகம்,ரவீந்திர பவன், 35,பெரோஸ்ஷா சாலை,புதுதில்லி.

### Pedagogy

விரிவுரை கொடுத்தல்,கலந்துரையாடல், காட்சிப் பதிவுகளின் வழியாக புலப்படுத்துதல்.

### Teaching Aids

கரும்பலகை பயன்படுத்துதல், காட்சி திரைவழியாகப் புலப்படுத்துதல்.

### Course Contents and Lecture Schedule

Module No.	TITLE	No. of Lectures hours	Content Delivery Method	Teaching Aids
<b>அலகு :1 தமிழ்க் காப்பிய இலக்கியம்(18மணிநேரம்)</b>				
1.1	சீலப்பதிகாரம் - வழக்குரை காதை	4	வீர்வுரை கொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல், காட்சித் திரை வழியாக புலப்படுத்துதல்.
1.2	மணிமேகலை - ஆபுத்திரன் திறம் அறிவித்த காதை	4	வீர்வுரை கொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல், காட்சித் திரை வழியாக புலப்படுத்துதல்.
1.3	கம்பராமாயணம் - வாலி வதைப்படலம்	4	வீர்வுரை கொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல், காட்சித் திரை வழியாக புலப்படுத்துதல்.
1.4	வில்லிபுத்தூரார் பாரதம் - கண்ணன் தூதுச்சுருக்கம்	3	வீர்வுரை கொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல்
1.5	கந்த புராணம் - அயனைச் சிறை நீக்கும் படலம்	3	வீர்வுரைகொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல்
<b>அலகு :2 தமிழ் பக்த இலக்கியம் (18 மணிநேரம்)</b>				
2.1.	தேவாரம் - திருஞானசம்பந்தர் (திருவேடகப் பதிகம்)	4	வீர்வுரைகொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல், காட்சித் திரை வழியாக புலப்படுத்துதல்.
2.2.	திருவாசகம் - மாணிக்கவாசகர் (பிடித்த பத்து)	4	வீர்வுரைகொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல், காட்சித் திரை வழியாக புலப்படுத்துதல்
2.3.	திருமந்திரம் - திருமுலர்(10 பாடல்கள்)	4	வீர்வுரைகொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல்.
2.4.	திருப்பாவை - ஆண்டாள் (10 பாசுரங்கள் தெர்வு செய்யப்பெற்றவை)	4	வீர்வுரை கொடுத்தல்.	கரும்பலகை பயன்படுத்துதல்
2.5.	பராபரக்கண்ணி - தாயுமானவர் (10 கண்ணிகள் தெர்வு செய்யப்பெற்றவை)	2	வீர்வுரைகொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல்.
<b>அலகு : 3 - நாடகம் (18 மணிநேரம்)</b>				
3.1	வைகையில் வெள்ளம் வரும்	18	நாடகத்தினை வாசிப்பதற்கான	காட்சித் திரை வழியாக புலப்படுத்துதல்.

	(சேதுபதி)		பயிற்சியளித்தல், மாணவர்களுக்கருநாடிக் கக் கற்றுக்கொடுத்தல்	
<b>ஆலகு: 4 - தமிழ் இலக்கணம் - அணிகள் (18 மணிநேரம்)</b>				
4.1	உவமை அணி - உருவகம் அணி - பிறிது மொழிதல் அணி - தற்குறிப்பேற்றம் அணி வஞ்சப்புகழ்ச்சி அணி - சீலடை அணி - வேற்றுமை அணி	8	விரிவுரை கொடுத்தல்	கரும்பலகை பயன்படுத்துதல்.
4.2	1. பாவகைகள் (வெண்பா, ஆசிரியப்பா)	7	விரிவுரைகொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன்படுத்துதல்.
4.3	கடிதம் வரைதல் - விண்ணப்பக் கடிதம், புகார்க் கடிதம், பாராட்டுக் கடிதம்.	3	விரிவுரைகொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன்படுத்துதல்.
<b>அலகு : 5தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத் தமிழும் (18மணிநேரம்)</b>				
5.1	அ)1. காப்பிய இலக்கிய வரலாறு 2. பக்தி இலக்கிய வரலாறு	9	விரிவுரைகொடுத்தல்	கரும்பலகை பயன்படுத்துதல்
5.2	ஆ)பத்திரிக்கைச் செய்தி எழுதுதல், நேர்காணல் எடுத்தல், துணுக்குகள் எழுதுதல்.	9	விரிவுரைகொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன்படுத்துதல்,
<b>Total</b>		<b>90</b>		

Note: figures in the parenthesis are marks

Course Designer (Name of the Course Teacher)	Head of the Department
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முனைவர் கு.இராமர்  
(உதவிப்பேராசிரியர்)

முனைவர் வ.க.ராமகிருஷ்ணன்  
(இணைப்பேராசிரியர்)

### DEPARTMENT SANSKRIT

Programme: B.A./ B.Sc. (CBCS and OBE)

(For those students admitted during the Academic Year 2018-19and after)

PART – I : Sanskrit	SEMESTER – III
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Course Title : <b>PROSE, POETICS AND HISTORY OF SANSKRIT LITERATURE –III</b>		
Course Code: <b>P1LS31</b>	Hours per week: <b>6</b>	Credits: <b>3</b>
CIA Marks: <b>25</b>	ESE Marks: <b>75</b>	Total Marks: <b>100</b>

#### Preamble:

Sanskrit is offered as an alternative language under Part –I for B.A./ B.Sc students during first four semesters the above column explains the scheme of the III semester.

#### Course Outcomes (COs)

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

Number	Statement	Knowledge Level
CO 1	Understand the important aspects of prose literature	K2
CO 2	Discriminate spirituality in Literature	K2
CO 3	Basic knowledge of Sanskrit poetics	K1
CO 4	Describe and defend history of early Sanskrit literature	K2
CO 5	Practice Creativity and Demonstrate various culture of World	K2, K3

**K1**-Knowledge

**K2**-Understand

**K3**-Apply

#### Syllabus

**Unit 1:** Prose - Śukanāsopadeśaḥ, poetics –Upamā, Ullekḥā. History of Sanskrit Literature – Gadya Kāvya-

introduction to Gadya Kāvya- structure of Gadya Kāvya- Kathā and Ākhyāyikā

**Unit 2:** Prose – Pañcatantra (introduction), poetics –Rūpaka, Apahnuti. History of Sanskrit Literature –Daśakumāracaritam of Daṇḍin, Vāsavadatta of Subandhu. Popular tales

**Unit 3:** Prose - Akarṇahrdayogardabhaḥ, poetics –Utprekṣā, Atiśayokti. History of Sanskrit Literature-Kādambarī of Bāṇabhaṭṭa- structure of Kādambarī. Historical Kāvya- Harṣacaritam of Bāṇabhaṭṭa.

**Unit 4:** Prose - Simhajambukakathā, poetics –Dīpaka, Arthāntaranyāsa. History of Sanskrit Literature- works of Vākpati, Bilhaṇa, Kalhaṇa, Vāmanabhaṭṭabāṇa.

**Unit 5:** Prose –Pāpabuddhi and Puṇyabuddhikathā, poetics – Śleṣa, Vyatireka. History of Sanskrit Literature- History of Campū-literature – works of Trivikramabhaṭṭa, Somadeva, Bhoja, Abhinavakālidāsa, Anantabhaṭṭa, Cidambarakavi, Rājāśarabhoji, Nīlakaṇṭhadīkṣita,

#### Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO 6	PO 7
CO1	9	9	9	3	9	-	9
CO2	9	9	9	9	3	-	3
CO3	3	3	9	9	9	1	3
CO4	9	9	9	9	9	-	9
CO5	9	9	9	9	3	-	3
	39	39	45	39	33	1	27

Strong -9

Medium -3

Low -1

#### Text Book(s)

1. Sāhityarasakāṇa, compiled by Dr. S. Jagadisan, Published by AMG Publications, Madurai -625010. Year of publication 1996.
2. A History of Sanskrit Literature, compiled by Dr. S. Jagadisan, Published by AMG Publications, Madurai -625010. Year of publication 1996.

#### Reference Books

1. A Short History of Sanskrit Literature, by T.K. Ramachandra Aiyar, published by R.S. Vadhyar & Sons, Kalpathi, Palakkad -678003 (2) A History of Sanskrit

#### Pedagogy

2. published by Motilal Banarsidass Publishers Private Limited, Delhi, 2017.

Chalk & Talk, Group Discussion, PPT

#### Teaching Aids

Green Board, LCD Projector, Interactive White Board

**UG Programme, Part -II English (CBCS-OBE) - SEMESTER III**  
(For those students who joined in the academic year 2018-2019 onwards)

PART II		
Course Title : English for Academic and Professional Excellence-I		
Course Code: P2LE31/ P2CE31	Hours per week: 6	Credit: 3

Sessional Marks: <b>25</b>	Summative Marks: <b>75</b>	Total Marks: <b>100</b>
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**Preamble:**

The students are expected to inculcate English socio-linguistic competence and moral values through world literature in English for communication skills.

**Course Outcome (CO):**

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

State One	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)		
CO1	Appraise various authors' socio-linguistic interests through prose discourses	K1	K2	K3
CO2	Develop comprehension skills through poetry	K1	K2	K3
CO3	Critique the discourses, characters and their psychological behaviour found in a English novel	K1	K2	K3
CO4	Demonstrate acquired grammar skill in listening, speaking, reading and writing	K1	K2	K3
CO5	Design and Repeat creative writing through composition exercises	K1	K2	K3

**K1- Remembering    K2 – Understanding    K3 – Applying**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	9	9	9	9	9	-	9
CO2	9	3	9	9	9	-	3
CO3	9	9	9	3	9	1	3
CO4	3	9	3	-	-	-	9
CO5	9	9	9	1	-	-	3
	39	39	39	22	27	1	27

**Strong -9**

**Medium -3**

**Low**

## SYLLABUS

**Unit-1 Prose**

1. *The Indian National Education* - Swami Chidbhavananda  
Educating the Adult (*Chapter I*)
2. *Women not the Weaker Sex* (gender) – Mahatma Gandhi
3. *Travel by Train* – John Boynton Priestley

**Unit-2 Poetry**

1. *The Toys* – Coventry Patmore
2. *The Soul's Prayer* – Sarojini Naidu
3. *Where the mind is Without Fear* - Rabindranath Tagore

**Unit-3 Novel**

*Oliver Twist* - Charles Dickens [*Abridged*]  
(For the three Sessional Exam)

**Unit-4 Grammar**

1. Concord and Question Tag
  2. Spotting Errors
- (For the three Sessional Exam)

**Unit-5 Composition**

1. Covering Letter and Résumé Preparation -1 (UK)
2. Interview skills

### 3. Dialogue Writing

#### Course Texts:

1. Swami Chidbhavananda. *The Indian National Education*. Tirupparaithurai: Sri Ramakrishna Tapovanam, 2017.
2. Dr.P.C.James Daniel, ed. *Gateway to English: An Anthology of Prose*. Chennai: Harrows Publications, 2018.
3. *Poetry*. Chennai: Main Spring Publishers, (or)  
< <https://www.poetryfoundation.org/poems/44845/the-toys-56d22417d5e2e>>  
< <https://www.poemhunter.com/poem/the-soul-s-prayer/>>  
<<https://www.poetryfoundation.org/poems/45668/gitanjali-35>>
4. Charles Dickens, *Oliver Twist*. London: Wordsworth Classic, 1992.
5. Abhijit Acharjee, and Rakesh Ramamoorthy, ed. *Frontiers of Communication: An Anthology of Short Stories and Prose*. Chennai: Cambridge University Press, 2018.
6. KV Joseph and Ae Augustine. *Trinity Grammar a Handbook*. New Delhi: Trinity Press... (or)  
G.Radhakrishna Pillai. *Emerald English Grammar and Composition*. Emerald Publisher. (or)  
Owen Hargie, David Dickson, and Dennis Tourish. *Communication Skills for Effective Management*. New York: Palgrave Macmillan, 2004.
7. Hari Mohan Prasad, and Uma Rani Sinha. *Objective English for Competitive Examinations*. New Delhi: McGraw Hill Education, 2016. (Prescribed chapters will be given.)

#### References:

1. Swami Chidbhavananda. *Vedanta Society*. <<https://sfvedanta.org/authors/swami-chidbhavananda/>>
2. Dr.A.Shanmugakani, ed. *Prose for Communication: An Anthology of Prose*. Madurai: Manimekala Publishing House, 2008.
3. Charles Dickens, *Oliver Twist (the Parish Boy's Progress)*. London: Richard Bentley, 1839.
4. K.V.Joseph. *A Textbook of English Grammar and Usage*. New Delhi: TATA McGraw Hill Education Private Limited, 2012.
5. A. J. Thomson, and A. V. Martinet. *A Practical English Grammar*. New Delhi: OUP, 1986.
6. Books by Dickens, Charles (sorted by popularity). <<http://www.gutenberg.org/ebooks/author/37>>
7. Mary Ellen Guffey, and Richard Almonte. *Essentials of Business Communication*. Toronto: Nelson Education, 2007.
8. Edgar Thorpe, and Showick Thorpe. *Objective English for Competitive Examinations*. New Delhi: Pearson India Education, 2017.

**PEDAGOGY:** Teacher made aids and Mechanical (ITC) Aids, Chalk and Talk with interactive session.

Note: (Additional online sources, presentation, and test will be given by the respective teachers in the English Language Lab. [Either 8.45 am to 9.30 am or 5.00 pm to 5.45 pm]).

**TEACHING AIDS:** Course Texts, Reference books, Writing Board, and Online Sources.

Course Content and Teaching or Lecture Schedule				
SYLLABUS				
Unit-1	Prose	No. of Class Hours (90)	Content delivery method	Teaching Aids
	1. <i>The Indian National Education</i> - Swami Chidbhavananda Educating the Adult (Chapter I) 2. <i>Women not the Weaker Sex</i> (gender) – Mahatma Gandhi 3. <i>Travel by Train</i> – John Boynton Priestley	3×6=18	Teacher made aids and Mechanical (ITC) Aids, Chalk and Talk with interactive session	Course Texts, Writing Board, and Online sources
Unit-2	Poetry			
	1. <i>The Toys</i> – Coventry Patmore 2. <i>The Soul's Prayer</i> – Sarojini Naidu 3. <i>Where the mind is Without Fear</i> - Rabindranath Tagore	3×6=18	Teacher made aids and Mechanical (ITC) Aids, Chalk and Talk with	Course Texts, Writing Board, and Online sources

			interactive session	
<b>Unit-3</b>	<b>Novel</b>			
	<i>Oliver Twist</i> - Charles Dickens [Abridged] (for the three Sessional Exam)	1×18=18	Teacher made aids and Mechanical (ITC) Aids, Chalk and Talk with interactive session	Course Texts, Writing Board, and Online sources
<b>Unit-4</b>	<b>Grammar</b>			
	1. Concord and Question Tag 2. Spotting Errors (For the three Sessional Exam)	2×9=18	Teacher made aids and Mechanical (ITC) Aids, Chalk and Talk with interactive session	Course Texts, Writing Board, and Online sources
<b>Unit-5</b>	<b>Composition</b>			
	1. Covering Letter and Résumé Preparation -1 (UK) 2. Interview skills 3. Dialogue Writing	3×6=18	Teacher made aids and Mechanical (ITC) Aids, Chalk and Talk with interactive session	Course Texts, Writing Board, and Online sources

### DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)

(For those students admitted during the 2018 -19 and after)

<b>PART – III : Core Theory</b>		<b>SEMESTER - III</b>
Course Title: <b>Biochemistry, Biophysics and Biometrics</b>		
Course Code: 08CT31	Hours per week:4	Credit:4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

#### Preamble

- ❖ To learn the structure, classification and properties of macro molecules
- ❖ To understand the principles of energy production of biological systems
- ❖ To train the students in basic statistical methods used in interpreting scientific data

#### Course Outcomes

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Know about the properties and types of carbohydrate and lipids	K1, K2 & K3
CO2	Distinguish the protein, amino acids and enzymes and their functions	K1, K2 & K3
CO3	Understand chemical nature and structure of nucleic acids	K1, K2 & K3
CO 4	Understand photobiology and relations between light and biological organisms	K1, K2 & K3
CO 5	Apply the biological data analysis	K1, K2 & K3

**K1-knowledge**

**K2-Understand**

**K3-Apply**

#### Mapping of CO with PO

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO 1	9	3	9	9	9	9	9
CO 2	9	3	9	9	9	9	9
CO 3	9	3	9	9	9	3	3
CO 4	9	3	1	9	3	9	3
CO 5	9	3	9	9	9	1	9
	45	15	37	45	39	31	33

**9-Strong**

**3-Medium**

**1-Low**

#### Mapping of CO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	9	1	9	9	9
CO 2	3	1	9	9	9
CO 3	9	1	1	3	3
CO 4	3	1	1	3	9
CO 5	1	1	3	9	9

**9-Strong**

**3-Medium**

**1-Low**

#### Syllabus

UNIT No.	CONTENT	HOURS
<b>Biochemistry</b>		
<b>UNIT I</b>	Carbohydrates: Classification, Structure and Properties of Monosaccharides only, Lipids - Types and properties only - Nucleic acids –Structure of DNA and types of RNA.	<b>12</b>
<b>UNIT II</b>	Structure and functions of Proteins only. Amino acids – Types and Properties only - Enzymes – Classification, properties and enzyme action.	<b>12</b>
<b>Biophysics</b>		
<b>UNIT III</b>	Law of thermodynamics – free energy – enthalpy –entropy – Redox Potential – free energy change in redox reactions – mitochondrial and chloroplast bioenergetics.	<b>12</b>

<b>UNIT IV</b>	Nature of light, light and plant pigments – absorption of light – fate of excited electrons – Action spectra – Photochemical reaction – Physical phenomena (Bioluminescence, Fluorescence, Phosphorescence)	<b>12</b>
<b>Biostatistics</b>		
<b>UNIT V</b>	Collection, tabulation and interpretation of data, Measures of central tendencies (Mean, Median, Mode) Measures of dispersion (Standard deviation and standard error)	<b>12</b>

### Text Books

1. Elementary Biophysics – Srivastava, Narosa Publishers, Chennai, 2013 Ed.
2. Biostatistics – B.K.Mahajani, J.P.Brothers, Delhi, 2010 Ed.
3. Biophysics and bioinstrumentation – N. Arumugam, Saras Publications, Nager coil, 2013 Ed

### Reference Books

1. 1 Outlines of Biochemistry - Conn & Stomp, John Wiley & Sons, 2010 Ed.
2. Biochemistry - Lehniger, Kalyani Publications, Chennai, 2012 Ed.
3. Elements of Biochemistry – H.S.Srivastava, Rastogi Pub. Meerut, 2013 Ed.

### Pedagogy

Chalk & Talk, Group Discussion, Power point presentation (PPT)

### Teaching Aids

Green Board, LCD Projector, Interactive White Board

### Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
<b>Biochemistry</b>				
<b>UNIT I</b>				
1.1	Carbohydrate: Classification,	3	Discussion	
1.2	Structure of Monosaccharide	2	Chalk & Talk	Green Board
1.3	Properties of Monosaccharide	3	Chalk & Talk	Green Board
1.4	Lipids – Types	2	PPT	LCD
1.5	Properties lipids	2	PPT	LCD
<b>UNIT II</b>				
2.1	Proteins: Structure	2	Chalk & Talk	Green Board
2.2	Functions of Proteins	2	PPT	LCD
2.3	Amino acids: Types	3	Chalk & Talk	Green Board

2.4	Properties amino acids	2	PPT	LCD
2.5	Enzymes: Classification	2	Chalk & Talk	Green Board
2.6	Properties of enzymes	2	Chalk & Talk	Green Board
2.7	Enzyme action.	3	PPT	LCD
<b>UNIT III</b>				
3.1	Nucleic acids: introduction	1	Chalk & Talk	Green Board
3.2	types: DNA and RNA	1	Chalk & Talk	Green Board
3.3	Nucleotides – building blocks of DNA and RNA	3	Chalk & Talk	Green Board
3.4	double helix model of DNA	2	PPT	Green Board
3.5	significance of DNA, DNA – types	2	PPT	Green Board
3.6	DNA replication	1	PPT	Green Board
3.7	types of RNA – structure of tRNA.	2	PPT	Green Board
<b>UNIT IV</b>				
4.1	Nature of light	1	Lecture	
4.2	Light and plant pigments	2	PPT	LCD
4.3	Absorption of light – fate of excited electrons	2	Chalk & Talk	Green Board
4.4	Action spectra	2	Chalk & Talk	Green Board
4.5	Physical phenomena Bioluminescence, Fluorescence, Phosphorescence)	2	PPT	LCD
4.6	Redox Potential – Mitochondrial and chloroplast bioenergetics.	3	Chalk & Talk	Green Board
<b>Biostatistics</b>				
<b>UNIT V</b>				
5.1	Introduction- Basic concepts of biostatistics	2	Chalk & Talk	Green Board
5.2	Collection, tabulation and interpretation of data	3	Chalk & Talk	Green Board
5.3	Measures of central tendencies (Mean, Median, Mode)	3	Chalk & Talk	Green Board
5.4	Measures of dispersion (Standard deviation and standard error)	4	Chalk & Talk	Green Board
	<b>Total</b>	<b>60</b>		

<b>Course Designer</b> <b>(Name of the Course Teacher)</b>	<b>Head of the Department</b>
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**Dr. C. SOUNDAR RAJU**

**Dr. N. LAXSHMANAN**

**DEPARTMENT OF BOTANY**

Programme: B.Sc. BOTANY (CBCS and OBE)

(For those students admitted during the 2018 -19 and after)

<b>PART – III : Core Theory</b>		<b>SEMESTER - III</b>
Course Title: Genetics and Bioinformatics		
Course Code: 08CT32	Hours per week:4	Credit:4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

**Preamble**

- ❖ To understand the Concepts of Mendelian inheritance, its deviation, multiple and polygenic inheritance
- ❖ To understand the basics of informatics used in Biology

- ❖ To familiarize the concepts of biological databases their applications through bioinformatics tools.

### Course Outcome

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

Number	Course Outcome	Knowledge Level ( According to Bloom's Taxonomy)
CO1	Acquire knowledge on hereditary laws, its deviations, types of crosses in Mendelian inheritance.	K1
CO2	To identify the process of sex determination, multiple and polygenic inheritance and deviation of Mendel's law through linkage and crossing over.	K1 & K2
CO3	To Understand various types of inheritance, its deviation diseases, molecular modifications, its regulation and human genome project.	K2
CO4	To have deeper understanding in biological databases, its application in gene comparison tools in phylogenetic tree construction.	K2
CO5	Trace the prokaryotic and eukaryotic genome isolation, identification, proteome, its products and development.	K3

**K1** – Knowledge

**K2** – Understand

**K3** – Apply

### CO with PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	9	9	9	3	3	3	3
CO2	9	9	9	3	9	3	1
CO3	9	9	9	9	3	3	1
CO4	9	3	9	9	3	3	3
CO5	9	3	9	9	3	3	3
	45	33	45	33	21	15	11

**9-Strong**

**3-Medium**

**1-Low**

### CO with PSO Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	9	3	1	3	3
CO2	3	3	3	3	3
CO3	3	3	3	3	3
CO4	3	9	3	9	9
CO5	3	9	3	9	9

**9-Strong**

**3-Medium**

**1-Low**

### Syllabus

<b>Unit – I</b>	Introduction to Genetics - Mendelian inheritance – Mendel's laws - law of dominance – Incomplete dominance: law of segregation - law of independent assortment – monohybrid cross - dihybrid	<b>(12 Hrs)</b>
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	cross - back and test crosses – Interaction of genes: complementary genes - epistasis	
<b>Unit – II</b>	Multiple alleles with reference to A, B, O & AB blood groups in man - Linkage - mechanism of crossing over and significance – Mechanism of sex determination in plants.	<b>(12 Hrs)</b>
<b>Unit – III</b>	Sex linked inheritance – Extrachromosomal inheritance – Male sterility in Maize – plastid inheritance – Mutation - Chromosomal aberrations and its types – genetic significance of mutations – mutagens – Human genome project – Gene regulation in prokaryotes.	<b>(12 Hrs)</b>
<b>Unit – IV</b>	Bioinformatics – Definition – Terminologies used in bioinformatics – internet basic – Database NCBI & PDB – Sequence analysis – Pairwise sequence alignment and multiple sequence alignment - similarity search tools – BLAST and FASTA and Phylogenetic tree Constructions - Applications of bioinformatics.	<b>(12 Hrs)</b>
<b>Unit – V</b>	Genomics – History and perspectives in genomic sciences – Prokaryotic and Eukaryotic genomics – Proteomics – Introduction – Terminologies used in proteomics – Proteome analysis – Techniques used for genomic studies: Polymerase Chain Reaction (PCR), RAPD & RFLP	<b>(12 Hrs)</b>

### Text Books:

1. Fundamental of genetics – D.D. Singh, Kalyani Pub. Chennai, 2012 Ed.
2. Genetics and Molecular biology – Veer Bala Rastogi, Kedarnath, Ramnats, Meerut, 2013 Ed.
3. Bioinformatics - B.G. Curran, CBS Publishers PVT Ltd, New Delhi, 2012 Ed.

### Reference Books:

1. Principles of Genetics – E.J. Gardner, Wiley Eastern Company, 2013 Ed
2. Human Genetics – Prentice Hall of India - Victor A. McKusick, PHI, 2010 Ed.
3. Bioinformatics - Tata McGraw Hill Education india, Delhi, 2010 Ed.

### Pedagogy

Chalk & Talk, PPT, Experiment

### Teaching Aids

Black Board, Green Board, Chart, Specimen, Plant Material, Permanent Slide, LCD Projector, Online virtual Lab & Interactive White Board

### Course Contents and Lecture Schedule

Module No.	Topic	No. of Class	Content Delivery method	Teaching Aids
<b>Unit – I</b>				
1.1	Introduction to Genetics	1	Calk & Talk	Green Board
1.2	Mendelian inheritance	1	Calk & Talk	Green Board
1.3	Mendels' laws - law of dominance – incomplete dominance I	1	Calk & Talk	Chart

1.4	Law of segregation	1	Calk & Talk	Green Board
1.5	Law of independent assortment	1	Calk & Talk	Chart & Green Board
1.6	Monohybrid cross	2	Calk & Talk	Chart & Green Board
1.7	Dihybrid cross	2	Calk & Talk	Green Board
1.8	Back and test crosses	2	Calk & Talk	Chart & Green Board
1.9	Complementary genes - Epistasis	1	Calk & Talk	Chart & Green Board
<b>Unit – II</b>				
2.1	Multiple alleles with reference to A, B, O blood groups in man.	3	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
2.2	Linkage and Crossing over theories	3	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
2.3	Linkage and Crossing significance	3	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
2.4	Mechanism of sex determination in plants.	3	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
<b>Unit – III</b>				
3.1	Sex linked inheritance – Extrachromosomal inheritance – Male sterility in Maize – plastid inheritance – Chromosomal aberrations and its types – Mutations – genetic significance of mutations – mutagens – Human genome project – Gene regulation in prokaryotes.	3	Calk & Talk	Chart, Plant material & Green Board
3.2	Male sterility in Maize – plastid inheritance	3	Calk & Talk	Chart, Plant material & Green Board
3.3	Chromosomal aberrations and its types – Mutations – genetic significance of mutations – mutagens –	3	Calk & Talk	Chart, Plant material & Green Board
3.4	Human genome project – Gene regulation in prokaryotes.	3	Calk & Talk	Chart, Plant material & Green Board
<b>Unit – IV</b>				

4.1	Bioinformatics – Definition	3	Calk & Talk	Chart, Plant material & Green Board
4.2	Terminologies used in bioinformatics	3	Calk & Talk	Green Board
4.3	Internet basics Database NCBI & PDB, Applications of bioinformatics.	3	Calk & Talk	Green Board
4.4	Sequence analysis – Pairwise sequence alignment and multiple sequence alignment, BLAST and FASTA and Phylogenetic tree Constructions	3	Calk & Talk	Green Board
<b>Unit – V</b>				
5.1	Genomics – History and perspectives in genomic sciences – Prokaryotic and Eukaryotic genomics – Techniques for genomic studies (PCR) – Introduction to RAPD & RFLP – Proteomics – Introduction – Terminologies used in proteomics – Proteome analysis.	2	Calk & Talk	Green Board
5.2	Prokaryotic and Eukaryotic genomics	2	Calk & Talk	Green Board & Specimen
5.3	Techniques for genomic studies (PCR)	2	Calk & Talk	Green Board & Plant material
5.4	Introduction to RAPD & RFLP	2	Calk & Talk	Green Board
5.5	Proteomics – Introduction – Terminologies used in proteomics – Proteome analysis.	2	Calk & Talk	Green Board
Total		60		

<b>Course Designer</b> <b>(Name of the Course Teacher)</b>	<b>Head of the Department</b>
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**Dr. N. LAKSHMANAN**

**Dr. N. LAKSHMANAN**

### **DEPARTMENT OF ZOOLOGY**

Programme: B.Sc., Zoology, (Under CBCS and LOCF)  
(For those students admitted during the Academic Year 2018 - 19 and after)

<b>PART – III : Allied</b>		<b>SEMESTER - III</b>
<b>Course Title : ANIMAL ORGANISATION</b>		
<b>Course Code: 09AT01</b>	<b>Hours per week: 4</b>	<b>Credits: 4</b>
<b>CIA: 25 Marks</b>	<b>ESE: 75 Marks</b>	<b>Total: 100 Marks</b>

### **Preamble**

- ❖ Students are enable to gain basic knowledge on taxonomical methods, outline classification of animals, morphological, anatomical and functional features of representative animals.

### Course Learning Outcomes (CLO)

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

No.	Course Learning Outcome	Knowledge Level (according to Bloom's Taxonomy)
<b>CLO 1</b>	Inculcate knowledge on animal classification and taxonomical methods with suitable examples.	K1
<b>CLO 2</b>	Understand the structure ingestion and egestion of bioprocesses in feeding and respiration of representative animals.	K2
<b>CLO 3</b>	Make awareness on movement of fluids, body and structural in invertebrates and chordates representatives.	K2
<b>CLO 4</b>	Observe a structure and functional aspects of nervous system, receptors in earthworm, insects and human.	K2
<b>CLO 5</b>	Trace the structure and processes of excretion, reproduction in selected invertebrates and chordates.	K3

**K<sub>1</sub>**-Remembering

**K<sub>2</sub>**-Understanding

**K<sub>3</sub>**-Applying

### Mapping of CO with PO

	PO 1	PO 2	PO 3	PO 4	PO 5	PO6	PO7
<b>CO 1</b>	9	3	-	3	9	9	3
<b>CO 2</b>	9	1	3	3	3	9	3
<b>CO 3</b>	9	1	9	3	9	3	3
<b>CO 4</b>	9	1	9	3	3	3	3
<b>CO 5</b>	9	1	9	9	9	9	3
	45	6	30	21	33	33	15

**9**-Strong

**3**-Medium

**1**-Low

### Mapping of CO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
<b>CO 1</b>	1	3-	1	9	2
<b>CO 2</b>	1	1	-	3	1
<b>CO 3</b>	-	3	2	3	1
<b>CO 4</b>	-	1	3	2	1
<b>CO 5</b>	-	1	1	3	1

**9**-Strong

**3**-Medium

**1**-Low

### Syllabus

<b>UNIT-I</b>	1. Principles of taxonomy – Binomial nomenclature - Animal Organisation – body types – protozoa – metazoa – types of coelom – types of symmetry 2. Outline classification of Invertebrates and the salient features of the Phyla with examples. Outline classification of Chordates upto classes giving examples	<b>(12 Hrs)</b>
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<b>UNIT-II</b>	1. Feeding and digestion in Amoeba and Frog. 2. Respiration in Amoeba, Cockroach, Gills in Fish and Lungs in bird.	<b>(12 Hrs)</b>
<b>UNIT- III</b>	1. Circulatory system in <i>Paramecium</i> , Earthworm and Calotes. 2. Locomotion in Amoeba, <i>Paramecium</i> , and Earthworm 3. Flight mechanism in Pigeon.	<b>(12 Hrs)</b>
<b>UNIT- IV</b>	1. Nervous system of Earthworm. 2. Human brain and ear. 3. Receptors – photoreceptors of Euglena, insects and man.	<b>(12 Hrs)</b>
<b>UNIT- V</b>	1. Excretion in Amoeba and Earthworm. 2. Excretion in Man- Structure of kidney and urine formation. 3. Reproductive system of Rabbit.	<b>(12 Hrs)</b>

### Text Books

1. A Text Book of Invertebrates –2004. Nair *et al.*, Saras Publications.
2. A Text Book of Chordates – 2004. Thangamani, *et.al.*, Saras Publications

### Reference Books

1. A Manual of Zoology, Vol. I- Invertebrata, 1982. Ekambaranatha Ayyar and Ananthakrishnan.
2. A Manual of Zoology, Vol. II – Chordata – 1982. Ekambaranatha Ayyar and Ananthakrishnan.

### Pedagogy

Chalk and talk, Group Discussion, PPT, Preserved animals and Field visit

### Teaching Aids

Green Board, LCD Projector, Interactive White Board

### Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
<b>Unit - I</b>				<b>12 Hours</b>
1.1	Principles of taxonomy – Binomial nomenclature - Animal Organisation – body types – protozoa – metazoa –	3	Chalk & Talk, PPT	Green Board
1.2	types of coelom – types of symmetry	3	Chalk & Talk, PPT	Microscope
1.3	Outline classification of Invertebrates and the salient features of the Phyla with examples	3	Lecture	PPT & White board
1.4	Outline classification of Chordates upto classes giving examples	3	Lecture	Green Board

Unit -II				12 Hours
2.1	Feeding and digestion in Amoeba, Hydra and Frog	6	Lecture	Green Board Charts
2.2	Respiration in Amoeba, Cockroach, Gills in Fish and Lungs in bird	6	Chalk & Talk, PPT	Green Board
Unit -III				12 Hours
3.1	Circulatory system in Paramoecium, Earthworm and Calotes	5	Chalk & Talk, PPT	Green Board
3.2	Locomotion in Amoeba, Paramoecium and Earthworm	5	Lecture PPT	Green Board Smart Board
3.3	Flight mechanism in Pigeon	2	Discussion Specimen	Green Board Microscope
Unit -IV				12 Hours
4.1	Nervous system of Earthworm	1	Discussion	Green Board
4.2	Human brain	2	Chalk & Talk, PPT	Green Board
4.3	Receptors – photoreceptors of Euglena, insects and man	4	Chalk & Talk, PPT Specimen	Green Board Microscope
4.4	Human ear	2	Chalk & Talk, PPT	Green Board
Unit -V				12 Hours
5.1	Excretion in Amoeba, Earthworm	5	Lecture	Green Board
5.2	Excretion in Man	3	Lecture	Green Board
	Reproductive system of Rabbit	4	Chalk & Talk, PPT	Green Board
	<b>Total</b>	<b>60</b>		

<b>Course Designer</b> (Name of the Course Teacher)	<b>Head of the Department</b>
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### DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

PART – IV : Skill Based Theory		SEMESTER - III
Course Title: Bioinstrumentation		
Course Code: 08SB31	Hours per week:2	Credit:2
CIA Marks: 25	ESE Marks: 75	Total Marks: 100



## Objectives

- ❖ To acquire practical knowledge of using various instruments and carry out experiments with them
- ❖ To know the principles of instruments used in biology
- ❖ To know the importance of bioinstruments

## UNIT I

Microscopy - The working principles of microscope-comparison of phase contrast and fluorescence microscopes-Electron microscope TEM and SEM Micrometry – ocular and stage

## UNIT II

Colorimetry and pH metry, basic principles and application of Colorimeter and pH meter

## UNIT III

Centrifugation - Basic principles and types of centrifuges, Application of analytical ultra centrifuge

## UNIT IV

Chromatographic techniques - Basic principles and Types (Paper, TLC and Column chromatography)

## UNIT V

Electrophoretic methods - Principles and types (PAGE)

## Text Books

1. Techniques in Biology – J. Jeyaraman, Higgin Bothams Ltd, 2010 Ed.
2. Analytical Biochemistry – P. Asokan, Chinna Publications, 2013 Ed.
3. Biophysics and bioinstrumentation – N. Arumugam, Saras Publicatoins, Nager coil, 2013 Ed

## Reference Books

1. Practical Biochemistry – David. T. Plummer, THM, 2010 Ed.
2. A biologist's guide to principles and techniques of Practical Biochemistry - Goulding & Wilson, ELBS, 2010 Ed.
3. Instrumental analysis for science and technology – Weferren, Agrobios India, 2010 Ed.

**தமிழ்த்துறை,  
விவேகானந்த கல்லூரி, திருவேடகம் மேற்கு.**

Programme : B.A., BSc., (CBCS and Outcome Based Education (OBE)  
(For those students admitted during the Academic Year 2018 – 2021 and after)

**பாடத்திட்டத்தின் கட்டமைப்பு (PROGRAMME STRUCTURE)**

UG Language PART – I TAMIL		SEMESTER : IV	
Subject Title : சங்க இலக்கியமும் நீதி இலக்கியமும்			
Course Code :PILT41	Hours per week : 18		Credit : 03
CIA Marks : 25	ESE Marks : 75		Total Marks : 100

### Preamble

1. பண்டைத் தமிழர்களில் ஒரு சமூகம் சார்ந்த வாழ்க்கை முறையினை உணர்த்துதல்.
2. தனிமனித வாழ்க்கைகளின் வழி களவு- கற்பு ஒழுக்க நெறிமுறைகளை வெளிப்படுத்துதல்.
3. வாழ்வில் கடைபிடிக்க வேண்டிய நீதிநெறிகளைப் புகட்டுதல்.
4. அகம், புறம் சார்ந்த வாழ்க்கைக்கான இலக்கண வரம்புகளை தெளிவுபடுத்துதல்.
5. சங்கஇலக்கிய மற்றும் நீதிஇலக்கிய காலகட்டங்களின் வரலாற்றினை விவரித்தல்.

### Course Outcomes (COs)

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

NO.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	பண்டைத் தமிழர்களில் ஒரு சமூகம் சார்ந்த ஒழுக்கங்கள் குறித்த நிலையினை வரையறை செய்தல்.	K <sub>1</sub> , K <sub>2</sub>
CO 2	ஐந்திணை மக்களின் அகஒழுக்கங்கள் குறித்த செய்திகளை கலந்துரையாடுதல்.	K <sub>2</sub> , K <sub>3</sub>
CO 3	சங்க இலக்கியம் மற்றும் நீதி இலக்கிய காலகட்டங்களில் வாழ்ந்த மக்கள் மற்றும் அவர்களின் வாழ்க்கையினை பதிவுசெய்த படைப்பாளர்கள் ஆகியோரின் வரலாற்றினை விவரித்தல்.	K <sub>2</sub> , K <sub>3</sub>
CO 4	பழங்கால மக்களின் அகம், புறம் தொடர்பான வாழ்க்கை நிகழ்வுகளின் மரபுநிலைகள் குறித்த திறன்களை அறிவித்தல்.	K <sub>2</sub>
CO 5	வாக்கியங்களைக் கண்டறிதல், சொற்களை ஒழுங்குபடுத்துதல், ஆங்கிலத்திற்கு நிகரான தமிழ்ச்சொற்களை கண்டறிதல், வழுவுச்சொற்களை நீக்குதல் போன்ற ஒரு மொழியின் பயன்பாட்டுத் தன்மையை தெளிவுறுத்தல்.	K <sub>1</sub> , K <sub>2</sub> , K <sub>3</sub>

K<sub>1</sub>-Knowledge

K<sub>2</sub>-Understand

K<sub>3</sub>-Apply

### Mapping of CO with PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	9	3	9	9	9	9	9
CO2	9	9	9	9	9	3	9
CO3	9	9	9	9	9	9	9

CO4	9	3	3	9	9	9	9
CO5	9	3	9	9	9	3	9
	45	27	39	45	45	33	45

### பாடத்திட்டம்(syllabus)

<b>அலகு : 1</b>	தமிழ்ச் சங்க இலக்கியம் (பத்துப்பாட்டு) 1. முல்லைப்பாட்டு	(18மணிநேரம்)
<b>அலகு : 2</b>	தமிழ்ச் சங்க இலக்கியம் (எட்டுத்தொகை) 1.நற்றிணை - (3பாடல்கள்) 2.குறுந்தொகை - (5பாடல்கள்) 3.கலித்தொகை - (2பாடல்கள்) 4.அகநானூறு - (2பாடல்கள்) 5.புறநானூறு - (3பாடல்கள்)	(18 மணிநேரம்)
<b>அலகு : 3</b>	தமிழ் நீதி இலக்கியம் 1. திருக்குறள் (செய்நன்றி அறிதல், காலம் அறிதல், குறிப்பு அறிதல்) 2. பழமொழி நானூறு (கல்வி அதிகாரம்) 3. கொன்றை வேந்தன் ( 10 பாடல்கள்) 4. முதுரை (10 பாடல்கள்)	(18 மணிநேரம்)
<b>அலகு : 4</b>	தமிழ் இலக்கணம் - பொருள் 1. அகப்பொருள் (அகத்திணைகள் - முதல், கரு, உர்ப்பொருள்) 2. புறப்பொருள் (புறத்திணைகள் - வெட்ச முதல் பெருந்திணை வரையுள்ள 12திணைகள்) 3. மரபியல் (பெயர் மரபுகள் - ஆண்பால்பெயர், பெண்பால்பெயர், இளமைப்பெயர்)	(18 மணிநேரம்)
<b>அலகு : 5</b>	தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத்தமிழும் 1. சங்க இலக்கிய வரலாறு 2. நீதி இலக்கிய வரலாறு 3. புத்தக மதிப்புரை, தமிழ்த் திரைப்பட விமர்சனம், கவிதை படைத்தல்.	(18 மணிநேரம்)

### பாட நூல்கள் (Text Books)

## 1.தமிழ் செய்யுட் தொகுப்பு (தமிழ்த்துறை வெளியீடு)

### பார்வை நூல்கள்(Reference Books)

1. தமிழ் இலக்கிய வரலாறு - சி.சேதுராமன்  
பாவை பப்ளிகேஷன்ஸ்,  
16(142)ஜானிஜான்கான் சாலை,  
இராயப்பேட்டை, சென்னை - 600014.
2. தமிழ் இலக்கிய வரலாறு - முனைவர்பாக்யமேர்  
நயு செஞ்சுர் புக ஹவுஸ்(பி)ல்ட்,  
41-பி, சீட்கோ இண்டஸ்ட்ரியல் எஸ்டேட்,  
அம்பத்தூர், சென்னை- 600 098.

### Pedagogy

வீர்வுரை கொடுத்தல்,கலந்துரையாடல், காட்சிப் பதவுகளின் வழியாக  
புலப்படுத்துதல், பயிற்சி கொடுத்தல்.

### Teaching Aids

கரும்பலகை பயன்படுத்துதல், காட்சி திரைவழியாக புலப்படுத்துதல்.

### Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
<b>அலகு :1தமிழ்ச் சங்க இலக்கியம் (பத்துப்பாட்டு)(18 மணிநேரம்)</b>				
1.	முல்லைப்பாட்டு	18	வீர்வுரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல்
<b>அலகு : 2தமிழ்ச் சங்க இலக்கியம் (எட்டுத்தொகை)(18 மணிநேரம்)</b>				
2.1.	நற்றிணை - 3 பாடல்கள்	3	வீர்வுரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல், காட்சித்திரை வழிப் புலப்படுத்துதல்
2.2	குறுந்தொகை - 5 பாடல்கள்	4	வீர்வுரைகொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல், காட்சித்திரை வழிப் புலப்படுத்துதல்
2.3	கலித்தொகை - 2 பாடல்கள்	4	வீர்வுரைகொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல் காட்சித்திரை வழிப் புலப்படுத்துதல்
2.4	அகநானூறு - 2 பாடல்கள்	3	வீர்வுரைகொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல் காட்சித்திரை வழிப்

				புலப்படுத்துதல்
2.5	புறநானூறு - 3 பாடல்கள்	4	வீரவரைகொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல் காட்சித்தரையழிப்பு புலப்படுத்துதல்
<b>அலகு : 3 தமிழ் நீதி இலக்கியம் (18 மணிநேரம்)</b>				
3.1	திருக்குறள் செய்நன்றியறிதல் (அதிகாரம்-11) காலமறிதல் (அதிகாரம் - 49)குறிப்பறிதல் (அதிகாரம் - 71)	6	வீரவரைகொடுத்தல்	கரும்பலகை பயன்படுத்துதல்
3.2	பழமொழி நானூறு (கல்வி அதிகாரம்)	4	வீரவரைகொடுத்தல்	கரும்பலகை பயன்படுத்துதல்
3.3	கொன்றை வேந்தன் (10 பாடல்கள்)	4	வீரவரைகொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல்
3.4	முதுரை (10 பாடல்கள்)	4	வீரவரைகொடுத்தல்	கரும்பலகை பயன்படுத்துதல்
<b>அலகு: 4தமிழ் இலக்கணம் - பொருள் (18 மணிநேரம்)</b>				
4.1	அகப்பொருள் - அகத்திணைகள் (முதற்கரு உழிப்பொருள்)	6	வீரவரைகொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன்படுத்துதல்
4.2	புறப்பொருள் - புறத்திணைகள் (வெட்சி முதல் பெருந்திணை வரை உள்ள -12 திணைகள்)	6	வீரவரைகொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன்படுத்துதல்
4.3	மரபியல் - பெயர் மரபுகள், ஆண்பால்,பெண்பால்,இளமைப் பெயர்	6	வீரவரைகொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன்படுத்துதல்
<b>அலகு : 5தமிழ் இலக்கிய வரலாறு(18 மணிநேரம்)</b>				

5.1	சங்க இலக்கிய வரலாறு	6	விரிவுரைகொடுத்தல்	கரும்பலகை பயன்படுத்துதல்
5.2	நீதி இலக்கிய வரலாறு	6	விரிவுரைகொடுத்தல்	கரும்பலகை பயன்படுத்துதல்
5.3	புத்தக மதிப்புரை, தமிழ்த் திரைப்பட விமர்சனம், கவிதை படைத்தல்.	6	விரிவுரைகொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல், காட்சித்திரை வழிப் புலப்படுத்துதல்
Total		90		

Course Course Designer  
(Name of the Course Teacher)

Head of the Department

முனைவர் கு.இராமர்  
(உதவிப்பேராசிரியர்)

முனைவர் வ.க.ராமகிருஷ்ணன்  
(இணைப்பேராசிரியர்)

### DEPARTMENT SANSKRIT

Programme: B.A./ B.Sc. (CBCS and OBE)

(For those students admitted during the Academic Year 2018-19and after)

PART – I : Language		SEMESTER – IV
Course Title: <b>DRAMA AND HISTORY OF SANSKRIT LITERATURE – IV</b>		
Course Code: <b>P1LS41</b>	Hours per week: <b>6</b>	Credits: <b>3</b>
CIA Marks: <b>25</b>	ESE Marks: <b>75</b>	Total Marks: <b>100</b>

#### Preamble:

Sanskrit is offered as an alternative language under Part –I for B.A./ B.Sc students during first four semesters theabove column explains the scheme of the IV semester.

#### Course Outcomes (COs)

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

Number	Statement	Knowledge Level
CO 1	To understand Sanskrit drama literature	K1, K2
CO 2	Comparing drama with modern life	K2
CO 3	Classify and discuss the importance of Sanskrit drama literature	K2
CO 4	Describe and defend history of early Sanskrit literature	K2

CO 5	Practice Creativity and Demonstrate different aspects of spoken sanskrit	K2, K3
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**K1-Knowledge**

**K2-Understand**

**K3-Apply**

### Syllabus

**Unit 1:** Introduction to Sanskrit drama literature, introduction and scope of spoken Sanskrit.

**Unit 2:** Characteristics features of Sanskrit dramas and Varieties of Sanskrit dramas, spoken Sanskrit for personal use.

**Unit 3:** Karṇabhāra up to Karṇa revealing his life history to Śalya, Dramas of Bhāsa, spoken Sanskrit for Educational purpose

**Unit 4:** Karṇabhāra up to the curse of Karṇa by Paraśurāma, Dramas of Kālidāsa, Moral and social aspects of dramas of Kālidāsa, spoken Sanskrit for commercial purpose.

**Unit 5:** Karṇabhāra up to the end of the play, Dramas of Bhavahūti, Moral and social aspects of dramas of Bhavahūti and other dramas,

### Mapping of CO and PO

	PO1	PO2	PO3	PO4	PO5	PO 6	PO 7
CO1	9	9	9	9	3	-	3
CO2	9	9	3	9	3	3	3
CO3	9	9	3	9	9	-	3
CO4	3	9	9	9	9	-	3
CO5	9	9	9	9	9	3	3
	39	45	33	45	33	6	15

Strong -9

Medium -3

Low -1

### Text Book(s)

1. Karṇabhāra of Bhāsa, pub. By R.S. Vadyar & sons, Palakkad, Kerala, 2004
2. A History of Sanskrit Literature, compiled by Dr. S. Jagadisan, Published by AMG Publications, Madurai -625010. Year of publication 1996.

### Reference Books

1. A Short History of Sanskrit Literature, by T.K. Ramachandra Aiyar, published by R.S. Vadyar & Sons, Kalpathi, Palakkad -678003.
2. A History of Sanskrit Literature, by A. Berriedale Keith, published by Mothilal Banarsidass Publishers Private Limited, Delhi, 2017.

### Pedagogy

Chalk & Talk, Group Discussion, PPT

### Teaching Aids

Green Board, LCD Projector, Interactive White Board

PART II		
Course Title : <b>English for Academic and Professional Excellence-II</b>		
Course Code: P2LE41/ P2CE41	Hours per week: <b>6</b>	Credit: <b>3</b>
Sessional Marks: <b>25</b>	Summative Marks: <b>75</b>	Total Marks: <b>100</b>

**Preamble:**

The students are expected to inculcate English socio-linguistic competence and moral values through world literature in English for communication skills.

**Course Outcome (CO):**

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

State One	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)		
CO1	Examine authors' motivations on life-training through various discourses	K1	K2	K3
CO2	Demonstrate the power of rhetoric skills through dramatic interactions	K1	K2	K3
CO3	Identify and demonstrate language skill and proficiency through objective English for competitive examinations/methods	K1	K2	K3
CO4	Author effective discourses for Public Speaking through acquired grammar skills	K1	K2	K3
CO5	Weigh current global issues through soft skills trained lessons and create writing through composition tools	K1	K2	K3

**K1- Remembering    K2 – Understanding    K3 – Applying**

**Programme Outcome**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	9	3	9	9	9	-	3
CO2	9	3	9	9	9	3	3
CO3	9	3	3	-	-	-	3
CO4	9	9	9	1	1	-	3
CO5	9	9	9	3	3	3	3
	45	27	39	22	22	6	15

**Strong -9**

**Medium -3**

**Low -1**

**SYLLABUS**

**Unit-1 Prose**

*The Indian National Education* by Swami Chidbhavananda

1. The Teacher
2. The Student
3. University Education on the Gurukula Pattern

**Unit-2 Drama**

1. William Shakespeare's *The Merchant of Venice*  
(Act-IV, Scene-I: Court scene)
2. Shakespeare's *Julius Caesar*  
(Act-III, Scene-II: Mark Antony and Brutus Speech)
3. Shakespeare's *Twelfth Night*  
(Act-V, Scene-I: Before Olivia's House)

**Unit-3 English for Competitive Examinations**

1. Synonyms and Antonyms



2. One word Substitution & Analogy
3. Foreign Words and Phrases in English

#### Unit-4 Art of Public Speaking Skills

1. Master of Ceremony/Anchoring Skills
2. Welcome Address, Introducing a Speaker,
3. Presidential Address, Keynote or Chief Guest's Address and Vote of Thanks

#### Unit-5 Soft-Skills for Capacity Building

1. Interpersonal skills (*Greetings* and Leave-taking Etiquette etc.)
2. Group Discussion for Placement
3. Covering Letter and Résumé Preparation -2 (USA)

#### Course Texts:

1. Swami Chidbhavananda. *The Indian National Education*. Tirupparaithurai: Sri Ramakrishna Tapovanam, 2017.
2. Richard Proudfoot, et al. *The Arden Shakespeare Complete Works*. London: Bloomsbury, 2016. (Prescribed Acts will be given.)
3. Bikram K. Das. *Functional Grammar & Spoken & Written Communication in English*. New Delhi: *Orient BlackSwan*, (or) Mary Ellen Guffey, and Richard Almonte. *Essentials of Business Communication*. Toronto: Nelson Education, 2007.
4. Dale Carnegie. *The Art of Public Speaking*. Massachusetts: Wyatt North Publishing, 2013.
5. Hari Mohan Prasad, and Uma Rani Sinha. *Objective English for Competitive Examinations*. New Delhi: McGraw Hill Education, 2016. (Prescribed chapters will be given.)

#### References:

1. Swami Chidbhavananda. *Vedanta Society*. <<https://sfvedanta.org/authors/swami-chidbhavananda/>>
2. Edgar Thorpe, and Showick Thorpe. *Objective English for Competitive Examinations*. New Delhi: Pearson India Education, 2017.
3. W M. Cullen Bryant, ed. *The Complete Works of Shakespeare*. New York: The Amies Publishing Company, 1888.
4. William James Craig, ed. *The Complete Works of William Shakespeare (The Oxford Shakespeare)*. London: Oxford University Press, 1914.
5. Stephen E Lucal. *The Art of Public Speaking*. New York: McGraw-Hill Education, 2015.
6. K.V.Joseph. *A Textbook of English Grammar and Usage*. New Delhi: TATA McGraw Hill Education Private Limited, 2012.

**PEDAGOGY:** Teacher made aids and Mechanical (ITC) Aids, Chalk and Talk with interactive session.

Note: (Additional online sources, presentation, and test will be given by the respective teachers in the English Language Lab. [Either 8.45 am to 9.30 am or 5.00 pm to 5.45 pm]).

**TEACHING AIDS:** Course Texts, Reference books, Writing Board, and Online Sources.

Course Content and Teaching or Lecture Schedule				
SYLLABUS				
Unit-1	Prose	No. of Class Hours (90)	Content delivery method	Teaching Aids
	<i>The Indian National Education</i> by Swami Chidbhavananda 1. The Teacher 2. The Student 3. University Education on the Gurukula Pattern	3×6=18	Teacher made aids and Mechanical (ITC) Aids, Chalk and Talk with interactive session	Course Texts, Writing Board, and Online sources
Unit-2	Drama			

	1. William Shakespeare's <i>The Merchant of Venice</i> (Act-IV, Scene-I: Court scene) 2. Shakespeare's <i>Julius Caesar</i> (Act-III, Scene-II: Mark Antony and Brutus Speech) 3. Shakespeare's <i>Twelfth Night</i> (Act-V, Scene-I: Before Olivia's House)	3×6=18	Teacher made aids and Mechanical (ITC) Aids, Chalk and Talk with interactive session	Course Texts, Writing Board, and Online sources
<b>Unit-3</b>	<b>English for Competitive Exams</b>			
	1. Synonyms and Antonyms 2. One word Substitution & Analogy 3. Foreign Words and Phrases in English	3×6=18	Chalk and Talk with interactive session and PPT	Course Texts, Writing Board, and Online sources
<b>Unit-4</b>	<b>Art of Public Speaking</b>			
	1. Master of Ceremony/Anchoring Skills 2. Welcome Address, Introducing a Speaker, 3. Presidential Address, Keynote or Chief Guest's Address and Vote of Thanks	3×6=18	Teacher made aids and Mechanical (ITC) Aids, Chalk and Talk with interactive session	Course Texts, Writing Board, and Online sources
<b>Unit-5</b>	<b>Soft-Skills for Capacity Building</b>			
	1. Interpersonal skills ( <i>Greetings</i> and Leave-taking Etiquette etc.) 2. Group Discussion for Placement 3. Covering Letter and Résumé Preparation -2 (USA)	3×6=18	Teacher made aids and Mechanical (ITC) Aids, Chalk and Talk with interactive session	Course Texts, Writing Board, and Online sources

Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

PART – III : Core Theory		SEMESTER – IV
Course Title: Cell biology and Embryology		
Course Code: 08CT41	Hours per week:4	Credit:4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

**Preamble**

- ❖ To understand the modern concept of cell structure, components and function
- ❖ To apply knowledge from cell biology in biotechnology
- ❖ To acquire knowledge on the development of embryo in plant

**Course Outcome**

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

Number	Course Outcome	Knowledge Level ( According to Bloom's Taxonomy)
CO1	Explain the unique features of cell structure and its components	K1
CO2	To know the concepts of cell cycle, types of divisions and its significance	K1 & K2
CO3	To acquire knowledge on male reproductive structure and developments	K2
CO4	To understand the female reproductive structure and developments	K2
CO5	To understand structure and development of endosperm and embryo.	K3

**K1 – Knowledge**

**K2 – Understand**

**K3 – Apply**

**Mapping of CO with PO**

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO 1	9	1	1	9	9	3	9
CO 2	9	1	1	3	3	1	9
CO 3	9	1	1	9	9	3	9
CO 4	9	1	1	9	9	3	9
CO 5	9	1	1	3	9	9	9
	45	5	5	33	39	19	45

**9-Strong**

**3-Medium**

**1-Low**

**Mapping of CO with PsO**

	PO1	PO2	PO3	PO4	PO5
CO1	9	1	3	9	9
CO2	9	1	3	9	3
CO3	9	3	9	9	9
CO4	9	1	9	9	9
CO5	3	1	9	9	9

**9-Strong**

**3-Medium**

**1-Low**

**Syllabus**

<b>Unit – I</b>	Plant Cell structure - Brief account of structure and functions of the following Cell membrane, Golgi complex, Mitochondria, Chloroplast, Ribosomes & Endoplasmic reticulum	<b>(12 Hrs)</b>
<b>Unit – II</b>	Structure of Nucleus & chromosomes - Cell cycle, Cell division Mitosis, meiosis and their significance.	<b>(12 Hrs)</b>
<b>Unit – III</b>	Structure of microsporangium, microsporogenesis and development male gametophytes.	<b>(12 Hrs)</b>
<b>Unit – IV</b>	Structure of megasporangium, megasporogenesis, formation of female gametophytes ( <i>Polygonum</i> , <i>Allium</i> , <i>Peperomia</i> ) and Fertilization.	<b>(12 Hrs)</b>
<b>Unit – V</b>	Endosperm – types – formation and significance - Embryo – development of dicot embryo – <i>Capsella</i> , development of monocot embryo – <i>Luzula</i>	<b>(12 Hrs)</b>

**Text Books**

1. Cell Biology, Genetics & Molecular Biology – Dipak Kumar Kar, New Central Book Agency, Delhi 2013 Ed
2. Embryology of Angiosperms – P.S. Verma, Rastogi Pub. Meerut, 2012 Ed.
3. Molecular cell Biology- CB. Power, Himalaya Pub, New Delhi, 2013 Ed.

**Reference Books**

1. Cell and Molecular Biology – SP. Vyas, CBS Publishers Pvt.Ltd, New Delhi, 2013 Ed.
2. Cytogenetics – PA. Gupta, Rastogi Pub. Meerut, 2013 Ed.
3. Cell and Molecular biology – S.P. Vyas, CBS Pub, Chennai, 2013 Ed.

**Pedagogy**

Chalk & Talk, PPT, Experiment

**Teaching Aids**

Black Board, Green Board, Chart, Specimen, Plant Material, Permanent Slide, LCD Projector, Online virtual Lab & Interactive White Board

**Course Contents and Lecture Schedule**

Module No.	Topic	No. of Class	Content Delivery method	Teaching Aids
<b>UNIT I</b>				
1.1	Plant Cell structure -	1	Calk & Talk	Green Board
1.2	Differences between eukaryotic and Prokaryotic cells.	1	Calk & Talk	Green Board
1.3	Cell membrane	2	Calk & Talk	Chart
1.4	Golgi complex, Mitochondria,	2	Calk & Talk	Green Board
1.5	Chloroplast	2	Calk & Talk	Chart & Green

				Board
1.6	Endoplasmic reticulum	2	Calk & Talk	Chart & Green Board
1.8	Ribosomes	2	Calk & Talk	Chart & Green Board
<b>Unit – II</b>				
2.1	Structure of Nucleus& chromosomes	2	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
2.2	Cell cycle introduction Cell division types - Mitosis and meiosis and their significance.	3	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
2.3	Cell division types	3	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
2.4	Mitosis and its significance.	2	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
2.5	Meiosis and its significance.	2	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
<b>Unit – III</b>				
3.1	Structure of microsporangium,	3	Calk & Talk	Chart, Plant material & Green Board
3.2	Microsporogenesis	3	Calk & Talk	Chart, Plant material & Green Board
3.3	Development male gametophyte.	3	Calk & Talk	Chart, Plant material & Green Board
3.4	Summary of male organ development	3	Calk & Talk	Chart, Plant material & Green Board
<b>Unit – IV</b>				
4.1	Structure of megasporangium, megasporogenesis, formation of female gametophytes ( <i>Polygonum</i> , <i>Allium</i> , <i>Peperomia</i> ) and Fertilization.	3	Calk & Talk	Chart, Plant material & Green Board
4.2	Megasporogenesis,	3	Calk & Talk	Green Board
4.3	Formation of female gametophytes ( <i>Polygonum</i> ,	3	Calk & Talk	Green Board

	<i>Allium, Peperomia)</i>			
4.4	Process of Fertilization and post fertilization changes	3	Calk & Talk	Green Board
<b>Unit – V</b>				
5.1	Endosperm – types	2	Calk & Talk	Green Board
5.2	Endosperm – formation and significance	3	Calk & Talk	Green Board & Specimen
5.3	Embryo – Development of dicot embryo – <i>Capsella</i> ,	3	Calk & Talk	Green Board & Plant material
5.4	Development of monocot embryo – <i>Luzula</i>	3	Calk & Talk	Green Board
5.5	Summary of endosperm and embryo development	1	Calk & Talk	Green Board
Total		60		

<b>Course Designer</b> <b>(Name of the Course Teacher)</b>	<b>Head of the Department</b>
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**Dr. N. LAKSHMANAN**

**Dr. N. LAKSHMANAN**

## DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)

(For those students admitted during the 2018 -19 and after)

PART – III : Core Theory		SEMESTER – IV
Course Title: Plant Ecology		
Course Code: 08CT42	Hours per week:4	Credit:4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

### Preamble

- ❖ To create an awareness among the students on environmental problems and conservation, to help the learners to understand the hazards of pesticides and understand the principles of Phytogeography – various ways of plant distribution

### Course Outcomes (CO)

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

Number	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO1	Explain the ecological factors- the climatic factors, Biotic factors, Edaphic factor and conservation soil	K1/K3
CO2	Study on ecological groups and succession of succession – Xerosere and Hydrosere	K1 K2
CO3	Analysis on the vegetation in Quadrat method and vegetation of India and Tamil Nadu	K3
CO4	Study on eco - toxicology on hazards of pesticides – on animal, plants and human life.	K3
CO5	Discuss the phytogeography -distribution of plants – continuous and discontinuous distribution – Continental drift - Endemism – Age and Area hypothesis.	K1 K2

K1-knowledge

K2-Understand

K3-Apply

### Mapping of CO with PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	9	3	3	3	9	9	3
CO2	3	9	9	9	9	9	3
CO3	3	3	3	9	9	9	3
CO4	3	9	9	9	9	9	3
CO5	9	9	3	3	9	9	3
	27	33	27	33	45	46	15

9-Strong

3-Medium

1-Low

**Mapping of CO with PSO**

	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	9	3	3	3	9
<b>CO2</b>	9	3	3	9	3
<b>CO3</b>	9	3	3	9	9
<b>CO4</b>	3	3	3	9	9
<b>CO5</b>	9	3	3	9	3
	39	15	15	39	33

**9-Strong****3-Medium****1-Low****Syllabus**

<b>Unit-I</b>	<b>ECOLOGICAL FACTORS:</b> a) Climatic factors – Light, Temperature and wind b) Biotic factors – interaction among plants, interaction between plants and animals c) Edaphic factor – Composition of soil – Origin and formation of soil – soil profile – soil erosion and soil conservation.	<b>12hrs</b>
<b>Unit- II</b>	<b>ECOLOGICAL GROUPS AND SUCCESSION</b> a) Ecological groups – Xerophytes, Hydrophytes and Halophytes b) Succession – Kinds of succession – Process of succession – Types of succession – Xerosere and Hydrosere	<b>12hrs</b>
<b>Unit- III</b>	<b>STUDYING VEGETATION</b> a) Methods of studying vegetation – Quardrat method only. b) Vegetation of India and Tamil Nadu	<b>12hrs</b>
<b>Unit-IV</b>	<b>ECO-TOXICOLOGY</b> Hazards of pesticides – Effects of pesticides on animal life – effects on plants – effects on human life.	<b>12hrs</b>
<b>Unit- V</b>	<b>PHYTOGEOGRAPHY</b> Distribution of plants – continuous and discontinuous distribution – Continental drift - Endemism – Age and Area hypothesis.	<b>12hrs</b>

**Text Books:**

1. Plant Ecology - Shukla & Chandel, S. Chand & Company, 2013 Ed.
2. Environmental science and engineering – P. Venugobal Rao, PHI Learning, New Delhi, 2010 Ed.
3. Fundamentals of Ecology - Eugene P Odum, Oxford & IBH, 2013 Ed.

**Reference Books:**

1. Environmental studies – SK.Garg, Khanna Pub Delhi, 2012 Ed.
2. Plant Ecology – RS. Ambasht, Students Friends & Co, 2010 Ed.
3. Environmental Pollution and Toxicology - Ray Chandhuri & Gupta, periodical experts Book Agency, 2013 Ed.

**Pedagogy**

Chalk &amp; Talk, Group Discussion, PPT

**Teaching Aids**

Green Board, LCD Projector, Interactive White Board



### Course Content and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
Unit -1				
1.0	Introduce ecological factors	1	Discussion	Green Board
1.1	Climatic factors – Light,	1	Lecture	Green Board
1.2	Temperature and wind	1	Lecture	Green Board
1.3	Biotic factors	1	Discussion	Green Board
1.4	Interaction among plants	1	Chalk & Talk	Green Board
1.5	Interaction between plants and animal	1	Lecture	Green Board
1.6	Structure of edaphic factor	1	Lecture	Green Board
1.7	Composition of soil	1	Chalk & Talk	Green Board
1.8	Origin and formation of soil	2	Chalk & Talk	Green Board
1.9	Structure of soil profile	1	Discussion	LCD
1.9a	Soil erosion and soil conservation.	1	Chalk & Talk	Green Board
Unit -2				
2.0	Ecological groups and succession	1	Lecture	Green Board
2.1	Ecological groups – Xerophytes,	2	Chalk & Talk	Green Board
2.2	Explain the hydrophytes	2	Chalk & Talk	Green Board
2.3	Explain the halophytes	2	Chalk & Talk	Green Board
2.4	Structure of succession	2	Chalk & Talk	Green Board
2.5	Process of succession – types of succession - xerosere and hydrosere	3	Chalk & Talk	Green Board
Unit -3				
3.0	Studying vegetation	1	Chalk & Talk	Green Board
3.1	Practically demo for quadrat method	4	Chalk & Talk	Green Board
3.1	Vegetation of India	4	PPT	LCD
3.2	Vegetation of Tamil Nadu	3	PPT	LCD
Unit -4				
4.0	Eco- toxicology in hazards of pesticides	1	Discussion	Green Board
4.1	Effects of pesticides on animal life	4	Chalk & Talk	Green Board

4.2	Effects of pesticides on plants	4	Chalk & Talk	Green Board
4.3	Effects of pesticides on human life	3	Chalk & Talk	Green Board
<b>Unit -5</b>				
5.0	Introdcion about phytogeography	1	Lecture	GreenBoard
5.1	Distribution of plants	2	Chalk & Talk	Green Board
5.2	Distribution of plants – continuous and discontinuous distribution	3	Chalk & Talk	Green Board
5.3	Discuss the Continental drift	3	Chalk & Talk	Green Board
5.4	Endemism – Age and Area hypothesis.	3	Chalk & Talk	Green Board
	<b>Total</b>	<b>60</b>		

<b>Course Designer</b> <b>(Name of the Course Teacher)</b>	<b>Head of the Department</b>
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**Dr. T. SELLATHURAI**

**Dr. N. LAXMANAN**

**DEPARTMENT OF BOTANY**  
Programme: B.Sc. BOTANY (CBCS and OBE)

(For those students admitted during the 2018 -19 and after)

<b>PART – III : Core Lab</b>		<b>SEMESTER – IV</b>
Course Title: Biochemistry, Biophysics, Biometrics, Genetics, Bioinformatics, Cell Biology, Embryology & Plant Ecology		
Course Code: 08CP43	Hours per week:2	Credit:4
CIA Marks: 40	ESE Marks: 60	Total Marks: 100

#### **Preamble**

- ❖ To analyze the biochemical properties of given sample
- ❖ To acquire the knowledge and applications of biostatistics
- ❖ To know the organization of plant cell and observe the plant diversity

#### **Course Outcomes (CO)**

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

<b>No.</b>	<b>Course Outcome</b>	<b>Knowledge Level (according to Bloom's Taxonomy)</b>
<b>CO 1</b>	Knowledge and application of biochemical analysis	K1, K2, K3
<b>CO2</b>	Understanding and analyze the biological sample	K1, K2, K3
<b>CO3</b>	Apply statistical tools for analysis of vegetation, heredity and in bioinformatics	K1, K2, K3
<b>CO 4</b>	Apply the cell mechanisms	K1, K2, K3
<b>CO 5</b>	Analysis of biodiversity	K1, K2, K3

**K1-knowledge**

**K2-Understand**

**K3-Apply**

#### **Mapping of CO with PO**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO1</b>	9	3	3	3	9	9	3
<b>CO2</b>	3	9	9	9	9	9	3
<b>CO3</b>	3	3	3	9	9	9	3
<b>CO4</b>	3	9	9	9	9	9	3
<b>CO5</b>	9	9	3	3	9	9	3
	27	33	27	33	45	45	15

**9-Strong**

**3-Medium**

**1-Low**

#### **Mapping of CO with PSO**

	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	9	3	3	3	9
<b>CO2</b>	9	3	3	9	3
<b>CO3</b>	9	3	3	9	9
<b>CO4</b>	3	3	3	9	9
<b>CO5</b>	9	3	3	9	3

**9-Strong**

**3-Medium**

**1-Low**

**Syllabus**

UNIT No.	CONTENT	HOURS
UNIT I	1. Determination of Complementary colours 2. Verification of Beer's Law 3. Measurement of pH 4. Preparation of Buffers 5. Titration curve of weak acid	12
UNIT II	6. Titration curve of Strong acid 7. Preparation of standard graph for starch 8. Estimation of starch in a given material 9. Circular paper chromatography – Dyes 10. Ascending paper chromatography – Amino acids	12
UNIT III	11. Calculate the standard deviation of the given material 12. Making suitable graphs for the data using chart wizard 13. Observing and identifying the spotters at sight and writing explanatory notes on them. 14. Genetics problems- Keyboard, Mouse, CD, Floppy	12
UNIT IV	15. Onion Root tip squash to observe mitosis cell division 16. Rheo Flower bud squash to study meiosis 17. Non-living inclusion – Raphides & cystolith 18. Electron microphotographs –showing the ultra structure of cell organelles. 19. T.S. of anther to study various stages of microsporogenesis 20. Types of ovules (slides) 21. Embryo mounting – <i>Cucumis</i>	12
UNIT V	22. Study of xerophytes, hydrophytes and halophytes 23. Internal structure of <i>Nerium</i> leaf, <i>Casuarina</i> stem, <i>Hydrilla</i> stem and <i>Nymphaea</i> petiole 24. Methods of studying vegetation – quadrat method.	12

**Text Books**

1. Buchanan BB Gruissem W Jones RL. Biochemistry and Molecular biology of Plants, IK
2. International Publishers, New Delhi. 2000.
3. Ajoy Paul Text Book of Cell and Molecular Biology, Books and Allied (P)Ltd, 2007.
4. Odum EP Barrett Gary W. Fundamentals of Ecology, Brooks/Cole, 2004.

**Reference Books**

1. Berg JM Tymoczko JL Stryer L. Biochemistry (Fifth edition), W H Freeman and Company
2. Nelson DL Cox MM. Lehninger Principles of Biochemistry (Fourth edition)
3. Shukla RS Chandal PS. A Text Book of Plant Ecology, S.Chand Publishers, 2009.

**Pedagogy**

Chalk &amp; Talk, Group Discussion, Power point presentation (PPT)

**Teaching Aids**

Green Board, LCD Projector, Interactive White Board

**Course Contents and Lecture Schedule**

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT I				
1.1	Determination of Complementary colours	3	Chalk & Talk	Green Board, Instrument, Glassware & chemicals
1.2	Verification of Beer’s Law	2		
1.3	Measurement of pH	2		
1.4	Preparation of Buffers	2		
1.5	Titration curve of weak acid	3		
UNIT II				
2.1	Titration curve of Strong acid	2	Chalk & Talk	Green Board, Instrument, Glassware & chemicals
2.2	Preparation of standard graph for starch	2		
2.3	Estimation of starch in a given material	2		
2.4	Circular paper chromatography – Dyes	3		
2.5	Ascending paper chromatography – Aminoacids	3		
UNIT III				
3.1	Calculate the standard deviation of the given material	3	Chalk & Talk	Green Board, Vegetation
3.2	Making suitable graphs for the data using chart wizard	2	Chalk & Talk	Green Board, Vegetation
3.3	Observing and identifying the spotters at sight and writing explanatory notes on them.	2	Chalk & Talk	Green Board, Photos, Plant materials
3.3	Genetics problems	3	Chalk & Talk	Green Board
3.4	Keyboard, Mouse, CD, Floppy	2	Hardwares	Computer
UNIT IV				
4.1	Onion Root tip squash to observe mitosis cell division	2	Chalk & Talk	Green Board, Microscope, Photos, Plant materials

4.2	Rheo Flower bud squash to study meiosis	2	Chalk & Talk	Green Board, Microscope, Photos, Plant materials
4.3	Non-living inclusion – Raphides & cystolith	2	Chalk & Talk	Green Board, Microscope, Photos, Plant materials
4.4	Electron microphotographs – showing the ultra structure of cell organelles.	2	Chalk & Talk	Green Board, Microscope, Specimen, Plant materials
4.5	T.S. of anther to study various stages of Microsporogenesis	2	Chalk & Talk	Green Board, Microscope, Photos, Specimen
4.6	Types of ovules (slides)	1	Chalk & Talk	Green Board, Microscope, Photos, Specimen,
4.7	Embryo mounting – <i>Cucumis</i>	1	Chalk & Talk	Green Boar, Microscope, Specimen, Plant materials d
<b>UNIT V</b>				
5.1	Study of xerophytes, hydrophytes and halophytes	4	Chalk & Talk	Green Board, Microscope, Specimen
5.2	Internal structure of <i>Nerium</i> leaf, <i>Casuarina</i> stem, <i>Hydrilla</i> stem and <i>Nymphaea</i> petiole	4	Chalk & Talk	Green Board, Microscope, Specimen
5.3	Methods of studying vegetation – quadrat method.	4	Chalk & Talk	Green Board, Microscope, Specimen

<b>Course Designer</b> <b>(Name of the Course Teacher)</b>	<b>Head of the Department</b>
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**Dr. C. SOUNDAR RAJU**

**Dr. N. LAXSHMANAN**

**DEPARTMENT OF ZOOLOGY**

Programme: B.Sc., Zoology, (Under CBCS and LOCF)  
(For those students admitted during the Academic Year 2018 - 19 and after)

<b>PART – III : Allied</b>		<b>SEMESTER – IV</b>
<b>Course Title : BIOLOGY AND HUMAN WELFARE</b>		
<b>Course Code: 09AE02</b>	<b>Hours per week: 4</b>	<b>Credits: 4</b>
<b>CIA: 25 Marks</b>	<b>ESE: 75 Marks</b>	<b>Total: 100 Marks</b>

### Preamble

- ❖ To enable the students to develop knowledge on various diseases, transmission and remedies. Also develop knowledge on entrepreneurial avenues in biology.

### Course Outcomes (CO)

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
<b>CO 1</b>	Acquire knowledge on structure, mode of infection, development and remedies of virus and viral diseases.	K1
<b>CO 2</b>	Understand the structure, mode of infections, biology and remedies of bacteria and bacterial diseases.	K2
<b>CO 3</b>	Impart knowledge on differential diseases caused by fungal, protozoan and helminthes.	K2
<b>CO 4</b>	Explore the avenues, opportunities and limitations of sericulture, fish culture and vermiculture	K2
<b>CO 5</b>	Trace the organization, characteristics, candidates, culture and entrepreneurial values of biogas, mushroom culture, apiculture.	K3

**K<sub>1</sub>-Remembering**

**K<sub>2</sub>-Understanding**

**K<sub>3</sub>-Applying**

### Mapping of CO with PO

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO 1</b>	3	-	9	3	3	1	1
<b>CO 2</b>	3	-	9	3	3	1	1
<b>CO 3</b>	3	-	9	3	3	1	-
<b>CO 4</b>	3	-	3	1	-	9	3
<b>CO 5</b>	3	-	3	1	-	9	3
	15	-	33	11	9	21	8

**9-Strong**

**3-Medium**

**1-Low**

### Mapping of CO with PSO

	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>
<b>CO 1</b>	-	3	1	2	1
<b>CO 2</b>	-	1	1	3	-
<b>CO 3</b>	-	-	1	1	1
<b>CO 4</b>	-	1	9	3	3
<b>CO 5</b>	-	1	9	9	1

**9-Strong**

**3-Medium**

**1-Low**

**Syllabus**

<b>UNIT-I</b>	a. Structure of a typical virus b. Brief account on Viral diseases c. Polio, Rabies and AIDS	<b>(12 Hrs)</b>
<b>UNIT-II</b>	a. Structure of typical Bacteria b. Brief account on Bacterial diseases c. Cholera, Tuberculosis and Tetanus	<b>(12 Hrs)</b>
<b>UNIT- III</b>	a. Fungal diseases – Ringworm and Black piedra b. Protozoan diseases – Amoebic dysentery and Malaria c. Helminth parasites – Ancylostoma and Wucheraria	<b>(12 Hrs)</b>
<b>UNIT- IV</b>	a. Sericulture – Scope – Silkworm biology – Life cycle – common diseases and control – silkworm rearing methods. b. Fish culture – Scope and Importance – types of culture – identification of common edible fishes- induced breeding- common diseases and control – maintenance of fish pond. c. Vermiculture – Features of exotic and indigenous species – rearing and culturing – Characteristics of Vermicast and Vermiwash – Economics of Vermiculture.	<b>(12 Hrs)</b>
<b>UNIT- V</b>	a. Biogas production – characteristic features of biogas – production of biogas – uses b. Mushroom culture – nutritive and medicinal value – Morphology of Indian oyster mushroom – cultivation of paddy straw mushroom – Advantages. c. Apiculture – biology of honey bee – bee hive – honey extraction – medicinal value – bee wax and bee venom.	<b>(12 Hrs)</b>

**Text Books**

1. Text Book of Clinical Protozoology – N.S. Ruprah, Oxonian Press.
2. Text Book of Microbiology – 2004 Ananthanarayanan, Orient Longman.

**Reference Books**

1. Text Book of Preventive and Social Medicines – Park and Davis.
2. Handbook on Mushrooms – 1988. Nita Bahi, Oxford and IBH.
3. Biogas Technology- A Practical Handbook – Khandelwal & S.S. Mahdi.
4. An Introduction to Sericulture Ganga shetty, Oxford and IBH.
5. Vermicomposting for sustainable agriculture 2005 Gupta, Agrobios.

**Pedagogy**

Chalk and talk, Group Discussion, PPT, Preserved animals and Field visit

**Teaching Aids**

Green Board, LCD Projector, Interactive White Board

**Course Contents and Lecture Schedule**



Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
<b>Unit -I</b>				<b>12 Hours</b>
1.1	Structure of a typical virus	3	Chalk & Talk, PPT	Green Board
1.2	Viral diseases – Chicken pox	3	Chalk & Talk, PPT	Microscope
1.3	Polio, Rabies	2	Lecture	PPT & White board
1.4	Mumps, Influenza	2	Lecture	Green Board
1.5	AIDS, COVID-19	2	Lecture	Green Board
<b>Unit -II</b>				<b>12 Hours</b>
2.1	Structure of typical Bacteria	4	Lecture	Green Board Charts
2.2	Bacterial diseases – Cholera	4	Chalk & Talk, PPT	Green Board
2.3	Tuberculosis and Tetanus	4	Chalk & Talk, PPT, ppt	Green Board Smart Board
<b>Unit -III</b>				<b>12 Hours</b>
3.1	Fungal diseases – Ringworm and Black piedra	2	Chalk & Talk, PPT	Green Board
3.2	Protozoan diseases – Amoebic dysentery and Malaria	3	Lecture PPT	Green Board Smart Board
3.3	Helminth parasites – Ancylostoma, Wuchereria	3	Discussion Specimen	Green Board Microscope
<b>Unit -IV</b>				<b>12 Hours</b>
4.1	Sericulture	4	Discussion	Green Board
4.2	Fish culture	4	Chalk & Talk, PPT	Green Board
4.3	Vermiculture	4	Chalk & Talk, PPT Specimen	Green Board Microscope
<b>Unit -V</b>				<b>12 Hours</b>
5.1	Biogas production	4	Lecture	Green Board
5.2	Mushroom culture	4	Chalk & Talk, PPT	Green Board
5.3	Apiculture	4	Chalk & Talk, PPT	Green Board
	<b>Total</b>	<b>60</b>		

<b>Course Designer</b> (Name of the Course Teacher)	<b>Head of the Department</b>
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**DEPARTMENT OF ZOOLOGY**

Programme: B.Sc., Zoology, (Under CBCS and LOCF)  
(For those students admitted during the Academic Year 2018 - 19 and after)

<b>PART – III : Allied</b>		<b>SEMESTER - II</b>
<b>Course Title : PRACTICAL - I</b>		
<b>Course Code: 09AP03</b>	<b>Hours per week: 2</b>	<b>Credits: 4</b>
<b>CIA: 40 Marks</b>	<b>ESE: 60 Marks</b>	<b>Total: 100 Marks</b>

### Preamble

- ❖ Visualize, analyse and observe the various types of organisms in microbes, invertebrata and chordata, their organ systems, adaptations, their diversity and behavioral patterns.

### Course Outcomes (CO)

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
<b>CO 1</b>	Acquire knowledge on the body systems in the representative animals	K1,K2,K3
<b>CO 2</b>	Notify the specific characters, identifying structures in the preserved, stuffed and dried animals.	K1,K2,K3
<b>CO 3</b>	Observe the microscopic organisms to analyse their survival skills.	K1,K2,K3
<b>CO 4</b>	Demonstrate the staining and mounting techniques in microbes and representative insects.	K1,K2,K3
<b>CO 5</b>	Trace the entrepreneurial skills, biodiversity, habitat, environment through the field visit.	K1,K2,K3

**K1-Remembering**

**K2-Understanding**

**K3-Applying**

### Mapping of CO with PO

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO 1</b>	3	-	-	-	3	3	1
<b>CO 2</b>	3	-	-	-	3	9	3
<b>CO 3</b>	1	-	-	1	3	3	1
<b>CO 4</b>	1	-	-	1	1	3	3
<b>CO 5</b>	-	-	9	3	3	9	3
	8	-	9	5	13	27	11

**9-Strong**

**3-Medium**

**1-Low**

### Mapping of CO with PSO

	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>
<b>CO 1</b>	-	3	1	3	1
<b>CO 2</b>	-	1	1	3	-
<b>CO 3</b>	-	-	1	1	1
<b>CO 4</b>	-	1	9	3	3
<b>CO 5</b>	-	1	9	9	1

**9-Strong**

**3-Medium**

**1-Low**

## Syllabus

1. Observation of the following -Spotters (12 Hrs)
  - Paramoecium conjugation
  - Obelia (entire)
  - Hydra (entire)
  - Taenia (entire)
  - Scolex of Taenia
  - Ascaris male and female
  - Neries (entire)
  - Penaeus
  - Pila (entire) and shell of Fresh water mussel)
  - Starfish (entire)
  - Amphioxus, Balanoglossus, Scoliodon
  - Cobra, Viper, Pigeon
  - Skull of Pigeon dorsal and ventral view
  - Pectoral girdle of pigeon
  - Fore and hind limb of Frog
  - Symsacrum of bird
2. Simple staining of Bacteria from milk and sewage water.
3. Mounting of mouth parts of Mosquito, Housefly and Honey bee.
4. Identification of Ascaris (male & female) and Tapeworm.
5. Identification of egg, larva, pupa and adult of silk moth.
6. Dissection to show silk glands.
7. Common appliances used in silkworm rearing and apiculture.
8. Visit to Biogas production, Mushroom culture and Fish culture centres.

## Text Books

1. Kapoor, 2014 Practical Zoology, Silver Line Publications, Allahabad, Uttarpradesh

## Reference Books

1. Pechenik, Jan A 2014 – Biology of the Invertebrates, Tata McGraw – Hill Pub. Company Ltd., New Delhi
2. Vasantika Kashyap, 2013, Life of Invertebrates, Second Revised Edition, Vikas Pub. House Pvt. Ltd., New Delhi
3. Kotpal, R.L. 2012. Modern Text Book of Zoology, Invertebrates (Animal diversity – I), Rastogi Publications, Meerut
4. Barnes, R.D. 2006, Invertebrate Zoology, IV Edition, Holf Saunders International edition
5. Ekambaranatha Ayyar and Ananthakrishnan, T.N. 2005, A manual of Zoology, volume I, Invertebrate, Viswanathan (Printers and Publishers) Pvt. Ltd., Chennai
6. Kotpal, R.L. 2011. Vertebrates, Rastogi Publications
7. Gupta R.C and Girish Chopra, 2003 - Comparative Anatomy of Chordates – R.Chand & Co, New Delhi
8. Newmann, 1981, The Phylum chordata, Biology of vertebrates and their kin, Satish Book Enterprises, Agra.

**Pedagogy**

Chalk and talk, Charts and models, Smart board, Group Discussion, PPT, Preserved animals, slides and Field visit

**Teaching Aids**

Green Board, LCD Projector, Interactive White Board, Microscope – Dissection, Compound, Deep vision and Phase Contrast Microscope.

**Course Contents and Lecture Schedule**

Module No.	Topic	No. of Practicals	Content Delivery Method	Teaching Aids
1	1. Observation of the following - Spotters <ul style="list-style-type: none"> <li>• Paramoecium conjugation</li> <li>• Obelia (entire)</li> <li>• Hydra (entire)</li> <li>• Taenia (entire)</li> <li>• Scolex of Taenia</li> <li>• Ascaris male and female</li> <li>• Neries (entire)</li> <li>• Penaeus</li> <li>• Pila (entire) and shell of Fresh water mussel)</li> <li>• Starfish (entire)</li> <li>• Amphioxus, Balanoglossus, Scoliodon</li> <li>• Cobra, Viper, Pigeon</li> <li>• Skull of Pigeon dorsal and ventral view</li> <li>• Pectoral girdle of pigeon</li> <li>• Fore and hind limb of Frog</li> <li>• Symsacrum of bird</li> </ul>	2	Chalk & Talk, PPT Dissection Tools	Green Board Charts
2	2. Simple staining of Bacteria from milk and sewage water.	2	Chalk & Talk, PPT Dissection Tools	Green Board Microscope Charts
3	3. Mounting of mouth parts of Mosquito, Housefly and Honey bee.	2	Chalk & Talk, PPT Dissection Tools	Green Board Microscope Charts
4	4. Identification of Ascaris (male & female) and Tapeworm.	2	Chalk & Talk, PPT	Green Board

			Dissection Tools	Microscope Charts
5	5. Identification of egg, larva, pupa and adult of silk moth.	2	Chalk & Talk, PPT Dissection Tools	Green Board Microscope Charts
6	6. Dissection to show silk glands.	4	Software Internet with Wifi	Smart Board Charts Models Laptops
7	7. Common appliances used in silkworm rearing and apiculture.	1	Discussion	Green Board
8	8. Visit to Biogas production, Mushroom culture and Fish culture centres	1	Discussion	Green Board
	<b>Total</b>	<b>60</b>		

<b>Course Designer</b> <b>(Name of the Course Teacher)</b>	<b>Head of the Department</b>
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## DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

PART – IV : Skill Based Theory		SEMESTER – IV
Course Title: Horticulture		
Course Code: 08SB41	Hours per week:2	Credit:2
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

### Preamble

- ❖ To provide theoretical and practical aspects of gardening to enable the students to be self reliant knowledge and self employment
- ❖ To know the various types of ecofriendly environment in front of homes
- ❖ To know the simple practice for the improvement of innovative garden

### UNIT I

Introduction to Horticulture-types of gardening-indoor, public and dam gardens

### UNIT II

Propagation techniques-methods of cutting, layering, grafting and budding

### UNIT III

Cultural practices: Transplanting methods (bare rooted, shifting and balling, burlapping, potting and repotting) irrigation and manuring

### UNIT IV

Horticultural techniques- disbudding, ringing, notching, smudging and pruning

### UNIT V

Kitchen gardening-layout and maintenance, indoor gardening, rockery, Bonsai and lawn

### Text Books

1. Horticulture – V.L. Sheela, MJ Publishers, 2013 Ed.
2. Horticulture at a glance – Amar singh, Kalyani Pub, Chennai, 2013 Ed.
3. A manual of Gardening – Arun zingare, Satyam Pub, Jaipur, 2013 Ed.

### Reference Books

1. Hand Book of Horticulture - K.L.Chaddhe, D.I and Pub. Agri, New Delhi, 2012 Ed.
2. Principles of Horticulture - S.Prasad, Agrobios, International Books, 2013 Ed.
3. A manual of Gardening – Arun zingare, Satyam Pub, Jaipur, 2013 Ed.

## DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

<b>PART – III : Core Theory</b>		<b>SEMESTER – V</b>
Course Title: Taxonomy of Angiosperms & Economic Botany		
Course Code: 08CT51	Hours per week:6	Credit:4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

### Preamble

- ❖ To study the floral characters with an aim to identify the taxon authentically
- ❖ To prepare taxonomic keys with the help of morphological and floral characters
- ❖ To acquire knowledge on useful plant products and its proper application to wellbeing of human

### Course outcome (CO)

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

Number	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO1	To study about botanical nomenclature and principles of classification	K1,K2,K3
CO2	To understand the herbarium preparation techniques	K1,K2,K3
CO3	Distinguish the features and economic importance of Angiosperm families	K1,K2,K3
CO4	Distinguish features and economic importance of the Angiosperm families	K1,K2,K3
CO5	To study and understand the economically importance of plant	K1,K2,K3
<b>K1-knowledge</b>		<b>K2-Understand</b>
		<b>K3-Apply</b>

### Mapping of CO with PO

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
<b>CO 1</b>	9	9	3	9	3	9	3
<b>CO 2</b>	9	9	3	9	9	9	3
<b>CO 3</b>	9	9	3	9	9	9	3
<b>CO 4</b>	9	9	3	9	3	9	3
<b>CO 5</b>	9	3	3	9	3	9	3
	45	39	15	45	27	45	15
<b>9-Strong</b>		<b>3-Medium</b>			<b>1-Low</b>		

### Mapping of CO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
<b>CO 1</b>	9	9	9	9	3
<b>CO 2</b>	9	9	3	9	9
<b>CO 3</b>	9	9	9	3	9
<b>CO 4</b>	9	9	9	9	3
<b>CO 5</b>	9	9	9	9	3
<b>9-Strong</b>		<b>3-Medium</b>			<b>1-Low</b>

### Syllabus

<b>Unit- I</b>	Botanical Nomenclature and principles of classification. Bentham & Hooker - Merits and demerits, Engler & Prantl - Important technologies in morphological features	<b>(12 Hrs)</b>
<b>Unit- II</b>	ICBN - Botanical survey of India - field and herbarium techniques - Modern trends in taxonomy (Chemo & Numerical)	<b>(12 Hrs)</b>
<b>Unit- III</b>	Vegetative, floral characters and Economic importance of the following families: Annonaceae, Capparidaceae, Sterculiaceae, Meliaceae, Rutaceae, Caesalpinaceae, Mimosaceae, Cucurbitaceae and Apiaceae	<b>(12 Hrs)</b>
<b>Unit-IV</b>	Distinguishing features and economic importance of the following families: Rubiaceae, Asteraceae, Asclepiadaceae, Solanaceae, Scrophulariaceae, Lamiaceae, Amarantaceae, Euphorbiaceae, Orchidaceae, Arecaceae & Poaceae.	<b>(12 Hrs)</b>
<b>Unit- V</b>	Fibers and fiber yielding plants - Spices and condiments - Resins and gums - Processing and extraction of sugar & tea	<b>( 12 Hrs)</b>

#### Text Books:

1. Taxonomy of Angiosperms- B.P. Pandey, S.Chand & Company Ltd, Delhi, 2014 Ed.
2. Practical Taxonomy of Angiosperms – R.K. Singha, Inter. Publishing House, Delhi, 2013 Ed.
3. Plant Taxonomy – OP. Sharma, McGraw Hill Education, India, Delhi 2010 Ed.

#### Reference Books:

1. Economic Botany-B.P. Pandey, S.Chand & Company Ltd, Delhi, 2014 Ed.
2. Economic Botany- Hill. Albert .T, Surjeet Publications Delhi, 2012 Ed.
3. Morphology of Angiosperms – Eames Arthur.J, Surjeet Publications Delhi, 2014 Ed.

#### Pedagogy

Chalk & Talk, Group Discussion, PPT

#### Teaching Aids

Green Board, LCD Projector, Interactive White Board

#### Course Content and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
<b>Unit -1</b>				
1.0	Botanical Nomenclature	1	Discussion	Green Board
1.1	Botanical Nomenclature and principles of classification	1	Lecture	Green Board
1.2	Classifications of Bentham & Hooker - Merits and demerits	5	Discuss	Green Board
1.3	Classifications of Engler & Prantl.- Merits and demerits, Important technologies in morphological features	5	Lecture	Green Board
<b>Unit -2</b>				
2.0	ICBN - Botanical survey of India - Field and herbarium techniques	2	Lecture	Green Board



2.1	Modern trends in taxonomy (Chemo & Numerical)	2	Chalk & Talk	Green Board
2.2	Modern trends in taxonomy – (Chemotaxonomy)	4	Chalk & Talk	Green Board
2.3	Modern trends in taxonomy (Numerical taxonomy)	4	Chalk & Talk	Green Board
Unit -3				
3.0	Distinguishing features and economic importance of Annonaceae,	2	Chalk & Talk	Green Board
3.1	Distinguishing features and economic importance of Capparidaceae	2	Discussion	
3.2	Distinguishing features and economic importance of Sterculiaceae	2	Chalk & Talk	Green Board
3.3	Distinguishing features and economic importance of Meliaceae	1	PPT	
3.4	Distinguishing features and economic importance of Rutaceae	1	Discussion	Green Board
3.5	Distinguishing features and economic importance of Caesalpinaceae	1	Chalk & Talk	Green Board
3.6	Distinguishing features and economic importance of Mimosaceae	1	Chalk & Talk	Green Board
3.7	Distinguishing features and economic importance of Cucurbitaceae	1	Chalk & Talk	Green Board
3.8	Distinguishing features and economic importance of Apiaceae	1	Lecture	Green Board
Unit -4				
4.0	Distinguishing features and economic importance of Rubiaceae	1	Discussion	Green Board
4.1	Distinguishing features and economic importance of Asteraceae	1	Chalk & Talk	Green Board
4.2	Distinguishing features and economic importance of Asclepiadaceae	1	Chalk & Talk	Green Board
4.3	Distinguishing features and economic importance of Solanaceae	1	Chalk & Talk	Green Board
4.4	Distinguishing features and economic importance of Scrophulariaceae	1	Lecture	Green Board
4.5	Distinguishing features and economic importance of	1	Chalk & Talk	Green Board

	Lamiaceae			
4.6	Distinguishing features and economic importance of Amarantaceae,	1	Chalk & Talk	Green Board
4.7	Distinguishing features and economic importance of Euphorbiaceae	1	Chalk & Talk	Green Board
4.8	Distinguishing features and economic importance of Orchidaceae	2	Chalk & Talk	Green Board
4.9	Distinguishing features and economic importance of Areaceae and Poaceae	1	Chalk & Talk	Green Board
Unit -5				
5.1	Economic Importance of fiber and fiber yielding plants	3	Lecture	Green Board
5.2	Economic Importance of spices and condiments	3	Chalk & Talk	Green Board
5.2	Economic Importance of Resins and gums	3	Chalk & Talk	Green Board
5.3	Economic Importance: Processing and extraction of sugar & tea	3	Chalk & Talk	Green Board
	<b>Total</b>	<b>60</b>		

<b>Course Designer</b> <b>(Name of the Course Teacher)</b>	<b>Head of the Department</b>
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**Dr. T. SELLATHRAI**

**Dr. V. RAMESH**

**DEPARTMENT OF BOTANY**

Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

PART – III : Core Theory		SEMESTER – V
Course Title: Plant Physiology		
Course Code: 08CT52	Hours per week:5	Credit:4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

#### Preamble

- ❖ To study the organization and physiology of plants
- ❖ To acquire the basic knowledge of cellular basis of physiological functions.
- ❖ To know the mechanism in plant metabolic activities such as photosynthesis, respiration and transpiration

#### Course Outcomes (CO)

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Knowledge of plants and water relations	K1, K2, K3
CO2	Understand the system of photosynthesis and respiration in plants	K1, K2, K3
CO3	Understanding and application of nitrogen and lipid metabolism in plants	K1, K2, K3
CO 4	Knowledge of plant nutrients and their application for their development	K1, K2, K3
CO 5	Understand the knowledge of plant growth development such as hormone function, physiology of flowering and seed germination	K1, K2, K3

**K1-knowledge**

**K2-Understand**

**K3-Apply**

#### Mapping of CO with PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	9	9	9	9	3	9	3
CO2	9	9	3	3	3	3	3
CO3	3	3	3	3	3	9	9
CO4	9	3	3	3	3	3	3
CO5	9	9	3	3	3	3	3
	39	33	21	21	15	27	21

**9-Strong**

**3-Medium**

**1-Low**

#### Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
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<b>CO1</b>	9	3	9	9	3
<b>CO2</b>	3	3	9	9	3
<b>CO3</b>	3	3	9	3	3
<b>CO4</b>	3	3	9	3	9
<b>CO5</b>	3	3	9	3	3
<b>9-Strong</b>		<b>3-Medium</b>		<b>1-Low</b>	

### Syllabus

<b>UNIT No.</b>	<b>CONTENT</b>	<b>HOURS</b>
<b>UNIT I</b>	<b>Plants and water relations</b> a) Diffusion – osmosis – water potential concept – plasmolysis b) Mechanism of absorption of water – factors affecting absorption c) Transpiration – Types of transpiration – Mechanism of stomatal opening –significance of transpiration – Guttation. d) Ascent of Sap: Mechanism of water movement.	<b>(12 Hrs)</b>
<b>UNIT II</b>	a) Photosynthesis – Structure of Chloroplast and Chlorophyll pigments – light reaction – Dark reactions (C <sub>3</sub> and C <sub>4</sub> pathways) CAM. plants – Photorespiration. b) Respiration – RQ – Mechanism [Glycolysis, Kreb's cycle – oxidative phosphorylation – Pentose phosphate shunt- fermentation.	<b>(12 Hrs)</b>
<b>UNIT III</b>	a) Nitrogen metabolism - Nitrate reduction – Aminoacid synthesis – mechanism of protein synthesis. b) Lipid metabolism - Synthesis of glycerol and fatty acids – condensation of glycerol and fatty acids – $\beta$ oxidation of fatty acids.	<b>(12 Hrs)</b>
<b>UNIT IV</b>	<b>Mineral nutrition</b> a) Role of macro and micro elements – mechanism of absorption of minerals. b) Enzymes – Classification, properties – enzyme action – enzyme inhibitors. c) Mechanism of translocation of solutes.	<b>(12 Hrs)</b>
<b>UNIT V</b>	<b>Growth and development</b> a) Growth – definition – Physiological effects of Growth hormones (Auxins, gibberellins, Cytokinins and ethylene) b) Physiology of flowering – Photo periodism and Vernalization. c) Seed dormancy.	<b>( 12 Hrs)</b>

### Text Books

1. Plant Physiology – Suraj Mandal, Campus Books, New Delhi, 2014 Ed.
2. Plant Physiology – Ray Noggle .G, MJP Publishers, Chennai, 2010 Ed.
3. Plant Physiology - Jain, V.K, S.Chand & Company Ltd, Delhi, 2013 Ed.

### Reference Books

1. Plant Physiology - Salisbury & Ross, C.B.S Publishers, Delhi, 2013 Ed.

2. Plant Physiology – G. Ray Noggle, PHI Learning, New Delhi, 2010 Ed.
3. Plant Physiology – Suraj Mandal, Campus Books, New Delhi, 2013 Ed.

### **Pedagogy**

Chalk & Talk, Group Discussion, Power point presentation (PPT)

### **Teaching Aids**

Green Board, LCD Projector, Interactive White Board

### **Course Contents and Lecture Schedule**

<b>Module No.</b>	<b>Topic</b>	<b>No. of Lectures</b>	<b>Content Delivery Method</b>	<b>Teaching Aids</b>
<b>UNIT I</b>				
<b>Plants and water relations</b>				
1.1	Diffusion- Osmosis	2	Discussion	
1.2	Water potential concept	1	Chalk & Talk	Green Board
1.3	Plasmolysis	1	Chalk & Talk	Green Board
1.4	Mechanism of absorption of water	1	Chalk & Talk	Green Board
1.5	Factors affecting absorption	1	PPT	LCD
1.6	Transpiration – Types of transpiration	1	PPT	LCD
1.7	Mechanism of stomatal opening- Significance of transpiration	2	Discussion	
1.8	Guttation-	1	Chalk & Talk	Green Board
1.9	Ascent of Sap- Mechanism of water movement.	2	Chalk & Talk	Green Board
<b>UNIT II</b>				
2.1	Photosynthesis: Structure of Chloroplast and Chlorophyll pigments	1	Chalk & Talk	Green Board
2.2	Light reaction – Dark reactions	1	Chalk & Talk	Green Board
2.3	C <sub>3</sub> and C <sub>4</sub> pathways	2	Chalk & Talk	Green Board
2.4	CAM Plants- Photorespiration	2	Chalk & Talk	Green Board
2.5	Respiration – RQ	1	PPT	LCD
2.6	Mechanism of glycolysis	1	PPT	LCD
2.7	Mechanism of Kreb's cycle	1	Chalk & Talk	Green Board
2.8	Oxidative phosphorylation	1	PPT	LCD
2.9	Pentose phosphate shunt- Fermentation	2	PPT	LCD
<b>UNIT III</b>				
3.1	Nitrogen metabolism	2	Chalk & Talk	Green Board
3.2	Nitrate reduction	1	PPT	LCD
3.3	Amino acid synthesis	1	Chalk & Talk	Green Board
3.4	Mechanism of protein synthesis.	2	PPT	LCD

3.5	Lipid metabolism	2	Chalk & Talk	Green Board
3.6	Synthesis of glycerol and fatty acids	2	Chalk & Talk	Green Board
3.7	Condensation of glycerol and fatty acids	1	Chalk & Talk	Green Board
3.8	$\beta$ oxidation of fatty acids	1	Chalk & Talk	Green Board
<b>UNIT IV</b>				
<b>Mineral nutrition</b>				
4.1	Role of macro and micro elements	2	PPT	LCE
4.2	Mechanism of absorption of minerals.	2	PPT	LCD
4.3	Enzymes – Classification	2	Chalk & Talk	Green Board
4.4	Properties of enzymes	1	PPT	LCD
4.5	Enzyme action	2	PPT	LCD
4.6	Enzyme inhibitors	1	PPT	LCD
4.7	Mechanism of translocation of solutes.	2	Chalk & Talk	Green Board
<b>UNIT V</b>				
<b>Growth and development</b>				
5.1	Growth – definition-physiological effects of Growth hormones	1	Chalk & Talk	Green Board
5.2	Auxins	1	PPT	LCD
5.3	Gibberellins	1	PPT	LCD
5.4	Cytokinins	1	PPT	LCD
5.5	Ethylene	1	PPT	LCD
5.6	Physiology of flowering	2	Chalk & Talk	Green Board
5.7	Photo periodism	2	PPT	LCD
5.8	Vernalization.	1	Chalk & Talk	Green Board
5.9	Seed dormancy	2	Chalk & Talk	Green Board
	<b>Total</b>	<b>60</b>		

<b>Course Designer</b> (Name of the Course Teacher)	<b>Head of the Department</b>
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**Dr. C. SOUNDAR RAJU**

**Dr. V. RAMESH**

## DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)

(For those students admitted during the 2018 -19 and after)

PART – III : Core Theory		SEMESTER – V
Course Title: Microbiology		
Course Code: 08CT53	Hours per week:6	Credit:4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

### Preamble

- ❖ To acquire basic knowledge on microbes
- ❖ To know the importance of microbes in day today life.
- ❖ To know the value of immune system immunity

### Course Outcome

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

Number	Course Outcome	Knowledge Level ( According to Bloom's Taxonomy)
CO1	Know the contributions of microbiologists learn about the structure microbes	K1, K2& K3
CO2	Develop understanding on the concept of microbial nutrition Measure the growth of microbes	K1, K2& K3
CO3	Apply the concept of microbial control	K1, K2& K3
CO4	Understand concepts of Industrial microbiology Apply the usage of microorganisms in industry Explain the concept of fermentation	K1, K2& K3
CO5	Gain the basic knowledge of Immunology Understand the concept of Immunological diagnostics	K1, K2& K3

**K1** – Knowledge

**K2** – Understand

**K3** – Apply

### Mapping of CO with PO

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO 1	9	1	9	9	9	9	9
CO 2	9	1	9	9	9	9	3
CO 3	9	1	9	9	9	9	9
CO 4	9	1	1	9	9	3	3
CO 5	9	1	9	9	9	1	9
	45	5	37	45	45	31	33

**9**-Strong

**3**-Medium

**1**-Low

### Mapping of CO with PSO

	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>
<b>CO 1</b>	9	9	3	9	9
<b>CO 2</b>	3	3	9	9	9
<b>CO 3</b>	1	9	9	9	9
<b>CO 4</b>	3	3	9	9	9
<b>CO 5</b>	1	1	1	9	3

**9-Strong**

**3-Medium**

**1-Low**

### **Syllabus**

<b>Unit – I</b>	Introduction to Microbiology – contributions of Anton Van Leeuwenhoek, Louis Pasteur, Robert Koch and his postulates - Microbial diversity – General features and structure of Bacteria, Viruses, Yeast and Cyanobacteria - Staining of Bacteria	<b>(12 Hrs)</b>
<b>Unit – II</b>	Microbial growth - nutrient requirements - sources of nutrients – nutritional classification - culture media – measurement of growth – bacterial growth curve – role of antimicrobial agents on growth.	<b>(12 Hrs)</b>
<b>Unit – III</b>	Control of microbes – basic aspects of sterilization, disinfection, antiseptic, sanitation, tyndallisation, pasteurization - Use of Physical methods (dry heat, moist heat, UV light, ionizing radiation, filtration, HEPA filter) and Chemical methods (Phenolic compounds, alcohols, halogens, heavy metals, aldehydes) in sterilization process	<b>(12 Hrs)</b>
<b>Unit – IV</b>	Microbial Metabolism – Photosynthesis – Light reactions of Purple Sulfur bacteria, Purple Non - Sulfur bacteria, Green Sulfur bacteria, Green Non-Sulfur bacteria – Lactic acid and Citric acid fermentation.	<b>(12 Hrs)</b>
<b>Unit – V</b>	Immunology- Brief account of Immune system: primary & secondary (Lymphoid organs, Lymphocytes, Phagocytes), Types of Antigen, Antibody Structure, Types and Function – Brief account of Antigen Antibody reaction.	<b>( 12 Hrs)</b>

### **Text Books**

1. Microbiology and immunology – Ajit Kumar Banerjee, New Central Book Agency Delhi, 2012 Ed.
2. A text Book of Microbiology – R.C. Dubey, S.Chand & Company Ltd, Delhi, 2014 Ed.
3. Microbiology - S. Jeeva, Scitech Publications PVT. LTD, Chennai, 2010 Ed.

### **Reference Books**

1. Microbiology – R.P. Singh, Kalyani Publishers, Ludhiana, 2012 Ed.
2. Microbiology- L.M.Prescott, J.P.Harley, D.A. Klein, McGraw Hill, Hill Education India, 2010 Ed.
3. Microbiology - Michael J. Pelczar, McGraw Hill Education India, 2012 Ed.

### **Pedagogy**

Chalk & Talk, PPT, Experiment & on the spot teaching

### **Teaching Aids**



Black Board, Green Board, Chart, Specimen, Plant Material, LCD Projector, Online virtual Lab & Interactive White Board

### Course Contents and Lecture Schedule

Module No.	Topic	No. of Class	Content Delivery method	Teaching Aids
<b>UNIT I</b>				
1.1	Introduction to Microbiology	3	Calk & Talk	Green Board & Online virtual Lab
1.2	Contributions of Anton Van Leeuwenhoek, Louis Pasteur, Robert Koch and his postulates	3	Calk & Talk	Green Board & Online virtual Lab
1.3	Microbial diversity – General features and structure of Bacteria, Viruses, Yeast and Cyanobacteria	3	Calk & Talk	Green Board & Online virtual Lab
1.4	Staining of Bacteria	3	Calk & Talk	Green Board Online virtual Lab
<b>Unit – II</b>				
2.1	Microbial growth - nutrient requirements & sources of nutrients	3	Calk & Talk	Green Board Online virtual Lab & PPT
2.2	Nutritional classification	3	Calk & Talk	Green Board Online virtual Lab & PPT
2.3	culture media – measurement of growth: Direct & indirect methods	3	Calk & Talk	Green Board Online virtual Lab & PPT
2.4	Bacterial growth curve – role of antimicrobial agents on growth.	3	Calk & Talk	Green Board, Online virtual Lab & PPT
<b>Unit – III</b>				
3.1	Control of microbes – basic aspects of sterilization,	3	Calk & Talk	Green Board, Online virtual Lab & PPT
3.2	Disinfection, antiseptic, sanitation, tyndallisation, pasteurization	3	Calk & Talk	Green Board, Online virtual Lab & PPT
3.3	Use of Physical methods (dry heat, moist heat, UV light, ionizing radiation, filtration, HEPA filter)	3	Calk & Talk	Green Board, Online virtual Lab & PPT
3.4	Chemical methods (Phenolic compounds, alcohols, halogens, heavy metals,	3	Calk & Talk	Green Board, Online virtual Lab & PPT

	aldehydes) in sterilization process			
<b>Unit – IV</b>				
4.1	Microbial Metabolism	3	Calk & Talk	Green Board, Online virtual Lab & PPT
4.2	Photosynthesis – Light reactions of Purple Sulfur bacteria	3	Calk & Talk	Green Board, Online virtual Lab & PPT
4.3	Purple Non - Sulfur bacteria, Green Sulfur bacteria	3	Calk & Talk	Green Board, Online virtual Lab & PPT
4.4	Lactic acid and Citric acid fermentation	3	Calk & Talk	Green Board, Online virtual Lab & PPT
<b>Unit – V</b>				
5.1	Immunology - Brief account of Immune system: primary & secondary	3	Calk & Talk	Green Board & PPT
5.2	Lymphoid organs, Lymphocytes, Phagocytes	3	Calk & Talk	Green Board & Smart class
5.3	Antigen: structure, properties & types	2	Calk & Talk	Green Board & PPT
5.4	Antibody Structure, Types and Function	2	Calk & Talk	Green Board & e- Content
5.5	Brief account of Antigen Antibody reaction	2	Calk & Talk	Green Board & PPT
Total		60		

**Course Designer**  
**(Name of the Course Teacher)**

**Head of the Department**

**Dr. V. RAMESH**

**Dr. V. RAMESH**

**DEPARTMENT OF BOTANY**

Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

<b>PART – III : Elective Theory</b>		<b>SEMESTER – V</b>
Course Title: Medicinal Botany		
Course Code: 08EP5A	Hours per week:5	Credit:5
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

**Preamble:**

To acquire knowledge on botanical diagnosis of fragmentary crude drugs,  
To know the preliminary photochemistry of plant organs and identify medicinal taxon

**Course outcome (CO)**

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

<b>Number</b>	<b>Course Outcome</b>	<b>Knowledge Level (according to Bloom's Taxonomy)</b>
CO1	To acquire the history and indigenous system of medicine	K1
CO2	To know the isolation techniques of secondary metabolites To apply the use of medicinal plant in their day to day life	K2 K3
CO3	To explore their skills of collection and processing of crude drugs	K2 K3
CO4	To know the classical and technical aspects of medicinal plants	K2 K3
CO5	To know the classical and technical aspects of medicinal plants	K2/K3

**K1-knowledge**

**K2-Understand**

**K3-Apply**

**Mapping of CO with PO**

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO1</b>	9	3	9	9	9	9	3
<b>CO2</b>	9	9	3	9	3	3	3
<b>CO3</b>	9	3	3	3	9	9	9
<b>CO4</b>	9	3	9	3	9	9	9
<b>CO5</b>	9	3	9	9	3	9	9
	45	21	33	33	33	39	33

**9-Strong**

**3-Medium**

**1-Low**

**Mapping of CO with PSO**

	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	9	9	9	9	3
<b>CO2</b>	3	3	9	9	3
<b>CO3</b>	3	3	9	9	3
<b>CO4</b>	9	3	9	9	9
<b>CO5</b>	3	3	9	9	9

**9-Strong**

**3-Medium**

**1-Low**

## Syllabus

<b>Unit- I</b>	Pharmacognosy – definition, scope, History, Indigenous system of medicine (Ayurveda, Unani & Siddha) –Classification of crude drugs (Alphabetical, Taxonomical, Morphological, Pharmacological, Chemical and Chemotaxonomical)	<b>(12 Hrs)</b>
<b>Unit- II</b>	Products derived from plants (Secondary metabolites) pharmaceutically important products, their classification, properties, isolation and medicinal uses of the following Alkaloids, Tannins, Phenols, Resins and gums	<b>(12 Hrs)</b>
<b>Unit- III</b>	Collection and processing of crude drugs- harvesting, drying, garbling, packing and storage of crude drugs, Drugs adulteration- types of adulterants –methods of drug evaluation (Physical, chemical, biological and organoleptic) Evaluation and Pharmacopoeia standards.	<b>(12 Hrs)</b>
<b>Unit-IV</b>	Botanical names, common and vernacular names, morphology of the useful parts and medicinal uses of the following: Stem & Tuber - <i>Zingiber officinale</i> Bark & wood - <i>Cinnamomum zeylanicum</i> , <i>Santalum album</i> Leaves - <i>Cassia senna</i> Buds & flowers - <i>Eugenia caryophyllota</i> Fruits - <i>Aegle marmelos</i> Seeds - <i>Myristica fragrans</i> Resins and Gums - <i>Ferula asafoetida</i>	<b>(12 Hrs)</b>
<b>Unit- V</b>	Botanical name, common name, family, chemical constituents, cultivation, Processing, harvesting and uses of the following Ashwaganda - <i>Withania somnifera</i> Sothukathalai - <i>Aloe vera</i> Nelli - <i>Emblica officinalis</i> Safflower - <i>Carthamus tinctorius</i>	<b>( 12 Hrs)</b>

## Text Books

1. Medicinal plants of India – SS. Lal, New Central Book Agency, Delhi, 2012 Ed.
2. Herbs cultivation and medicinal uses - H. Panda, NIIR Publication, N. Delhi, 2012 Ed.
3. Economic Botany - S.L. Kochar, MacMillan Indian Ltd.N.Delhi, 2010 Ed.

## Reference Books

1. Economic Botany - F. Hill, Tata Mcgraw Hill Publishing com. N.Delhi, 2010 Ed.
2. Medicinal Plants-Anil Kumar, Inter. Sci. Publishing Academy, New Delhi, 2014 Ed.
3. Economic Botany – Albert F. Hill, Surjeet Publications, Delhi, 2012 Ed.

## Pedagogy

Chalk & Talk, Group Discussion, PPT

## Teaching Aids

Green Board, LCD Projector, Interactive White Board

### Course Content and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
Unit -1				
1.0	Pharmacognosy – definition, scope, History	2	Discussion	Green Board
1.1	Indigenous system of medicine (Ayurveda, Unani & Siddha) and Chemotaxonomical)	5	Lecture	Green Board
1.2	Classification of crude drugs (Alphabetical, Taxonomical, Morphological, Pharmacological, Chemical and Chemotaxonomical)	5	Discuss	Green Board
Unit -2				
2.0	Products derived from plants (Secondary metabolites)	2	Lecture	Green Board
2.1	pharmaceutically important products, their classification, properties, isolation and medicinal uses of Alkaloids	4	Chalk & Talk	Green Board
2.2	pharmaceutically important products, their classification, properties, isolation and medicinal uses of Tannins	3	Chalk & Talk	Green Board
2.3	pharmaceutically important products, their classification, properties, isolation and medicinal uses of Resins and gums	3	Chalk & Talk	Green Board
Unit -3				
3.0	Collection and processing of crude drugs- harvesting, drying, garbling, packing and storage of crude drugs	2	Chalk & Talk	Green Board
3.1	Drugs adulteration- types of adulterants	3	Discussion	
3.2	Methods of drug evaluation (Physical, chemical, biological and organoleptic)	4	Chalk & Talk	Green Board
3.3	Evaluation and Pharmacopoeia standards	3	PPT	
Unit -4				
4.0	Medicinal uses of lower plants – Botanical names, common and vernacular names, morphology of the useful parts and medicinal uses of Medicinal uses of lower plants – Botanical names, common and vernacular names, morphology of the useful parts and medicinal uses of Stem & Tuber - <i>Zingiber officinale</i>	1	Discussion	Green Board
4.1	Medicinal uses of lower plants – Botanical names, common and vernacular names, morphology of the useful parts and medicinal uses of Leaves - <i>Cassia senna</i>	1	Chalk & Talk	Green Board
4.2	Medicinal uses of lower plants – Botanical	1	Chalk &	Green

	names, common and vernacular names, morphology of the useful parts and medicinal uses of Buds & flowers - <i>Eugenia caryophyllota</i>		Talk	Board
4.3	Medicinal uses of lower plants – Botanical names, common and vernacular names, morphology of the useful parts and medicinal uses of Fruits - <i>Aegle marmelos</i>	1	Chalk & Talk	Green Board
4.4	Medicinal uses of lower plants – Botanical names, common and vernacular names, morphology of the useful parts and medicinal uses of Seeds - <i>Myristica fragrans</i>	1	Lecture	Green Board
	Medicinal uses of lower plants – Botanical names, common and vernacular names, morphology of the useful parts and medicinal uses of Resins and Gums - <i>Ferula asafoetida</i>	1		
Unit -5				
5.0	Botanical name, common name, family, chemical constituents, cultivation, Processing, harvesting and uses of Ashwaganda - <i>Withania somnifera</i>	3	Lecture	Green Board
5.1	Botanical name, common name, family, chemical constituents, cultivation, Processing, harvesting and uses of Sothukathalai - <i>Aloe vera</i>	3	Chalk & Talk	Green Board
5.2	Botanical name, common name, family, chemical constituents, cultivation, Processing, harvesting and uses of Nelli - <i>Emblica officinalis</i>	3	Chalk & Talk	Green Board
5.3	Botanical name, common name, family, chemical constituents, cultivation, Processing, harvesting and uses of Safflower- <i>Carthamus tinctorius</i>	3	Chalk & Talk	Green Board
	<b>Total</b>	<b>60</b>		

**Course Designer**  
**(Name of the Course Teacher)**

**Head of the Department**

**Dr. T. SELLATHURAI**

**Dr. V. RAMESH**

## DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)

(For those students admitted during the 2018 -19 and after)

PART – III : Elective Theory		SEMESTER – V
Course Title: Organic Farming		
Course Code: 08EP5B	Hours per week:5	Credit:5
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

### Preamble

- ❖ To acquire the knowledge in the field of organic farming and their importance
- ❖ To identify the microorganisms as biocontrol agent
- ❖ To understand the different strategy in the crop production

### Course Outcomes (CO)

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Acquire the knowledge of Concept of organic farming	K1, K2, K3
CO 2	Understand the organic plant nutrient management	K1, K2, K3
CO 3	Understand the mechanism and importance of various organic plant protection	K1, K2, K3
CO 4	The apply organic crop production practices methods	K1, K2, K3
CO 5	Development of organic farming for the entrepreneurship skill	K1, K2, K3

K1-knowledge

K2-Understand

K3-Apply

### Mapping of CO with PO

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	9	9	3	3	3	3	3
CO2	3	3	9	9	9	9	9
CO3	3	9	9	9	9	9	9
CO4	3	3	9	9	9	9	9
CO5	3	3	9	9	9	9	9
	21	27	39	39	39	39	39

9-Strong

3-Medium

1-Low

### Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	9	9
CO2	3	9	9	9	9
CO3	3	9	9	9	9
CO4	3	9	9	9	9
CO5	3	9	9	9	9

9-Strong

3-Medium

1-Low

**Syllabus**

UNIT NO.	CONTENT	HOURS
UNIT I	Organic Farming: definition, types and roll of farming - pure organic farming - integrated farming system and mixed farming concept of different cropping systems	(12 Hrs)
UNIT II	Composting: principles, methods, stages, types and factors – sources of nutrients: farmyard manure - rural compost - city compost, oil cakes, animal wastes, types and method of vermicomposting - green manure – panchakavya and field Application	(12 Hrs)
UNIT III	Water and weed management practices – mulching and types: dry mulching, green mulching, live mulching & stone mulching	(12 Hrs)
UNIT IV	Integrated plant protection management – biofence: definition and its companion plants – herbal pest repellants – neem and its formulations – bacterial and fungal biopesticides	(12 Hrs)
UNIT V	Organic crops certification: guidelines - requirements – procedure – validity – labeling- organic crops marketing	( 12 Hrs)

**Text Books**

1. Dahama, A.K. (1997). Organic Farming for sustainable Agriculture, Second Enlarged Edition, Jodhpur.
2. Sambamurthy, A.V.S.S. (2005). A Textbook of Algae, I.K. International Pvt. Ltd., New Delhi.
3. Sharma, P.D. (2012). Microbiology and Plant Pathology (3<sup>rd</sup> Edition), Rastogi Publications, Meerut.

**Reference Books**

1. Veeresh, G.K, Organic Farming, Foundation books Pvt. Ltd, New Delhi (2006).
2. Anindra Nag (2008). Textbook of Agricultural Biotechnology, PHI Learning Private Limited, New Delhi.
3. Vayas,S.C, Vayas, S. and Modi, H.A. (1998). Bio-fertilizers and organic Farming Akta Prakashan, Nadiad

**Pedagogy**

Chalk & Talk, Group Discussion, Power point presentation (PPT)

**Teaching Aids**

Green Board, LCD Projector, Interactive White Board

**Course Contents and Lecture Schedule**

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT I				Green Board
1.1	Organic Farming: definition, types and roll of farming.	4	Chalk & Talk	Green Board
1.2	pure organic farming - integrated	4	Chalk & Talk	Green Board



	farming system			
1.3	mixed farming concept of different cropping systems	4	Chalk & Talk	Green Board
<b>UNIT II</b>				
2.1	Composting- principles, methods, stages, types and factors.	2	Discussion	Green Board
2.2	Sources of nutrients for Organic Manure	2	Lecture	Green Board
2.3	farmyard manure - rural compost - city compost, oil cakes, animal wastes	2	PPT	LCD
2.4	types and method of vermicomposting	2	Lecture	
2.5	Green manure	2	Chalk & Talk	Green Board
2.6	Panchakavya and field Application	2	Chalk & Talk	Green Board
<b>UNIT III</b>				
3.1	Water and weed management practices	3	Lecture	Green Board
3.2	mulching and types	3	Discussion	Green Board
3.3	dry mulching, green mulching	3	PPT	LCD
3.4	live mulching & stone mulching	3	Chalk & Talk	Green Board
<b>UNIT IV</b>				
4.1	Integrated plant protection management	2	PPT	LCD
4.2	Biofence: definition and its companion plants	2	Chalk & Talk	Green Board
4.3	Herbal pest repellants	2		
4.4	Neem and its formulations	2	Lecture	Green Board
4.5	Bacterial biopesticides	2	Discussion	Green Board
4.6	Fungal biopesticides	2	Lecture	Green Board
<b>UNIT V</b>				
5.1	Organic crops certification	3	Discussion	Green Board
5.2	guidelines - requirements	3	Lecture	Green Board
5.3	procedure – validity	3	Discussion	Green Board
5.4	labeling- organic crops marketing	3	Discussion	Green Board
	<b>Total</b>	<b>60</b>		

<b>Course Designer</b> (Name of the Course Teacher)	<b>Head of the Department</b>
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**Dr. T. SELLATHURAI**

**Dr. V. RAMESH**

**DEPARTMENT OF BOTANY**  
Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

<b>PART – IV : Skill Based Theory</b>		<b>SEMESTER – V</b>
Course Title: Mushroom Cultivation		
Course Code: 0BSB51	Hours per week:2	Credit:2
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

**Preamble**

- ❖ To acquire basic knowledge on mushrooms
- ❖ To know the importance of mushrooms
- ❖ To know the value of mushrooms in day today life

**UNIT I**

Introduction to mushroom cultivation - General characters, systematic position, morphology, climatic needs of mushrooms – Identification of mushrooms - types of mushroom: common edible and poisonous mushroom - Mushroom training and research centers in Tamil Nadu & India

**UNIT II**

Nutrient profile of mushroom - nutritional value, medicinal value - recipes of Mushroom: Mushroom soup, sandwich, gravy, omelette, mushroom chilly, manchurian and briyani

**UNIT III**

Mushroom shed construction - spawn preparation (grain spawn) - advantages of grain spawn - medium preparation - spawn running - storage of spawn

**UNIT IV**

Mushroom cultivation & harvesting - button mushroom (*Agaricus bisporus*), oyster mushroom (*Pleurotus sajor-caju*), milky mushroom (*Calocybe indica*), paddy straw mushroom (*Volvariella volvacea*) - mushrooms disease and control measures: bacterial, fungal, insect pest & nematodes diseases

**UNIT V**

Post harvest operations: Harvesting – storage and preservation: freezing, drying, freeze drying and canning – spoilage of mushrooms - packing – marketing.

**Text Books**

1. Hand book of Mushroom Cultivation-1999 - TNAU. Covai
2. Mushroom Cultivation, 2005 - Singh
3. Edible mushrooms – M. Christensen, publ. by university of Minnesota press, 2011 Ed.

**Reference Books**

1. Mushroom a manual of cultivation – Biswal Subrata, PHI Learning Pvt Ltd, Delhi, 2012 Ed.
2. Mushroom Cultivation, 2005 – Suman

3. The mushroom book. A popular guide to the identification and study of our common fungi, with special emphasis on the edible fungi. - Marshall, Nina L, garden city publisher garden city, New York, 2010 Ed.

<b>Course Designer (Name of the Course Teacher)</b>	<b>Head of the Department</b>
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**Dr. J. ARULRAJ**

**Dr. V. RAMESH**

### **DEPARTMENT OF BOTANY**

Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

<b>PART – III : Core Theory</b>		<b>SEMESTER – VI</b>
Course Title: Biotechnology		
Course Code: 08CT61	Hours per week:6	Credit:4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

#### **Preamble**

- ❖ To keep the students abreast of all the latest developments in Biotechnology
- ❖ To provide insights into advanced aspects of Agriculture, Environment and Medicine
- ❖ To expand the knowledge of the students in Biotechnology.

#### **Course Outcome**

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

<b>Number</b>	<b>Course Outcome</b>	<b>Knowledge Level ( According to Bloom's Taxonomy)</b>
<b>CO1</b>	Understand the core concepts and fundamentals of plant biotechnology and genetic Engineering Analyze the enzymes and vectors for genetic manipulations Examine gene cloning and evaluate different methods of gene transfer	K1, K2& K3
<b>CO2</b>	Understand the concepts of Fermentation technology Apply the fermentation techniques for industrial production of potential products	K1, K2& K3
<b>CO3</b>	Know the types of biofertilizer and apply that to their field Examine the mechanism of nitrogen fixation	K1, K2& K3
<b>CO4</b>	Analyze the contribution of microbiology area of science in water treatment, bioremediation and phytoremediation. Analyze microbiology of waste water and its implications Reflect upon various sustainable environmental	K1, K2& K3

	protection strategies	
<b>CO5</b>	Learn the techniques of gene therapy Gain the knowledge of human health care products	K1, K2& K3

**K1** – Knowledge

**K2** – Understand

**K3** – Apply

#### Mapping of CO with PO

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>
<b>CO 1</b>	9	9	3	9	9	9	3
<b>CO 2</b>	9	9	3	9	9	9	3
<b>CO 3</b>	9	9	3	9	9	9	3
<b>CO 4</b>	9	9	3	9	3	9	3
<b>CO 5</b>	9	9	3	9	3	9	3
	45	45	25	45	33	45	15

**9-Strong**

**3-Medium**

**1-Low**

#### Mapping of CO with PSO

	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>
<b>CO 1</b>	9	9	9	9	9
<b>CO 2</b>	9	9	3	9	9
<b>CO 3</b>	9	9	9	9	9
<b>CO 4</b>	9	9	9	9	9
<b>CO 5</b>	9	9	9	9	9

**9-Strong**

**3-Medium**

**1-Low**

#### Syllabus

<b>Unit – I</b>	<b>Recombinant DNA Technology:</b> Introduction of rDNA Technology - molecular tools: nomenclature and characteristics of Restriction Endonucleases & Ligases – Cloning vehicles: bacterial vectors (pBR322, pUC19, Ti plasmid), viral vectors (M13), Cosmid, Shuttle vector, Eukaryotic Vectors (YAC) – Brief account on strategies of gene cloning in Bacteria – Application of genetic engineering.	<b>(12 Hrs)</b>
<b>Unit – II</b>	<b>Industrial Biotechnology:</b> An introduction to fermentation process –Batch fermentation vs continuous fermentations - Components of a typical bioreactor - Types of bioreactors: laboratory and production fermenters - Industrial production of ethyl alcohol, citric acid and penicillin - Immobilization of enzymes and single cell proteins.	<b>(12 Hrs)</b>
<b>Unit – III</b>	<b>Agricultural Biotechnology:</b> Introduction to Biofertilizer - Types of Potential Biofertilizers (Bacteria, BGA, <i>Azolla</i> & <i>Mychorrhiza</i> ) – mechanism of Nitrogen Fixation with reference to <i>Rhizobium</i> – root nodulation – nif genes – regulation of nif genes - Brief account of Biopesticides	<b>(12 Hrs)</b>
<b>Unit – IV</b>	<b>Environmental Biotechnology:</b> Biological treatment of sewage: primary, secondary and tertiary treatment – Biogas: biogas plant, methanogenesis, methanogenic bacteria & application of biogas – Biofuels from algae and higher plants – Brief account on Bioremediation of contaminated soil and Phytoremediation of water	<b>(12 Hrs)</b>
<b>Unit – V</b>	<b>Medical Biotechnology:</b> Brief account of Gene therapy –	<b>(12 Hrs)</b>

	definition and types (Non-classical gene therapy: somatic cell therapy, germ line therapy and stem cell therapy & classical gene therapy) – Outlines of DNA finger printing - Production of health care products: Insulin, Human growth hormone and monoclonal antibodies.	
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### Text Books

1. Molecular Biology and Biotechnology - H.D. Humar, Vikas Publishing House, 2012
2. Advances in Biotechnology- S.N. Jogdand, Oxford University Press, 2013 Ed.
3. A text Book of Biotechnology – R.C
4. Dubey, S.Chand & Company Ltd, Delhi, 2014

### References Books

1. Modern Biotechnology - S.B. Primrose, Black Well Scientific Publications, 2010 Ed.
2. Plant Biotechnology – PK. Gupta, Rastogi Pub, Meerut, 2012 Ed.
3. Medical Biotechnology – Nallari Pratibha, Oxford University Press, New Delhi, 2010 Ed.

### Pedagogy

Chalk & Talk, PPT, Experiment & on the spot teaching

### Teaching Aids

Black Board, Green Board, Chart, Specimen, Plant Material, LCD Projector, Online virtual Lab & Interactive White Board

### Course Contents and Lecture Schedule

Module No.	Topic	No. of Class	Content Delivery method	Teaching Aids
<b>UNIT I</b>				
1.1	Introduction of rDNA Technology	3	Calk & Talk	Green Board & PPT, Online Virtual Lab
1.2	molecular tools: nomenclature and characteristics of Restriction Endonucleases (Types I-IV and subtypes of II) & Ligases –	3	Calk & Talk	Green Board & PPT, Online Virtual Lab
1.3	Cloning vehicles: bacterial vectors (pBR322, pUC19, Ti plasmid), Viral vectors - M13, Cosmid, Shuttle vector, Eukaryotic Vectors (YAC)	3	Calk & Talk	Green Board & PPT, Online Virtual Lab
1.4	Brief account on Strategies of gene cloning in Bacteria – Application of genetic engineering.	3	Calk & Talk	Green Board & PPT, Online Virtual Lab
<b>Unit – II</b>				
2.1	An introduction to fermentation process	3	Calk & Talk	Green Board & PPT,

				Online Virtual Lab
2.2	Batch fermentation vs continuous fermentations	3	Calk & Talk	Green Board & PPT, Online Virtual Lab
2.3	Components of a typical bioreactor - Types of bioreactors: laboratory and production Fermenters	3	Calk & Talk	Green Board & PPT, Online Virtual Lab
2.4	Industrial production of ethyl alcohol, citric acid and penicillin - Immobilization of enzymes and single cell proteins	3	Calk & Talk	Green Board & PPT, Online Virtual Lab
<b>Unit – III</b>				
3.1	Introduction to Biofertilizer	3	Calk & Talk	Green Board
3.2	Types of Potential Biofertilizers (Bacteria, BGA, <i>Azolla</i> & <i>Mychorrhiza</i> )	3	Calk & Talk	Field & Green Board
3.3	mechanism of Nitrogen Fixation with reference to <i>Rhizobium</i> – root nodulation – nif genes – regulation of Nif genes	3	Calk & Talk	Field teaching & Green Board
3.4	Brief account of Biopesticides	3	Calk & Talk	Field & Green Board
<b>Unit – IV</b>				
4.1	Biological treatment of sewage: primary, secondary and tertiary treatment	3	Calk & Talk	Green Board & Online Virtual Lab
4.2	Biogas: biogas plant, methanogenesis: methanogenic bacteria & application of biogas	3	Calk & Talk	Green Board, PPT & Smart class
4.3	Biofuels from algae and higher plants	3	Calk & Talk	Green Board & Online Virtual Lab
4.4	Bioremediation of contaminated soil and Phytoremediation of water	3	Calk & Talk	Green Board & Online Virtual Lab
<b>Unit – V</b>				
5.1	Brief account of Gene therapy	3	Calk & Talk	Green Board & PPT
5.2	Gene therapy: Definition and types (Non-classical gene therapy: somatic cell therapy, germ line therapy and stem cell therapy & classical gene therapy)	3	Calk & Talk	Green Board & Smart class
5.3	Outlines of DNA finger printing	2	Calk & Talk	Green Board & PPT

5.4	Production of health care products: Insulin, Human growth Hormone	2	Calk & Talk	Green Board & e- Content
5.5	Monoclonal antibodies	2	Calk & Talk	Green Board & PPT
Total		60		

<b>Course Designer</b> <b>(Name of the Course Teacher)</b>	<b>Head of the Department</b>
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**Dr. V. RAMESH**

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### **DEPARTMENT OF BOTANY**

Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

<b>PART – III : Elective Theory</b>		<b>SEMESTER - VI</b>
Course Title: Tissue Culture		
Course Code: 08EP6A	Hours per week:5	Credit:5
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

#### **Preamble**

- ❖ To accommodate the recent developments in Plant Biotechnology
- ❖ To acquire knowledge in tissue culture
- ❖ To acquire practical knowledge in tissue culture techniques

#### **Course Outcomes (CO)**

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
<b>CO 1</b>	Knowledge of plant tissue culture laboratory and medium preparation	K1, K2, K3
<b>CO2</b>	Understand the various regeneration system in plants	K1, K2, K3
<b>CO3</b>	Methods its application of protoplast and anther culture	K1, K2, K3
<b>CO 4</b>	Application of plant secondary metabolite production and its utilization	K1, K2, K3
<b>CO 5</b>	Application of transgenic plants in horticulture	K1, K2, K3

**K1-knowledge**

**K2-Understand**

**K3-Apply**

#### **Mapping of CO with PO**

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>
<b>CO 1</b>	<b>9</b>	<b>9</b>	<b>3</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>

CO 2	9	9	9	9	9	9	3
CO 3	9	9	9	3	3	9	3
CO 4	9	9	9	3	3	9	9
CO 5	9	9	3	9	3	9	3
	45	45	33	33	27	45	27

9-Strong

3-Medium

1-Low

#### Mapping of CO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	9	9	9	9	9
CO 2	9	9	3	9	9
CO 3	9	9	9	9	3
CO 4	9	9	3	9	3
CO 5	9	9	9	9	9

9-Strong

3-Medium

1-Low

#### Syllabus

UNIT No.	CONTENT	HOURS
UNIT I	Introduction - Milestones in plant tissue culture – tools required for tissue culture lab – Media preparation, sterilization techniques.	(12 Hrs)
UNIT II	Explants - Initiation and maintenance of callus – organogenesis (Auxillary Bud culture, Nodal culture) Somatic embryogenesis – meristem culture – Artificial seeds – Germplasm preservation.	(12 Hrs)
UNIT III	Isolation and purification of protoplast-Protoplast fusion and Somatic hybridization - Anther culture and haploid generation – use of haploids in plant breeding.	(12 Hrs)
UNIT IV	Suspension culture – Production of secondary metabolites-some pharmaceutically important secondary metabolites and their plant sources (Alkaloids, Tannins, Phenols and Resins with examples.	(12 Hrs)
UNIT V	Application of tissue culture in Horticulture – Transgenic plants – production of herbicide resistance, pest resistance, & salt tolerant plants – conservation of endangered and rare species.	( 12 Hrs)

#### Text Books

1. Advances in Biotechnology- S.N. Jogdand, Oxford University Press, 2013 Ed.
2. A text Book of Biotechnology – R.C. Dubey, S.Chand & Company Ltd, Delhi, 2014 Ed.
3. Plant cell and Tissue Culture – Shekhaward Mahipal Singh, Sara's publications, Nagercoil, 2013 Ed.

#### Reference Books

1. Plant cell and tissue culture – S. Narayanasamy, Tata McGraw Hill Company, Delhi, 2012 Ed
2. Introduction to plant cell, tissue and organ culture – D. Prohit Sunil, PHI Learning Private Ltd, Delhi, 2013 Ed.



3. Plant Biotechnology a practical manual – CC. Giri, International Publishing House, Delhi, 2013 Ed.

### **Pedagogy**

Chalk & Talk, Group Discussion, Power point presentation (PPT)

### **Teaching Aids**

Green Board, LCD Projector, Interactive White Board

### **Course Contents and Lecture Schedule**

<b>Module No.</b>	<b>Topic</b>	<b>No. of Lectures</b>	<b>Content Delivery Method</b>	<b>Teaching Aids</b>
<b>UNIT I</b>				
1.1	Introduction of plant tissue culture	1	Discussion	
1.2	Milestones in plant tissue culture	2	PPT	
1.3	Tools required for tissue culture lab	3	PPT	LCD
1.4	Media preparation	3	Discussion	
1.5	Sterilization techniques	3	Chalk & Talk	Green Board
<b>UNIT II</b>				
2.1	Explants	1	Chalk & Talk	Green Board
2.2	Initiation and maintenance of callus	1	Chalk & Talk	Green Board
2.3	Organogenesis (Auxillary Bud culture, Nodal culture)	2	PPT	LCD
2.4	Somatic embryogenesis	2	PPT	LCD
2.5	Meristem culture	2	Chalk & Talk	Green Board
2.6	Artificial seeds	2	Chalk & Talk	Green Board
2.7	Germplasm preservation	2	Chalk & Talk	Green Board
<b>UNIT III</b>				
3.1	Isolation and purification of protoplast	2	Chalk & Talk	Green Board
3.2	Protoplast fusion and Somatic hybridization	3	Chalk & Talk	Green Board
3.3	Anther culture	2	PPT	LCD
3.4	Haploid generation	2	Chalk & Talk	Green Board
3.5	Uses of haploids in plant breeding	3	Chalk & Talk	Green Board
<b>UNIT IV</b>				
4.1	Suspension culture	4	Lecture	
4.1	Production of secondary metabolites	4	Chalk & Talk	Green Board
4.3	Pharmaceutically important secondary metabolites and their plant sources (Alkaloids, Tannins, Phenols and Resins with examples.	4	Chalk & Talk	Green Board

UNIT V				
5.1	Application of tissue culture in Horticulture	3	Chalk & Talk	Green Board
5.2	Transgenic plants	3	Chalk & Talk	Green Board
5.3	Production of herbicide resistance, pest resistance, & salt tolerant plants.	3	Chalk & Talk	Green Board
5.4	Conservation of endangered and rare species	3	Chalk & Talk	Green Board
	<b>Total</b>	<b>60</b>		

<b>Course Designer</b> (Name of the Course Teacher)	<b>Head of the Department</b>
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**Dr. C. SOUNDAR RAJU**

**Dr. V. RAMESH**

**DEPARTMENT OF BOTANY**

Programme: B.Sc. BOTANY (CBCS and OBE)

(For those students admitted during the 2018 -19 and after)

<b>PART – III : Elective Theory</b>		SEMESTER - VI
Course Title: Seed Science and Technology		
Course Code: 08EP6B	Hours per week:5	Credit:5
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

**Preamble**

- ❖ To acquire knowledge in Seed science
- ❖ To acquire practical knowledge in Seed production and Storage technology

**Course Outcomes (CO)**

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Knowledge of seed production of economically important plants	K1, K2, K3
CO2	Understand the principles and methods of seed processing	K1, K2, K3
CO3	Gain the application of seed storage	K1, K2, K3
CO 4	Know and understand the seed health	K1, K2, K3
CO 5	Acquire the knowledge of seed quality control	K1, K2, K3

**K1-knowledge**

**K2-Understand**

**K3-Apply**

**Mapping of CO with PO**

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>
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CO 1	9	9	3	9	9	9	9
CO 2	9	9	9	9	3	3	3
CO 3	9	9	9	3	3	9	3
CO 4	9	9	3	3	3	3	3
CO 5	9	9	3	9	3	9	3
	45	45	27	33	21	33	21

9-Strong

3-Medium

1-Low

#### Mapping of CO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	9	9	9	9	3
CO 2	9	9	3	3	3
CO 3	9	3	9	3	3
CO 4	9	9	3	9	3
CO 5	9	9	9	3	3

9-Strong

3-Medium

1-Low

#### Syllabus

UNIT No.	CONTENT	HOURS
UNIT I	<b>Seed Production:</b> General system of seed multiplication - Seed production agencies - Identification of seed production areas and factors affecting it - Compact area approach in seed production - Principles and methods: paddy & sesame.	(12 Hrs)
UNIT II	<b>Seed Processing:</b> Principles - seed drying, precleaning, grading, treatment, pelleting and packaging - Seed enhancement treatment and their applications - seed processing machines - seed quality maintenance.	(12 Hrs)
UNIT III	<b>Seed Storage:</b> Requirements and types of seed storage - Factors affecting seed storage: moisture, temperature, humidity and moisture equilibrium - viability nomographs - seed deterioration causes and control measures - Storage structures and their impact.	(12 Hrs)
UNIT IV	<b>Seed Health:</b> Significance of seed health - mode and mechanism of transmission of microorganisms (fungi, bacteria and viruses) – seed borne pathogens – methods and detection & seed borne diseases : paddy and sesame	(12 Hrs)
UNIT V	<b>Seed Quality Control:</b> Seed legislation - Seeds Act 1966, Seed Rules 1969 and New Seed Bill 2004, Seed Law Enforcement - Seed certification – Pre and post quality testing or genetic purity - Seed testing concepts and objectives.	( 12 Hrs)

#### Text Books

1. Vanangamudi K. Seed science and Technology, New India Publishing Agency, 2014.
2. Basra A. Handbook of Seed Science and Technology Paperback, CRC press, 2008

#### Reference Books

1. Lawrence O. Copeland, Miller B. McDonald. Principles of seed science and Technology, Springer, US, 2001

2. Nandkumar Fageria. The use of Nutrients in crop plants, CRC Press, 2008

### **Pedagogy**

Chalk & Talk, Group Discussion, Power point presentation (PPT)

### **Teaching Aids**

Green Board, LCD Projector, Interactive White Board

### **Course Contents and Lecture Schedule**

<b>Module No.</b>	<b>Topic</b>	<b>No. of Lectures</b>	<b>Content Delivery Method</b>	<b>Teaching Aids</b>
<b>UNIT I: Seed Production</b>				
1.1	General system of seed multiplication	2	Chalk & Talk	Green Board
1.2	Seed production agencies	2	PPT	LCD
1.3	Identification of seed production areas and factors affecting it	2	PPT	LCD
1.4	Compact area approach in seed production	2	Chalk & Talk	Green Board
1.5	Principles and methods paddy, sesame	4	Chalk & Talk	Green Board
<b>UNIT II: Seed Processing</b>				
2.1	Principles of seed processing	2	Chalk & Talk	Green Board
2.2	Seed drying - precleaning, grading, treatment, pelleting and packaging	3	Chalk & Talk	Green Board
2.3	Seed enhancement treatment and their applications	2	PPT	LCD
2.4	Seed processing machines	3	PPT	LCD
2.5	Seed quality maintenance	2	Chalk & Talk	Green Board
<b>UNIT III: Seed Storage</b>				
3.1	Requirements and types of seed storage	2	Chalk & Talk	Green Board
3.2	Factors affecting seed storage - moisture, temperature, humidity and moisture equilibrium	3	Chalk & Talk	Green Board
3.3	Viability nomographs	2	PPT	LCD
3.4	Seed deterioration causes and control measures	2	Chalk & Talk	Green Board
3.5	Storage structures and their impact	3	Chalk & Talk	Green Board
<b>UNIT IV: Seed Health</b>				
4.1	Significance of seed health	2	PPT	LCD
4.2	Mode and mechanism of transmission of microorganisms	3	Chalk & Talk	Green Board

	(fungi, bacteria and viruses)			
4.3	Seed - borne pathogens	2	Chalk & Talk	Green Board
4.4	Methods of detection of seed borne diseases	2	Chalk & Talk	Green Board
4.5	Important seed-borne diseases of paddy and sesame and their control measures	3	Chalk & Talk	Green Board
<b>UNIT V: Seed Quality Control</b>				
5.1	Seed legislation - Seeds Act 1966	2	Chalk & Talk	Green Board
5.2	Seed Rules 1969 and New Seed Bill 2004	2	Chalk & Talk	Green Board
5.3	Seed Law Enforcement	2	Chalk & Talk	Green Board
5.4	Seed certification	2	PPT	LCD
5.5	Pre-and post-quality testing or genetic purity	2	Chalk & Talk	Green Board
5.6	Seed testing concepts and objectives	2	Chalk & Talk	Green Board
	<b>Total</b>	<b>60</b>		

<b>Course Designer (Name of the Course Teacher)</b>	<b>Head of the Department</b>
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**Dr. C. SOUNDAR RAJU**

**Dr. V. RAMESH**

### DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)

(For those students admitted during the 2018 -19 and after)

<b>PART – III : Elective Theory</b>		<b>SEMESTER -VI</b>
Course Title: Biodiversity Conservation and Management		
Course Code: 08EP6C	Hours per week:5	Credit:5
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

#### Preamble

- ❖ To introduce the various aspects of biodiversity to the students
- ❖ To spread across the message of preventing widespread biodiversity loss.
- ❖ To highlight the uses and values of biodiversity

#### Course Outcome

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

<b>Number</b>	<b>Course Outcome</b>	<b>Knowledge Level ( According to Bloom's Taxonomy)</b>
<b>CO1</b>	Explain the levels of biodiversity To know the preliminaries of biodiversity Provide a thorough knowledge on Plant diversity	K1, K2& K3
<b>CO2</b>	Understand the importance of Biodiversity and Bioresources. Acquire the basic knowledge about how to use biodiversity resources	K1, K2& K3
<b>CO3</b>	Explain the concept of biodiversity losses Explain the relation between biodiversity and human life. Learn the conservation of threatened plants.	K1, K2& K3

<b>CO4</b>	Explain the concept of biodiversity and conservation strategies Learn the conservation of threatened plants.	K1, K2& K3
<b>CO5</b>	Gain understanding on the biodiversity hotspots of the world and India	K1, K2& K3

**K1** – Knowledge

**K2** – Understand

**K3** – Apply

#### Mapping of CO with PO

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>
<b>CO 1</b>	9	9	9	9	9	9	9
<b>CO 2</b>	9	9	9	9	9	9	3
<b>CO 3</b>	9	9	9	3	3	9	3
<b>CO 4</b>	9	9	9	9	3	9	9
<b>CO 5</b>	9	9	9	9	3	9	3
	<b>45</b>	<b>45</b>	<b>45</b>	<b>39</b>	<b>27</b>	<b>45</b>	<b>27</b>

9-Strong

3-Medium

1-Low

#### Mapping of CO with PSO

	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>
<b>CO 1</b>	9	3	9	9	9
<b>CO 2</b>	9	3	3	9	9
<b>CO 3</b>	9	9	1	3	9
<b>CO 4</b>	9	9	3	9	3
<b>CO 5</b>	9	3	9	3	9

9-Strong

3-Medium

1-Low

#### Syllabus

<b>Unit – I</b>	<b>Preliminaries in biodiversity conservation</b> Definition: preservation, environmentalism, ecology and wildlife - Closer look at biodiversity - Levels of Biodiversity: Genetic ( $\alpha$ , $\beta$ and $\gamma$ diversity), Species, Community and Ecosystem diversity - why biodiversity is rich in tropics? – Biodiversity at global, national (India) and local levels	<b>(12 Hrs)</b>
<b>Unit – II</b>	<b>Economic Valuation of Biodiversity</b> Total economic value - use value: direct (Consumptive, productive and Non consumptive) indirect (watershed benefits, ecosystem services and evolutionary process), option values – Non use value: Existence, Altruistic & Bequest Values	<b>(12 Hrs)</b>
<b>Unit – III</b>	<b>Loss of Biodiversity</b> Major causes for the loss of biodiversity: Biodiversity loss- habitat destruction and fragmentation, Over exploitation of natural resources, population explosion and hunting – Endemism and Biodiversity, listing threatened diversity: Extinct, Extinct in wild, critically endangered, Endangered, Vulnerable, Near Threatened, Least concern - Species richness and species index, and abundance	<b>(12 Hrs)</b>
<b>Unit – IV</b>	<b>Conservation of biodiversity</b> Strategies followed in conservation – <i>In-situ</i> conservation: sacred	<b>(12 Hrs)</b>

	groves, biosphere reserves, National parks and wild life sanctuaries. – Ex-situ conservation: cryopreservation, germplasm conservation Zoos, botanical gardens, pollen bank, gene bank, seed bank, tissue culture – ecotourism – organization involved in conservation activities: NBPGR, BSI, MoEF & NBA	
<b>Unit – V</b>	<b>Conservation and management Activities</b> Biodiversity hot spots - red data book - Hot spots found in India – Role of IUCN, WWF and MAB programmers - biodiversity conservation of India: Environmental Protection Act – Forest conservation act & Biodiversity act.	<b>(12 Hrs)</b>

### Text Books

1. Krishnamurthy. KV - An advanced Text Book on Biodiversity -. –
2. Melchias, G.2001. Biodiversity and Conservation. Oxford and IBH publishing company Pvt, Ltd, New Delhi.
3. Kumar,- Biodiversity principles and conservation –International Book Distributors, Dehradun, 2013 Ed.

### References Books

1. E. Benson - Plant Conservation Biotechnology - Ane Books distributors, New Delhi 2013 Ed.
2. Samit Ray and Arun K. Ray - Biodiversity Biotechnology -, New Central Book Agency, Kolkata, 2010 Ed.
3. F.C.O. Osmaston - The management of Forest -, international book publishers, 2010 Ed.

### Pedagogy

Chalk & Talk, PPT, Experiment & on the spot teaching

### Teaching Aids

Black Board, Green Board, Chart, Specimen, Plant Material, LCD Projector, Online virtual Lab & Interactive White Board

### Course Contents and Lecture Schedule

Module No.	Topic	No. of Class	Content Delivery method	Teaching Aids
<b>UNIT I</b>				
1.1	Definition –: preservation, environmentalism, ecology and wildlife - Closer look at biodiversity	3	Calk & Talk	Green Board & Filed
1.2	Levels of Biodiversity: Genetic ( $\alpha$ , $\beta$ and $\gamma$ diversity), Species, Community and Ecosystem diversity	3	Calk & Talk	Green Board & Filed
1.3	Why biodiversity is rich in tropics?	3	Calk & Talk	Green Board & Filed
1.4	Biodiversity at global, national (India) and local levels	3	Calk & Talk	Green Board



<b>Unit – II</b>				
2.1	Total economic value - use value: direct	3	Calk & Talk	Green Board
2.2	Consumptive, productive and Non consumptive) indirect (watershed benefits, ecosystem services and evolutionary process)	3	Calk & Talk	Plant products , Field & Green Board
2.3	option values – Non use value	3	Calk & Talk	Field teaching & Green Board
2.4	Existence, Altruistic & Bequest Values	3	Calk & Talk	Plant products, Field & Green Board
<b>Unit – III</b>				
3.1	Major causes for the loss of biodiversity: Biodiversity loss-habitat destruction and fragmentation, Over exploitation of natural resources, population explosion and hunting	3	Calk & Talk	Green Board
3.2	Endemism and Biodiversity, listing threatened diversity	3	Calk & Talk	Field & Green Board
3.3	Extinct, Extinct in wild, critically endangered, Endangered, Vulnerable, Near Threatened, Least concern	3	Calk & Talk	Field teaching & Green Board
3.4	Species richness and species index, and abundance	3	Calk & Talk	Field & Green Board
<b>Unit – IV</b>				
4.1	Strategies followed in conservation – <i>In-situ</i> conservation: sacred groves, biosphere reserves, National parks and wild life sanctuaries	3	Calk & Talk	Green Board & Online Virtual Lab
4.2	Ex-situ conservation: cryopreservation, germplasm conservation Zoos	3	Calk & Talk	Green Board, PPT & Smart class
4.3	botanical gardens, pollen bank, gene bank, seed bank, tissue culture	3	Calk & Talk	Green Board & Online Virtual Lab
4.4	Ecotourism – organization involved in conservation activities: IUCN, NBPGR, BSI, MoEF & NBA	3	Calk & Talk	Green Board & Online Virtual Lab
<b>Unit – V</b>				
5.1	Biodiversity hot spots & red data book	3	Calk & Talk	Green Board & PPT
5.2	Hot spots found in India – Role of IUCN	3	Calk & Talk	Green Board & Smart class

5.3	WWF and MAB programmers	2	Calk & Talk	Green Board & PPT
5.4	biodiversity conservation of India: Environmental Protection Act	2	Calk & Talk	Green Board & e- Content
5.5	Forest conservation act & Biodiversity act	2	Calk & Talk	Green Board & PPT
Total		60		

<b>Course Designer</b> <b>(Name of the Course Teacher)</b>	<b>Head of the Department</b>
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**Dr. V. RAMESH**

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### **DEPARTMENT OF BOTANY**

Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

<b>PART – III : Elective Theory</b>		<b>SEMESTER -VI</b>
Course Title: Botanical Entrepreneurship		
Course Code: 08EP6D	Hours per week:5	Credit:5
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

#### **Preamble**

- ❖ To inculcate in students the dependence of man on plants.
- ❖ To provide knowledge based on various plant products.
- ❖ To establish their plant resource based business units

#### **Course Outcome**

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

<b>Number</b>	<b>Course Outcome</b>	<b>Knowledge Level ( According to Bloom's Taxonomy)</b>
<b>CO1</b>	Explain the unique features of Nursery To know the techniques of nursery establishment Expertise in the field of organic manure preparation	K1, K2& K3
<b>CO2</b>	Gain knowledge in floriculture Acquire the basic knowledge of ornamental plants	K1, K2& K3
<b>CO3</b>	Familiarize in commercial vegetables and fruits Explain the relation between plants and human life.	K1, K2& K3
<b>CO4</b>	Create understanding on various plant products the	K1, K2& K3

	humanity depends on	
<b>CO5</b>	To make them to discern the marketing of medicinal plants Becomes an entrepreneur through gaining knowledge in botanical techniques.	K1, K2& K3

**K1** – Knowledge

**K2** – Understand

**K3** – Apply

#### Mapping of CO with PO

	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PO 6</b>	<b>PO 7</b>
<b>CO 1</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>
<b>CO 2</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>3</b>
<b>CO 3</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>3</b>	<b>3</b>	<b>9</b>	<b>3</b>
<b>CO 4</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>3</b>	<b>3</b>	<b>9</b>	<b>9</b>
<b>CO 5</b>	<b>9</b>	<b>9</b>	<b>3</b>	<b>9</b>	<b>3</b>	<b>9</b>	<b>3</b>
	<b>45</b>	<b>45</b>	<b>39</b>	<b>33</b>	<b>27</b>	<b>45</b>	<b>27</b>

**9-Strong**

**3-Medium**

**1-Low**

#### Mapping of CO with PSO

	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>	<b>PSO 5</b>
<b>CO 1</b>	<b>9</b>	<b>3</b>	<b>9</b>	<b>9</b>	<b>9</b>
<b>CO 2</b>	<b>9</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>9</b>
<b>CO 3</b>	<b>9</b>	<b>9</b>	<b>1</b>	<b>3</b>	<b>9</b>
<b>CO 4</b>	<b>9</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>3</b>
<b>CO 5</b>	<b>9</b>	<b>3</b>	<b>9</b>	<b>3</b>	<b>9</b>

**9-Strong**

**3-Medium**

**1-Low**

#### Syllabus

<b>Unit – I</b>	<b>Nursery Establishment and Management</b> Definition, objectives, scope and building up of infrastructure for nursery - planning and seasonal activities - Planting - direct seeding and transplants – water management - identification of deficiency symptoms - field and post harvest diseases - remedial measures and nutritional management practices – preparation and apply of farmyard and organic manure	<b>( 12Hrs)</b>
<b>Unit – II</b>	<b>Ornamental Plants and Floriculture</b> Propagation of plants for beautification: Identification and salient features of some ornamental plants [Carnation, Aster, <i>Chrysanthemum</i> , <i>Dahlia</i> , Marigold, Rose, Orchids, cacti and succulents ( <i>Opuntia</i> , <i>Agave</i> and Spurges)] Ornamental trees (Sarakkondrai, Kattuthimaram, fishtail palm and coral tree). Cut flowers - bonsai - Importance of flower shows and exhibitions	<b>(12 Hrs)</b>
<b>Unit – III</b>	<b>Commercial vegetable and Fruits Management</b> Nutritional values and economics of vegetable and Fruits crops – spoilage – Factors influencing of spoilage – preservation techniques (physical and chemical) - Cold storage techniques -	<b>(12 Hrs)</b>

	Aseptic and Packaging for transportation	
<b>Unit – IV</b>	<b>Plant based products</b> Survey on the demand and requirement of Herbal products / formulations – cosmetics: herbal face pack, mehendi, organic hair oil and dye - Preparation of health drinks: (sukumalli coffee & malt) Botanical recipes: jam, jelly, pickle, vaththal, fruit salad – Preparation and marketing of palm craft	<b>(12 Hrs)</b>
<b>Unit – V</b>	<b>Entrepreneurship</b> Entrepreneurship opportunity, Necessity to promote Indian Traditional health Concept, Demand & opportunity for Herbal products Retailing, Marketing techniques, Sales & Promotion - Steps for starting small scale industry – schemes: NABARD, NCDC and NSIC	<b>(12 Hrs)</b>

### Text Books

1. Kumar, N. (1997) Introduction to Horticulture, Rajalakshmi Publications, Nagercoil.
2. Bose, T.K. and Som, M.G.V. (1986). Vegetable crops in India. Naya Prokash, Calcutta
3. Bose, T.K. (1985). Fruits of India tropical and subtropical. Naya Prokash, Calcutta.

### Reference books

1. Thirugnanasambantham, *et al.* (2012). Introduction to Herbal Entrepreneurship, Rohini Institute of Alternative Medicine, 40/41, Spartan Avenue, Mugappair East, Chennai.
2. Sundararajan, J.S. Muthuswamy, J. Shanmugavelu, K.G. Balakrishnan, R. (1995). A guide to horticulture, Thiruvankadam Printers, Coimbatore.
3. Butts, E. and Stensson, K. (2012). Sheridan Nurseries: One hundred years of People, Plans, and Plants. Dundurn Group Ltd.

### Pedagogy

Chalk & Talk, PPT, Experiment & on the spot teaching

### Teaching Aids

Black Board, Green Board, Chart, Specimen, Plant Material, LCD Projector, Online virtual Lab & Interactive White Board

### Course Contents and Lecture Schedule

Module No.	Topic	No. of Class	Content Delivery method	Teaching Aids
<b>UNIT I</b>				
1.1	Definition, objectives, scope and building up of infrastructure for nursery - planning and seasonal activities	3	Calk & Talk	Green Board & Filed
1.2	Planting: direct seeding and transplants	2	Calk & Talk	Green Board & Filed
1.3	water management - identification of	2	Calk & Talk	Green Board

	deficiency symptoms			& Filed
1.4	Field and post harvest diseases - remedial measures and nutritional management practices	2	Calk & Talk	Green Board
1.5	preparation and apply of farmyard and organic manure	3	Calk & Talk	Green Board & Field
<b>Unit – II</b>				
2.1	Propagation of plants for beautification:	3	Calk & Talk	Plant material & Green Board
2.2	Identification and salient features of some ornamental plants (Carnation, Aster, Chrysanthemum, Dahlia, Marigold, Rose, Lilium, Orchids cacti and succulents (opuntia, agave and spurges)	3	Calk & Talk	Plant material, Field & Green Board
2.3	Ornamental trees (Sarakkondrai, Kattuthimaram, fishtail palm and coral tree). Cut flowers - bonsai	3	Calk & Talk	Plant material & Green Board
2.4	Importance of flower shows and exhibitions	3	Calk & Talk	Plant material, Field & Green Board
<b>Unit – III</b>				
3.1	Nutritional values and economics of vegetable and Fruits crops	3	Calk & Talk	Chart, Plant material & Green Board
3.2	spoilage – Factors influencing of spoilage	3	Calk & Talk	Chart, Plant material & Green Board
3.3	preservation techniques (physical and chemical)	3	Calk & Talk	Plant material & Green Board
3.4	Cold storage techniques - Aseptic and Packaging for transportation	3	Calk & Talk	Plant material & Green Board
<b>Unit – IV</b>				
4.1	Survey on the demand and requirement of Herbal products / formulations	3	Calk & Talk	Plant material & Green Board
4.2	cosmetics: herbal face pack, mehandi, organic hair oil and dye	3	Calk & Talk	Green Board & plant material
4.3	Preparation of health drinks: (sukkumalli coffee & malt) Botanical recipes: jam, jelly, pickle, vaththal, fruit salat	3	Calk & Talk	Green Board & plant material
4.4	Preparation and marketing of palm craft	3	Calk & Talk	Green Board & Plant material

<b>Unit – V</b>				
5.1	Entrepreneurship opportunity, Necessity to promote Indian Traditional health Concept,	3	Calk & Talk	Green Board
5.2	Demand & opportunity for Herbal products Retailing	3	Calk & Talk	Green Board
5.3	Marketing techniques, Sales & Promotion	2	Calk & Talk	Green Board
5.4	Steps for starting small scale industry	2	Calk & Talk	Green Board
5.5	Schemes: NABARD, NCDC and NSIC	2	Calk & Talk	Green Board
Total		60		

<b>Course Designer</b> (Name of the Course Teacher)	<b>Head of the Department</b>
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**Dr. V. RAMESH**

**Dr. V. RAMESH**

### **DEPARTMENT OF BOTANY**

Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

<b>PART – IV : Skill Based Theory</b>		<b>SEMESTER - VI</b>
Course Title: Plant Breeding		
Course Code: 08SB61	Hours per week:2	Credit:2
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

#### **Preamble**

- ❖ To know the varieties released through the various methods of plant breeding
- ❖ To know the various types of ecofriendly environment hybrids production
- ❖ To know the simple practice for the improvement of innovative hybrids

#### **UNIT I: Plant introduction**

Introduction of Plant Breeding, Scope and Achievements in plant breeding, - Indian Agricultural Research Institute (IARI) - Aim of plant introduction – procedure for plant introduction – acclimatization – achievements in plant introduction.

#### **UNIT II: Selection**

Methods of selection – Mass selection, pure line selection and Clonal selection – procedure and its advantages & achievements.

#### **UNIT III: Hybridization**

Introduction of Hybridization, Objectives and Prerequisites, various hybridization techniques, Hybridization methods – Interspecific hybridization, Interspecific hybridization, pedigree and bulk methods

#### **UNIT IV: Heterosis**

Definition, effects of hybrid vigour, methods of Heterosis breeding, Utilization of hybrid vigour in breeding

## UNIT V

Introduction to Ploidy breeding, Types of polyploids, methods to induce polyploidy, Introduction of Mutation breeding, Types of mutations in plant breeding, its advantages and disadvantages.

### Text Books:

1. Elementary Principles of Plant Breeding - H.K Chanduri, Oxford & IBM, 2013 Ed
2. Plant Breeding and seed savings – A.K. Zingare, Satyam Pub, Jaipur, 2013 Ed.
3. Plant Breeding – SS. Sandhu, Black Prints, New Delhi, 2013 Ed.

### Reference Books:

1. Dry Land Horticulture in India – P.P. Deshmukh, Himalaya Publishing House, Mumbai, 2013 Ed.
2. Principles of Plant breeding - R.W. Allard, John Wiley & Sons, 2010 Ed.
3. Plant Breeding, biomet & biotech – Dijak Kumar, New Central Book Agency, New Delhi, 2010 Ed.

Course Designer (Name of the Course Teacher)	Head of the Department
Dr. J. ARULRAJ	Dr. V. RAMESH

### DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

PART – IV : Skill Based Subject		
Subject Title: <b>Remote Sensing and GIS</b>		
Subject Code: 08SB62	Hours per week: 2	Credit: 2
CIA Marks: 25	Summative Marks: 75	Total Marks: <b>100</b>

### Preamble

- ❖ To know the instruments employed in remote sensing
- ❖ To study the satellite data products; forest mapping
- ❖ To know the importance of remote sensing in forest management.

### UNIT I: Introduction to Remote Sensing

Definition of Remote sensing, Physical basis- basic wave theory and quantum theory, Electromagnetic spectrum, and its usage in remote sensing, Interactions with atmosphere – scattering and absorption.

### UNIT II: Remote sensing instruments

Introduction to Sensors, Classification of sensors, Active and Passive instruments, Derivation of Information-Remotely sensed data and its different type. Platforms and its various types.

### UNIT III: Remote Sensing Applications

Thematic Map, Thematic applications, Integrated applications, NRSA and NNRMS, IRS and future mission.

### UNIT IV: Geographical information system

Introduction, Definition, Components of GIS – Hardware, Software, Data, People and methods

## UNIT V: GIS Application:

Introduction, Problem identification, Designing a model, Project Management and implementation.

### Text Books

1. Basics of RS & GIS. S. Kumar University science press, New Delhi, 2012
2. RS & GIS. B. Bhatta, Oxford University Press, 2010.
3. Applications of Remote Sensing & GIS - Rajeev Sharma, 2005

### Reference Books

1. Principles of remote sensing an introductory textbook –Wim H. Bakker et al., the inter institute of aerospace survey and earth sciences, Netherlands 2010 Ed.
2. Remote sensing and image interpretation. Lilles and Kiefer, Chipman, Wiley India – New Delhi – 2012.
3. Physical basis of RS - George Joseph, 2005

Course Designer (Name of the Course Teacher)	Head of the Department
Dr. J. ARULRAJ	Dr. V. RAMESH

### DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

PART – IV : Core Theory		SEMESTER - VI
Course Title: Nanobiology		
Course Code: 08SB63	Hours per week:2	Credit:2
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

### Preamble

- ❖ To acquire knowledge in nano biology
- ❖ To obtain various skills in nanotechnology
- ❖ To learn the newer technologies for competency.

### Unit I: Nanotechnology

Introduction, definition of nanoobjects – Types- non-intentionally-made nanomaterials Intentionally-made nanomaterials, Nanotechnology Products - Top-Down and Bottom-UP, Classification of nanomaterials- Zero-dimensional (0D), One-dimensional (1D), Two-dimensional (2D), Three-dimensional (3D), basic principles of nanotechnology – areas of applications.

### Unit II: Cellular Machines

Nanomaterial's (Nano- tubes, Nano-wires, Nano- crystals, Nano- particles – Quantum dots, Biomacromolecules (DNA and Protein structure).

### Unit III: Biosensors

Enzymes and protein based sensing – DNA amplification, DNA probes and assays – Liposomes, Fluidics, Biomembranes and Biochips.

### Unit IV: Nanomedicine

Importance in diagnostics – Biocompatibility – diseases and Therapeutics.



## Unit V: Nanotechnology and Agriculture

Nano Agricultural Mechanization – Genetically Modified Organism's – Agricultural Engineering – Need for Nanoagriculture.

### Text Books

1. Nano Biotechnology – Subbiah Balagi, MZP Publishers, 2010 Ed.
2. Nano Science & Nanotechnology – KK. Chatiopadhyay, PHI Learning, New Delhi, 2012 Ed.
3. Bio Nanotechnology – Vinita Singh, Advanced Learners Press, New Delhi, 2013 Ed.

### Reference Books

1. Elements of Nanotechnology – KK. Sulabha, IBD Pub. New Delhi, 2010 Ed.
2. Bioinformatics – Methods & Protocols – Misener, IBD Pub. New Delhi, 2013 Ed.
3. Nanotechnology – U. Kumar, Agrobios. India, 2013 Ed.

Course Designer (Name of the Course Teacher)	Head of the Department
Dr. J. ARULRAJ	Dr. V. RAMESH

### DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and OBE)  
(For those students admitted during the 2018 -19 and after)

PART – III : Core Lab		SEMESTER - VI
Course Title: Taxonomy of Angiosperms, Economic Botany, Microbiology, Plant Physiology and Biotechnology		
Course Code: 08CP62	Hours per week:6	Credit:4
CIA Marks: 40	ESE Marks: 60	Total Marks: 100

### Preamble

- ❖ To acquire the knowledge of angiosperm taxonomy and economic botany of given specimen
- ❖ To understand the physiology of plants
- ❖ To know the application of microorganism and biotechnology

### Course Outcomes (CO)

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Knowledge of Angiosperm taxonomy and understanding the economic importance	K1, K2, K3
CO2	Understanding and detection of plant physiology experiments	K1, K2, K3
CO3	Analysis and apply the physiology plants	K1, K2, K3
CO 4	Analysis and apply the microbiological experiment	K1, K2, K3

<b>CO 5</b>	Knowledge and Analysis of plant biotechnology experiments	K1, K2, K3
<b>K1-knowledge</b>		<b>K2-Understand</b>
		<b>K3-Apply</b>

#### Mapping of CO with PO

	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>
<b>CO1</b>	9	9	9	9	9	3	3
<b>CO2</b>	9	9	3	9	3	9	9
<b>CO3</b>	9	9	9	9	9	9	9
<b>CO4</b>	9	3	9	9	3	9	9
<b>CO5</b>	9	9	9	9	9	3	9
	<b>45</b>	<b>39</b>	<b>39</b>	<b>45</b>	<b>33</b>	<b>33</b>	<b>39</b>

9-Strong

3-Medium

1-Low

#### CO-PSO Mapping

	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	9	3	9	9	9
<b>CO2</b>	9	3	9	9	9
<b>CO3</b>	9	9	9	9	9
<b>CO4</b>	9	9	9	9	9
<b>CO5</b>	9	9	9	9	9

9-Strong

3-Medium

1-Low

#### Syllabus

<b>UNIT No.</b>	<b>CONTENT</b>	<b>HOURS</b>
<b>UNIT I</b>	<b>Taxonomy of Angiosperms &amp; Economic Botany</b> <ol style="list-style-type: none"> <li>Study of Inflorescence</li> <li>Flower morphology and Floral diagram</li> <li>Identifying the families included in the syllabus</li> <li>Spotters from economic Botany</li> <li>Field study – Plant collection – Herbarium preparation – Submission of 20 Herbarium sheets with Filed reports (10 marks )</li> </ol>	<b>12</b>
<b>UNIT II</b>	<b>Plant Physiology</b> (Experiments carried out by the students) <ol style="list-style-type: none"> <li>Measurement of OP by Chardakov's method</li> <li>Measurement of OP by Gravimetric method</li> <li>Measurement of rate of Transpiration – Ganong's Potometer</li> <li>Transpiration equals absorption</li> <li>Effect of light on Photosynthesis</li> <li>Effect of CO<sub>2</sub> concentration on Photosynthesis</li> </ol>	<b>12</b>
<b>UNIT III</b>	<b>Plant Physiology</b> <ol style="list-style-type: none"> <li>Separation of Leaf Pigments – Paper Chromatography</li> <li>Find out the Respiration Quotient of the given material- Ganong's Respirometer.</li> <li>Imbibition Pressure – using Dilatometer.</li> </ol> <b>Spotters</b>	<b>12</b>

	<ol style="list-style-type: none"> <li>1. Four leaf experiment</li> <li>2. Foliar transpiration</li> <li>3. Ganong's Light screen</li> <li>4. Ganong's Respiroscope</li> <li>5. Mohl's half-leaf experiment</li> <li>6. Evolution O<sub>2</sub> during Photosynthesis</li> <li>7. Arc Auxanometer</li> <li>8. Clinostat</li> <li>9. Phototropism</li> <li>10. Kuhen's fermentation vessel</li> </ol>	
<b>UNIT IV</b>	<b>Microbiology</b> (Experiments carried out by the students) 25. Staining of Bacteria – Gram staining.  <b>Spotters</b> 26. Sterilization techniques and media preparation 27. Isolation of microorganisms from natural sources by serial dilution and plating methods 28. Pure culture techniques 29. Assessment of Bacterial growth 30. Study of Colony Characteristics of Bacteria 31. Bacterial motility-Hanging drop method 32. Antibiotic sensitivity test 33. Visit to microbiology divisions of an Industry	<b>12</b>
<b>UNIT V</b>	<b>Plant Biotechnology</b> <b>Spotters</b> 1. Tissue culture experiments (Media preparation-Surface sterilization) 2. Callus induction- Regeneration of plants - Synthetic seed production 3. Isolation of genomic DNA from Plant 4. Isolation of genomic DNA from Bacteria 5. Isolation of Plasmid DNA 6. Spectroscopic analysis of DNA 7. Agarose Gel Electrophoresis 8. Visit to tissue culture divisions of an Industry	<b>12</b>

#### **Text Books**

1. Practical Taxonomy of Angiosperms – R.K. Singha, Inter. Publishing House, Delhi, 2013 Ed
2. Economic Botany-B.P. Pandey, S.Chand & Company Ltd, Delhi, 2014 Ed.
3. Plant Physiology - Jain, V.K, S.Chand & Company Ltd, Delhi, 2013 Ed.

#### **Reference Books**

1. Morphology of Angiosperms – Eames Arthur.J, Surjeet Publications Delhi, 2014 Ed.
2. Plant Physiology - Salisbury & Ross, C.B.S Publishers, Delhi, 2013 Ed.
3. Microbiology- L.M.Prescott, J.P.Harley, D.A. Klein, McGraw Hill, Hill Education India, 2010 Ed.

4. Plant Biotechnology – PK. Gupta, Rastogi Pub, Meerut, 2012 Ed.

### **Pedagogy**

Chalk & Talk, Group Discussion, Power point presentation (PPT)

### **Teaching Aids**

Green Board, LCD Projector, Interactive White Board, Microscope, Specimen, Instrument.

### **Course Contents and Lecture Schedule**

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT I				
1.1	Study of Inflorescence	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Plants material, Instrument, Lab. Exp
1.2	Flower morphology and Floral diagram	2		
1.3	Identifying the families included in the syllabus	4		
1.4	Spotters from economic Botany	2		
1.5	Herbarium preparation	2		
UNIT II				
2.1	Measurement of OP by Chardakov's method	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
2.2	Measurement of OP by Gravimetric method	2		
2.3	Measurement of rate of Transpiration – Ganong's Potometer	2		
2.4	Transpiration equals absorption	2		
2.5	Effect of light on Photosynthesis	2		
2.6	Effect of CO <sub>2</sub> concentration on Photosynthesis	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
UNIT III				
3.1	Separation of Leaf Pigments – Paper Chromotography	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
3.2	Find out the Respiration Quotient of the given material- Ganong's Respirometer.	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware,

				Instrument, Lab. Exp
3.3	Imbibition Pressure – using Dilatometer.	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
	1. Four leaf experiment 2. Foliar transpiration 3. Ganong's Light screen		Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
3.3	4. Ganong's Respiroscope 5. Mohl's half-leaf experiment 6. Evolution O <sub>2</sub> during Photosynthesis	3	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
3.4	7. Arc Auxanometer 8. Clinostat 9. Phototropism 10. Kuhen's fermentation vessel	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
<b>UNIT IV</b>				
4.1	Sterilization techniques and media preparation	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp.
4.2	Isolation of microorganisms from natural sources by serial dilution and plating methods	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
4.3	Pure culture techniques	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
4.4	Study of Colony Characteristics of Bacteria	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
4.5	Bacterial motility-Hanging drop method	1	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp

4.6	Assessment of Bacterial growth	1	Chalk & Talk	Green Board, Microscope, Photos, Specimen, Lab. Exp.
4.7	Staining of Bacteria – Simple and gram staining.	1	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
4.8	Antibiotic sensitivity test	1	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
<b>UNIT V</b>				
5.1	Tissue culture experiments (Media preparation- Surface sterilization)	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
5.2	Callus induction- Regeneration of plants- Synthetic seed production	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
5.3	Isolation of genomic DNA from Plant	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
5.4	Isolation of genomic DNA from Bacteria	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
5.5	Isolation of Plasmid DNA	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
5.6	Spectroscopic analysis of DNA	1	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
5.7	Agarose Gel Electrophoresis	1	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp

**Course Designer**  
**(Name of the Course Teacher)**

**Head of the Department**

**Dr. C. SOUNDAR RAJU**

**Dr. V. RAMESH**

**DEPARTMENT OF BOTANY**

Programme: B.Sc. BOTANY (CBCS and LOCF)

(For those students admitted during the 2021 - 22 and after)

<b>PART – IV : Common Subject Theory</b>		
<b>Subject Title : Value Education</b>		
<b>Subject Code: VEUG61</b>	<b>Hours per week: 2</b>	<b>Credit: 2</b>
<b>Sessional Marks: 25</b>	<b>Summative Marks: 75</b>	<b>Total Marks: 100</b>

**UNIT I: The heart of Education**

Introduction – Eternal Value – Integrated approach to value education - one for all and all for one – Responsibilities of a citizen – Habit Vs wisdom – purifying mind pollution – Respect for all Religions – Parents, teachers and fellow students – The need and benefit of exercise and meditation for students.

**UNIT II**

**The Value of Body and Life Energy**

Introduction – what are the causes for pain, Disease and death? Three Basic needs for all living Beings – Personal Hygiene Five Factors of Balance in Life – The need and benefits of physical Exercise – The value and Base of Life energy – The value and Base of Bio-magnetism - You are your own best caretaker.

## **The Marvelous nature of mind**

Introduction- Bio-magnetism – The base of the mind – characterisation of the Genetic Centre – metal frequency – practice for a creative mind - benefits of meditation.

## **UNIT III**

### **Analysis of Thought**

Introduction – An Exposition on the nature of thought– six roots for thoughts – Introspection for analysis of thoughts-practical techniques for analysis of thoughts. Benefits of Blessings Effects of good vibrations – Make Blessing a Daily Habit

## **UNIT IV**

### **Moralisation of Desire**

Introduction – moralization of desire - Analyse your desires – Summary of practice.

### **Neutralisation of Anger:**

Introduction – meaning – characteristics of Anger – Anger is a Destructive emotion – Anger spoils our relationship with others – Some common misconception about anger – will power and method success through awareness – method of neutralisation of anger.

## **UNIT V**

### **Eradication of Worries**

Worry is a mental disease – Nature's Law of cause and effect – factors beyond our control – How to deal with problems – analyse your problem and eradicate worry

### **Harmonious Relationships**

Introduction – Three angles of life – The value of harmony in personal relations – Love and Compassion – pleasant face and loving words – appreciation and gratitude to parents and teachers – Bringing needed reforms in educational institutions – Why should we serve others? Brotherhood – A scientific Basis for Universal Brotherhood protection of the environment – non-violence and the five fold moral culture.

### **Text Book: Value Education for Health, Happiness and Harmony**

(Based on the Philosophy and Teachings of Swami Vethanthiri Maharisi)



**DEPARTMENT OF BOTANY**  
Programme: B.Sc. BOTANY (CBCS and LOCF)  
(For those students admitted during the 2021 - 22 and after)

<b>PART – V : Common Subject Theory</b>		
<b>Subject Title : Extension Activities</b>		
<b>Subject Code: EAUG61</b>	<b>Hours per week:</b>	<b>Credit: 1</b>
<b>Sessional Marks: 25</b>	<b>Summative Marks: 75</b>	<b>Total Marks: 100</b>

**UNIT-I: Community Development-I**

Definition – structure and composition – community based issues – need for awareness – Developmental Programmes.

**UNIT – II: Community Development–II**

Rural Scenario – need of the Community – need for the community service – role of youth in community building – communal harmony – literacy – Educational Recreation.

**UNIT – III: Volunteer Empowerment**

Women's Emancipation – formation of Youth Clubs – Self-Help Groups – Youth and Development.

**UNIT – IV: Social Analysis**

Social issues – cultural invasion – media infiltration – human rights  
Education/Consumer Awareness – Adolescents Reproductive – HIV/AIDS/STD –  
Social harmony/National integration – Blood Donation.

### **UNIT – V: Introduction to NSS**

Basic Concepts – profile – aims – objectives – symbol – Motto – structure –  
Regular activities – Special Camping Programme – Adventure Programme – National  
Days and Celebrations.(Applicable to NSS Students)

(OR)

NCC - Origin – Organisation – Ministry of Defence – Armed forces –  
commands – Defence establishments in Tamil Nadu Civil Defence – Aid to civil  
authorities – Disaster management – Leadership – Man management – Adventure  
activities – Social service

**Reference:** National Service Scheme Manual (Revised), Ministry of Human  
Resources Development, government of India.

## **CERTIFICATE COURSE IN MEDICINAL BOTANY**

### **UNIT: I**

Pharmacognosy – definition, Scope, History, Indigenous system of medicine  
(Ayurveda, Unani & Siddha) – Classification of crude drugs (Alphabetical, Taxonomical,  
morphological, Pharmacological, chemical and Chetexonomical)

### **UNIT: II**

Collection and processing of crude drugs- harvesting, drying, garbling, packing and  
storage of crude drugs, Drugs adulteration- types of adulterants –methods of drug evaluation  
(Physical, chemical, biological and organoleptic) Evaluation and Pharmacopoeia standards.

### **UNIT: III**

Products derived from plants (Secondary metabolites) pharmaceutically important  
products, their classification, properties, isolation and medicinal uses of the following  
Alkaloids, Tannins, Phenols, Resins and gums

### **UNIT: IV**

Botanical names, common and vernacular names, morphology of the useful parts and  
medicinal uses of the following:

Stem & Tuber	- <i>Zingiber officinale</i>
Bark & wood	- <i>Cinnamomum verum</i> , <i>Santalum album</i>

Leaves	- <i>Cassia alexandrina</i>
Buds & flowers	- <i>Syzygium aromaticum</i>
Fruits	- <i>Aegle marmelos</i>
Seeds	- <i>Myristica fragrans</i>
Resins and Gums	- <i>Ferula asa-foetida</i>

#### **UNIT: V**

Botanical name, common name, family, chemical constituents, cultivation, processing, harvesting and uses of the following *Withania somnifera*, *Aloe vera*, *Emblica officinalis* and *Carthamus tinctorius*

#### **Text Books**

1. Medicinal plants of India –SS. Lal, New central book Agency, Delhi, 2012 Ed.
2. Herbs Cultivation and medicinal uses – H.Panda, NIIR Publication, New Delhi, 2010 Ed.
3. Economic Botany-s.L.kochar, MacMillan Indian Ltd, New Delhi, 2012 Ed.

#### **Reference Books**

1. Economic Botany-F.Hill, Tata Mcgraw HillPublishing.com, New Delhi, 2014 Ed.
2. Medicinal plants-Anil Kumar, Inter.sci. Publishing academy, New Delhi, 2014 Ed.
3. Economic Botany-Albert F.Hill surjeet Publications, Delhi, 2012 Ed.

## **CERTIFICATE COURSE IN HORTICULTURE**

#### **UNIT: I**

Introduction to Horticulture - types of gardening-indoor, public and dam gardens.

#### **UNIT: II**

Propagation techniques –methods of cutting, layering, grafting and budding.

#### **UNIT: III**

Cutting practices: Transplanting methods (bare rooted, shifting and balling, burlapping, potting and reporting) irrigation and manuring.

#### **UNIT: IV**

Horticulture techniques: disbudding, ringing, notching, smudging and pruning.

#### **UNIT: V**

Kitchen gardening-layout and maintenance, indoor gardening, rockery, Bonsai and lawn.

#### **Text books**

1. Horticulture – V.L.Sheela, MJ Publishers, 2013 Ed.
2. Horticulture at a glance Amar singh, kalyani Pub, Chennai, 2013 Ed.
3. A manual of Gardening - Arun Zingare, satyam Pub, Jaipur, 2013 Ed.

**Reference Books**

1. Hand Book of Horticulture- K.L.Chadde, D.I.and Pub, Agri, New Delhi, 2012 Ed.
2. Principles of Horticulture- S.Prasad, Agrobios, International Books, 2013 Ed.
3. A manual of Gardening - Arun Zingare, satyam Pub, Jaipur, 2013 Ed.