

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

**Learning Outcome Based Curriculum Framework
(LOCF)**

**(For those students admitted during the Academic year
2021 – 2022 and after)**



VIVEKANANDA COLLEGE

Tiruvedakam West, Madurai District-625234, Tamil Nadu

(For those students admitted during the Academic year 2021 – 2022 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 DEPARTMENT

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.

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, Microcentrifuge, Electrophoresis Colony counter, 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 **2340** books with national & international standard. Moreover, we have CSIR-JRF/NET & SET EXAM assisted recent edited books like Molecular Cell Biology by Lodish et al., Biochemistry by Stryer et al., Developmental biology by Gilbert, Plant Physiology by Lincoln Taiz et al., etc. & Selected books. 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 and Dr. T. SELLATHURAI are also recognized supervisor for guiding PhD scholars and Dr. V. RAMESH has 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.

ABOUT THE PROGRAMME

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 Discipline Specific Elective and Ability Enhancement Course (c) Skill Enhancement courses (d) Value Education (e) Environmental studies and (f) Generic Elective Course. 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 Discipline Specific Elective include Project and Viva-voce, Ability Enhancement Courses and skill Enhancement 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.

Programme Educational Objectives (PEOs)

Under graduates of B.Sc. Botany program will be

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

P.No.	Programme Outcome	Description
PO1	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.
PO2	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.
PO3	Social Interaction and Problem Solving	Elicit views of others, mediate disagreements and help reach conclusions in group settings.
PO4	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.
PO5	Professional Ethics and Human Values	Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
PO6	Environment and Sustainability	Understand the issues of environmental contexts and Sustainable development.
PO7	Self –directed and	Acquire the ability to engage in independent and life – long

	life – long learning	learning in the broadest context socio- technological changes
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Programme Specific Outcomes (PSOs)

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

Graduate Attributes (GA)

No.	Attribute	Description
GA 1	Scientific Knowledge	Apply the knowledge of mathematics, science, arts and humanities fundamentals to the solution of complex problems in the day-to-day life.
GA 2	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.
GA 3	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.
GA 4	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.
GA 5	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.
GA 6	Environment and sustainability	Understand the impact of the solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
GA 7	Ethics and Values	Apply ethical principles, commit to professional ethics, responsibilities and norms of the life through value oriented life training.
GA 8	Leadership Quality	Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.
GA 9	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.
GA 10	Project management and Finance	Demonstrate knowledge and understanding of the economics and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
GA 11	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.
GA 12	Entrepreneurial Skills	Create confidence to become an entrepreneur by providing entrepreneurial skills and technical skills.
GA 13	Harmonious Development of Individual	Make an individual as perfect man through the harmonious development of physical, emotional and intellectual cultures.

CO- PO Mapping

Course Code	Course Title	PO1	PO2	PO3	PO4	PO5	PO6	PO7
P1LT11	Ikkalak Kavithaiyum Urainadaiyum	45	11	33	39	33	21	45
P1LS11	Fundamental Grammar & History of Sanskrit Literature – I	39	33	33	45	45		39
P2LE11	General English - I	45	45	39	24	30	06	45
08CT11	Algae and Bryophytes	45	31	13	15	25	45	15
08CT12	Fungi and Plant Pathology	45	45	33	17	23	18	21
07ATB1	Allied Paper I : Chemistry for Biologist – I	5	5	5	5	5	5	15
P1LT21	Ikkalak Kadhai Ilakkiyamum Makkal Thagavaliyalum	45	7	21	39	39	9	45
P1LS21	Poetry, Grammar & History of Sanskrit Literature – II	33	39	39	45	33	1	45
P2LE21	General English – II	45	45	39	24	36	13	45
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	45	33	39	39	45	9	45

	Ilakkiyamum Nadagamum							
P1LS31	Prose, Poetics & History of Sanskrit Literature – III	39	39	45	39	33	1	27
P2LE31	English for Academic and Professional Excellence–I	45	45	39	24	30	06	45
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	39	45	33	45	33	6	15
P1LS41	Drama and History of Sanskrit Literature – IV	45	45	39	18	24	06	45
P2LE41	English for Academic and Professional Excellence - II	45	45	39	18	24	06	45
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	-	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	45	39	15	45	27	45	15
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	Plant Biotechnology	45	45	15	45	33	45	15
08CP62	Core Practical - III	45	39	39	45	33	33	39
08EP6A	Biodiversity Conservation and Management	45	45	45	39	27	45	27
08EP6B	Botanical Entrepreneurship	45	45	39	33	27	45	27

ASSESSMENT (Pattern – CIA & ESE)

Distribution of questions and marks

Bloom's Taxonomy	CIA					ESE				
	Part -A	Part -B	Part -C	Part -D	Total	Part- A	Part -B	Part -C	Part- D	Total
Knowledge	10×1=10				(50 marks converted in to 15 marks + Assignment 5 marks + Cycle test 5 marks) Total 25 marks	10×1=10	5 out of 7 5×2=10			Total 75 marks
Understand		5 out of 7 5×2=10	3 out of 5 3×6=18					5×5=25 (a or b)		
Apply				1 out of 2 1×12=12					3 out of 5 3×10=30	

CIA - Continuous Internal Assessment; **ESE** – End Semester Examination

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 Course	08CT11	Algae and Bryophytes	4	4	25	75	100
	Core Course	08CT12	Fungi and Plant Pathology	4	4	25	75	100
	Core Course	08CP23	Core Practical – I	2	-	-	-	-
	AEC	07ATB1	Allied Paper I : Chemistry for Biologist – I	4	4	25	75	100
	AEC		Allied: Volumetric Estimation	2	-	-	-	-
IV	GEC	08NE11	Non Major Elective Paper I : Energy Resources	2	2	25	75	100
			TOTAL	30	20			

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 Course	08CT21	Pteridophytes, Gymnosperms and Paleobotany	4	4	25	75	100
	Core Course	08CT22	Plant Anatomy and Microtechniques	4	4	25	75	100
	Core Course	08CP23	Core Practical – I	2	4	40	60	100
	AEC	07ATB2	Chemistry for Biologist - II	4	4	25	75	100
	AEC	07APB3	Volumetric Estimation	2	2	40	60	100
IV	GEC	08NE21	Non Major Elective Paper II :	2	2	25	75	100

			Gardening					
			TOTAL	30	26			

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 Course	08CT31	Biochemistry, Biophysics & Biometrics	4	4	25	75	100
	Core Course	08CT32	Genetics & Bioinformatics	4	4	25	75	100
	Core Course	08CP43	Core Practical – II	2	-	-	-	-
	AEC	09AT01	Allied Paper I : Animal Organization	4	4	25	75	100
	AEC		Allied: Practical	2	-	-	-	-
IV	SEC	08SB31	Skill Based Course I: Bio- Analytical Techniques	2	2	25	75	100
			TOTAL	30	20			

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 Course	08CT41	Cell Biology and Embryology	4	4	25	75	100
	Core Course	08CT42	Plant Ecology	4	4	25	75	100
	Core Course	08CP43	Core Practical – II	2	4	40	60	100
	AEC	09AT02	Biology and Human Welfare	4	4	25	75	100
	AEC	09AP03	Allied : Practical	2	2	40	60	100

IV	SEC	08SB41	Skill Based Course II: Horticulture and Plant Breeding	2	2	25	75	100
			TOTAL	30	26			

FIFTH SEMESTER

Part	Study Component	Course Code	Title of the Paper	Hours	Credit	CIA Marks	ESE Marks	Total
III	Core Course	08CT51	Taxonomy of Angiosperms & Economic Botany	6	4	25	75	100
	Core Course	08CT52	Plant Physiology	5	4	25	75	100
	Core Course	08CT53	Microbiology	6	4	25	75	100
	Core Course	08CP62	Core Practical – III	4	-	-	-	-
	DSE	08EP5A 08EP5B	Elective – I : Medicinal Botany Elective – II: Organic farming	5	5	25	75	100
IV	SEC	08SB51	Skill Based Course – III : Mushroom Cultivation	2	2	25	75	100
	ES	ESUG51	Environmental Studies	2	2	25	75	100
			TOTAL	30	21			

SIXTH SEMESTER

Part	Study Component	Course Code	Course Title	Hrs	Credit	CIA Marks	ESE Marks	Total
III	Core Course	08CT61	Plant Biotechnology	5	4	25	75	100
	Core Course	08CP62	Core Practical – III	6	4	40	60	100
	DSE	08EP61	Project Work and Viva -Voce	6	5	--	100	100
	DSE	08EP6A 08EP6B	Biodiversity Conservation and Management Botanical Entrepreneurship	5	5	25	75	100
IV	SEC	08SB61	Skill Based Course: IV Botany for Competitive Examinations	2	2	25	75	100
	SEC	08SB62	Skill Based Course: V Remote Sensing and GIS	2	2	25	75	100
	SEC	08SB63	Skill Based Course: VI Nanobiology	2	2	25	75	100
	VE	VEUG61	Value Education	2	2	25	75	100
V	EA	EAUG61	Extension Activities		1	25	75	100

			TOTAL	30	27			
			TOTAL		140			

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

Note:

CC: Core Course, **AEC:** Ability Enhancement Course, **SEC:** Skill Enhancement Course, **DSE:** Discipline Specific Elective, **GEC:** Generic Elective Course

GUIDELINES FOR PROJECT

The final year students should undergo a project work during VI semester

- Students are divided into groups and each group is guided by a mentor.
- The group should not exceed five students, also interested student can undergo individually.
- A problem is chosen, objectives are framed, and data is collected, analyzed and Documented in the form of a project report/Dissertation
- Viva – Voce is conducted at the end of this semester, by an external examiner and concerned mentor (Internal Examiner).
- Project work constitutes 100 marks, out of which 40 is internal and 60 is external marks.

விவேகானந்த கல்லூரி, திருவேடகம் மேற்கு-625 243
தமிழ்த்துறை

Programme : B.A., BSc., (Under CBCS and LOCF)

(For those students admitted during the Academic Year 2021 - 2022 and after)

PART – I: TAMIL		SEMESTER : I
Course Title : கவிதை இலக்கியமும் கதை இலக்கியமும்		
Course Code : P1LT11	Hours per week : 6	Credits : 3
CIA : 25 Marks	ESE : 75 Marks	Total: 100 Marks

முன்னுரை

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.

பாடதிட்டத்தின் முடிவுகள்

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.	K1, K2
CO 2	உயிர் எழுத்துக்கள், மெய்யெழுத்துக்கள், உயிர்மெய்யெழுத்துக்கள், சார்பெழுத்துக்கள் ஆகியன குறித்தும் அவற்றை எழுதும் விதங்கள் குறித்தும் வகைப்படுத்தும் திறன் அறிதல்.	K2, K3
CO 3	மரபுக்கவிதை வாயிலாக படைப்பாளர்களின் காலகட்டத்தையும், படைப்பின் வழியாக அக்காலகட்ட மக்களின் வாழ்க்கை நகழ்வுகளின் வரலாற்றினையும் விவரித்தல்.	K2, K3
CO 4	தாய் மொழியின் சிறப்பு, பொதுவுடைமை சிந்தனை, அறியாமை நீக்கல், உண்மைத்துறவு நிலை குறித்த சமூக நிலைகளை கலந்துரையாடுதல்	K2
CO 5	மொழியினைப் பிழையின்றி எழுதுதல் - பேசுதல், ஒலி வேறுபாட்டினை அறிந்து மயக்கம் நீக்குதல் போன்ற ஒரு மொழியின் பயன்பாட்டுத் தன்மையைத் தெளிவுறுத்தல்.	K1, K2, K3

K1-Remembering

K2-Understanding

K3-Applying

Mapping of CLO and PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	3	9	9	3	9	9
CLO2	9	3	9	3	9	3	9
CLO3	9	3	9	9	3	9	9
CLO4	9	1	3	9	9	-	9
CLO5	9	1	3	9	9	-	9
	45	11	33	39	33	21	45

பாடத்திட்டம்

அலகு : 1	<p>மரபுக்கவிதைகள்</p> <p>1.பாரதியார் கவிதைகள்</p> <p>1. தமிழ் (நான்கு பத்தி)</p> <p>2. நடிப்புச் சுதேசிகள்</p> <p>2. பாரதிதாசன் கவிதைகள்</p> <p>1. நீங்கலே சொல்லுங்கள்</p> <p>2. புதியதோர் உலகம் செய்வோம்</p> <p>3. நாமக்கல் கவிஞர் வெ.இராமலிங்கம் பிள்ளை</p> <p>1.குருதேவர் இராமகிருஷ்ணர் (3 பாடல்கள்)</p>	18மணிநேரம்
அலகு : 2	<p>புதுக்கவிதைகள்</p> <p>2.1 கவிஞர் கண்ணதாசன் (தேர்ந்தெடுக்கப்பெற்றவை)</p> <p>2.2 கவிஞர் வைரமுத்து (தேர்ந்தெடுக்கப்பெற்றவை)</p> <p>2.3 கவிஞர் மு.மேத்தா (தேர்ந்தெடுக்கப்பெற்றவை)</p>	18மணிநேரம்
அலகு : 3	<p>சிறுகதை நாவல் இலக்கியம்</p> <p>3.1 (தேர்ந்தெடுக்கப்பெற்ற 5 சிறுகதைகள்)</p> <p>3.2 நாவல் இலக்கியம் (துணைந்தவன்)</p>	18மணிநேரம்
அலகு : 4	<p>தமிழ் இலக்கணம் - எழுத்து</p> <p>4.1. முதல் எழுத்துக்கள்,சார்பெழுத்துக்கள்</p> <p>4.2. மொழி முதல் எழுத்துக்கள்,மொழி இறுதி எழுத்துக்கள்</p> <p>4.3 வல்லெழுத்து மீதும் இடங்கள்,வல்லெழுத்து மீதும் இடங்கள்</p>	18மணிநேரம்
அலகு : 5	<p>தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத் தமிழும்</p> <p>5.1 கவிதை இலக்கியத்தின் தோற்றமும் வளர்ச்சியும்</p> <p>5.2 கதை இலக்கியத்தின் தோற்றமும் வளர்ச்சியும்</p> <p>5.3 மரபுப்பிழை நீக்குதல் - பிறமொழிச் சொற்களை நீக்குதல்- பிழையற்ற தொடரைத் தேர்ந்தெடுத்தல் - ஒருமை பன்மை மயக்கம்- ஓர் எழுத்து ஒரு மொழிக்குரிய பொருள் - ஒல் வேறுபாடுகளும் பொருள் வேறுபாடுகளும் - பொருத்தமான பொருள் - பொருத்தமான தொடர் அறிதல்.</p>	18மணிநேரம்

பார்வை நூல்கள்

- 1.தமிழ் இலக்கிய வரலாறு - பேரா.முனைவர் பாக்கியமேரி, நயு செஞ்சுரி புக் ஹவுஸ்(பி)லிட், 41-ப், சீட்கோ இண்டஸ்டிரியல் எஸ்டேட்,அம்பத்தூர், சென்னை- 600 098.
- 2.தமிழ் இலக்கிய வரலாறு- மு.வரதராசனார்,சாகத்திய அகாடமி,தலைமை அலுவலகம்,ரவீந்திர பவன்,35,பெரோஸ்ஷா சாலை,புதுதில்.

பாட நூல்கள்

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

E-Resource

1. <https://www.youtube.com/watch?v=0ywU98OzxPk>
2. https://www.youtube.com/watch?v=lbs_-S0Ej3o
3. <https://ta.wikipedia.org/wiki/%E0%AE%95%E0%AE%A3%E0%AF%8D%E0%AE%A3%E0%AE%A4%E0%AE%BE%E0%AE%9A%E0%AE%A9%E0%AF%8D>
4. <https://ta.wikipedia.org/s/zf>
5. <https://www.youtube.com/watch?v=bNxBG0EO18o>
6. <https://www.youtube.com/watch?v=oPnN6XrsFMs>
7. <https://www.youtube.com/watch?v=unPtSMNeWLg>
8. https://podhutamizh.blogspot.com/2017/09/blog-post_42.html
9. https://podhutamizh.blogspot.com/2017/09/blog-post_15.html
10. <http://dhivyabharathy51097.blogspot.com/2017/04/blog-post.html>
11. <http://neelamegan.blogspot.com/2015/09/blog-post.html>

கற்பிக்கும் முறைகள்

விரிவுரை கொடுத்தல், கலந்துரையாடல், காட்சிப் பதிவுகளின் வழியாக புலப்படுத்துதல்.

கற்பிக்க உதவுதல்

கரும்பலகை பயன்படுத்துதல், காட்சி திரைவழியாகப் புலப்படுத்துதல்.

Course Contents and Lecture Schedule

Module No.	Title	No. of Lectures	Content Delivery Method	Teaching Aids
அலகு - 1 தமிழ்ச் செய்யுள் : மரபுக்கவிதைகள் (18மணிநேரம்)				
1.	பாரதியார் கவிதைகள் தமிழ் (நான்கு பத்தி), நடிப்புச் சுதேசிகள்	8	விரிவுரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல், காட்சித் திரை வழியாக புலப்படுத்துதல்
2.	பாரதிதாசன் கவிதைகள் நீங்கலே சொல்லுங்கள், புதியதோர் உலகம் செய்வோம்.	7	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
அலகு - 2 தமிழ்ச்செய்யுள் : புதுக்கவிதைகள் (18 மணிநேரம்)				
6.	கவிஞர் கண்ணதாசன் கவிதைகள் (தேர்வு செய்யப் பெற்றவை)	6	விரிவுரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல், காட்சித் திரை வழியாக புலப்படுத்துதல்

				ல்.
7.	கவிஞர் வைரமுத்து கவிதைகள் (தேர்வு செய்யப் பெற்றவை)	6	விரிவுரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துத ல், காட்சித் திரை வழியாக புலப்படுத்துத ல்
8.	மு.மேத்தா கவிதைகள் (தேர்வு செய்யப் பெற்றவை)	6	விரிவுரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துத ல்.
அலகு - 3 சிறுகதை இலக்கியம் - நாவல் இலக்கியம் (18 மணிநேரம்)				
3.1	சிறுகதை இலக்கியம் (தேர்வு செய்யப்பெற்ற 5 சிறுகதைகள்)	8	விரிவுரை கொடுத்தல், நன்னெறிக் கதைகள் மாணவர்கள் கூறுக்கேட்டல்.	கரும்பலகை பயன்படுத்துத ல்.
3.2	நாவல் இலக்கியம் (துணிந்தவன்)	10	விரிவுரை கொடுத்தல், நன்னெறிக் கதைகள் மாணவர்கள் கூறுக்கேட்டல்.	கரும்பலகை பயன்படுத்துத ல்.
அலகு - 4 தமிழ் இலக்கணம் - எழுத்து (18 மணிநேரம்)				
4.1	முதல் எழுத்துக்கள், சார்பெழுத்துக்கள்	6	விரிவுரை கொடுத்தல்	கரும்பலகை பயன்படுத்துத ல்.
4.2	மொழி முதல் எழுத்துக்கள், மொழி இறுதி எழுத்துக்கள்	6	விரிவுரை கொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன்படுத்துத ல், காட்சித் திரை வழியாக புலப்படுத்துத ல்
4.3	வல்லெழுத்து மீதும் இடங்கள், வல்லெழுத்து மீதும் இடங்கள்	6	விரிவுரை கொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன்படுத்துத ல், காட்சித் திரை வழியாக புலப்படுத்துத ல்.
அலகு : 5தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத் தமிழும்(18மணிநேரம்)				
5.1	கவிதை இலக்கியத்தின் தோற்றமும் வளர்ச்சியும் - கதை இலக்கியத்தின் தோற்றமும் வளர்ச்சியும்	12	விரிவுரைகொடுத்த ல்	கரும்பலகை பயன்படுத்துத ல்
5.2	ஆ) மரபுப்பிழை நீக்குதல் - பிறமொழிச் சொற்களை நீக்குதல் - பிழையற்ற தொடரைத் தேர்ந்தெடுத்தல் - ஒருமை பன்மை மயக்கம் - ஓர் எழுத்து ஒரு மொழிக்குரிய பொருள் -	6	விரிவுரை கொடுத்தல், பயிற்சி கொடுத்தல்.	கரும்பலகை பயன்படுத்துத ல்,

	ஒன் வேறுபாடுகளும் பொருள் வேறுபாடுகளும் - பொருத்தமான பொருள் - பொருத்தமான தொடர் அறிதல்.			
	Total	90		

DEPARTMENT SANSKRIT

Programme: B.A./ B.Sc. (Under CBCS and LOCF)

(For those students admitted during the Academic Year 2021-22 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 Marks	ESE Marks: 75 Marks	Total Marks: 100 Marks

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
CLO 1	Identifying Devanāgarī script, Describe modern literature and Illustrate	K1, K2
CLO 2	Discriminate spirituality in Literature	K2
CLO 3	Classify and discuss traditional names of Divine beings to animals in the world	K2
CLO 4	Describe and defend history of early Sanskrit literature	K2
CLO 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 Kāvyas

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 (Devanagarī) script to IPC. Transliterating from IPC to Sanskrit (Devanagarī) script.

Mapping of CLO and PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO 6	PLO 7
CLO1	9	9	3	9	9	-	9
CLO2	3	3	9	9	9	-	9
CLO3	9	3	9	9	9	-	3
CLO4	9	9	9	9	9	-	9
CLO5	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

DEPARTMENT OF ENGLISH

Programme: B.A., B.Sc., B.Com., & B.Com. (CA) (Under CBCS and LOCF)
(For those students admitted during the Academic Year 2021-22 onwards)

PART – II : English		SEMESTER – I
Subject Title : ENGLISH FOR BASIC COMMUNICATION SKILLS		
Course Code: P2LE11/P2CE11	Hours per week: 6	Credit: 3
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

Preamble

The students are expected to inculcate English language proficiency and its socio-linguistic competency.

Course Outcomes (CO)

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO1	Use and interpret imaginative, and creative skills through the poetic genre	K1,K2,K3
CO2	Recognize listening, and reading proficiency through the prose discourses	K1,K2,K3
CO3	State socio-linguistic influence of authors found in the short stories	K1,K2,K3
CO4	Examine the properties of listening, speaking, reading, and writing activities to enhance English grammar usages	K1,K2,K3
CO5	Execute and exercise LSRW skills in academic and career	K1,K2,K3

K1- Remembering K2 - Understanding K3 - Applying

Mapping of CLO and PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	9	9	3	9	3	9
CLO2	9	9	9	9	9	-	9
CLO3	9	9	9	9	9	3	9
CLO4	9	9	3	-	-	-	9
CLO5	9	9	9	3	3	-	9
	45	45	39	24	30	06	45

Strong-9

Medium -3

Low -1

Syllabus

Unit-1 Poetry

1. The Lord of My Life – Rabindranath Tagore
2. The Road Not Taken – Robert Frost
3. Hawk Roosting – Ted Hughes

Unit-2 Prose

1. The Secret of Work – Swami Vivekananda
2. Fourscore and Seven Years ago... – Abraham Lincoln
3. What Kind of Peace Do We Want? – J.F. Kennedy

Unit-3 Short Stories

1. A Shadow – R K Narayan
2. Karma – Khushwant Singh
3. The Romance of a Busy Broker – O Henry

Unit-4 Grammar

1. Parts of Speech
2. Kinds of Sentence
3. Punctuation

Unit-5 Oral & Written Communication

1. **Listening** – Comprehension practice from Poetry, Prose, Short-stories, observing/viewing E-content (with subtitles), Guest/Invited Lectures, Conference/Seminar Presentations & Tests and DD National News Live, BBC, CNN, VOA etc
2. **Speaking** – In Group Discussion Forum, speak about Tongue Twisters, Critical Thinking, Seminar Presentations on Classroom-Assignments, and Peer-Team interactions/AIF in Class-room
3. **Reading** – Pronunciation practice and enhancement from Poetry, Prose, Short-stories, Magazines, Newspaper etc
4. **Writing** – Asking & Giving Directions/Instructions, Developing Hints, and Filling Forms.

Text Books

1. *The Norton Anthology English Literature*. New York/London: W.W.Norton, 2012. (or) Vinay Harwadker, and A.K.Ramanujan, ed. *The Oxford Anthology of Modern Indian Poetry*. New Delhi: OUP, 1994. (or) Robert Anderson et al. *Elements of Literature: Fourth Course Literature of the United States*. Florida: HRW Inc. 1993. (or) Dr.M.Moovendhan, ed. *Wings of Poesy*. Chennai: Thamarai Publications, 2018. (or) <<https://www.poemhunter.com/poem/lord-of-my-life/>> The Lord of My Life – Rabindranath Tagore <<https://allpoetry.com/Hawk-Roosting>> Hawk Roosting <<https://poets.org/poem/road-not-taken>> The Road Not Taken.
2. Swami Vivekananda. “The Secret of Work.” *Links: Indian Prose in English*. Ed. G.S.Balarama Gupta. New Delhi: Macmillan Indian Limited, 1989.
3. Dr.P.C.James Daniel, ed. *Gateway to English: An Anthology of Prose*. Chennai: Harrows Publications, 2018.
<http://www.abrahamlincolnonline.org/lincoln/speeches/gettysburg.htm>
4. Abhijit Acharijee, and Rakesh Ramamoorthy, ed. *Frontiers of Communication: An Anthology of Short Stories and Prose*. Chennai: Cambridge University Press, 2018.
5. Michael Swan and Catherine Walter. *How English Works: A Grammar Practice Book*. Oxford: OUP, 1997. (or) Wren and Martin. *High School English Grammar and Composition*. New Delhi: S.Chand & Company LTD.1935.
6. Owen Hargie, David Dickson, and Dennis Tourish. *Communication Skills for Effective Management*. New York: Palgrave Macmillan, 2004. (or)
7. British Council | LearnEnglish <<https://learnenglish.britishcouncil.org/skills>>

8. BBC News < <https://www.bbc.com/news>> VOA Learning English
<<https://learningenglish.voanews.com/>>
9. University Grants Commission (UGC), New Delhi <
<https://www.ugc.ac.in/subpage/EContent-URL.aspx>> British Council |
LearnEnglish < <https://www.youtube.com/channel/UCOtnuKKoAbN47IuYMeDP0g>> Cambridge Assessment English
<<https://www.cambridgeenglish.org/test-your-english/>>
10. CLIL (Content & Language Integrated Learning) – Module by TANSCHÉ
Note: (Text: Prescribed chapters or pages will be given to the students by the department and the college)

Reference Books

1. Eileen Thompson et al. *Prentice Hall Literature: The English Tradition*. 2.Ed. New Jersey: Prentice-Hall Inc., 1989. (or) John Pfordresher et al. *England in Literature*. Illinois: Scott, Foresman & Co., 1989. (or) Board of Editors. *Pearls in a String: English for Communication*. Chennai: Emerald Publishers, 2009.
2. Steuart H King, ed. *New Vistas in English Prose*. Bombay: Blackie & Sons Publishers, 1980.
3. Swami Vivekananda. “Work and Its Secret: The Secret of Work.” *The Complete Works of Swami Vivekananda*. Vol-II. Kolkata: Advaita Ashrama, 1989.
4. MG Narasimha Murthy, ed. *Famous Indian Stories*. Mumbai: Orient BlackSwan, 2009.
5. Chambers. *English Grammar and Composition*. London: William and Robert Chambers, 1855.
6. J. C.Nesfield. *Manual of English Grammar and Composition*. London: Macmillan, 1908.
7. Dennis Freeborn. *A Course Book in English Grammar*. London: Macmillan, 1987.
8. Elaine Walker and Steve Elsworth. *Grammar Practice for Elementary Students*. Harlow (UK): Pearson, 2000.
9. Mary Ellen Guffey, and Richard Almonte. *Essentials of Business Communication*. Toronto: Nelson Education, 2007.
10. Raymond Murphy and Louise Hashemi. *English Grammar in Use Supplementary Exercises*. Cambridge: CUP, 2004.
11. K.V.Joseph. *A Textbook of English Grammar and Usage*. New Delhi: TATA McGraw Hill Education Private Limited, 2012.
12. British Council | LearnEnglish <
<https://www.youtube.com/channel/UCOtnuKKoAbN47IuYMeDP0g>>
13. TOEFL Test < <https://www.ets.org/toefl>>

E Resources and References

Unit-1 Poetry

<https://www.enotes.com/topics/rabindranath-tagore/critical-essays/analysis-1>
<http://www.stfrancisschool.edu.in/uploads/studymaterial/2020-04-30-IX-English-2.pdf>
<https://www.slideshare.net/mithu12345/the-road-not-taken-113790468>
<https://allpoetry.com/Hawk-Roosting>
<https://www.litcharts.com/poetry/ted-hughes/hawk-roosting>

Unit-2 Prose

<http://xylemofenglish.blogspot.com/2016/05/the-secret-of-work-by-swami-vivekananda.html>
<https://www.slideserve.com/molimo/the-secret-of-work>
https://rmc.library.cornell.edu/gettysburg/good_cause/transcript.htm

<https://www.slideshare.net/micdshistory/abraham-lincoln-and-the-gettysburg-address>
<https://www.wagingpeace.org/john-f-kennedy-speaks-of-peace/>
<https://www.yourarticlelibrary.com/essay/essay-on-peace-need-and-importance-of-peace/40381>

Unit-3 Short Story

<https://englishsummary.com/lesson/a-shadow-summary-rk-narayan/#gsc.tab=0>
<https://brainly.in/question/1315290>
<https://ardhendude.blogspot.com/2014/04/theme-and-critical-analysis-of.html>
<http://sittingbee.com/karma-khushwant-singh/>
<https://americanliterature.com/author/o-henry/short-story/the-romance-of-a-busy-broker>
<http://sittingbee.com/the-romance-of-a-busy-broker-o-henry/>

Unit-4 Grammar

<https://www.learngrammar.net/english-grammar/en-parts-of-speech>
<https://www.learngrammar.net/english-grammar/sentence-definition-n-types>
<https://www.slideshare.net/ShabazSj/punctuations-and-their-use>

Unit-5 Oral & Written Communication

<https://content.byui.edu/file/b8b83119-9acc-4a7b-bc84-efacf9043998/1/Writing-2-5-2.html>
<https://www.towson.edu/careercenter/students/careerskills/communication.html>
<https://www.slideshare.net/shahbaazahmed15/bc-communication>
<https://www.inflibnet.ac.in/>

DEPARTMENT OF BOTANY

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

(For those students admitted during the 2021 - 2022 and after)

PART – III : Core Course 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 knowledge on classification of algae and bryophytes
- ❖ To understand their structure and reproduction
- ❖ To identify the algae and bryophytes and know their economic importance

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 know the characteristics of algae, classify the Algae and apply the economic values of algae.	K1, K2 & K3
CO2	Compare the structure and reproduction of Algae	K1, K2 & K3
CO3	Explain the life cycle of Algae	K1, K2 & K3
CO4	Understand the characters of Bryophytes, classification and its economic importance	K1, K2 & K3
CO5	Describe the structure and Reproduction of Bryophytes	K1, K2 & K3

K1-knowledge**K2**-Understand**K3**-Apply**Mapping of CLO with PLO**

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7
CLO 1	9	9	3	3	3	9	3
CLO 2	9	9	3	3	9	9	3
CLO 3	9	9	3	3	9	9	3
CLO 4	9	1	1	3	3	9	3
CLO 5	9	3	3	3	1	9	3
	45	31	13	15	25	45	15

9-Strong**3**-Medium**1**-Low**Mapping of CLO with PSO**

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	9	9	9	9	9
CLO 2	9	9	9	9	9
CLO 3	9	9	9	9	9
CLO 4	9	9	3	3	3
CLO 5	9	9	3	3	3

9-Strong

3-Medium

1-Low

Syllabus

UNIT No.	CONTENT	HOURS
Unit-I	General Characteristics of Algae - F.E. Fritsch classification Algae (class level only), Economic importance of algae in agriculture, environment, medicine and industries	12
Unit- II	Structure and reproduction of the following a. Chlorophyceae - <i>Oedogonium</i> b. Xanthophyceae - <i>Vaucheria</i> c. Bacillariophyceae - Diatoms	12
Unit- III	Structure and reproduction of the following a. Phaeophyceae - <i>Sargassum</i> , b. Rhodophyceae - <i>Polysiphonia</i> , c. Cyanophyceae – <i>Nostoc</i>	12
Unit-IV	General Characteristics Bryophytes - Classification of Bryophytes (G.M. Smith, 1955) – Economic importance of Bryophytes	12
Unit- V	Structure and reproduction of following a. Hepaticopsida - <i>Marchantia</i> b. Anthocerotopsida - <i>Anthoceros</i> c. Bryopsida - <i>Funaria</i>	12

Text Books

1. Botany for Degree Students Algae – P.C. Vashishta, S.Chand & Company Ltd, Delhi, 2014 Ed.
2. An Introduction of Bryophyta, A Prashid, VIKAS Publishing House PVT Ltd, New Delhi, 2018 Ed.
3. Botany for Degree Students Bryophytes - P.C. Vashishta, S.Chand& Company Ltd, Delhi, 2014 Ed.

Reference Books

1. Algae, OP Sharma, McGraw Hill Education (India) PVT, Ltd., New Delhi, 2016 Ed.
2. College Botany – Ganfule Hirendra (Chandra) Vol. I, New centre book agency, London, 2013 Ed.
3. Biodiversity, V Singh, PC Pande and DK Jain, Rastogi Publications, Meerut, 2018 Ed

Online Resources

1. <https://www.slideshare.net/gkumarimahesh/algae-115147367> (Algae)
2. <https://www.slideshare.net/VaniYadla/oedogoniumyv-autosavedyvppt> (*Oedogonium*)
3. <https://www.slideshare.net/sajigeorge64/general-characters-of-rhodophyceae-life-cycle-of-polysiphonia> (*Polysiphonia*)
4. <https://www.slideshare.net/vivekaiden/algae-sargassam-porphyra-and-diatoms> (*Sargassum*)
5. <https://www.slideshare.net/Eva983/the-bryophytes-61776435> (Bryophytes)
6. <https://www.slideshare.net/sumitachoudhary/marchantia-ppt> (*Marchantia*)
7. <https://www.slideshare.net/SyedaFari2/anthoceros-133566351> (*Anthoceros*)
8. <https://www.slideshare.net/AnkitaThakur52/funaria-80239528> (*Funaria*)

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
ALGAE				
Unit - I				
1.1	Plant Kingdom	2	Discussion	Green Board
1.2	General characters of Algae	2	Lecture	Green Board
1.3	Fritsch classification of Algae (Outline only)	3	Lecture	Green Board
1.4	Characters of Algae at class level		Discussion	Green Board
1.4	Economic importance of Algae	2	Discussion	Green Board
1.5	Importance of Algae in Agriculture, Environment, Medicine and Industries	3	Discussion	Green Board
Unit - II				
2.1	Structure of <i>Oedogonium</i>	2	Lecture	Green Board
2.2	Reproduction of <i>Oedogonium</i>	2	Chalk & Talk	Green Board
2.3	Structure of <i>Vaucheria</i>	2	Chalk & Talk	Green Board
2.4	Reproduction of <i>Vaucheria</i>	2	Chalk & Talk	Green Board
2.5	Structure of <i>Diatoms</i>	2	Chalk & Talk	Green Board
2.6	Reproduction of <i>Diatoms</i>	2	Chalk & Talk	Green Board
Unit – III				
3.1	Structure of <i>Sargassum</i>	2	Chalk & Talk	Green Board
3.2	Reproduction of <i>Sargassum</i>	2	Discussion	Green Board
3.3	Structure of <i>Polysiphonia</i>	2	PPT	LCD
3.4	Reproduction of <i>Polysiphonia</i>	2	Chalk & Talk	Green Board
3.5	Structure of <i>Nostoc</i>	2	Chalk & Talk	Green Board
3.6	Reproduction of <i>Nostoc</i>	2	Chalk & Talk	Green Board

BRYOPHYTES				
Unit – VI				
4.1	General characters	4	Discussion	Green Board
4.2	Classification of Bryophytes (G.M. Smith, 1955)	4	Chalk & Talk	Green Board
4.3	Economic importance	4	Chalk & Talk	Green Board
Unit - V				
5.1	Structure of <i>Marchantia</i>	2	Lecture	Green Board
5.2	Reproduction of <i>Marchantia</i>	2	Chalk & Talk	Green Board
5.3	Structure of <i>Anthoceros</i>	2	Chalk & Talk	Green Board
5.4	Reproduction of <i>Anthoceros</i>	2	Chalk & Talk	Green Board
5.5	Structure of <i>Funaria</i>	2	Chalk & Talk	Green Board
5.6	Reproduction of <i>Funaria</i>	2	Discussion	Green Board
Total		60		

Course Designer (Name of the Course Teacher)	Head of the Department
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Dr. C. SOUNDAR RAJU

Dr. V. RAMESH

DEPARTMENT OF BOTANY

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

(For those students admitted during the 2021 - 2022 and after)

PART – III : Core Course 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

CO Number	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	Classify the Fungi and know its economic importance	K1, K2 & K3
CO2	Knowledge about the fungi based on structure and reproduction	K1, K2 & K3
CO3	Understand the fungal structure and reproduction	K1, K2 & K3
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.	K1, K2 & K3

K1-Knowledge

K2-Understand

K3-Apply

Mapping of CLO with PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO 1	9	9	9	9	3	6	9
CLO 2	9	9	3	1	9	3	1
CLO 3	9	9	9	3	1	3	1
CLO 4	9	9	3	1	9	3	1
CLO 5	9	9	9	3	1	3	9
	45	45	33	17	23	18	21

9-Strong

3-Medium

1-Low

CLO-PSO Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5
CLO1	9	3	9	9	9
CLO2	9	3	9	9	9
CLO3	9	9	3	3	9
CLO4	9	9	3	9	3

CLO5	9	3	9	3	9
	9-Strong		3-Medium		1-Low

Syllabus

UNIT No.	CONTENT	HOURS
FUNGI		
UNIT I	Introduction – General characteristics of Fungi - 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)	12
UNIT II	Structure and reproduction of the following: a. Myxomycetes : <i>Stemonitis</i> b. Oomycetes : <i>Albugo</i> c. Ascomycetes : <i>Penicillium</i>	12
UNIT III	Structure and Reproduction of the following: a. Basidiomycetes : <i>Puccinia</i> and <i>Agaricus</i> b. Deuteromycetes : <i>Cercospora</i>	12
UNIT IV	Lichens: A general account of lichens – Structure (internal and external morphology), classification (Crustose, Foliose, Fruticose, Leprose, Squamulose & Wolf Lichens), reproduction and economic importance of lichens.	12
PLANT PATHOLOGY		
UNIT V	Symptoms, causes and control measures 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	12

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, 2018 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. Fungi and allied Microbes – O.P. Sharma, Mcgraw Hill, New Delhi, 2016 Ed.
3. The Fungi – Satish Kumar, Pragati Prakashan, Meerut 2015 Ed

Online Resources:

1. <https://www.slideshare.net/RAMESHVELCHAMY/introduction-to-fungi-new> (Introduction to Fungi)
2. <https://www.slideshare.net/RAMESHVELCHAMY/classificatio-of-fungi-alexopoulos-and-mims-new> (Classification of Fungi)

3. <https://www.slideshare.net/RAMESHVELCHAMY/economic-importance-of-fungi-238546961> (Economic Importance of Fungi)
4. <https://www.slideshare.net/RAMESHVELCHAMY/penicillium-structure-and-reproduction> (Penicillium-Structure and Reproduction)
5. <https://www.slideshare.net/RAMESHVELCHAMY/agaricus-238960757> (Agaricus - Structure and Reproduction)
6. <https://www.slideshare.net/RAMESHVELCHAMY/lichens-structure-classification-and-reproduction> (Lichens – Types, Structure, Reproduction and Importances)
7. <https://www.slideshare.net/RAMESHVELCHAMY/little-leaf-of-brinjal-238960763> (Little Leaf of Brinjal)
8. <https://www.slideshare.net/RAMESHVELCHAMY/blast-disease-in-rice> (Blast disease in Rice)
9. <https://www.slideshare.net/RAMESHVELCHAMY/citrus-canker-239051433> (Citrus Canker)
10. <https://www.slideshare.net/RAMESHVELCHAMY/bunchy-top-of-banana> (Bunchy Top of Banana)

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
FUNGI				
UNIT I				
	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	
UNIT II				
	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
UNIT III				
	Structure and reproduction of Basidiomycetes : <i>Puccinia</i>	4	Chalk & Talk	Green Board
	Structure and reproduction of Basidiomycetes : <i>Agaricus</i>	4	Chalk & Talk	Green Board

	Structure and reproduction of Deuteromycetes : <i>Cercospora</i>	4	Chalk & Talk	Green Board
UNIT IV				
	General Characteristics of Lichens	2	Lecture	
	Structure of Lichens – Crustose, Foliose & Fruticose, Leprose, Squamulose & Wolf Lichens	4	Chalk & Talk	Green Board
	Reproduction of Lichens	4	Chalk & Talk	Green Board
	Economic importance of Lichens	2		
PLANT PATHOLOGY				
UNIT V				
	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 Fungal disease - Blast disease in Rice	3	Chalk & Talk	Green Board
	Symptoms, causes and control of Mycoplasma - Little leaf of Brinjal	3	Chalk & Talk	Green Board
	Total	60		

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

Dr. V. RAMESH

DEPARTMENT OF CHEMISTRY

Programme: B.Sc. Botany / B.Sc. Zoology, (CBCS and LOCF)

(For those students who admitted during the Academic Year 2021-22 and after)

PART – III: Allied Subject Theory		SEMESTER I
Course Title: CHEMISTRY FOR BIOLOGIST -I		
Course Code: 07ATB1/07APZ1	Hours per week: 4	Credits: 4
CIA Marks: 25 Marks	ESE Marks: 75 Marks	Total Marks: 100 Marks

Preamble

Students are enabled to

- ✓ Understand the basic organic principles study the principles of titrimetric elaborately.
- ✓ Acquire an idea about the catalysis and photochemistry
- ✓ Gain 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)
CO 1	Identify and discuss the various types of isomerisms.	K1, K2 & K3
CO 2	Explain the basics of organic chemistry and interpret the types of reactions.	K1, K2 & K3
CO 3	Describe the cleavage of covalent bonds and explain about the reaction intermediates.	K1, K2 & K3
CO 4	Illustrate the basics of catalysis and define and demonstrate the laws of photochemistry	K1, K2 & K3
CO 5	Interpret and demonstrate basics of titrimetry	K1, K2 & K3

K1-Remembering

K2-Understanding

K3-Applying

Mapping of CLO and PLO

	PLO 1	PLO 2	PLO 3	PLO 4	PLO5	PLO6	PLO7
CLO 1	3	1	1	1	1	1	3
CLO 2	3	1	1	1	1	1	3
CLO 3	3	1	1	1	1	1	3
CLO 4	3	1	1	1	1	1	3
CLO 5	3	1	1	1	1	1	3
	5	5	5	5	5	5	15

9-Strong

3-Medium

1-Low

Mapping of CLO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	-	-	1	3	1
CLO 2	-	-	-	3	1
CLO 3	-	-	-	3	1

CLO 4	-	-	-	3	1
CLO 5	-	-	-	3	1
	13	7	13	5	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.

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, difference between homolytic and heterolytic cleavage – Intermediates: Definition, formation and stability of carbocation, carbanion and free radical.

UNIT-IV: CATALYSIS AND PHOTOCHEMISTRY

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

Photochemistry: Introduction – comparison of thermal and photochemical reactions – Jablonski diagram, internal conversion, intersystem crossing, fluorescence and phosphorescence – chemiluminescence and bioluminescence.

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 Book

1. Bahl, A and Bahl, B.S. *Advanced Organic Chemistry*, S. Chand Publishing Company Ltd, New Delhi, 2012.
2. Arun bahl, Bahl B.S. and Tuli, G.D. *Essentials of Physical chemistry*, New Delhi.

Reference Books

1. Morrison, R.T. and Boyd, R.N. *Organic chemistry*, 6th Ed., Prentice Hall Private Ltd, New Delhi, 1997.
2. Soni, P.L. *Text Book of Organic Chemistry*, Sultan Chand, New Delhi, 2005.
3. Puri. B.R., Sharma L.R. and Pathania M.S. *Principles of Physical chemistry*, 30th Ed., Vishal publication, Jalandhar-Delhi, 2007.

E - Resources

1. <https://www.youtube.com/watch?v=nP0gDV0xDLY>
2. <https://www.youtube.com/watch?v=2NDOL11d6no>

3. <https://www.youtube.com/watch?v=LrtDlc6BfaE>
4. <https://www.youtube.com/watch?v=wRAo-M8xBHM>
5. https://www.youtube.com/watch?v=Mjck01ao9Mw&list=PLj_Alq7xw30kL1S84P_SMO2wSfkTeN6n

DEPARTMENT OF BOTANY

(For those students admitted during the 2021 -22 and after)

PART – IV : Generic Elective Course		SEMESTER - I
Course Title: Energy Resources		
Course Code: 08NE11	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

Syllabus

UNIT No	CONTENT	HOURS
Unit – I	Sources of energy – conventional and non conventional-Present world Energy scenario.	6
Unit – II	Conventional energy- coal, oil, gas, thermal power and nuclear energy	6
Unit – III	Non-Conventional - Solar energy-advantages-solar gadgets available Solar energy utilization in India and Hydro power.	6
Unit – IV	Wind energy – advantages and disadvantages -wind mills and Tidal energy.	6
Unit – V	Biomass energy – Biogas production, bioethanol, biodiesel (from plant lipids and from hydrocarbons)	6

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.

Online Resources:

1. <https://www.nrdc.org/stories/renewable-energy-clean-facts> (Renewable Energy)
2. <https://www.greenfacts.org/en/biofuels/1-2/1-definition.htm> (Biofuels)
3. <https://www.solarschools.net/knowledge-bank/non-renewable-energy> (Conventional energy)

4. <https://www.nrdc.org/stories/renewable-energy-clean-facts> (Energy resources)
5. <https://www.slideshare.net/Rameshpandey41/energy-resources-71750497> (Conventional and Non conventional Energy)
6. <https://www.slideshare.net/manowarachowdhury3/ppt-on-energy-resources> (Conventional energy resources)
7. <https://www.slideshare.net/SushilKumarGupta4/wind-energy-77305212> (Wind energy)
8. <https://www.slideshare.net/asadleo002/biogas-production-23836894> (Biogas production)

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

Dr. V.

**விவேகானந்த கல்லூரி, திருவேடகம் மேற்கு-625 243
தமிழ்நாடு**

Programme : B.A., BSc., (Under CBCS and LOCF)

(For those students admitted during the Academic Year 2021 - 2022 and after)

PART – I : TAMIL		SEMESTER : II
Course Title : இடைக்கால இலக்கியமும் நாடக இலக்கியமும்		
Course Code : P1LT21/P1CT21	Hours per week : 6	Credits : 03
CIA : 25 Marks	ESE : 75 Marks	Total: 100 Marks

முன்னுரை

1. சமூக வெளிப்பாடுகளை உணர்த்துதல்
2. தனிமனித நேர்மை உணர்த்துதல்
3. பக்தி மற்றும் நாடகம் பற்றிய அடிப்படை அறிவை புகட்டுதல்
4. கணினிச் சொற்களின் வகைமை அறிதல்
5. சைவ-வைணவ, சிற்றிலக்கியம், நாடகம்- ஆகியவற்றின் வரலாற்றினைத் தெளிவுபடுத்துதல்

பாடதிட்டத்தின் முடிவுகள்

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

NO.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	பக்தி மற்றும் சிற்றிலக்கியத்தின் வாயிலாக தனி மனித மற்றும் சமூக ஒழுக்கங்கள் குறித்த தன்மையினை வரையறை செய்தல்.	K1, K2
CO 2	பக்தி இலக்கியங்கள் மற்றும் சிற்றிலக்கியங்கள் குறித்த செய்திகளைக் கலந்துரையாடுதல்.	K2, K3
CO 3	சைவம் - வைணவம், சிற்றிலக்கியம், நாடகம் போன்ற இலக்கியத்தின் தன்மைகளையும், அதனைப் படைத்த படைப்பாளர்களின் வரலாற்றினையும் விவரித்தல்.	K2, K3
CO 4	பெயர் - வினை, வினா - விடை, வேற்றுமை, தொகைகள் ஆகியன குறித்த தெளிவும்,	K2

	அவற்றை வகைப்படுத்தும் திறன் குறித்தும் அறிதல்.	
CO 5	கண்ணியில் தமிழ் மொழியின் பயன்பாட்டுத் தன்மையை தெளிவுறுத்தல்.	K1, K2, K3

K1-Remembering

K2-Understanding

K3-Applying

Mapping of CLO and PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	3	3	9	9	3	9
CLO2	9	3	9	9	9	3	9
CLO3	9	1	3	9	9	3	9
CLO4	9	-	3	9	9	-	9
CLO5	9	-	3	3	3	-	9
	45	7	21	39	39	9	45

பாடத்திட்டம்

அலகு - 1	<p>சைவ இலக்கியம் - வைணவ இலக்கியம்</p> <p>1.1 தேவாரம் - திருஞானசம்பந்தர் (திருவேடகப்பதிகம்)</p> <p>1.2 திருவாசகம் - மாணிக்கவாசகர் (பிடித்த பத்து)</p> <p>1.3 திருமாந்திரம் - திருமுலர் (தேர்வுசெய்யப்பெற்ற 10 பாடல்கள்)</p> <p>1.4 திருப்பாவை - ஆண்டாள் (தேர்வுசெய்யப்பெற்ற 10 பாடல்கள்)</p> <p>1.5 பெரிய திருமொழி - குலசேகரஆழ்வார் (தேர்வுசெய்யப்பெற்ற 10 பாடல்கள்)</p>	(18 மணிநேரம்)
அலகு - 2	<p>சிறுநிலக்கியம்</p> <p>2.1 முக்கூடற் பள்ளி (தேர்வு செய்யப்பெற்ற பாடல்)</p> <p>2.2 நந்திக்கலம்பகம் (தேர்வு செய்யப்பெற்ற பாடல்)</p> <p>2.3 கலிங்கத்துப்பராணி(தேர்வு செய்யப்பெற்ற பாடல்)</p> <p>2.4 தமிழ்விடு தூது (தேர்வு செய்யப்பெற்ற பாடல்)</p> <p>2.5 பிள்ளைத் தமிழ் (தேர்வு செய்யப்பெற்ற பாடல்)</p> <p>2.6 குற்றாலக்குறவஞ்சி(தேர்வு செய்யப்பெற்ற பாடல்)</p>	(18மணிநேரம்)
அலகு - 3	<p>நாடக இலக்கியம்</p> <p>1. வைகையில் வெள்ளம் வரும் (சேதுபதி)</p>	(18மணிநேரம்)
அலகு - 4	<p>தமிழ் இலக்கணம் - சொல்</p> <p>4.1 பெயர்ச்சொல் - வினைச் சொல்</p> <p>4.2 வினா - விடை வகைகள்</p> <p>4.3 வேற்றுமைகள்</p> <p>4.4 தொகைகள்</p>	(18மணிநேரம்)
அலகு - 5	<p>தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத்தமிழும்</p> <p>1.1 பக்தி இலக்கியத்தின் தோற்றமும் வளர்ச்சியும்.</p> <p>1.2 சிறுநிலக்கியத்தின் தோற்றமும் வளர்ச்சியும்.</p> <p>1.3 நாடகத்தின் தோற்றமும் வளர்ச்சியும்.</p> <p>1.4 கண்ணித்தமிழ் அறிமுகம் - கண்ணி ஆங்கிலச்சொல்லுக்கு நிகரான தமிழ்ச் சொல் அறிதல்.</p>	(18மணிநேரம்)

பாட நூல்கள்

1. பக்த் இலக்கிய செய்யுள் தொகுப்பு,தமிழ்த்துறை வெளியீடு
2. சிற்றிலக்கிய செய்யுள் தொகுப்பு, தமிழ்த்துறை வெளியீடு
3. வைகையில் வெள்ளம் வரும் - சேதுபதி
4. தமிழ் இலக்கிய வரலாறு - முனைவர் பாக்யமேர்,நியூ செஞ்சுரி புக் ஹவுஸ்(பி)ல்ட்,

41-ப், சீட்கோ இண்டஸ்ட்ரியல் எஸ்டேட்,அம்பத்தூர், சென்னை-600 098.

பார்வை நூல்கள்

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

E-Resource

1. http://www.tamilvu.org/library/nationalized/pdf/44-avvai_durasami_pillai/sievaellakiyavaralaru.pdf
2. <https://www.keetru.com/index.php/2009-10-07-10-44-25/2011-sp-41283151/17598-2011-11-30-03-20-32>
3. <http://www.tamilvu.org/courses/degree/p103/p1033.pdf>
4. <https://www.youtube.com/watch?v=OPOW-e7jFo8>
5. <https://www.youtube.com/watch?v=X0PtXv3l5oc>
6. <https://nandycraft.com/vetrumai.html>
7. <https://www.youtube.com/watch?v=uOF87NDPhVY>
8. <https://www.youtube.com/watch?v=Lk9-xG4HXzk>

கற்பிக்கும் முறைகள்

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

கற்பிக்க உதவுதல்

கரும்பலகை பயன்படுத்துதல், காட்சி திரைவழியாக புலப்படுத்துதல்.

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching Aids
அலகு - 1 சைவ, வைணவ - இலக்கியம் (18 மணிநேரம்)				
1.1	சைவ இலக்கியம் - வைணவ இலக்கியம் தேவாரம் திருஞானசம்பந்தர் (திருவேடகப் பதிகம்)	4	விரிவுரை கொடுத்தல், கலந்துரையாடல் .	கரும்பலகை பயன்படுத்துதல்
1.2	திருவாசகம் மாணிக்கவாசகர் (பிடித்த பத்து)	4	விரிவுரை கொடுத்தல், கலந்துரையாடல் .	கரும்பலகை பயன்படுத்துதல்
1.3	திருமாந்திரம் - திருமூலர் (தேர்வுசெய்யப்பெற்ற 10	4	விரிவுரை கொடுத்தல்,	கரும்பலகை

	பாடல்கள்)		கலந்துரையாடல் .	பயன்படுத்தாதல்
1.4	தீர்ப்பாவை - 10 பாடல்கள் தெர்வு செய்யப்பெற்றவை (ஆண்டாள்)	3	வீர்வுரை கொடுத்தல், கலந்துரையாடல் .	கரும்பலகை பயன்படுத்தாதல்
1.5	பெரிய திருமொழி - 10 பாடல்கள் (குலசேகர ஆழ்வார்)	3	வீர்வுரை கொடுத்தல், கலந்துரையாடல் .	கரும்பலகை பயன்படுத்தாதல்
அலகு : 2 சிற்றிலக்கியம் (18 மணிநேரம்)				
2.1	சிற்றிலக்கியம் முக்கூடற் பள்ளி (தேர்வு செய்யப்பெற்ற பாடல்)	3	வீர்வுரை கொடுத்தல், கலந்துரையாடல் .	கரும்பலகை பயன்படுத்தாதல்
2.2	நந்திக்கலம்பகம் (தேர்வு செய்யப்பெற்ற பாடல்)	3	வீர்வுரை கொடுத்தல், கலந்துரையாடல் .	கரும்பலகை பயன்படுத்தாதல்
2.3	கலிங்கத்துப்பராணி (தேர்வு செய்யப்பெற்ற பாடல்)	3	வீர்வுரை கொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்தாதல்
2.4	தமிழ்விடு தூது (தேர்வு செய்யப்பெற்ற பாடல்)	3	வீர்வுரை கொடுத்தல், கலந்துரையாடல் .	கரும்பலகை பயன்படுத்தாதல்
2.5	மீனாட்சியம்மைப் பிள்ளைத் தமிழ் (தேர்வு செய்யப்பெற்ற பாடல்)	3	வீர்வுரை கொடுத்தல், கலந்துரையாடல் .	கரும்பலகை பயன்படுத்தாதல்
2.6	குற்றாலக்குறவஞ்சி (தேர்வு செய்யப்பெற்ற பாடல்)	3	வீர்வுரை கொடுத்தல், கலந்துரையாடல் .	கரும்பலகை பயன்படுத்தாதல்
அலகு : 3 நாடக இலக்கியம் (18 மணிநேரம்)				
3.1	வைகையில் வெள்ளம் வரும்	18	வீர்வுரை கொடுத்தல்	கரும்பலகை பயன்படுத்தாதல்
அலகு : 4 தமிழ் இலக்கணம் - சொல் (18 மணிநேரம்)				
4.1	பெயர்ச்சொல் - வினைச்சொல்	8	வீர்வுரை கொடுத்தல், பயிற்சிகொடுத்தல் .	கரும்பலகை பயன்படுத்தாதல்
4.2	வினா - விடை வகைகள்	3	வீர்வுரை கொடுத்தல், பயிற்சிகொடுத்தல் .	கரும்பலகை பயன்படுத்தாதல்
4.3	வேற்றுமைகள்	3	வீர்வுரை கொடுத்தல்,	கரும்பலகை

			பயிற்சிகொடுத்தல் .	பயன்படுத்த துதல்
4.4	தொகைகள் வேற்றுமைத் தொகை, வினைத்தொகை, பண்புத்தொகை, உவமைத்தொகை, உம்மை த்தொகை, அன்மொழித்தொகை	4	விரிவுரை கொடுத்தல், பயிற்சிகொடுத்தல் .	கரும்பலகை க பயன்படுத்த துதல்
அலகு : 5 தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத் தமிழும் (18 மணிநேரம்)				
5.1	பக்தி இலக்கியத்தின் தோற்றமும் வளர்ச்சியும்.	5	விரிவுரை கொடுத்தல்	கரும்பலகை க பயன்படுத்த துதல்
5.2	சிறுநிலக்கியத்தின் தோற்றமும் வளர்ச்சியும்	5	விரிவுரை கொடுத்தல்	கரும்பலகை க பயன்படுத்த துதல்
5.3	நாடக இலக்கியத்தின் தோற்றமும் வளர்ச்சியும்	5	விரிவுரை கொடுத்தல், பயிற்சிகொடுத்தல் .	கரும்பலகை க பயன்படுத்த துதல்
5.4	கண்ணித் தமிழ் அறிமுகம் - கண்ணி ஆங்கிலச்சொல்லுக்கு நிகரான தமிழ்ச் சொல் அறிதல்.	3	விரிவுரை கொடுத்தல்,	கரும்பலகை க பயன்படுத்த துதல்
Total		90		

DEPARTMENT SANSKRIT

Programme: B.A./ B.Sc. (Under CBCS and LOCF)

(For those students admitted during the Academic Year 2021-22 and after)

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

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 II semester.

Course Outcomes (COs)

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

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

K1-Knowledge

K2-Understand

K3-Apply

Syllabus

Unit 1: Introduction to Sanskrit poetry literature such as Gnostic, Didactic and devotional. Campū literature and its contents.

Unit 2: Kalividambanam- scholars - teachers- Astrologers.

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

Unit 4: Sabhāraṇjanaśatakam -Wisdom and its acquisition

Unit 5: Sabhāraṇjanaśatakam- Poetry

Mapping of CLO and PLO

	PLO1	PLO 2	PLO3	PLO4	PLO5	PLO 6	PLO 7
CLO1	3	9	9	9	9	1	9
CLO2	9	9	3	9	9	-	9
CLO3	3	3	9	9	9	-	9
CLO4	9	9	9	9	3	-	9
CLO5	9	9	9	9	3	-	9
	33	39	39	45	33	1	45

Strong -9

Medium -3

Low -1

Text Book(s)

1. Kalividambanam and Sabhāraṇjanaśatakam 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

DEPARTMENT OF ENGLISH

Programme: B.A., B.Sc., B.Com., & B.Com. (CA) (Under CBCS and LOCF)
(For those students admitted during the Academic Year 2021-22 onwards)

PART – II : English		SEMESTER - II
Subject Title : ENGLISH FOR ADVANCED COMMUNICATION SKILLS		
Course Code: P2LE21/P2CE21	Hours per week: 6	Credit: 3
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

Preamble

The students are expected to inculcate English language proficiency and its socio-linguistic competency.

Course Outcome (CO):

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

No	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO1	Interpret philosophical thoughts and language mastery found in the poetry	K1, K2, K3
CO2	Repeat listening, and reading proficiency through the prose discourses	K1, K2, K3
CO3	Discuss the socio-linguistic and psychological behaviour of author, and characters found in the drama/play	K1, K2, K3
CO4	Examine the properties of listening, speaking, reading, and	K1, K2, K3

	writing activities to enhance English grammar usages	
CO5	Exercise LSRW skills	K1, K2, K3

K1 – Remembering K2–Understanding K3 – Applying

Mapping of CLO and PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	9	9	3	9	9	9
CLO2	9	9	9	9	9	1	9
CLO3	9	9	9	9	9	3	9
CLO4	9	9	3	-	-	-	9
CLO5	9	9	9	3	9	-	9
	45	45	39	24	36	13	45
Strong-9		Medium -3		Low -1			

Syllabus

Unit-1 Poetry

1. Alfred, Lord Tennyson – *Ulysses*
2. Nissim Ezekiel – *Night of the Scorpion*
3. Robert Frost – *Stopping by Woods on a Snowy Evening*

Unit-2 Prose

1. Swami Vivekananda – *Sisters and Brothers of America*
2. Martin Luther King Jr. – *I Have a Dream*
3. Francis Bacon – *Of Friendship*

Unit-3 Drama

William Shakespeare – *The Merchant of Venice*
(For the three Continuous Internal Assessment [CIA] Tests)

Unit-4 Grammar

1. Auxiliary (Helping) and Modal Verbs
2. Tenses
3. Question Tags

Unit-5 Oral & Written Communication

1. **Listening** – Comprehension practice from Poetry, Prose, Drama /Online Voice Practice, observing/viewing E-content (with subtitles), Guest/Invited Lectures, Conference/Seminar Presentations & Tests, and BBC, CNN, DD National News Live, VOA etc
2. **Speaking** – In Group Discussion Forum, speak about Theatrical/Dramatic Enactment, Body- Language, Mock-Interview, Seminar Presentations on Classroom-Assignments, and Peer-Team-interactions/AIF in Class-room
3. **Reading** – Intonation practice and its enhancement from Poetry, Prose, Drama, News-Paper, and Individual-Assignments

4. **Writing** – Writing Formal Letters/Résumé Preparation, Transcoding (graphs, diagrams, Charts and data), and Report Writing.*

Text Books

1. Anderson et al. *Elements of Literature: Fourth Course Literature of the United States*. Florida: HRW Inc. 1993. (or) Vinay Harwadker, and A.K.Ramanujan, ed. *The Oxford Anthology of Modern Indian Poetry*. New Delhi: OUP, 1994. *The Norton Anthology English Literature*. New York/London: W.W.Norton, 2012. (or) Dr.M.Moovendhan, ed. *Wings of Poesy*. Chennai: Thamarai Publications, 2018. (or)
<<https://www.poemhunter.com/poem/night-of-the-scorpion/>>
<<https://www.poetryfoundation.org/poems/44475/la-belle-dame-sans-merci-a-ballad>>
<<https://poets.org/poem/stopping-woods-snowy-evening>>
2. Swami Vivekananda. *Sisters and Brothers of America*, (Chicago address at the World Parliament of Religions, 11th Sep, 1893.)
<<http://www.advaitayoga.org/advaitayogaarticles/svchicagoadd.html>>
3. Dr.P.C.James Daniel, ed. *Gateway to English: An Anthology of Prose*. Chennai: Harrows Publications, 2018.
4. William Shakespeare. *The Merchant of Venice*. Ed. John Russell Brown. London: Methuen & Co., 1905.
<<https://archive.org/details/in.ernet.dli.2015.126032/page/n7/mode/2up>> (or) Peter Alexander. *William Shakespeare: The Complete Works*. London: The English Language Book Society and Collins, 1964.
5. Michael Swan and Catherine Walter. *How English Works: A Grammar Practice Book*. Oxford: OUP, 1997. (or) Wren and Martin. *High School English Grammar and Composition*. New Delhi: S.Chand& Company LTD.1935.
6. Owen Hargie, David Dickson, and Dennis Tourish. *Communication Skills for Effective Management*. New York: Palgrave Macmillan, 2004. (or)
7. British Council | LearnEnglish<<https://learnenglish.britishcouncil.org/skills>>
8. BBC News <<https://www.bbc.com/news>>
9. VOA Learning English <<https://learningenglish.voanews.com/>>
10. University Grants Commission (UGC), New Delhi
<<https://www.ugc.ac.in/subpage/EContent-URL.aspx>>
11. British Council | LearnEnglish<<https://www.youtube.com/channel/UCOtnu-KKoAbN47IuYMeDPOg>> Cambridge Assessment English
<<https://www.cambridgeenglish.org/test-your-english/>>
12. CLIL (Content & Language Integrated Learning) – Module by TANSCHENOTE: (Text: Prescribed chapters or pages will be given to the students by the department and the college)

Reference Books

1. Eileen Thompson et al. *Prentice Hall Literature: The English Tradition*. 2.Ed. New Jersey: Prentice-Hall Inc., 1989. (or) John Pfordresher et al. *England in Literature*. Illinois: Scott, Foresman& Co., 1989. (or) Steuart H King, ed. *New Vistas in English Prose*. Bombay: Blackie & Sons Publishers,1980.
2. The Art Institute of Chicago, “Sisters and Brothers of America!”
<<https://www.artic.edu/articles/710/sisters-and-brothers-of-america>>
3. Dr.A.Shanmugakani, ed. *Prose for Communication: An Anthology of Prose*. Madurai: Manimekala Publishing House, 2008.

4. William James Craig, ed. *The Complete Works of William Shakespeare*. London: Oxford University Press, 1914.
5. William Shakespeare. *The Merchant of Venice*. London: J.Tonson, 1734.
<https://archive.org/details/merchantofvenice00shak_11/page/36/mode/2up>
6. George Yule. *Oxford Practice Grammar Advanced*. Oxford: OUP, 2006.
7. L.G.Alexander. *Longman English Grammar Practice for Intermediate Students*. Harlow (UK): Longman, 1990.
8. Roger Berry. *English Grammar: A Resource Book for Students*. London: Routledge, 2012.
9. K.V.Joseph. *A Textbook of English Grammar and Usage*. New Delhi: TATA McGraw Hill Education Private Limited, 2012.
10. Mary Ellen Guffey, and Richard Almonte. *Essentials of Business Communication*. Toronto: Nelson Education, 2007.

E Resources and References

Unit-1 Poetry

<https://www.litcharts.com/poetry/alfred-lord-tennyson/ulysses>

<https://www.poetryfoundation.org/poems/45392/ulysses>

<https://owlcation.com/humanities/Analysis-of-Poem-The-Night-of-the-Scorpion-by-Nissim-Ezekiel>

<https://literaryyog.com/night-scorpion-nissim-ezekiel/>

<https://www.poetryfoundation.org/poems/42891/stopping-by-woods-on-a-snowy-evening>

<https://studymoose.com/analysis-of-stopping-by-woods-on-a-snowy-evening-by-robert-frost-essay>

Unit-2 Prose

<https://thejeshgn.com/wiki/great-speeches/sisters-and-brothers-of-america-swami-vivekananda/>

<https://www.ukessays.com/essays/english-language/speech-analysis-martin-luther-kings-i-have-a-dream-speech-7887.php>

<https://litpriest.com/essays/of-friendship-summary-analysis-francis-bacon/>

Unit-3 Drama

<https://www.shakespeare.org.uk/explore-shakespeare/shakespeadia/shakespeares-plays/merchant-venice/>

<https://www.rsc.org.uk/the-merchant-of-venice/about-the-play/famous-quotes>

<https://www.litcharts.com/lit/the-merchant-of-venice/characters>

<https://www.slideshare.net/ciaffaroni/the-merchant-of-venice-62390271>

Unit-4 Grammar

<https://www.gingersoftware.com/content/grammar-rules/verbs/auxiliary-or-helping-verbs/>

https://www.englisch-hilfen.de/en/grammar/english_tenses.htm

https://www.grammar.cl/Intermediate/Question_Tags.htm

Unit-5 Oral & Written Communication

<https://content.byui.edu/file/b8b83119-9acc-4a7b-bc84-efacf9043998/1/Writing-2-5-2.html>

<https://www.towson.edu/careercenter/students/careerskills/communication.html>

<https://www.slideshare.net/shahbaazahmed15/bc-communication>

DEPARTMENT OF BOTANY

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

(For those students admitted during the 2021 - 22 and after)

PART – III : Core Course Theory		SEMESTER - II
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 knowledge about primitive terrestrial plants
- ❖ To understand the structure and reproduction of Pteridophytes and Gymnosperms
- ❖ To develop skills in fossil plants

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	Understand the characters of Pteridophytes & know its economic importance.	K1, K2 & K3
CO2	Know the structure and reproduction of Pteridophytes	K1, K2 & K3
CO3	Acquire the characters of Gymnosperms and identify the its economic importance	K1, K2 & K3
CO4	Know the structure and reproduction of Gymnosperms	K1, K2 & K3
CO5	Aware the evolution of organisms and fossils plants	K1, K2 & K3

K1-knowledge

K2-Understand

K3-Apply

Mapping of CLO with PLO

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7
CLO 1	9	9	3	3	3	9	3
CLO 2	9	9	3	3	9	9	3
CLO 3	9	9	3	3	9	9	3
CLO 4	9	1	3	3	3	9	3
CLO 5	9	3	3	3	1	9	3
	45	31	15	15	25	45	15

9-Strong**3-Medium****1-Low****Mapping of CLO with PSO**

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	9	9	3	3	3
CLO 2	9	9	3	9	9
CLO 3	9	9	9	9	9
CLO 4	9	9	9	9	3
CLO 5	9	9	3	3	3

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

UNIT NO	CONTENT	HOURS
Pteridophytes		
Unit- I	General characteristics of Pteridophytes - Classification of Pteridophytes (Sporne 1976) – Stellar evolution – Economic importance of Pteridophytes	12
Unit- II	Structure and reproduction of the following a. Psilotales - <i>Psilotum</i> b. Lycopodiales - <i>Lycopodium</i> c. Equisetales - <i>Equisetum</i> d. Filicales – <i>Marselia</i>	12
Gymnosperms		
Unit- III	General characteristics of gymnosperms - Classification of Gymnosperms (Sporne, 1967) - Economic importance of gymnosperms with reference to wood, essential oils, resins and drugs	12
Unit-IV	Structure and Reproduction of the following a. Cycadales - <i>Cycas</i> b. Coniferales - <i>Pinus</i> c. Gnetales- <i>Gnetum</i>	12
Paleobotany		
Unit- V	Geological era - Formation of fossils – types of fossils - detailed study of the following a. Psilopsida - <i>Rhynia</i> b. Phenopsida - <i>Calamites</i> , c. Cycadofilicales – <i>Lyginopteris</i>	12

Text Books:

1. An introduction to Embryophyta –Pteridophytes - N.S. Parihar, Surjeet Publications, Delhi, 2012 Ed.
2. Pteridophyta, PC Vashishta, AK Sinha, Anil Kumar, S Chand and Company PVT Ltd, New Delhi, 2016 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. Gymnosperms, OP Sharma, Shivani Dixit, Pragati Prakashan, PVT Ltd, Meerut, 2020

Online Resources:

1. <https://www.slideshare.net/EasyBiologyClassEBC/pteridophytes-general-characteristics-ppt-by-easybiologyclass> (Pteridophytes)
2. <https://www.slideshare.net/SyedaFari2/psilotum-88047646> (*Psilotum*)
3. <https://www.slideshare.net/ArSlanJanjua6/marsilea-structure-and-reproduction> (*Marsilea*)
4. <https://www.slideshare.net/SARASilpi/gymnosperms-10047007> (Gymnosperms)
5. <https://www.slideshare.net/SyedaFari2/cycas> (*Cycas*)
6. <https://www.slideshare.net/shivduraigaran/gnetum-a-powerpoint-presentation-on-gymnosperms> (*Gnetum*)
7. <https://www.slideshare.net/pradhanpravin11/paleobotany> (Paleobotany)
8. <https://www.slideshare.net/HemantKumar1131/types-of-fossils-and-uses> (Fossils)
9. <https://www.slideshare.net/MaitriThakor/rhynia> (*Rhynia*)

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
Pteridophytes				
Unit –I				
1.1	General characters of Pteridophytes	2	Discussion	Green Board
1.2	Classification of Pteridophytes (Sporne 1976)	4	Lecture	Green Board
1.3	Stelar evolution	4	Discuss	Green Board
1.4	Economic importance of Pteridophytes	2	Lecture	Green Board
Unit – II				

2.1	Structure of <i>Psilotum</i>	1	Lecture	Green Board
2.2	Reproduction of <i>Psilotum</i>	2	Chalk & Talk	Green Board
2.3	Structure of <i>Lycopodium</i>	1	Chalk & Talk	Green Board
2.4	Reproduction of <i>Lycopodium</i>	2	Chalk & Talk	Green Board
2.5	Structure of <i>Equisetum</i>	1	Chalk & Talk	Green Board
2.6	Reproduction of <i>Equisetum</i>	2	Chalk & Talk	Green Board
2.7	Structure of <i>Marselia</i>	1	Chalk & Talk	Green Board
2.8	Reproduction of <i>Marselia</i>	2	Chalk & Talk	Green Board
Gymnosperms				
Unit –III				
3.1	General characters of Gymnosperms	2	Chalk & Talk	Green Board
3.2	Classification of Gymnosperms (Sporne, 1967)	5	Discussion	
3.3	Economic importance of gymnosperms with reference to wood, essential oils, resins and drugs	5	Chalk & Talk	Green Board
Unit – IV				
4.1	Structure of <i>Cycas</i>	2	Discussion	Green Board
4.2	Reproduction of <i>Cycas</i>	2	Chalk & Talk	Green Board
4.3	Structure of <i>Pinus</i>	2	Chalk & Talk	Green Board
4.4	Reproduction of <i>Pinus</i>	2	Chalk & Talk	Green Board
4.5	Structure of <i>Gnetum</i>	2	Lecture	Green Board
4.6	Reproduction of <i>Gnetum</i>	2		
Paleobotany				
Unit –V				
5.1	Geological era	2	Lecture	Green Board
5.2	Formation of fossils	2	Chalk & Talk	Green Board
5.3	types of fossils	2	Chalk & Talk	Green Board
5.4	Structure of Rhynia	2	Chalk & Talk	Green Board
5.5	Structure of Calamites	2	Chalk &	Green

			Talk	Board
5.6	Structure of Lyginopteris	2	Chalk & Talk	Green Board
	Total	60		

Course Designer (Name of the Course Teacher)	Head of the Department
Dr. C. SOUNDAR RAJU	Dr. V. RAMESH

DEPARTMENT OF CHEMISTRY

Programme: B.Sc. Botany / B.Sc. Zoology/Physics (CBCS and LOCF)
(For those students who admitted during the Academic Year 2021-22 and after)

PART – III: Allied Practical		SEMESTER I
Course Title: VOLUMETRIC ESTIMATION		
Course Code: 07APB3 / 07APZ3 / 07APP3	Hours per week: 2	Credits: -
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)
CO1	Anticipate, recognize, and respond properly to potential hazards in laboratory procedures	K1, K2 & K3

CO2	Perform accurate quantitative measurements	K1, K2 & K3
CO3	Interpret experimental results and draw reasonable conclusions	K1, K2 & K3
CO4	Keep accurate and complete experimental records	K1, K2 & K3
CO5	Interpret experimental results and draw reasonable conclusions	K1, K2 & K3
CO6	Communicate effectively through oral and written reports	K1, K2 & K3

K1-Remembering

K2-Understanding

K3-Applying

Mapping of CLO and PLO

	PLO 1	PLO 2	PLO 3	PLO 4	PLO5	PLO6	PLO7
CLO 1	1	1	3	1	3	3	1
CLO 2	9	1	9	1	3	3	1
CLO 3	3	1	9	1	3	3	1
CLO 4	3	1	9	1	3	3	1
CLO 5	3	1	9	1	3	3	1
	19	5	39	5	15	15	5

9-Strong

3-Medium

1-Low

Mapping of CLO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	1	3	3	1	-
CLO 2	-	1	3	3	-
CLO 3	-	1	1	1	-
CLO 4	3	3	3	1	-
CLO 5	3	3	3	1	1
	7	11	13	7	1

9-Strong

3-Medium

1-Low

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: ACIDIMETRY AND ALKALIMETRY

1. Estimation of Sodium Hydroxide

(Standard sodium carbonate vs. Link sulphuric acid vs. Given sodium hydroxide)

2. Estimation of Sodium Carbonate
(Standard sodium hydroxide vs. Link hydrochloric acid vs. Given sodium carbonate)
3. Estimation of Sulphuric acid
(Standard oxalic acid vs. Link sodium hydroxide vs. Given sulphuric acid)
4. Estimation of Hydrochloric acid
(Standard oxalic acid vs. Link sodium hydroxide vs. Given sodium hydrochloric acid)

UNIT-IV: REDOX TITRATIONS

PERMANGANOMETRY

1. Estimation of oxalic acid
(Standard ferrous sulphate vs. Link potassium permanganate vs. Given oxalic acid)
2. Estimation of potassium permanganate
(Standard sodium hydroxide vs. Link oxalic acid vs. Given potassium permanganate)
3. Estimation of ferrous sulphate
(Standard oxalic acid vs. Link potassium permanganate vs. Given ferrous sulphate)
4. Estimation of ferrous ammonium sulphate
(Standard ferrous sulphate vs. Link potassium permanganate vs. Given ferrous ammonium sulphate)

UNIT-V: DICHROMETRY

1. Estimation of Potassium dichromate (Potassium permanganate vs. Link ferrous ammonium sulphate vs. Given potassium dichromate)

Text Book

1. Venkateswaran, V., Veerasamy, R. and Kulandaivelu, A.R. *Basic Principles of Practical*
2. *Chemistry*, 2nd Ed., Sultan Chand & Sons, New Delhi, 2017.
3. Thomas, A.O. *B.Sc. Main Practical Chemistry*, Scientific Book Centre, Cannanore, 2003.

Reference Books

1. Gnanaprakasam, N.S. and Ramamurthy, G. *Organic Chemistry Lab Manual*, S. Viswanathan Pvt. Ltd, 2007.
2. Jeffery, G.H., Basset, J. and others, *Vogel's Textbook of Quantitative Chemical Analysis*, ELBS, 5th Ed., London, 1989.

E - Resources

1. <https://www.youtube.com/watch?v=KyZtyEF6kqk>
2. <https://www.youtube.com/watch?v=ka62KfMgRv8>
3. <https://www.youtube.com/watch?v=hxYorBeMhnc>
4. <https://www.youtube.com/watch?v=xOQ6tweyWuE>
5. <https://www.youtube.com/watch?v=bHkFSavcU5I>
6. <https://www.youtube.com/watch?v=gSauVhYtVIU>

Course Designer
(Name of the Course Teacher)

Head of the Department

DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and LOCF)
(For those students admitted during the 2021 - 22 and after)

PART – III : Core Course Theory		SEMESTER – II
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

CO Number	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	To know the unique features & chemical nature of cell wall Acquire the basic knowledge about internal tissues of higher plants	K1, K2 & K3
CO2	To compare the general and specific internal	K1, K2 & K3

	characteristics of dicot & monocot stem and root	
CO3	To know the concept of secondary thickening and anomalous secondary growth in stem and roots	K1, K2 & K3
CO4	To understand the internal structure of dicot leaf, node and root formation	K1, K2 & K3
CO5	Training the students in various staining technique and handling of microscope To Make temporary microscopic slides	K1, K2 & K3

K1 – Knowledge

K2 – Understand

K3 – Apply

Mapping of CLO with PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	9	9	3	1	3	3
CLO2	9	9	3	9	3	1	3
CLO3	9	9	9	3	9	3	3
CLO4	9	3	9	1	3	3	3
CLO5	9	9	9	3	1	1	1
	45	39	39	19	17	11	13

9-Strong

3-Medium

1-Low

CLO-PSO Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5
CLO1	9	3	9	9	9
CLO2	9	3	9	9	9
CLO3	9	9	1	3	9
CLO4	9	9		9	3
CLO5	9	3	9	3	9

9-Strong

3-Medium

1-Low

Syllabus

UNIT NO	CONTENT	HOURS
Unit – I	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	12
Unit – II	Primary structures of dicot stem, monocot stem, Dicot root & Monocot root	12
Unit – III	Normal secondary thickening in dicot stem and dicot root – Anomalous secondary growth in <i>Boerhaavia</i> and <i>Dracaena</i>	12
Unit – IV	Internal structure of Dicot leaf – Nodal anatomy of <i>Justicia</i> , <i>Azadirachta</i> and <i>Aralia</i> – Lateral roots formation	12
Unit – V	Microtechniques: Fixation of plant materials – Sectioning of plant materials (Hand section only) – Staining – Mounting and whole mount preparation	12

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 and Microtechniques, Annie Ragland, Saras Publications, Nagercoil, 2014 Ed.

4. Botany for Degree Students, BP Pandey, S Chand and Company PVT Ltd. 2012 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 Anatomy - A.Fahn, Pergamon Press, 2010 Ed.

Online Resources

1. <https://www.researchgate.net/publication/228552007> (A beginner's guide to The study of plant structure)
2. <https://www.researchgate.net/publication/309118583> (Techniques in Anatomy Cytology and Histochemistry of Plants)
3. <https://www.freebookcentre.net/biology-books-download> (Plant Anatomy Lecture)
4. <https://www.researchgate.net/publication/318394791> (Plant Anatomy and Embryology)
5. <https://www.easybiologyclass.com/> (Parenchyma cells in plant structure classification and functions)
6. <https://pdfbookslibs.com/esaus> (Plant Anatomy meristems cells)

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
Unit I: Cell wall and Tissue system				
1.1	Ultra Structure of cell wall	2	Calk & Talk	Green Board
1.2	Chemical nature of cell wall	1	Calk & Talk	Green Board
1.3	Plasmodesmata	1	Calk & Talk	Chart
1.4	Pits	1	Calk & Talk	Green Board
1.5	Meristems	2	Calk & Talk	Chart & Green Board
1.6	Simple tissue	1	Calk & Talk	Green Board
1.7	Complex tissues	2	Calk & Talk	Chart & Green Board
1.8	Secretory Tissues	1	Calk & Talk	Chart & Green Board
1.9	Trichomes	1		
Unit – II: Primary structure of plant organs				
2.1	Internal structure of Dicot stem	3	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board

2.2	Internal structure of Monocot stem	3	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
2.3	Internal structure of Dicot root	3	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
2.4	Internal structure of Monocot root	3	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
Unit – III: Normal and Anomalous secondary growth				
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
Unit – IV: Nodal Anatomy				
4.1	Internal structure of Dicot leaf	3	Calk & Talk	Chart, Plant material & Green Board
4.2	Nodal anatomy in <i>Justicia</i>	2	Calk & Talk	Green Board
4.3	Nodal anatomy in <i>Azadirachta</i>	2	Calk & Talk	Green Board
4.4	Nodal anatomy in <i>Aralia</i>	2		
4.5	Lateral roots formation	3	Calk & Talk	Green Board
Unit – V: Microtechniques				
5.1	Introduction of Microtechniques	2	Calk & Talk	Green Board
5.2	Microtomes	2	Calk & Talk	Green Board
5.3	Fixation of plant materials	2	Calk & Talk	Green Board & Specimen
5.4	Sectioning (Hand section)	2	Calk & Talk	Green Board & Plant material
5.5	Staining	2	Calk & Talk	Green Board
5.6	Mounting	2	Calk & Talk	Green Board
Total		60		

Course Designer
(Name of the Course Teacher)

Head of the Department

DEPARTMENT OF CHEMISTRY

Programme: B.Sc Botany /B.Sc. Zoology, (CBCS and LOCF)

(For those students who admitted during the Academic Year 2021-22 and after)

PART – III: Allied Subject Theory		SEMESTER II
Course Title: CHEMISTRY FOR BIOLOGIST-II		
Course Code: 07ATB2/07APZ2	Hours per week: 4	Credits: 4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100 Marks

Preamble

Students are enabled to,

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

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, compare and contrast the various concepts of acids and bases	K1, K2 & K3
CO 2	Discuss the nature of chemical bonding	K1, K2 & K3

CO 3	Summarize and describe the basics of amino acids, proteins and vitamins and their biological functions	K1, K2 & K3
CO 4	discuss and assess the effect of selected pesticides and fungicides	K1, K2 & K3
CO 5	Create awareness on pollution and its impact	K1, K2 & K3

K₁-Remembering

K₂-Understanding

K₃-Applying

Mapping of CLO and PLO9-Strong

	PLO 1	PLO 2	PLO 3	PLO 4	PLO5	PLO6	PLO7
CLO 1	3	1	1	1	1	1	3
CLO 2	3	1	1	1	1	1	3
CLO 3	3	1	1	1	1	1	3
CLO 4	3	1	1	1	1	9	3
CLO 5	3	1	1	1	1	9	3
	15	5	5	5	5	21	15

9-Strong

3-Medium

1-Low

Mapping of CLO with PSO

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

9-Strong

3-Medium

1-Low

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 and properties of ionic compounds – Covalent bond: Polar and non-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 strecker synthesis) – properties of amino acids and glycine – Zwitter ion – polypeptides – proteins, classification. Vitamins: Classification and biological functions of vitamins A, B₆, B₁₂, C, D, E and K (structural elucidation not required).

UNIT-IV: PESTIDCIDES 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. Soni, P.L. and Mohan Katyal. *Text book of Inorganic Chemistry*, Sultan Chand & Sons, New Delhi, 2010.
2. Soni, P.L. *Text Book of Organic Chemistry*, Sultan Chand, New Delhi, 2005.
3. Kanagasabai, C.S. *Environmental Studies*, Rasee publishers, Madurai, 2005.

Reference Books

1. Malik, W.U., Tuli, G.D. and Madan, R.D. *Selected Topics in Inorganic Chemistry*, S. Chand & Co., New Delhi, 2006.
2. Bahl, B. S. and Arun Bhal, *Text book of Organic Chemistry*, Chand Ltd., 2006.
3. Yagodin, B.A. (Ed), *Agricultural Chemistry*, 2 volumes, Mir Publishers, Moscow, 1976.
4. Yogendra, N. and Srivastava, N. *Environmental Pollution*, Ashish Publishing House. New Delhi. 1998.

E - Resources

1. <https://www.youtube.com/watch?v=aeLQjdo3tGE>
2. <https://www.youtube.com/watch?v=laq2kcrxuWU&list=PLyqSpQzTE6M93oV6C9iM4VpoiTqlz4vwi>
3. <https://www.youtube.com/watch?v=DhwAp6yQHQI>
4. <https://www.youtube.com/watch?v=PfSTt0pzvSI>
5. https://www.youtube.com/watch?v=4AuwG2G_ERU&list=PLF5457B8AE71516CE

Course Designer
(Name of the Course Teacher)

Head of the Department

DEPARTMENT OF BOTANY
 Programme: B.Sc. BOTANY (CBCS and LOCF)
 (For those students admitted during the 2021 - 22 and after)

PART – III : Core Course Lab		SEMESTER – II
Course Title: 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)
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CO1	To revise the morphology and reproductive structures in Algae, Fungi, Lichens, and Bryophyte	K1, K2 & K3
CO2	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	K1, K2 & K3
CO3	To compare the life cycles of Algae, Fungi, Lichens, Bryophytes Pteridophytes and Gymnosperms	K, K2 & K3
CO4	To prepare microsections and to professionally draw plant sketches	K1, K2 & K3
CO5	To analyze bacterial, fungal, viral and mycoplasmal plant diseases	K1, K2 & K3

K2 – Understand

K3 – Apply

K4 – Analyze

Mapping of CLO with PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	9	9	3	9	3	3
CLO2	9	9	3	9	3	9	9
CLO3	9	9	9	3	9	3	9
CLO4	9	3	9	3	3	3	3
CLO5	9	9	9	3	3	3	3
	45	39	39	21	27	21	27

9-Strong

3-Medium

1-Low

CLO-PSO Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5
CLO1	9	3	9	9	9
CLO2	9	3	9	9	9
CLO3	9	9	3	3	9
CLO4	9	9	9	9	3
CLO5	9	3	9	3	9

9-Strong

3-Medium

1-Low

Syllabus

UNIT NO	CONTENT	HOURS
Unit – I	A detailed study of thallus organization and reproductive structures of the following forms: Algae: <i>Oedogonium</i> , <i>Vaucheria</i> , Diatoms, <i>Sargassum</i> , <i>Polysiphonia</i> , <i>Nostoc</i> Fungi : <i>Penicillium</i> , <i>Albugo</i> , <i>Puccinia</i> , <i>Agaricus</i> and <i>Cercospora</i> Lichen – <i>Usnea</i> , <i>Parmelia</i>	12
Unit – II	A detailed study of morphology, anatomy and structure of vegetative & spore bearing parts of the following genera: Bryophytes: <i>Marchantia</i> , <i>Anthoceros</i> , <i>Funaria</i>	12
Unit – III	A detailed study of following diseases: Bunchy top of Banana, Citrus Canker, Blast disease in Rice and Little leaf of Brinjal	12
Unit – IV	A detailed study of morphology, anatomy and structure of vegetative &	12

	spore bearing parts of the following genera: Pteridophytes: <i>Psilotum</i> , <i>Lycopodium</i> & <i>Marselia</i> Gymnosperms : <i>Cycas</i> & <i>Gnetum</i> Fossils : <i>Rhynia</i> , <i>Calamites</i> & <i>Lyginopteris</i>	
Unit – V	A detailed study of the internal morphology of dicot, monocot stem & root and dicot leaf – including anomalous secondary thickening.	12

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 – GanfuleHirendra (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.

Online Resources

1. <http://virtualplant.ru.ac.za/Main/ANATOMY/B1PR2006.htm#principle> (Plant Antomy)
2. <https://ucmp.berkeley.edu/IB181/HpageIB181.html> (Virtual Paleo Botany Lab)

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
UNIT I				
1.1	<i>Oedogonium</i> , <i>Vaucheria</i> , <i>Diatoms</i> , <i>Sargassum</i>	2	Calk & Talk	Green Board, Plant material , Specimen & permanent slide
1.2	<i>Polysiphonia</i> , <i>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
Unit – II				
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
Unit – III				
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
Unit – IV				
4.1	<i>Psilotum, Lycopodium & Marselia</i>	2	Calk & Talk	Plant material & Green Board
4.2	<i>Cyca & Gnetum</i>	3	Calk & Talk	Plant material
4.3	<i>Rhynia, Calamites & Lyginopteris</i>	3	Calk & Talk	Plant material
Unit – V				
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 & Dracaena</i>	2	Calk & Talk	Chart & Plant material Green

				Board
Total		30		

Course Designer (Name of the Course Teacher)	Head of the Department
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Dr. C. SOUNDAR RAJU

Dr. V. RAMESH

DEPARTMENT OF BOTANY

(For those students admitted during the 2021 - 22 and after)

PART – IV : Generic Elective Course		SEMESTER – II
Course Title: Gardening		
Course Code: 08NE21	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

UNIT NO	CONTENT	HOURS
Unit – I	Introduction to gardening – types of garden - Advantages of gardening	6
Unit – II	Propagation methods like cutting, layering, Grafting, budding, division and separation	6
Unit – III	Garden operations: Transplanting methods (Bare rooted, shifting and balling and burlapping) - irrigation (surface, spray and drip) – Manuring	6
Unit – IV	Ornamental gardening, Indoor gardening, Rockery, Bonsai and Lawn making, Terrarium, Aquarium, Terrace garden, Veranda	6

	garden and Hanging baskets	
Unit – V	Kitchen gardening – importance, layout, suitable plants and advantages	6

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.

Online Resources

1. <https://gardenbeast.com/ebooks/> (Garden)
2. <https://www.gardenfundamentals.com/free-gardening-books/> (Components of Gardens)
3. https://www.barnesandnoble.com/b/free-ebooks/nook-books/home-garden/gardening/_/N-ry0Z8qaZ12zj (Gardening)
4. <https://manybooks.net/titles/rockwelletext048hmv10.html> (Rockery)
5. <http://index-of.co.uk/Tutorials/Gardening%20Basics%20for%20Dummies.pdf>
6. http://www.eagleheightsgardens.org/tips/garden_manual_v_1.1.pdf

Course Designer (Name of the Course Teacher)		Head of the Department
Dr. V. RAMESH		Dr. V. RAMESH
விவேகானந்த கல்லூரி, திருவேடகம் மேற்கு-625 243		
தமிழ்த்துறை		
Programme: B.A., B.Sc. (Under CBCS and LOCF)		
(For those students admitted during the Academic Year 2021 - 2022 and after)		
PART – I TAMIL		SEMESTER : III
Course Title : : கார்ப்பிய இலக்கியமும் உரைநடை இலக்கியமும்		
Course Code : P1LT31	Hours per week : 6	Credits : 3
CIA : 25 Marks	ESE : 75 Marks	Total: 100 Marks

முன்னுரை

1. வாழ்க்கையின் உறுதிப்பொருள்களான அறம், பொருள், இன்பம் வீடுபேறு ஆகியனவற்றை உணர்த்துதல்.
2. இறைவழிபாட்டு சிந்தனைகளை வளர்த்தல்.
3. உரைநடை இலக்கியத்தின் வாயிலாக தனிமனித ஒழுக்க நலனை எடுத்துக்காட்டல்.
4. மரபுக்கவிதைகளின் வகைமைகளை அறிதல்.
5. கார்ப்பியம் மற்றும் உரைநடை இலக்கியத்தின் வரலாற்றினை அறிவித்தல்.

பாடதிட்டத்தின் முடிவுகள்

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

NO.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
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CLO 1	கார்ப்பிய இலக்கியங்களின் வாயிலாக அறம், பொருள், இன்பம், வீடுபேறு என்ற வாழ்க்கையின் உறுதிப்பொருட்கள், எவ்வுயிரையும் தம்முயிர்போல மதித்தல், பிறர் மனை நோக்கா நிலை, பகைமை பாராட்டாத தன்மை, ஆணவம் இல்லா வாழ்க்கை போன்றவைகளை வரையறை செய்த தன்மைகளை உணர்த்துதல்.	K1, K2
CLO 2	மரபு இலக்கணங்களான அணிகள், பாவகைகளின் வாயிலாக மாணவர்களின் இலக்கியச்சுவை உணர்வினை வளர்த்து, கற்பனைத் திறன்களை அறிவித்தல்.	K2, K3
CLO 3	உரைநடை இலக்கியங்களின் வாயிலாக இறைவழிபாட்டுச் சிந்தனைகளை தனிமனித வாழ்க்கை நகழ்வுகளின் வழி வெளிப்படுத்தி, உலக இயல்புகளை மொழிந்து, பரம்பொருளை அடையக்கூடிய வழிவகைகளையும், சமரச சன்மார்க்க நெறிகளையும் தெளிவுறுத்துதல்.	K2, K3
CLO 4	புராண, இதிகாசங்களின் வழி அக்காலகட்டமக்களின் சமூக நிலைகளைக் கலந்துரையாட செய்தல்.	K2
CLO 5	கார்ப்பியம் மற்றும் உரைநடை இலக்கியம் தோன்றிய காலகட்ட வரலாற்றினை விவரித்தல். கணிவிக்கு தமிழ் அறிமுகமான நிலைகள், அதற்குப் பயன்படுத்தக் கூடிய கணிவித் தமிழ்ச்சொற்கள் ஆகியன குறித்து விவரித்தல்	K1, K2, K3

K1-Remembering

K2-Understanding

K3-Applying

Mapping of CLO and PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	9	9	9	9	3	9
CLO2	9	9	9	9	9	3	9
CLO3	9	9	9	9	9	3	9
CLO4	9	3	3	3	9	-	9
CLO5	9	3	9	9	9	-	9
	45	33	39	39	45	9	45

பாடத்திட்டம்

அலகு - 1	கார்ப்பிய இலக்கியம் 1. சிலப்பதிகாரம்-(கனாத்திறம் உரைத்த காதை) 2. மணிமேகலை (ஆதிரை பிச்சையிட்ட காதை) 3. சீவகசிந்தாமணி (குணமாலையார் இலம்பகம்)	18மணிநேரம்
அலகு - 2	இதிகாச இலக்கியம் 1. கம்பராமாயணம் (குகப்பலம்) 2. மகாபாரதம் (கண்ணன் தூதுச் சருக்கம்) 3. ஸ்ரீகந்த புராணம் - தேவகாண்டம் (தெய்வானை, வள்ளி திருமணம்)	
அலகு - 3	உரைநடை இலக்கியம் 1. சித்பவானந்த சிந்தனைகள்	18மணிநேரம்
அலகு - 4	தமிழ் இலக்கணம்	18மணிநேரம்

	1.அணிகள் - உவமை - உருவகம் - பிந்து மொழிதல் - தற்குறிப்பேற்றம் - வஞ்சப்புகழ்ச்சி அணி 2.பாவகைகள் - வெண்பா - ஆசிரியப்பா 3.மடல் வரைதல் - விண்ணப்பம் - புகார்க் கடிதம் - பாராட்டுக் கடிதம்	
அலகு - 5	தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத் தமிழும் 1. காப்பிய இலக்கிய வரலாறு 2. உரைநடை இலக்கிய வரலாறு 3. செய்தத்தாள் தொடங்கும் வழிமுறைகள் செய்தத்தாளின் நிர்வாக அமைப்பு- பேட்டி	18மணிநேரம்

பாட நூல்கள்

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

பார்வை நூல்கள்

- 1.தமிழ் இலக்கிய வரலாறு - பேரா.முனைவர் பாக்கியமேரி, நியு செஞ்சுரி புக் ஹவுஸ்(பி)லிட்,41-ம், சீட்கோ இண்டஸ்டிரியல் எஸ்டேட், அம்பத்தூர், சென்னை- 600 098.
- 2.தமிழ் இலக்கிய வரலாறு- மு.வரதராசனார்
சாகித்திய அக்காதெமி,தலைமை அலுவலகம்,ரவீந்திர பவன், 35,பெரோஸ்ஷா சாலை,புதுதில்லி.

E-Resources

1. <https://www.youtube.com/watch?v=JRkZ1W4V7e4>
2. <https://www.youtube.com/watch?v=svvgz4Bt3Vo>
3. <https://www.youtube.com/watch?v=PSG4fuuHruo>
4. <https://www.youtube.com/watch?v=yFGkSYyhsRA>
5. https://www.tamildigitallibrary.in/admin/assets/book/TVA_BOK_0002569_%E0%A%E%B5%E0%AE%BF%E0%AE%B2%E0%AF%8D%E0%AE%B2%E0%AE%BF%E0%AE%AA%E0%AF%81%E0%AE%A4%E0%AF%8D%E0%AE%A4%E0%AF%82%E0%AE%B0%E0%AE%BE%E0%AE%B0%E0%AF%8D_%E0%AE%AA%E0%AE%BE%E0%AE%B0%E0%AE%A4%E0%AE%AE%E0%AF%8D.pdf
6. <https://www.youtube.com/watch?v=Oa7RKkVyVHA>
7. <http://www.shakthibharathi.com/uploads/%E0%AE%95%E0%AE%BE%E0%AE%AA%E0%AF%8D%E0%AE%AA%E0%AE%BF%E0%AE%AF%20%E0%AE%87%E0%AE%B2%E0%AE%95%E0%AF%8D%E0%AE%95%E0%AE%BF%E0%AE%AF%20%E0%AE%B5%E0%AE%B0%E0%AE%B2%E0%AE%BE%E0%AE%B1%E0%AF%81.pdf>
8. https://www.gunathamizh.com/2020/05/blog-post_30.html

கற்பிக்கும் முறைகள்

விரிவுரை கொடுத்தல், கலந்துரையாடல், காட்சிப் பதிவுகளின் வழியாக புலப்படுத்துதல்.

கற்பிக்க உதவுதல்

கரும்பலகை பயன்படுத்துதல், காட்சி திரைவழியாகப் புலப்படுத்துதல்.

Course Contents and Lecture Schedule

Module No.	Topic	No. of Lectures	Content Delivery Method	Teaching
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				Aids
அலகு-1 தமிழ்ச் சங்க இலக்கியம் (பத்துப்பாட்டு)(18 மணிநேரம்)				
1.	முல்லைப்பாட்டு	18	விரிவுரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல்
அலகு : 2 தமிழ்ச் சங்க இலக்கியம் (எட்டுத்தொகை) (18 மணிநேரம்)				
2.1.	நற்றிணை - 3 பாடல்கள்	3	விரிவுரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்துதல், காட்சித் திரை வழிப் புலப்படுத்துதல்
2.2	குறுந்தொகை - 5 பாடல்கள்	4	விரிவுரை கொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல், காட்சித்திரை வழிப் புலப்படுத்துதல்
2.3	கலித்தொகை - 2 பாடல்கள்	4	விரிவுரை கொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல் காட்சித்திரை வழிப் புலப்படுத்துதல்
2.4	அகநானூறு - 2 பாடல்கள்	3	விரிவுரை கொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல் காட்சித்திரை வழிப் புலப்படுத்துதல்
2.5	புறநானூறு - 3 பாடல்கள்	4	விரிவுரை கொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல் காட்சித்திரை வழிப் புலப்படுத்துதல்
அலகு - 3 தமிழ் நீதி இலக்கியம் (18 மணிநேரம்)				
3.1	திருக்குறள் செய்நன்றியறிதல் (அதிகாரம்-11) காலமறிதல் (அதிகாரம் - 49)	6	விரிவுரை கொடுத்தல்	கரும்பலகை பயன்படுத்துதல்
3.2	பழமொழி நானூறு (கல்வி அதிகாரம்)	4	விரிவுரை கொடுத்தல்	கரும்பலகை பயன்படுத்துதல்
3.3	கொன்றை வேந்தன் (10 பாடல்கள்)	4	விரிவுரை கொடுத்தல், கலந்துரையாடல்.	கரும்பலகை பயன்படுத்துதல்

3.4	முதுரை (10 பாடல்கள்)	4	விர்வுரை கொடுத்தல்	கரும்பலகை பயன்படுத்து தல்
அலகு : 4 தமிழ் இலக்கணம் - பொருள் (18 மணிநேரம்)				
4.1	அகப்பொருள் - அகத்திணைகள் (முதற் கரு உர்ப்பொருள்)	6	விர்வுரை கொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன் படுத்துதல்
4.2	புறப்பொருள் - புறத்திணைகள் (வெட்சி முதல் பெருந்திணை வரை உள்ள -12 திணைகள்)	6	விர்வுரை கொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன்படுத்து தல்
4.3	மரபியல் - பெயர் மரபுகள், ஆண்பால்,பெண்பால், இளமைப் பெயர்	6	விர்வுரை கொடுத்தல், பயிற்சிகொடுத்தல்.	கரும்பலகை பயன்படுத்து தல்
அலகு : 5 தமிழ் இலக்கிய வரலாறு (18 மணிநேரம்)				
5.1	சங்க இலக்கிய வரலாறு	6	விர்வுரை கொடுத்தல்	கரும்பலகை பயன்படுத்து தல்
5.2	நீதி இலக்கிய வரலாறு	6	விர்வுரை கொடுத்தல்	கரும்பலகை பயன்படுத்து தல்
5.3	புத்தக மதிப்புரை, தமிழ்த் திரைப்பட விமர்சனம், கவிதை படைத்தல்.	6	விர்வுரை கொடுத்தல், கலந்துரையாடல்	கரும்பலகை பயன்படுத்து தல், காட்சித்திரை வழிப் புலப்படுத்து தல்
Total		90		

DEPARTMENT SANSKRIT

Programme: B.A./ B.Sc. (Under CBCS and LOCF)

(For those students admitted during the Academic Year 2021-22 and after)

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

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
CLO 1	Understand the important aspects of prose literature	K2

CLO 2	Discriminate spirituality in Literature	K2
CLO 3	Basic knowledge of Sanskrit poetics	K1
CLO 4	Describe and defend history of early Sanskrit literature	K2
CLO 5	Practice Creativity and Demonstrate various culture of world	K2, K3

K1-Knowledge

K2-Understand

K3-Apply

Syllabus

Unit 1: Prose -Gurubhakti, poetics –Upamā, Ullekhā. History of Sanskrit Literature – Gadya Kāvya- introduction to Gadya Kāvya- structure of Gadya Kāvya- Kathā and Ākhyāyikā

Unit 2: Prose –Śukānasopadeśa, poetics –Rūpaka, Apahnuti. History of Sanskrit Literature – Daśakumāracaritam of Daṇḍin, Vāsavadatta of Subandhu. Popular tales

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

Unit 4: Prose - Pañcatantra (introduction), poetics –Dīpaka, Arthāntaranyāsa. History of Sanskrit Literature- works of Vākpati, Bilhaṇa, Kalhaṇa, Vāmananabhaṭṭabāṇa.

Unit 5: Prose –Vāsudevadautyam, poetics – Śleṣa, Vyatireka. History of Sanskrit Literature- History of Campū-literature – works of Trivikramabhaṭṭa, Somadeva, Bhoja, Abhinavakālidāsa, Anantabhaṭṭa, Cidambara-kavi, Rājāśarabhoji, Nīlakaṇṭhadīkṣita, Veṅkaṭādri.

Mapping of CO and PO

	PLO1	PLO 2	PLO3	PLO4	PLO5	PLO 6	PLO 7
CLO1	9	9	9	3	9	-	9
CLO2	9	9	9	9	3	-	3
CLO3	3	3	9	9	9	1	3
CLO4	9	9	9	9	9	-	9
CLO5	9	9	9	9	3	-	3
	39	39	45	39	33	1	27

Strong -9

Medium -3

Low -1

Text Book(s)

1. Sāhityarasakhaṇa, 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. Vadhya & 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

DEPARTMENT OF ENGLISH**Programme:** B.A., & B.Sc., (Under CBCS and LOCF)

(For those students admitted during the Academic Year 2021-22 onwards)

PART – II : English		SEMESTER – III
Subject Title : ENGLISH FOR ACADEMIC EXCELLENCE AND SUCCESS		
Course Code: P2LE31/P2CE31	Hours per week: 6	Credit: 3
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

Preamble:

The students are expected to inculcate English language proficiency and its socio-linguistic competency.

Course Outcome (CO):

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

No	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO1	Develop comprehension skills of poetic diction/usage through the poetry	K1, K2, K3
CO2	Appraise various authors' socio-linguistic values through the prose discourses	K1, K2, K3
CO3	Critique the views of the author, and characters from their discourses found in the novel	K1, K2, K3
CO4	Examine the properties of listening, speaking, reading, and writing activities to enhance English grammar usages	K1, K2, K3
CO5	Exercise LSRW skills	K1, K2, K3

K1-Remembering**K2– Understanding****K3 –Applying****Mapping of CLO and PLO****Syllabus**

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	9	9	3	9	3	9
CLO2	9	9	9	9	9	-	9
CLO3	9	9	9	9	9	3	9
CLO4	9	9	3	-	-	-	9
CLO5	9	9	9	3	3	-	9

	45	45	39	24	30	06	45
Strong-9	Medium -3			Low -1			

Unit-1 Poetry

1. *The Soul's Prayer* – Sarojini Naidu
2. *La Belle Dame Sans Merci* – John Keats
3. *The Lotus* – Toru Dutt

Unit-2 Prose

1. *Women Not the Weaker Sex* – Mahatma Gandhi
2. *The Lady, or the Tiger?* – Frank R. Stockton
3. *Educating the Adult* (Chapter-I) *The Indian National Education* – Swami Chidbhavananda

Unit-3 Novel

Oliver Twist – Charles Dickens [Abridged]
(For the three Continuous Internal Assessment [CIA] Tests)

Unit-4 Grammar

1. Active Voice and Passive Voice
2. Direct Speech and Indirect Speech
3. Sentence Connectors and Linkers

Unit-5 Oral & Written Communication

1. **Listening** – Comprehension practice from Poetry, Prose, Novel/Online Voice Practice, observing/viewing E-content (with subtitles), Guest/Invited Lectures, Conference/Seminar Presentations & Tests, and DD National News Live, BBC, CNN, VOA etc
2. **Speaking** – In Group Discussion Forum, participate in the Turn Taking, and Conversation Management, Debating, Defending/Mock Viva-Voice, Seminar Presentations on Classroom-Assignments, and Peer-Team-interactions/AIF in Class-room
3. **Reading** – Different Reading Strategies in Poetry, Prose, Novel, Newspaper etc
4. **Writing** – *Dialogue/Conversation Writing*, Advertisement Writing, and *Creative Writing* (autobiography, article etc,) for publication in *Mass Media*.*

Text Books

1. Vinay Harwadker, and A.K.Ramanujan, ed. *The Oxford Anthology of Modern Indian Poetry*. New Delhi:OUP, 1994. (or)
The Norton Anthology English Literature. New York/London: W.W.Norton, 2012.
(or) Dr.M.Moovendhan, ed. *Wings of Poesy*. Chennai: Thamarai Publications, 2018
(or)
2. <<https://www.poemhunter.com/poem/the-soul-s-prayer/>>
3. <[https://en.wikisource.org/wiki/The_Bengali_Book_of_English_Verse/The_Lotus_\(Toru_Dutt\)](https://en.wikisource.org/wiki/The_Bengali_Book_of_English_Verse/The_Lotus_(Toru_Dutt))>
4. <<https://www.poetryfoundation.org/poems/45392/ulysses>>
5. Swami Chidbhavananda. *The Indian National Education*. Tirupparaithurai: Sri Ramakrishna Tapovanam, 2017.

<http://www.rktapovanam.org/book_details.php?book_id=MjE=>

6. Dr.P.C. James Daniel, ed. *Gateway to English: An Anthology of Prose*. Chennai: Harrows Publications, 2018.
7. Abhijit Acharijee, and Rakesh Ramamoorthy, ed. *Frontiers of Communication: An Anthology of Short Stories and Prose*. Chennai: Cambridge University Press, 2018.
8. Charles Dickens. *Oliver Twist*. Chennai: Nestling Books, 2018. (or)
9. Charles Dickens. *Oliver Twist (the Parish Boy's Progress)*. London: Richard Bentley, 1839.

<https://ia800204.us.archive.org/34/items/olivertwist01dickrich/olivertwist01dickrich.pdf>

10. Michael Swan and Catherine Walter. *How English Works: A Grammar Practice Book*. Oxford: OUP, 1997. (or) Wren and Martin. *High School English Grammar and Composition*. New Delhi: S.Chand & Company LTD.1935.
11. Owen Hargie, David Dickson, and Dennis Tourish. *Communication Skills for Effective Management*. New York: Palgrave Macmillan, 2004. (or)
12. British Council | LearnEnglish<<https://learnenglish.britishcouncil.org/skills>>
13. BBC News <<https://www.bbc.com/news>>VOA LearningEnglish
14. <<https://learningenglish.voanews.com/>>
15. University Grants Commission (UGC), New Delhi
<<https://www.ugc.ac.in/subpage/EContent-URL.aspx>> British Council |
LearnEnglish<<https://www.youtube.com/channel/UCOtnu-KKoAbN47IuYMeDP0g>>
Cambridge Assessment English<<https://www.cambridgeenglish.org/test-your-english/>>
16. CLIL (Content & Language Integrated Learning) – Module by TANSCHENOTE: (Text: Prescribed chapters or pages will be given to the students by the department and the college)

Reference Books

1. Eileen Thompson et al. *Prentice Hall Literature: The English Tradition*. 2.Ed. New Jersey: Prentice-Hall Inc., 1989. (or) John Pfordresher et al. *England in Literature*. Illinois: Scott, Foresman& Co., 1989.
2. Swami Chidbhavananda. *Vedanta Society*.<<https://sfvedanta.org/authors/swami-chidbhavananda/>>
3. Dr.A.Shanmugakani, ed. *Prose for Communication: An Anthology of Prose*. Madurai: Manimekala Publishing House, 2008.
4. Charles Dickens. *Oliver Twist*. London: Wordsworth Classic, 1992.
5. J. C.Nesfield. *Manual of English Grammar and Composition*. London: Macmillan, 1908.
6. John Eastwood. *Oxford Practice Grammar*. Oxford: OUP, 1945.
7. Dennis Freeborn. *A Course Book in English Grammar*. London: Macmillan, 1987.
8. K.V.Joseph. *A Textbook of English Grammar and Usage*. New Delhi: TATA McGraw Hill Education Private Limited, 2012.
9. J. Thomson, and A. V. Martinet. *A Practical English Grammar*. New Delhi: OUP, 1986.
10. Mary Ellen Guffey, and Richard Almonte. *Essentials of Business Communication*. Toronto: Nelson Education, 2007.
11. Edgar Thorpe, and Showick Thorpe. *Objective English for Competitive Examinations*. New Delhi: Pearson India Education, 2017.

12. Mary Ellen Guffey, and Richard Almonte. *Essentials of Business Communication*. Toronto: Nelson Education, 2007.

E Resources and References

Unit-1 Poetry

<https://www.sajepedia.com/naidus-the-souls-prayer/>

<https://www.criticalbuzz.co.in/critical-analysis-of-the-souls-prayer-by-sarojini-naidu/>

<https://www.poetryfoundation.org/articles/69748/john-keats-la-belle-dame-sans-merci>

<https://www.cliffsnotes.com/literature/k/keats-poems/summary-and-analysis/la-belle-dame-sans-merci-original-version>

<https://www.literaturewise.in/mdl/mod/page/view.php?id=142>

<https://www.slideshare.net/stmaryspg2014/the-lotus-toru-dutt>

Unit-2 Prose

<https://degmateng.wordpress.com/2017/03/31/unit-2-prose-ls-1-women-not-the-weaker-sex-m-k-gandhi/>

<https://www.mkgandhi.org/momgandhi/chap60.htm>

<https://www.eastoftheweb.com/short-stories/UBooks/LadyTige.shtml>

<https://www.supersummary.com/the-lady-or-the-tiger/summary>

<https://www.slideshare.net/BharathiRaja6/part2-english-educating-the-adult-chapteri-taken-from-indian-national-education-written-by-srimath-swami-chidbhavananda>

Unit-3 Novel

<https://www.booksummary.net/oliver-twist-charles-dickens/>

<https://www.cliffsnotes.com/literature/o/oliver-twist/character-list>

https://www.studypool.com/studyGuides/Oliver_Twist/Themes#:~:text=Oliver%20Twist%20is%20a%20story,all%20the%20obstacles%20between%20them.

Unit-4 Grammar

<https://www.edudose.com/english/active-and-passive-voice-rules/>

<https://www.perfect-english-grammar.com/reported-speech.html>

<https://linguapress.com/grammar/conjunctions.htm>

Unit-5 Oral & Written Communication

<https://content.byui.edu/file/b8b83119-9acc-4a7b-bc84-efacf9043998/1/Writing-2-5-2.html>

<https://www.towson.edu/careercenter/students/careerskills/communication.html>

<https://www.slideshare.net/shahbaazahmed15/bc-communication>

DEPARTMENT OF BOTANY

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

(For those students admitted during the 2021 -22 and after)

PART – III : Core Course Theory		SEMESTER – III
Course Title: Biochemistry, Biophysics and Biometrics		
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 (CO)

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	To understand the structure and functions of carbohydrates and lipids in living organisms	K1, K2 & K3
CO2	To learn the structure and role of proteins, amino acids and enzymes	K1, K2 & K3
CO3	To remember chemical nature and structure of nucleic acids	K1, K2 & K3
CO 4	To apply the fundamentals of thermodynamics and biophysical forces in biochemical systems	K1, K2 & K3
CO 5	To acquire the knowledge and applications of fundamentals in Biostatistics	K1, K2 & K3
K1-knowledge		K2-Understand
		K3-Apply

Mapping of CLO with PLO

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7
CLO 1	9	3	9	9	9	9	9
CLO 2	9	3	9	9	9	9	9
CLO 3	9	3	9	9	9	3	3
CLO 4	9	3	1	19	3	9	3
CLO 5	9	3	9	9	9	1	9
	45	15	37	55	39	31	33
9-Strong		3-Medium			1-Low		

Mapping of CLO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	9	1	9	9	9
CLO 2	3	1	9	9	9
CLO 3	9	1	1	3	3
CLO 4	3	1	1	3	9
CLO 5	1	1	3	9	9
9-Strong		3-Medium			1-Low

Syllabus

UNIT No.	CONTENT	HOURS
Biochemistry		
UNIT I	Carbohydrates: classification, structure (open chain structure, ring structure of glucose) properties of monosaccharides only and Functions of carbohydrates - Lipids: Triglycerides, fatty acids: saturated and unsaturated, classification of lipids: simple, compound and derived lipids (brief account only)	12
UNIT II	Amino acids: types and properties only- Proteins: primary, secondary, tertiary structure and physiochemical properties – Enzymes: Classification, nomenclature, properties and Mechanism of enzyme action: Lock and Key model and Induced Fit model	12
UNIT III	Nucleic acids: introduction, definition, types: DNA and RNA - Nucleotides – building blocks of DNA and RNA, double helix model of DNA – significance of DNA, DNA types, DNA replication, types of RNA – structure of tRNA.	12
Biophysics		
UNIT IV	Introduction - Nature of light, light and plant pigments – absorption of light – Action spectra – Physical phenomena:	12

	Bioluminescence, Fluorescence, Phosphorescence - Law of thermodynamics – Redox Potential – chloroplast bioenergetics.	
Biometrics		
UNIT V	Introduction- Basic concepts of biostatistics - Collection, Presentation of data: Tabulation, Graphic and Diagrammatic - Measures of central tendencies: Mean, Median, Mode - Measures of dispersion - Standard deviation and standard error	12

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, Nagercoil, 2013 Ed

Reference Books

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

Online Resources

1. https://onlinecourses.swayam2.ac.in/cec20_bt12/announcements?force=true (Biochemistry of Biomolecules)
2. https://onlinecourses.swayam2.ac.in/cec19_bt02/announcements?force=true (Biochemistry and Molecular Biology)
3. <https://www.slideshare.net/RAMESHVELCHAMY/carbohydrates-238355692> (Carbohydrates Introduction)
4. <https://www.slideshare.net/RAMESHVELCHAMY/carbohydrates-monosaccharides-properties> (Carbohydrates: Properties Of Monosaccharides)
5. <https://www.youtube.com/watch?v=8D6qL9W9MyE> (Structure of Monosaccharides)
6. <https://www.slideshare.net/RAMESHVELCHAMY/structure-of-dna> (Structure and Types of DNA)
7. <https://www.slideshare.net/RAMESHVELCHAMY/structure-and-types-of-rna> (Structure and Types of RNA)
8. <https://www.slideshare.net/RAMESHVELCHAMY/aminoacids-238546959> (Amino Acids)
9. <https://www.slideshare.net/RAMESHVELCHAMY/enzymes-238569149> (Enzymes)
10. <https://www.slideshare.net/RAMESHVELCHAMY/proteins-238569158> (Proteins)
11. <https://www.slideshare.net/RAMESHVELCHAMY/law-of-thermodynamics-bioluminescence-fluorescence-phosphorescence> (Biophysics)
12. <https://www.slideshare.net/RAMESHVELCHAMY/basics-of-bio-statistics> (Biostatistics)
13. <https://www.slideshare.net/RAMESHVELCHAMY/biostatistics-238960760> (Biostatistics)

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
Biochemistry				
UNIT I				
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
UNIT II				
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
UNIT III				
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
UNIT IV				
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 – Chloroplast bioenergetics.	3	Chalk & Talk	Green Board
Biostatistics				
UNIT V				
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
	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 LOCF)
 (For those students admitted during the 2021 - 22 and after)

PART – III : Core Course Theory		SEMESTER – III
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

CO Number	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	To acquire the knowledge on laws of inheritance	K1, K2 & K3
CO2	To understand the concept of multiple alleles, recombination and sex determination	K1, K2 & K3
CO3	To gain the knowledge of extra chromosomal inheritance, mutation and gene regulation	K1, K2 & K3
CO4	To remember the basics of data bases of NCBI	K1, K2 & K3
CO5	To, apply the skills to analyze the sequence alignments and phylogeny	K1, K2 & K3

K1 – Knowledge

K2 – Understand

K3 – Apply

CLO with PLO Mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
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CLO1	9	9	9	3	3	3	3
CLO2	9	9	9	3	9	3	1
CLO3	9	9	9	9	3	3	1
CLO4	9	3	9	9	3	3	3
CLO5	9	3	9	9	3	3	3
	45	33	45	33	21	15	11

9-Strong; 3-Medium; 1-Low

CLO with PSO Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5
CLO1	9	3	1	3	3
CLO2	3	3	3	3	3
CLO3	3	3	3	3	3
CLO4	3	9	3	9	9
CLO5	3	9	3	9	9

9-Strong

3-Medium

1-Low

Syllabus

UNIT NO	CONTENT	HOURS
Unit – I	Introduction to Genetics - Mendelian inheritance – Mendels’ laws - law of dominance – Incomplete dominance: law of segregation - law of independent assortment – monohybrid cross - dihybrid cross - back and test crosses – Interaction of genes: complementary genes - epistasis	12
Unit – II	Multiple alleles with reference to A, B, O & AB blood groups in man - Linkage - crossing over - mechanism of crossing over and significance – Mechanism of sex determination in plants.	12
Unit – III	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 (Operon Concept).	12
Unit – IV	Bioinformatics – Introduction, Terminologies used in bioinformatics – National Center for Biotechnology Information (NCBI): Tools and Databases of NCBI, Database Retrieval Tool, Sequence Submission to NCBI, Basic local alignment search tool (BLAST)	12
Unit – V	Introduction and Salient Features of EMBL Nucleotide Sequence Database (EMBL-Bank), DNA Data Bank of Japan (DDBJ), Swiss-Prot - Sequence Alignments, Multiple Sequence Alignment (MSA), MSA by CLUSTALW - Phylogenetic tree Constructions - Applications of bioinformatics.	12

Text Books:

1. Elements of genetics – Rastogi Veer Bala, Kedarath Ramnath, Meerut, 2020 Ed.
2. Genetics and Molecular biology – Veer Bala Rastogi, Kedarnath, Ramnath, 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.

Online Resources:

1. <https://nptel.ac.in/courses/102/103/102103044/> (Bioinformatics Tools)
2. https://onlinecourses.swayam2.ac.in/cec21_bt02/preview (The definition of endemism)
3. https://nptel.ac.in/content/storage2/courses/downloads_new/102104068/noc19_bt32_assignment_Week_6.pdf (Conservation Genetics)
4. <https://nptel.ac.in/content/storage2/courses/102103012/pdf/mod2.pdf> (Chromosome structure and organization)
5. <https://www.merriam-webster.com/dictionary/bioinformatics> (Definition of bioinformatics)
6. <https://nptel.ac.in/courses/102/106/102106065/> (Concepts and importance of Bioinformatics)
7. <https://www.genome.gov/genetics-glossary/DNA-Sequencing> (DNA sequencing)

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
UNIT I				
1.1	Introduction to Genetics	1	Calk & Talk	Green Board
1.2	Mendelian inheritance	1	Calk & Talk	Green Board
1.3	Mendel's laws - law of dominance – incomplete dominance I	2	Calk & Talk	Chart
1.4	Law of segregation	1	Calk & Talk	Green Board
1.5	Law of independent assortment	2	Calk & Talk	Chart & Green Board
1.6	Monohybrid cross	1	Calk & Talk	Chart & Green Board
1.7	Dihybrid cross	2	Calk & Talk	Green Board
1.8	Back and test crosses	1	Calk & Talk	Chart & Green Board
1.9	Complementary genes - Epistasis	1	Calk & Talk	Chart & Green Board
Unit – II				
2.1	Multiple alleles with reference to A, B,	4	Calk & Talk	Chart, Online

	O blood groups in man.			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.	2	Calk & Talk	Chart, Online virtual Lab , Plant material & Green Board
Unit – III				
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
Unit – IV				
4.1	Bioinformatics – Introduction, Terminologies used in bioinformatics	3	Calk & Talk	Chart, Plant material & Green Board
4.2	National Center for Biotechnology Information (NCBI)	3	Calk & Talk	Green Board
4.3	Tools and Databases of NCBI & Database Retrieval Tool,	3	Calk & Talk	Green Board
4.4	Sequence Submission to NCBI, Basic local alignment search tool (BLAST)	3	Calk & Talk	Green Board
Unit – V				
5.1	Introduction and Salient Features of EMBL Nucleotide Sequence Database (EMBL-Bank)	2	Calk & Talk	Green Board
5.2	DNA Data Bank of Japan (DDBJ),	2	Calk & Talk	Green Board &

	Swiss-Prot			Specimen
5.3	Sequence Alignments, Multiple Sequence Alignment (MSA), MSA by CLUSTALW	2	Calk & Talk	Green Board & Plant material
5.4	Phylogenetic tree Constructions	2	Calk & Talk	Green Board
5.5	Applications of bioinformatics.	2	Calk & Talk	Green Board
Total		60		

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

Dr. V. RAMESH

DEPARTMENT OF ZOOLOGY

Programme: B.Sc., Zoology, (Under CBCS and LOCF)

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

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

Preamble

- ❖ Students are enable to gain basic knowledge on taxanomical 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)
CLO 1	Inculcate knowledge on animal classification and taxonomical methods with suitable examples.	K1
CLO 2	Understand the structure ingestion and egestion of bioprocesses in feeding and respiration of representative animals.	K2
CLO 3	Make awareness on movement of fluids, body and structural in invertebrates and chordates representatives.	K2
CLO 4	Observe a structure and functional aspects of nervous system, receptors in earthworm, insects and human.	K2
CLO 5	Trace the structure and processes of excretion, reproduction in selected invertebrates and chordates.	K3

K1-Remembering

K2-Understanding

K3-Applying

Mapping of CLO with PLO

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO6	PLO7
CLO 1	9	3	-	3	9	9	3
CLO 2	9	1	3	3	3	9	3
CLO 3	9	1	9	3	9	3	3

CLO 4	9	1	9	3	3	3	3
CLO 5	9	1	9	9	9	9	3
	45	7	30	21	33	33	15
9-Strong		3-Medium			1-Low		

Mapping of CLO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	1	3-	1	9	2
CLO 2	1	1	-	3	1
CLO 3	-	3	2	3	1
CLO 4	-	1	3	2	1
CLO 5	-	1	1	3	1

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

Syllabus

UNIT-I	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	(12 Hrs)
UNIT-II	1. Feeding and digestion in Amoeba and Frog. 2. Respiration in Amoeba, Cockroach, Gills in Fish and Lungs in bird.	(12 Hrs)
UNIT- III	1. Circulatory system in <i>Paramecium</i> , Earthworm and Calotes. 2. Locomotion in Amoeba, <i>Paramecium</i> , and Earthworm 3. Flight mechanism in Pigeon.	(12 Hrs)
UNIT- IV	1. Nervous system of Earthworm. 2. Human brain and ear. 3. Receptors – photoreceptors of Euglena, insects and man.	(12 Hrs)
UNIT- V	1. Excretion in Amoeba and Earthworm. 2. Excretion in Man- Structure of kidney and urine formation. 3. Reproductive system of Rabbit.	(12 Hrs)

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
Unit - I				12 Hours
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
	Total	60		

Course Designer
(Name of the Course Teacher)

Head of the Department

DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and LOCF)
(For those students admitted during the 2021 - 22 and after)

PART – IV : Skill Enhancement Course		SEMESTER – III
Course Title: Bio-Analytical Techniques		
Course Code: 08SB31	Hours per week:2	Credit:2
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

Preamble

- ❖ 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

Principles of microscopy: Light microscopy, compound microscopy - Transmission and Scanning electron microscopy: Brief account on sample preparation for electron microscopy, Use in biological research – Micrometry: ocular and stage

UNIT II

Spectrophotometry: Calorimeter & UV- Vis Spectrometer - basic principles and application - pH and pH meter – Buffers and its Properties - Applications.

UNIT III

Centrifugation - Differential and density gradient centrifugation, type of rotors, analytical centrifugation for estimation of mass of biological molecules, ultracentrifugation and applications

UNIT IV

Chromatographic techniques - Basic principles and Types: Paper chromatography; Column chromatography, TLC, GLC, HPLC, Affinity chromatography

UNIT V

Electrophoretic methods - Principles and types: Agarose gel electrophoresis, sodium dodecyl sulphate–polyacrylamide gel electrophoresis (SDS-PAGE)- Polymerase chain reaction (PCR)

Text Books

1. Techniques in Biology – J. Jeyaraman, Higgin Bothams Ltd, 2010 Ed.
2. Research methodology for biological Science - N. Gurumani., MJP, Publishers, Chennai, 2011 Ed.
3. Biophysics and bioinstrumentation – N. Arumugam, Saras Publications, Nagercoil, 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.

Online Resources

1. <https://nptel.ac.in/courses/102/103/102103044/> (Microscopic Techniques, Spectroscopic Techniques, Electrophoretic Techniques & Chromatographic Techniques)
2. <https://www.slideshare.net/SumatiHajela/ph-meter-179331797> (pH meter)
3. <https://www.slideshare.net/khadeejaikram56/centrifugation-49732927> (Centrifugation)

விவேகானந்த கல்லூரி, திருவேடகம் மேற்கு-625 243
தமிழ்த்துறை

Programme: B.A., B.Sc.(Under CBCS and LOCF)

(For those students admitted during the Academic Year 2021 - 2022 and after)

PART – I TAMIL		SEMESTER : IV
Course Title : சங்க இலக்கியமும் நீதி இலக்கியமும்		
CourseCode : P1LT41	Hours per week : 6	Credits : 03
CIA : 25 Marks	ESE : 75 Marks	Total: 100 Marks

முன்னுரை

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.

பாடத்திட்டத்தின் முடிவுகள்

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

NO.	Course Learning Outcome	Knowledge Level (according to Bloom's Taxonomy)
CLO 1	பண்டைத் தமிழர்களில் ஒரு சமூகம் சார்ந்த ஒழுக்கங்கள் குறித்த நிலையினை வரையறை செய்தல்.	K1, K2
CLO 2	ஐந்திணை மக்களின் அகஒழுக்கங்கள் குறித்த செய்திகளை கலந்துரையாடுதல்.	K2, K3
CLO 3	சங்க இலக்கியம் மற்றும் நீதி இலக்கிய காலகட்டங்களில் வாழ்ந்த மக்கள் மற்றும் அவர்களின் வாழ்க்கையினை பதிவுசெய்த படைப்பாளர்கள் ஆகியோரின் வரலாற்றினை விவரித்தல்.	K2, K3
CLO 4	பழங்கால மக்களின் அகம், புறம் தொடர்பான வாழ்க்கை நகழ்வுகளின் மரபுநிலைகள் குறித்த திறன்களை அறிவித்தல்.	K2

CLO 5	வாக்கியங்களைக் கண்டறிதல், சொற்களை ஒழுங்குபடுத்துதல், ஆங்கிலத்திற்கு நகரான தமிழ்ச்சொற்களை கண்டறிதல், வழுவுச்சொற்களை நீக்குதல் போன்ற ஒரு மொழியின் பயன்பாட்டுத் தன்மையை தெளிவுறுத்தல்.	K1, K2, K3
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K1-Remembering

K2-Understanding

K3-Applying

Mapping of CLO with PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	3	9	9	9	9	9
CLO2	9	9	9	9	9	3	9
CLO3	9	9	9	9	9	9	9
CLO4	9	3	3	9	9	9	9
CLO5	9	3	9	9	9	3	9
	45	27	39	45	45	33	45

பாடத்திட்டம்

அலகு - 1	தமிழ்ச் சங்க இலக்கியம் (பத்துப்பாட்டு) 1. முல்லைப்பாட்டு	(18 மணிநேரம்)
அலகு - 2	தமிழ்ச் சங்க இலக்கியம் (எட்டுத்தொகை) 1.நற்றிணை - (3பாடல்கள்) 2.குறுந்தொகை - (5பாடல்கள்) 3.கலித்தொகை - (2பாடல்கள்) 4.அகநானூறு - (2பாடல்கள்) 5.புறநானூறு - (3பாடல்கள்)	(18 மணிநேரம்)
அலகு - 3	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)
அலகு - 4	தமிழ் இலக்கணம் - பொருள் 1. அகப்பொருள் (அகத்திணைகள் - முதல், கரு, உர்ப்பொருள்) 2. புறப்பொருள் (புறத்திணைகள் - வெட்சி முதல் பெருந்திணை வரையுள்ள 12திணைகள்) 3. மரபியல் (பெயர் மரபுகள் - ஆண்பால்பெயர், பெண்பால்பெயர், இளமைப்பெயர்)	(18 மணிநேரம்)
அலகு - 5	தமிழ் இலக்கிய வரலாறும் பயன்பாட்டுத்தமிழும் 1. சங்க இலக்கிய வரலாறு 2. நீதி இலக்கிய வரலாறு 3. புத்தக மதப்புரை, தமிழ்த் திரைப்பட விமர்சனம், கவிதை படைத்தல்.	(18 மணிநேரம்)

பாட நூல்கள்

1.தமிழ் செய்யுட் தொகுப்பு (தமிழ்த்துறை வெளியீடு)

பார்வை நூல்கள்

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

E-Resource

1. <http://www.tamilvu.org/library/nationalized/pdf/17-kagovindan/mullaippattuoruvilakkam.pdf>
2. <https://www.keetru.com/index.php/2014-03-08-04-35-27/2014-03-08-12-18-14/2826-2010-01-29-08-13-35>
3. <https://www.youtube.com/watch?v=rDIzpWkbzn8>
4. https://www.youtube.com/watch?v=ZHNH_jlgznc
5. <https://www.youtube.com/watch?v=fQxJBfGOxgk>
6. <https://www.youtube.com/watch?v=fiK782BcyhY>

கற்பிக்கும் முறைகள்

விரிவுரை கொடுத்தல், கலந்துரையாடல், காட்சிப் பதிவுகளின் வழியாக புலப்படுத்துதல், பயிற்சி கொடுத்தல்.

கற்பிக்க உதவுதல்

கரும்பலகை பயன்படுத்துதல், காட்சி திரைவழியாக புலப்படுத்துதல்.

Course Contents and Lecture Schedule

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

				ர வழிப் புலப்படுத்து தல்
2.4	அகநானூறு - 2 பாடல்கள்	3	வீர்வுரை கொடுத்தல், கலந்துரை யாடல்.	கரும்பலகை பயன்படுத்து தல் காட்சித்தை ர வழிப் புலப்படுத்து தல்
2.5	புறநானூறு - 3 பாடல்கள்	4	வீர்வுரை கொடுத்தல், கலந்துரை யாடல்.	கரும்பலகை பயன்படுத்து தல் காட்சித்தை ர வழிப் புலப்படுத்து தல்
அலகு - 3 தமிழ் நீதி இலக்கியம் (18 மணிநேரம்)				
3.1	திருக்குறள் செய்நன்றியறிதல் (அதிகாரம்-11) காலமறிதல் (அதிகாரம் - 49) குறிப்பறிதல் (அதிகாரம் - 71)	6	வீர்வுரை கொடுத்தல்	கரும்பலகை பயன்படுத்து தல்
3.2	பழமொழி நானூறு (கல்வி அதிகாரம்)	4	வீர்வுரை கொடுத்தல்	கரும்பலகை பயன்படுத்து தல்
3.3	கொன்றை வேந்தன் (10 பாடல்கள்)	4	வீர்வுரை கொடுத்தல், கலந்துரை யாடல்.	கரும்பலகை பயன்படுத்து தல்
3.4	முதுரை (10 பாடல்கள்)	4	வீர்வுரை கொடுத்தல்	கரும்பலகை பயன்படுத்து தல்
அலகு : 4 தமிழ் இலக்கணம் - பொருள் (18 மணிநேரம்)				
4.1	அகப்பொருள் - அகத்திணைகள் (முதற் கரு உரப்பொருள்)	6	வீர்வுரை கொடுத்தல், பயிற்சிகொ டுத்தல்.	கரும்பலகை பயன் படுத்துதல்
4.2	புறப்பொருள் - புறத்திணைகள் (வெட்சி முதல் பெருந்திணை வரை உள்ள -12 திணைகள்)	6	வீர்வுரை கொடுத்தல், பயிற்சிகொ டுத்தல்.	கரும்பலகை பயன்படுத்து தல்
4.3	மரபியல் - பெயர் மரபுகள், ஆண்பால்,பெண்பா ல், இளமைப் பெயர்	6	வீர்வுரை கொடுத்தல், பயிற்சிகொ டுத்தல்.	கரும்பலகை பயன்படுத்து தல்
அலகு : 5 தமிழ் இலக்கிய வரலாறு (18 மணிநேரம்)				

5.1	சங்க இலக்கிய வரலாறு	9	விரிவுரை கொடுத்தல்	கரும்பலகை பயன்படுத்து தல்
5.2	நீதி இலக்கிய வரலாறு	9	விரிவுரை கொடுத்தல்	கரும்பலகை பயன்படுத்து தல்
	Total	90		

DEPARTMENT SANSKRIT

Programme: B.A./ B.Sc. (Under CBCS and LOCF)

(For those students admitted during the Academic Year 2021-22 and after)

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

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 IV semester.

Course Outcomes (COs)

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

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

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: Abhijnanasakuntalam Act –IV, up to arrival of sage Kanva to hermitage, Dramas of Bhāsa, spoken Sanskrit for Educational purpose

Unit 4: Abhijnanasakuntalam Act –IV, advice of sage Kanva to Sakuntala, Dramas of Kālidāsa, Moral and social aspects of dramas of Kālidāsa, spoken Sanskrit for commercial purpose.

Unit 5: Abhijnanasakuntalam Act –IV, up to the end of the play, Dramas of Bhavahūti, Moral and social aspects of dramas of Bhavahūti and other dramas,

Mapping of CLO and PLO

	PLO1	PLO 2	PLO3	PLO4	PLO5	PLO 6	PLO 7
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CLO1	9	9	9	9	3	-	3
CLO2	9	9	3	9	3	3	3
CLO3	9	9	3	9	9	-	3
CLO4	3	9	9	9	9	-	3
CLO5	9	9	9	9	9	3	3
	39	45	33	45	33	6	15

Strong -9 Medium -3 Low -1

Text Book(s)

1. Kaṇabhāra 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

DEPARTMENT OF ENGLISH

Programme: B.A., & B.Sc., (Under CBCS and LOCF)

(For those students admitted during the Academic Year 2021-22 onwards)

PART – II : English		SEMESTER – IV
Subject Title : ENGLISH FOR CAREER AND PROFESSIONAL DEVELOPMENTS		
Course Code: P2LE41/P2CE41	Hours per week: 6	Credit: 3
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

Preamble:

The students are expected to inculcate English language proficiency and its socio-linguistic competency.

Course Outcome (CO):

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO1	Examine authors' motivations on life-training through the prose discourses	K1, K2, K3
CO2	Demonstrate the understanding of techniques of human communication studies from basic theories and process.	K1, K2, K3
CO3	Weigh current global issues through creativity with prior knowledge of soft skills, and learned lessons	K1, K2, K3
CO4	Take part and pass the English language proficiency examinations	K1, K2, K3
CO5	Exercise LSRW skills	K1, K2, K3

K1-Remembering

K2 – Understanding

K3 –Applying

Mapping of CLO and PLO

Syllabus

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	9	9	9	9	3	9
CLO2	9	9	9	3	9	-	9
CLO3	9	9	9	3	3	3	9
CLO4	9	9	3	-	-	-	9
CLO5	9	9	9	3	3	-	9
	45	45	39	18	24	06	45

Strong-9

Medium -3

Low -1

Unit-1 Prose

1. The Teacher (Chapter-IV)
2. The Student (Chapter-V)
3. University Education on the Gurukula Pattern (Chapter-VI)

Unit-2 Drama

William Shakespeare-*The Tempest*

(for the three Continuous Internal Assessment [CIA] Tests)

Unit-3 Soft-Skills for Capacity Building

1. Interpersonal skills (Greetings and Leave-taking etc.)
2. Group Discussion for placement/career
3. Interview Skills for placement/career

Unit-4 English for Competitive Examinations

1. Spotting Errors (Articles & Tenses)
2. Analogy and One-Word Substitution
3. Synonyms and Antonyms

Unit-5 Oral & Written Communication

1. **Listening** – Comprehension practice from Prose, Drama etc /Online Voice Practice, observing/viewing E-content (with subtitles), Guest/Invited Lectures, Conference/Seminar Presentations & Tests, and DD National News Live, BBC, CNN, VOA etc
2. **Speaking** – In Group Discussion Forum, speak about Negotiation, Role-Play, Seminar Presentations on Classroom-Assignments, and Peer-Team-interactions/AIF in Class-room
3. **Reading** – Extensive Reading of Prose, (Film with subtitles), and Individual-Classroom- Assignments
4. **Writing** – *Writing and editing Public Speech like Welcome Address/Vote of Thanks, Introducing a Speaker/Keynote Speech/Address, Master of Ceremony/Anchoring etc.**

Text Books

1. Swami Chidbhavananda. *The Indian National Education*. Tirupparaithurai: Sri Ramakrishna Tapovanam, 2017.
<http://www.rktapovanam.org/book_details.php?book_id=MjE=>
2. William Shakespeare. *The Tempest*. Ed. Morton Luce. London: Methuen & Co, 1919.
3. Cary J Green. *Leadership and Soft Skills for Students*. Indiana: Dog Ear Publishing. 2015. (or) Bruce Tulgan. *Bridging the Soft Skills Gap: How to Teach the Missing Basics to Today's Young Talent*: New Jersey: John Wiley & Sons Inc., 2015. (or) Owen Hargie, David Dickson, and Dennis Tourish. *Communication Skills for Effective Management*. New York: Palgrave Macmillan, 2004. (or) Dale Carnegie. *The Art of Public Speaking*. Massachusetts: Wyatt North Publishing, 2013.
4. Hari Mohan Prasad, and Uma Rani Sinha. *Objective English for Competitive Examinations*. New Delhi: McGrawHill Education, 2016. (or)
British Council | LearnEnglish <<https://learnenglish.britishcouncil.org/skills>>
5. BBC News <<https://www.bbc.com/news>> VOA Learning English
<<https://learningenglish.voanews.com/>>
University Grants Commission (UGC), New Delhi
<<https://www.ugc.ac.in/subpage/EContent-URL.aspx>> British Council |
LearnEnglish <<https://www.youtube.com/channel/UCOtnu-KKoAbN47IuYMeDPog>>
Cambridge Assessment English <<https://www.cambridgeenglish.org/test-your-english/>>
6. CLIL (Content & Language Integrated Learning) – Module by TANSCHÉ

NOTE: (Text: Prescribed chapters or pages will be given to the students by the department and the college)

Reference Books

1. Swami Chidbhavananda. *Vedanta Society*. <<https://sfvedanta.org/authors/swami-chidbhavananda/>>
2. Raman, Meenakshi and Sangeeta Sharma. *Technical Communication: Principles and Practice*. New Delhi, OUP, 2011.
3. Stephen E Lucal. *The Art of Public Speaking*. New York: McGraw-Hill Education, 2015.
4. Elaine Walker and Steve Elsworth. *Grammar Practice for Elementary Students*. Harlow (UK): Pearson, 2000.
5. Mary Ellen Guffey, and Richard Almonte. *Essentials of Business Communication*. Toronto: Nelson Education, 2007.
6. K.V.Joseph. *A Textbook of English Grammar and Usage*. New Delhi: TATA McGraw Hill Education Private Limited, 2012.
7. Edgar Thorpe, and Showick Thorpe. *Objective English for Competitive Examinations*. New Delhi: Pearson India Education, 2017.

E Resources and References

Unit-1 Prose

<https://www.slideshare.net/BharathiRaja6/the-teacher-taken-from-indian-national-education-by-srimath-swami-chidbhavananda>

<https://www.slideshare.net/BharathiRaja6/the-student-theory-on-students-role-in-gurukulam>

<https://www.slideshare.net/BharathiRaja6/part2-english-university-education-on-the-gurukula-pattern-taken-from-indian-national-education-by-srimath-swami-chidbhavananda-drsbharathiraja-assistant-professor-headic-department-of-english-vivekananda-college8870518474>

Unit-2 Drama

William Shakespeare-The Tempest

(for the three Continuous Internal Assessment [CIA] Tests)

Unit-3 Soft-Skills for Capacity Building

<http://ignou.ac.in/userfiles/Unit%201.pdf>

GREETINGS AND INTRODUCTION - IGNOU

<http://egyankosh.ac.in/bitstream/123456789/60752/1/Unit-1.pdf>

<http://bankatswamicollege.org/sites/default/files/upload/study%20material1.pdf>

<https://www.reed.co.uk/career-advice/group-interview-tips-dos-and-donts/>

<https://www.teachingenglish.org.uk/article/group-discussion-skills>

<https://www.interview-skills.co.uk/free-information/interview-guide/group-tasks-discussions>

<https://www.mheducation.co.in/placement-interviews-skills-for-success-9789351340140-india>

<https://www.prospects.ac.uk/careers-advice/interview-tips/how-to-prepare-for-an-interview>

Unit-4 English for Competitive Examinations

<https://www.tgct.gov.in/tgportal/staffcollege/DR%20ACTOs%2017.01.2020%20to%2018.02.2020/February%20-%202020%20%20PDF's/05.02.2020,%204.%20Smt.Suma%20Bindu%20Madam,%20>

[0Asst.Professor%20and%20Trainer%20@CELT%20\(O.U\),%20SPOTTING%20ERRORS%20.pdf](#)

<http://www.grammarinenglish.com/spottingerrors/>

<https://www.jagranjosh.com/articles/important-one-word-substitution-questions-for-ssc-cgl-exam-1531479845-1>

<https://www.englishclub.com/vocabulary/synonyms-antonyms.htm>

Unit-5 Oral & Written Communication

<https://content.byui.edu/file/b8b83119-9acc-4a7b-bc84-efacf9043998/1/Writing-2-5-2.html>

<https://www.towson.edu/careercenter/students/careerskills/communication.html>

<https://www.slideshare.net/shahbaazahmed15/bc-communication>

DEPARTMENT OF BOTANY

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

(For those students admitted during the 2021 - 22 and after)

PART – III : Core Course 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	To acquire the knowledge on laws of inheritance	K, K2 & K3
CO2	To understand the concept of multiple alleles, recombination and sex determination	K, K2 & K3
CO3	To gain the knowledge of extra chromosomal inheritance, mutation and gene regulation	K, K2 & K3
CO4	To remember the basics of data bases of NCBI	K, K2 & K3
CO5	To, apply the skills to analyze the sequence alignments and phylogeny	K, K2 & K3

K1 – Knowledge

K2 – Understand

K3 – Apply

Mapping of CLO with PLO

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7
CLO 1	9	1	1	9	9	3	9
CLO 2	9	1	1	3	3	1	9
CLO 3	9	1	1	9	9	3	9
CLO 4	9	1	1	9	9	3	9
CLO 5	9	1	1	3	9	9	9
	45	5	5	33	39	19	45

9-Strong

3-Medium

1-Low

Mapping of CLO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CLO1	9	1	3	9	9
CLO2	9	1	3	9	3
CLO3	9	3	9	9	9
CLO4	9	1	9	9	9
CLO5	3	1	9	9	9

3-Strong

2-Medium

1-Low

Syllabus

UNIT	CONTENT	HOURS
Unit – I	Plant Cell structure - structure and functions of the following Cell membrane, Mitochondria, Chloroplast, Ribosome, Endoplasmic reticulum and Golgi complex	12
Unit – II	Nucleus: structure and function - chromosomes: structure and function, giant chromosomes (Polytene and Lamp brush chromosomes) - Cell cycle, Cell division: Mitosis, meiosis and their significance.	12
Unit – III	Microsporogenesis: Development of microsporangium, Structure of anther, pollen grain structure and development	12

	of male gametophyte.	
Unit – IV	Megasporogenesis: Structure of ovule, types and development of embryosac - (<i>Polygonum</i> , <i>Allium</i> , <i>Peperomia</i>) Pollination, Fertilization: double fertilization and its significance.	12
Unit – V	Endosperm – types of endosperm (nuclear, cellular and helobial) and its significance – Embryo: development of dicot embryo (<i>Capsella</i> type), development of monocot embryo (<i>Luzula</i> type)	12

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.

Online Resources:

1. https://onlinecourses.swayam2.ac.in/cec20_ma14/unit?unit=67&lesson=70 (Cell Biology Unit 1 & 2)
2. https://onlinecourses.nptel.ac.in/noc20_bt36/course (Plant Embryology)
3. https://www.brainkart.com/article/Post-Fertilization-structure-and-events_38204/ (Fertilization, Endosperm and Dicot embryo development)
4. <https://www.slideshare.net/naveenagirish/monocot-and-dicot-navi> (Embryogenesis)
5. <https://www.slideshare.net/jayakar/embryogenesis> (Monocot Embryo development)

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
UNIT I				
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
Unit – II				
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
Unit – III				
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
Unit – IV				
4.1	Structure of megasporanigium, megasporogenesis, formation of female gametophytes (<i>Polygonum, Allium, Peperomia</i>)	3	Calk & Talk	Chart, Plant material & Green Board

	and Fertilization.			
4.2	Megasporogenesis,	3	Calk & Talk	Green Board
4.3	Formation of female gametophytes (<i>Polygonum</i> , <i>Allium</i> , <i>Peperomia</i>)	3	Calk & Talk	Green Board
4.4	Process of Fertilization and post fertilization changes	3	Calk & Talk	Green Board
Unit – V				
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		

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 LOCF)
(For those students admitted during the 2021 -22 and after)

PART – III : Core Course 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

- ❖ Understand the principles of Phytogeography of various ways of plant distribution

Course Outcomes (CO)

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

Number	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO1	To learn components of ecosystem and its factors	K1, K 2 /K3
CO2	To compare the different plant groups and plant succession	K1, K 2 /K3
CO3	To apply the quadrat method for vegetation analysis	K1, K 2 /K3
CO4	To gain the impact of pesticides in living organisms	K1, K 2 /K3
CO5	To remember the concept of phytogeography	K1, K 2 /K3

K1-knowledge

K2-Understand

K3-Apply

Mapping of CLO with PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	3	3	3	9	9	3
CLO2	3	9	9	9	9	9	3
CLO3	3	3	3	9	9	9	3
CLO4	3	9	9	9	9	9	3
CLO5	9	9	3	3	9	9	3
	27	33	27	33	45	45	15

9-Strong

3-Medium

1-Low

Mapping of CLO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CLO1	9	3	3	3	9
CLO2	9	3	3	9	3
CLO3	9	3	3	9	9
CLO4	3	3	3	9	9
CLO5	9	3	3	9	3

9-Strong

3-Medium

1-Low

Syllabus

UNIT No	CONTENT	HOURS
Unit-I	ECOLOGY AND THE ENVIRONMENT Ecology: Definitions, divisions and ecosystem: definitions and components of ecosystem Ecological Factors: 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.	12

Unit- II	ECOLOGICAL GROUPS AND SUCCESSION a) Ecological groups: Definitions, Classification & Adaptations of Xerophytes, Hydrophytes and Halophytes b) Succession: Kinds of succession – Process of succession – Types of succession – Xerosere and Hydrosere	12
Unit- III	POPULATION ECOLOGY a) Definitions – Ecotypes, its characteristics, formation and origin of new ecotypes, delimitation of ecotypes, significance of ecotypes – Ecoclines b) Methods of studying vegetation – Quadret method only.	12
Unit-IV	ECO-TOXICOLOGY Hazards of pesticides – Effects of pesticides on animal life – effects on plants – effects on human life.	12
Unit- V	PHYTOGEOGRAPHY Distribution of plants – continuous and discontinuous distribution – Continental drift - Endemism – Age and Area hypothesis.	12

Text Books

1. Plant Ecology - Shukla & Chandel, S. Chand & Company, 2013 Ed.
2. Environmental science and engineering – P. Venugopal 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 & 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				
1.1	Ecology ad ecosystem-Definition and types and ecological parameters	1	Discussion	Green Board
1.2	Introduce ecological factors	1	Discussion	Green Board
1.3	Climatic factors – Light,	1	Lecture	Green Board
1.4	Temperature and wind	1	Lecture	Green Board
1.5	Biotic factors	1	Discussion	Green Board

1.6	Interaction among plants	1	Chalk & Talk	Green Board
1.7	Interaction between plants and animal	1	Lecture	Green Board
1.8	Structure of edaphic factor	1	Lecture	Green Board
1.9	Composition of soil	1	Chalk & Talk	Green Board
1.10	Origin and formation of soil	1	Chalk & Talk	Green Board
1.11	Structure of soil profile	1	Discussion	LCD
1.12	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	Definitions – Ecotypes, its characteristics,	2	Chalk & Talk	Green Board
3.1	Formation and origin of new ecotypes,	3	Chalk & Talk	Green Board
3.2	Delimitation of ecotypes, significance of ecotypes – Ecoclines	3	PPT	LCD
3.3	Methods of studying vegetation – Quadrat method only	4	PPT	LCD
Unit -4				
4.0	Eco - toxicology in hazards of pesticides	2	Discussion	Green Board
4.1	Effects of pesticides on animal life	3	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
Unit -5				
5.0	Introduction about phytogeography	2	Lecture	Green Board
5.1	Distribution of plants	2	Chalk &	Green Board

			Talk	
5.2	Distribution of plants – continuous and discontinuous distribution	2	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
	Total	60		

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

Dr. V. RAMESH

DEPARTMENT OF BOTANY

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

(For those students admitted during the 2021 - 22 and after)

PART – III : Core Course Lab		SEMESTER – IV
Course Title: Biochemistry, Biophysics, Biometrics, Genetics, Bioinformatics, Cell Biology, Embryology and 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, embryology and ecology of plant

Course Outcomes (CO)

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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	To explain and formulate the biochemical experiments	K2
CO2	To analyze the biochemical experiments	K3
CO3	To apply statistical tools and categorize the genetical problems	K3
CO 4	To identify the cell organelles and embryological characters of the plants	K3
CO 5	To identify the ecological characters	K3

K1-knowledge

K2-Understand

K3-Apply

Mapping of CLO with PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	3	3	3	9	9	3
CLO2	3	9	9	9	9	9	3
CLO3	3	3	3	9	9	9	3
CLO4	3	9	9	9	9	9	3
CLO5	9	9	3	3	9	9	3
	27	33	27	33	45	45	15

9-Strong

3-Medium

1-Low

Mapping of CLO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CLO1	9	3	3	3	9
CLO2	9	3	3	9	3
CLO3	9	3	3	9	9
CLO4	3	3	3	9	9
CLO5	9	3	3	9	3

9-Strong

3-Medium

1-Low

Syllabus

UNIT No.	CONTENT	HOURS
UNIT I	1. Determination of Complementary Colors 2. Verification of Beer's Law 3. Preparation of Buffers Solution at different molar concentration and measurement of pH 4. Titration curve of weak acid 5. Titration curve of Strong acid 6. Preparation of standard graph for starch 7. Estimation of Protein in a given material	12

UNIT II	8. Estimation of starch in a given material 9. Circular paper chromatography – Dyes 10. Quantitative estimation of Plant Pigments using Spectrophotometer 11. Spectrometric Estimation of Isolated DNA 12. Separation of Proteins by Sodium Dodecyl sulfate – Polyacrylamide Gel Electrophoresis (SDS-PAGE) 13. Qualitative Test for carbohydrates and Protein (Any 10 in unit I & unit 2)	18
UNIT III	14. Calculate the standard deviation of the given material 15. Genetics problems 16. Observing and identifying the spotters at sight and writing explanatory notes on them – Bioinformatics Photographs	6
UNIT IV	17. Cell organelles (slides only) 18. Non-living inclusions – Raphides & cystolith (Slides only) 19. T.S. of anther to study various stages of Microsporogenesis (Slides only) 20. Types of ovules (Slides only) 21. Onion Root tip squash to observe mitosis cell division 22. Study of polyploidy in onion root tips 23. Embryo mounting – <i>Cucumis</i>	12
UNIT V	22. To determine the quantitative characters in the community by using quadrat method a) Frequency b) abundance c) density 24. Study of xerophytes, hydrophytes and halophytes (Photographs only) 25. Internal structure of <i>Nerium</i> leaf, <i>Casuarina</i> stem, <i>Hydrilla</i> stem and <i>Nymphaea</i> petiole 24. Field visit – Report preparation on vegetation types, conservation measures under taken in biosphere reserves/ national parks/ sanctuaries etc.	12

Text Books

1. J. Jeyaraman. Laboratory Manual in Biochemistry. Wiley Eastern Ltd.
2. Harborne, J.B. (1998). Phytochemical Methods. A guide to modern techniques of Plant Analysis. Chapman and Hall Publication, London
3. Odum EP Barrett Gary W. Fundamentals of Ecology, Brooks/Cole, 2004.
4. Johri, B.M. I (1984). Embryology of Angiosperms, Springer-Verlag, Netherlands.
5. Singh, R.J. (2017). Practical Mannual on Plant Cytogenetics. CRC Press, Boca Raton, Florida, USA.

Reference Books

1. Buchanan BB Gruissem W Jones RL. Biochemistry and Molecular biology of Plants, IK, International Publishers, New Delhi. 2000.
2. Keithwilson & John Walkar – Practical Biochemistry, Cambridge University Press.
3. Shukla RS Chandal PS. A Text Book of Plant Ecology, S.Chand Publishers, 2009.
4. Bhojwani, S.S. and Bhatnagar, S.P. (2011). The Embryology of Angiosperms, Vikas Publishing House. Delhi.

5. Karp, G. (2010). Cell Biology, John Wiley & Sons, U.S.A. 6th edition.

Online Resources

1. http://www.biology.arizona.edu/Cell_bio/activities/cell_cycle/cell_cycle.html (Onion Root Tip: Mitosis)
2. <http://virtualbiologylab.org/membranes/> (Cell Membranes)
3. <https://vlab.amrita.edu/?sub=3&brch=311> (Bioinformatics)
4. <https://vlab.amrita.edu/?sub=3&brch=63> (Biochemistry)
5. <https://vlab.amrita.edu/?sub=3&brch=187> (Cell Biology)
6. <https://vlab.amrita.edu/?sub=3&brch=272> (Plant Ecology)

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				
1.1	Determination of Complementary colours	3	Chalk & Talk	Green Board, Instrument, Glassware & chemicals
1.2	Verification of Beer's Law	2		
1.3	Preparation of Buffers & measurement of pH	2		
1.4	Titration curve of weak acid	2		
1.5	Titration curve of Strong acid			
1.5	Preparation of standard graph for starch & Estimation of Protein in a given material	3		
UNIT II				
2.1	Estimation of starch in a given material	4	Chalk & Talk	Green Board, Instrument, Glassware & chemicals
2.2	Circular paper chromatography – Dyes	2		
2.3	Quantitative estimation of Plant Pigments using Spectrophotometer	4		
2.4	Separation of Spectrometric Estimation of Isolated DNA	4		
2.5	Separation of Proteins by Sodium Dodecyl sulfate – Polyacrylamide Gel Electrophoresis (SDS-PAGE) Qualitative Test for carbohydrates and Protein	4		
UNIT III				
3.1	Calculate the standard deviation of the given material	2	Chalk & Talk	Green Board, Vegetation
3.2	Genetics problems	2	Chalk &	Green Board,

			Talk	Vegetation
3.3	Observing and identifying the spotters at sight and writing explanatory notes on them – Bioinformatics Photographs	2	Chalk & Talk	Green Board, Photos, Plant materials
UNIT IV				
4.1	1. Cell organelles (slides only) 2. Non-living inclusion – Raphides & cystolith (Slides only)	2	Chalk & Talk	Green Board, Microscope, Photos, Plant materials
4.2	T.S. of anther to study various stages of Microsporogenesis (Slides only)	2	Chalk & Talk	Green Board, Microscope, Photos, Plant materials
4.3	Types of ovules (Slides only)	2	Chalk & Talk	Green Board, Microscope, Photos, Plant materials
4.4	Onion Root tip squash to observe mitosis cell division	2	Chalk & Talk	Green Board, Microscope, Specimen, Plant materials
4.5	Study of polyploidy in onion root tips	2	Chalk & Talk	Green Board, Microscope, Photos, Specimen
4.6	Embryo mounting – <i>Cucumis</i>	2	Chalk & Talk	Green Board, Microscope, Photos, Specimen,
UNIT V				
5.1	To determine the quantitative characters in the community by using quadrat method. a) Frequency b) abundance c) density	4	Chalk & Talk	Photographs Green Board, Microscope, Specimen
5.2	Study of Xerophytes, hydrophytes and halophytes 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	Field visit – Report preparation on vegetation types, conservation measures under taken in biosphere reserves/ national parks/ sanctuaries etc.	4	Filed	Green Board, Microscope, Specimen

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

Dr. V. RAMESH

DEPARTMENT OF ZOOLOGY

Programme: B.Sc., Zoology, (Under CBCS and LOCF)

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

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

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)
CO 1	Acquire knowledge on structure, mode of infection, development and remedies of virus and viral diseases.	K1
CO 2	Understand the structure, mode of infections, biology and remedies of bacteria and bacterial diseases.	K2
CO 3	Impart knowledge on differential diseases caused by fungal, protozoan and helminthes.	K2
CO 4	Explore the avenues, opportunities and limitations of sericulture, fish culture and vermiculture	K2
CO 5	Trace the organization, characteristics, candidates, culture and entrepreneurial values of biogas, mushroom culture, apiculture.	K3

K₁-Remembering

K₂-Understanding

K₃-Applying

Mapping of CLO with PLO

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO6	PLO7
CLO 1	3	-	9	3	3	1	1
CLO 2	3	-	9	3	3	1	1
CLO 3	3	-	9	3	3	1	-
CLO 4	3	-	3	1	-	9	3
CLO 5	3	-	3	1	-	9	3
	15	-	33	11	9	21	8

9-Strong

3-Medium

1-Low

Mapping of CLO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	-	3	1	2	1
CLO 2	-	1	1	3	-
CLO 3	-	-	1	1	1
CLO 4	-	1	9	3	3
CLO 5	-	1	9	9	1

9-Strong

3-Medium

1-Low

Syllabus

UNIT-I	a. Structure of a typical virus b. Brief account on Viral diseases c. Polio, Rabies and AIDS	(12 Hrs)
UNIT-II	a. Structure of typical Bacteria b. Brief account on Bacterial diseases c. Cholera, Tuberculosis and Tetanus	(12 Hrs)
UNIT- III	a. Fungal diseases – Ringworm and Black piedra b. Protozoan diseases – Amoebic dysentery and Malaria c. Helminth parasites – Ancylostoma and Wucheraria	(12 Hrs)

UNIT- IV	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.	(12 Hrs)
UNIT- V	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.	(12 Hrs)

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.
- 6.

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
Unit -I				12 Hours
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

Unit -II				12 Hours
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
Unit -III				12 Hours
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
Unit -IV				12 Hours
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
Unit -V				12 Hours
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
Total		60		

Course Designer (Name of the Course Teacher)	Head of the Department
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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)

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

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)
CO 1	Acquire knowledge on the body systems in the representative animals	K1,K2,K3
CO 2	Notify the specific characters, identifying structures in the preserved, stuffed and dried animals.	K1,K2,K3
CO 3	Observe the microscopic organisms to analyse their survival skills.	K1,K2,K3
CO 4	Demonstrate the staining and mounting techniques in microbes and representative insects.	K1,K2,K3
CO 5	Trace the entrepreneurial skills, biodiversity, habitat, environment through the field visit.	K1,K2,K3

K1-Remembering

K2-Understanding

K3-Applying

Mapping of CLO with PLO

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO6	PLO7
CLO 1	3	-	-	-	3	3	1
CLO 2	3	-	-	-	3	9	3
CLO 3	1	-	-	1	3	3	1
CLO 4	1	-	-	1	1	3	3
CLO 5	-	-	9	3	3	9	3
	8	0	9	5	13	27	11

9-Strong

3-Medium

1-Low

Mapping of CLO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	-	3	1	3	1
CLO 2	-	1	1	3	-
CLO 3	-	-	1	1	1
CLO 4	-	1	9	3	3
CLO 5	-	1	9	9	1

9-Strong

3-Medium

1-Low

Syllabus

1. Observation of the following - **(12 Hrs)**

Spotters

- 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
 - Synsacrum 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
7. 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"> • 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	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 Dissection Tools	Green Board 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
	Total	60		

Course Designer (Name of the Course Teacher)	Head of the Department
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DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and LOCF)
(For those students admitted during the 2021 -22 and after)

PART – IV : Skill Enhancement Course		SEMESTER – IV
Course Title: Horticulture and Plant Breeding		
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 and improvement of innovative garden
- ❖ To know the simple practice for the plant breeding techniques

UNIT I

Introduction to Horticulture - types of gardening: indoor, public and dam gardens - Propagation techniques: Cutting, layering & grafting

UNIT II

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

UNIT III

Horticultural techniques: disbudding, ringing, notching, smudging and pruning - Kitchen gardening - layout and maintenance – rockery - Bonsai and lawn

UNIT IV

Introduction of Plant Breeding – Aims and procedure for plant introduction - acclimatization – achievements in plant introduction – selection methods: Mass selection, pure line selection

UNIT V

Hybridization and its methods: Interspecific hybridization, Interspecific hybridization, - Heterosis and methods of Heterosis breeding - Ploidy breeding: Types of polyploids, methods to induce polyploidy – mutation breeding: types, advantages and disadvantages

Text Books

1. Horticulture – V.L. Sheela, MJ Publishers, 2013 Ed.
2. Horticulture at a glance – Amar singh, Kalyani Pub, Chennai, 2013 Ed.
3. Elementary Principles of Plant Breeding - H.K Chanduri, Oxford & IBM, 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. Plant Breeding, biomet & biotech – Dijak Kumar, New Central Book Agency, New Delhi, 2010 Ed.

Online Resources:

1. <http://agrimoon.com/fundamentals-of-horticultur-pdf-book/>
2. <https://www.iaritoppers.com/p/horticulture-icar-ecourse-pdf-books.html>
3. <http://agrimoon.com/horticulture-icar-ecourse-pdf-books/>
4. <http://www.freebookcentre.net/Biology/Agriculture-Books.html>
5. <https://gardenbeast.com/ebooks/>
6. <https://connectapharma.com/qsn1u1/39153d-horticulture-books-pdf>

(Name of the Course Teacher)

Dr. V. RAMESH

Dr. V. RAMESH

DEPARTMENT OF BOTANY

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

(For those students admitted during the 2021 - 22 and after)

PART – III : Core Course Theory		SEMESTER – V
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

CO Number	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO1	Classify the Angiosperms based on their morphological characters	K1,K2 & K3
CO2	Understanding the herbarium preparation techniques and Modern taxonomy	K1,K2 & K3
CO3	Distinguish the features and economic importance of Angiosperm families	K1,K2 & K3
CO4	Demonstrate and point out the characters and values of plants	K1,K2 & K3
CO5	Identify and use the Economically important plants	K1,K2 & K3

K1-Knowledge

K2-Understand

K3-Apply

Mapping of CLO with PLO

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7
CLO 1	9	9	3	9	3	9	3
CLO 2	9	9	3	9	9	9	3
CLO 3	9	9	3	9	9	9	3
CLO 4	9	9	3	9	3	9	3
CLO 5	9	3	3	9	3	9	3
	45	39	15	45	27	45	15

9-Strong

3-Medium

1-Low

Mapping of CLO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	9	9	9	9	3
CLO 2	9	9	3	9	9
CLO 3	9	9	9	3	9
CLO 4	9	9	9	9	3
CLO 5	9	9	9	9	3

9-Strong

3-Medium

1-Low

Syllabus

UNIT No.	CONTENT	HOURS
Unit- I	Botanical Nomenclature – ICBN: and Classification: Bentham & Hooker - Merits and demerits, Engler & Prantl - Important terminologies in morphological features - Angiosperm Phylogeny Group (APG) classification outline only	15
Unit- II	Botanical survey of India - field and herbarium techniques - Modern trends in taxonomy (Chemo & Numerical) – Digital taxonomy: E- flora & Digital Herbaria	20
Unit- III	Vegetative, floral characters and Economic importance of the following families: Annonaceae, Capparidaceae, Meliaceae,	20

	Rutaceae, (Fabaceae viz.,) Faboideae, Ceasalpinioideae and Mimosoideae, Cucurbitaceae and Apiaceae	
Unit-IV	Distinguishing features and economic importance of the following families: Rubiaceae, Asteraceae, Asclepiadoideae Solanaceae, Scrophulariaceae, Lamiaceae, Amaranthaceae, Euphorbiaceae (Phyllanthaceae), Orchidaceae, Arecaceae & Poaceae.	20
Unit- V	Fibers and fiber yielding plants - Spices and condiments - Resins and gums - Processing and extraction of sugar & tea	15

Text Books

1. Taxonomy of Angiosperms- B.P. Pandey, S.Chand & Company Ltd, Delhi, 2014 Ed.
2. Plant Taxonomy, Saxena and Saxena, A Pragti Edition, Pragati PVT Ltd, Meerut, 2017 Ed.
3. Economic Botany- Hill Albert T, Surjeet Publications, New Delhi, 2012 Ed.

Reference Books

1. Morphology of Angiosperms – Eames Arthur.J, Surjeet Publications, New Delhi, 2014 Ed.
2. Economic Botany-B.P. Pandey, S Chand & Company Ltd, New Delhi, 2014 Ed.
3. Economic Botany, V Singh, PC Pande and DK Jain, Rastogi Publications, 2015 Ed.

Online Resources:

1. <https://www.slideshare.net/Wabworld/angiosperms-flowering-plants-powerpoint-presentation> (Taxonomy of angiosperms)
2. https://www.slideshare.net/bisharifa/botanical-nomenclature?next_slideshow=1 (Bionomial nomenclature)
3. <https://www.slideshare.net/DrRaviPrasadRaoBoyin/angiosperm-classifications> (Angiosperms classification)
4. <https://www.slideshare.net/ManojJoshi12/bentham-and-hooker-classification> (Bentham and Hooker classification)
5. https://www.slideshare.net/jayakar/engler-prantl-system-of-classification?next_slideshow=1 (Engler and Prantl classification)
6. <https://www.slideshare.net/gkumarimahesh/chemotaxonomy-115163128> (Chemotaxonomy)
7. <https://www.slideshare.net/bonnmengullo/herbarium-ppt> (Herbarium preparation)
8. <https://www.slideshare.net/BibianLalawmpuii/processing-of-tea> (Tea processing)
9. <https://www.slideshare.net/najjatarik/sugar-manufacturing-process> (Sugar processing)

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
Taxonomy of Angiosperms				

Unit - I				
1.1	Botanical Nomenclature	2	Chalk and talk	Green Board
1.2	Principles of classification	1	Chalk and talk	Green Board
1.3	Bentham & Hooker classifications of Angiosperms	3	Chalk and talk	Green Board
1.4	Merits and demerits of Bentham & Hooker classification of Angiosperms	2	Chalk and talk	Green Board
1.5	Engler & Prantl classifications of Angiosperms	3	Chalk and talk	Green Board
1.6	Merits and demerits of Engler & Prantl classification	1	Chalk and talk	Green Board
1.7	Important technologies in morphological features	3	Chalk and talk	Green Board
Unit – II				
2.1	ICBN	3	Chalk and talk	Green Board
2.2	Botanical survey of India	2	Chalk and talk	Green Board
2.3	Herbarium techniques	3	Chalk and talk	Green Board
2.4	Modern trends in taxonomy	3	Chalk & Talk	Green Board
2.5	Chemotaxonomy	3	Chalk & Talk	Green Board
2.6	Numerical taxonomy	3	Chalk & Talk	Green Board
2.7	Digital taxonomy	3	Chalk & Talk	Green Board
Unit –III : Distinguishing features and economic importance of following families				
3.1	Annonaceae	2	Chalk & Talk	Green Board
3.2	Capparidaceae	2	Chalk & talk	
3.3	Faboideae,	2	Chalk & Talk	Green Board
3.4	Meliaceae	2	Chalk & Talk	PPT
3.5	Rutaceae	2	Discussion	Green Board
3.6	Cesalpinioidae	2	Chalk & Talk	Green Board
3.7	Mimosoideae	2	Chalk & Talk	Green Board
3.8	Cucurbitaceae	2	Chalk & Talk	Green Board
3.9	Apiaceae	2	Lecture	Green Board

Unit – IV: Distinguishing features and economic importance of following families				
4.1	Rubiaceae	2		
4.2	Asteraceae	2	Discussion	Green Board
4.3	Asclepiadoideae	2	Chalk & Talk	Green Board
4.4	Solanaceae	2	Chalk & Talk	Green Board
4.5	Scrophulariaceae	1	Chalk & Talk	Green Board
4.6	Lamiaceae	2	Lecture	Green Board
4.7	Amarantaceae,	2	Chalk & Talk	Green Board
4.8	Euphorbiaceae	2	Chalk & Talk	Green Board
4.9	Orchidaceae	2	Chalk & Talk	Green Board
4.10	Arecaceae	1	Chalk & Talk	Green Board
4.11	Poaceae	2	Chalk & Talk	Green Board
Economic Botany				
Unit – V				
5.1	Fiber and fiber yielding plants	4	Lecture	Green Board
5.2	Spices and condiments	4	Chalk & Talk	Green Board
5.3	Resins and gums	3	Chalk & Talk	Green Board
5.4	Processing and extraction of sugar & tea	4	Chalk & Talk	Green Board
	Total	90		

Course Designer (Name of the Course Teacher)	Head of the Department
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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)

PART – III : Core Course 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

CO Number	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	To gain the knowledge of plants and water relationship involved in transport of water	K1, K2 & K3
CO2	To understand the system on physiological mechanisms of metabolic growth in plants	K1, K2 & K3
CO3	To demonstrate the physiological mechanisms involved in biosynthesis of molecules	K1, K2 & K3
CO 4	To knowledge of plant nutrients for their development	K1, K2 & K3
CO 5	To apply the knowledge on physiological mechanisms of growth regulators in emerging the seedlings	K1, K2 & K3
K1-knowledge		K2-Understand
		K3-Apply

Mapping of CLO with PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	9	9	9	3	9	3
CLO2	9	9	3	3	3	3	3
CLO3	3	3	3	3	3	9	9
CLO4	9	3	3	3	3	3	3
CLO5	9	9	3	3	3	3	3
	45	39	15	45	27	45	15
9-Strong		3-Medium			1-Low		

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CLO1	9	3	9	9	3
CLO2	3	3	9	9	3
CLO3	3	3	9	3	3
CLO4	3	3	9	3	9
CLO5	3	3	9	3	3
9-Strong		3-Medium			1-Low

Syllabus

UNIT	CONTENT	HOURS
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No.		
UNIT I	Plants and water relations: 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.	15
UNIT II	Mineral nutrition a) Role of macro and micro elements – mechanism of absorption of minerals. b) Mechanism of translocation of solutes - Composition of phloem sap, girdling experiment; Pressure flow model; Phloem loading and unloading.	15
UNIT III	Photosynthesis a) Structure of Chloroplast and Chlorophyll pigments – light reaction: light harvesting complex; light absorption, composition and characteristics of two photosystems, photosynthetic electron transport – Dark reactions (C ₃ and C ₄ pathways) CAM plants – Photorespiration. b) Respiration – RQ – Mechanism [Glycolysis, Kreb's cycle – oxidative phosphorylation – Pentose phosphate shunt-fermentation.	15
UNIT IV	Sensory photobiology Structure, function and mechanisms of action of phytochromes, cryptochromes and phototropins - Photoperiodism, Biological clocks and Vernalization - Plant movements: Geotropism, Phototropism, Thigmotropism	15
UNIT V	Growth and development Growth – definition – Physiological effects of Growth hormones (Auxins, gibberellins, Cytokinins, Absciscic acid and ethylene) - Seed dormancy: Physical and Chemical methods of breaking seed dormancy.	15

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.

Online Resources

1. <https://byjus.com/biology/plasmolysis/> plasmolysis
2. <https://byjus.com/questions/explain-the-mechanism-of-opening-and-closing-of-stomata/> (Mechanism of stomata opening
3. <https://www.livescience.com/51720-photosynthesis.html> (Photosynthesis)

4. <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/nitrogen-metabolism> (Nitrogen metabolism)
5. <https://www.britannica.com/science/enzyme> (Enzymes)
6. <https://www.britannica.com/science/photoperiodism> (Photoperiodism)

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				
Plants and water relations				
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	3	Chalk & Talk	Green Board
1.5	Factors affecting absorption	1	PPT	LCD
1.6	Transpiration – Types of transpiration	2	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
UNIT II				
2.1	Role of macro elements	2	Chalk & Talk	Green Board
2.2	Role of micro elements	2	Chalk & Talk	Green Board
2.3	Mechanism of absorption of minerals.	2	Chalk & Talk	Green Board
2.4	Mechanism of translocation of solutes	2	Chalk & Talk	Green Board
2.5	Composition of phloem sap, girdling experiment;	1	PPT	LCD
2.6	Pressure flow model;	2	PPT	LCD
2.7	Phloem loading and unloading.	4	Chalk & Talk	Green Board
UNIT III				
3.1	Photosynthesis: Structure of Chloroplast and Chlorophyll pigments	2	Chalk & Talk	Green Board
3.2	Light reaction – Dark reactions	2	PPT	LCD
3.3	C ₃ and C ₄ pathways	2	Chalk & Talk	Green Board
3.4	CAM Plants- Photorespiration	2	PPT	LCD

3.5	Respiration – RQ	2	Chalk & Talk	Green Board
3.6	Mechanism of glycolysis	2	Chalk & Talk	Green Board
3.7	Mechanism of Kreb's cycle, Oxidative Phosphorylation & Pentose phosphate shunt-Fermentation	2	Chalk & Talk	Green Board
3.8	Pentose phosphate shunt-Fermentation	3	Chalk & Talk	Green Board
UNIT IV				
4.1	Sensory photobiology Structure, function and mechanisms of action of phytochromes	4	PPT	LCE
4.2	Structure, function and mechanisms of action of cryptochromes and phototropins	4	PPT	LCD
4.3	Photoperiodism, Biological clocks and Vernalization	4	Chalk & Talk	Green Board
4.4	Plant movements: Geotropism, Phototropism, Thigmotropism	3	PPT	LCD
UNIT V				
Growth and development				
5.1	Growth – definition- physiological effects of Growth hormones	1	Chalk & Talk	Green Board
5.2	Auxins	2	PPT	LCD
5.3	Gibberellins	2	PPT	LCD
5.4	Cytokinins	2	PPT	LCD
5.5	Ethylene	1	PPT	LCD
5.6	Abscisic acid	2	Chalk & Talk	Green Board
5.8	Vernalization.	1	Chalk & Talk	Green Board
5.9	Seed dormancy	4	Chalk & Talk	Green Board
	Total	75		

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

Dr. V. RAMESH

DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and LOCF)
(For those students admitted during the 2021 - 22 and after)

PART – III : Core Course Theory		SEMESTER – V
Course Title: Microbiology		
Course Code: 08CT53	Hours per week:5	Credit:4
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

Preamble

- ❖ To acquire basic knowledge on micrLOCFs
- ❖ To know the importance of micrLOCFs 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

CO Number	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	To recall the contributions of microbiologists and diversity of micrLOCFs	K1, K2 & K3
CO2	To examine the nutritional characteristics and multiplication of micrLOCFs	K1, K2 & K3
CO3	To apply the concept of microbial controlling techniques	K1, K2 & K3
CO4	To assess the microbial photosynthesis and role of microorganisms in manufacturing of value added products	K1, K2 & K3
CO5	To gain the basic knowledge of immune system and antigen antibody reactions in biological systems	K1, K2 & K3

K1 – Knowledge

K2 – Understand

K3 – Apply

Mapping of CLO with PLO

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7
CLO 1	9	1	9	9	9	9	9
CLO 2	9	1	9	9	9	9	3
CLO 3	9	1	9	9	9	9	9
CLO 4	9	1	1	9	9	3	3
CLO 5	9	1	9	9	9	1	9
	45	5	37	45	45	31	33

9-Strong

3-Medium

1-Low

Mapping of CLO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	9	9	3	9	9
CLO 2	3	3	9	9	9
CLO 3	1	9	9	9	9
CLO 4	3	3	9	9	9
CLO 5	1	1	1	9	3

9-Strong

3-Medium

1-Low

Syllabus

UNIT NO	CONTENT	HOURS
Unit – I	Introduction to Microbiology – contributions of Anton Van Leeuwenhoek, Louis Pasteur, RLOCFrt Koch and his postulates - Microbial diversity – General features and structure of Bacteria, Viruses, Bacteriophage, Yeast and Cyanobacteria - Staining of Bacteria	15

Unit – II	Microbial growth - nutrient requirements - sources of nutrients – nutritional classification - culture media – measurement of growth – bacterial growth curve – role of antimicrobial agents on growth.	15
Unit – III	Control of microorganisms – 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	15
Unit – IV	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.	15
Unit – V	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 – Vaccines	15

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.

Online Resources

1. <https://www.slideshare.net/RAMESHVELCHAMY/introduction-to-microbiology-238350723> (Introduction To Microbiology)
2. <https://www.slideshare.net/RAMESHVELCHAMY/general-features-and-structure-of-cyanobacteria> (General Features and Structure of cyanobacteria)
<https://www.slideshare.net/RAMESHVELCHAMY/general-characters-and-structure-of-viruses> (General Features and Structure Of Viruses)
3. <https://www.slideshare.net/RAMESHVELCHAMY/general-features-and-structure-of-yeastppt> (General Features and Structure of Fungi)
4. <https://www.slideshare.net/RAMESHVELCHAMY/structure-of-bacterial-cell-238356353> (Structure of Bacteria)
5. <https://vlab.amrita.edu/?sub=3&brch=73&sim=208&cnt=1> (Staining Techniques)
6. <https://www.slideshare.net/RAMESHVELCHAMY/nutrition-and-nutritional-types-of-bacteria> (Nutrition and Nutritional Types of Bacteria)
7. <https://www.slideshare.net/RAMESHVELCHAMY/measurement-of-bacterial-growth> (Measurement of Bacterial Growth)
8. <https://www.slideshare.net/RAMESHVELCHAMY/culture-media-238960762> (Preparation of Culture Media)

9. <https://www.slideshare.net/RAMESHVELCHAMY/bacterial-growth-curve-238960758> (Bacterial Growth Curve)
10. <https://www.slideshare.net/RAMESHVELCHAMY/control-of-micrLOCFs> (Control of MicrLOCFs)
11. <https://www.slideshare.net/RAMESHVELCHAMY/bacterial-photosynthesis-239049215> (Bacterial Photosynthesis)
12. <https://www.slideshare.net/RAMESHVELCHAMY/citric-acid-production-239049232> (Citric acid Production)
13. <https://vlab.amrita.edu/?sub=3&brch=69&sim=721&cnt=1> (Direct Elisa)

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
UNIT I				
1.1	Introduction to Microbiology	4	Calk & Talk	Green Board & Online virtual Lab
1.2	Contributions of Anton Van Leeuwenhoek, Louis Pasteur, RLOCFrt Koch and his postulates	4	Calk & Talk	Green Board & Online virtual Lab
1.3	Microbial diversity – General features and structure of Bacteria, Viruses, Yeast and Cyanobacteria	4	Calk & Talk	Green Board & Online virtual Lab
1.4	Staining of Bacteria	3	Calk & Talk	Green Board Online virtual Lab
Unit – II				
2.1	Microbial growth - nutrient requirements & sources of nutrients	4	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	4	Calk & Talk	Green Board Online virtual Lab & PPT
2.4	Bacterial growth curve – role of antimicrobial agents on growth.	4	Calk & Talk	Green Board, Online virtual Lab & PPT
Unit – III				
3.1	Control of micrLOCFs – basic aspects of sterilization,	3	Calk & Talk	Green Board, Online virtual Lab & PPT

3.2	Disinfection, antiseptic, sanitation, tyndallisation, pasteurization	4	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)	4	Calk & Talk	Green Board, Online virtual Lab & PPT
3.4	Chemical methods (Phenolic compounds, alcohols, halogens, heavy metals, aldehydes) in sterilization process	4	Calk & Talk	Green Board, Online virtual Lab & PPT
Unit – IV				
4.1	Microbial Metabolism	4	Calk & Talk	Green Board, Online virtual Lab & PPT
4.2	Photosynthesis – Light reactions of Purple Sulfur bacteria	4	Calk & Talk	Green Board, Online virtual Lab & PPT
4.3	Purple Non - Sulfur bacteria, Green Sulfur bacteria	4	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
Unit – V				
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	3	Calk & Talk	Green Board & PPT
5.4	Antibody Structure, Types and Function	3	Calk & Talk	Green Board & e-Content
5.5	Brief account of Antigen Antibody reaction & Vaccines	3	Calk & Talk	Green Board & PPT
Total		90		

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

Dr. V. RAMESH

DEPARTMENT OF BOTANY

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

(For those students admitted during the 2021 – 22 and after)

PART – III : Discipline Specific Elective		SEMESTER – V
Course Title: Medicinal Botany		
Course Code: 08EP5A	Hours per week:5	Credit:5

CIA Marks: 25	ESE Marks: 75	Total Marks: 100
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Preamble

- ❖ To understand the concept of traditional medicines
- ❖ To acquire knowledge on botanical diagnosis of fragmentary crude drugs
- ❖ To know the preliminary photochemistry of plant organs and identify medicinal taxon

Course outcome

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

CO Number	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO1	To acquire the knowledge of traditional system of medicine	K1, K2 & K3
CO2	To explore skills on crude drugs preparation and evaluation	K1, K2 & K3
CO3	To gain the knowledge of plant derived secondary metabolites	K1, K2 & K3
CO4	To discuss the botanical description of medicinal plants	K1, K2 & K3
CO5	To apply the medicinal values of plants in day today life	K1, K2 & K3
<div> <div>K1-knowledge</div> <div>K2-Understand</div> <div>K3-Apply</div> </div>		

Mapping of CLO with PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	3	9	9	9	9	3
CLO2	9	9	3	9	3	3	3
CLO3	9	3	3	3	9	9	9
CLO4	9	3	9	3	9	9	9
CLO5	9	3	9	9	3	9	9
	45	21	33	33	33	39	33
<div> <div>9-Strong</div> <div>3-Medium</div> <div>1-Low</div> </div>							

Mapping of CLO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CLO1	9	9	9	9	3
CLO2	3	3	9	9	3
CLO3	3	3	9	9	3
CLO4	9	3	9	9	9
CLO5	3	3	9	9	9
<div> <div>9-Strong</div> <div>3-Medium</div> <div>1-Low</div> </div>					

Syllabus

UNIT NO	CONTENT	HOURS
Unit- I	Pharmacognosy – definition, scope, History, Indigenous system of medicine (Ayurveda, Siddha, Unani, Yoga, Naturopathy & Homoeopathy) – Classification of crude drugs (Alphabetical,	15

	Taxonomical, Morphological, Pharmacological, Chemical and Chemotaxonomical)	
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.	15
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	15
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>	15
Unit- V	Botanical name, common name, family, chemical constituents, and uses of the following Anticancer Plants – <i>Catharanthus roseus</i> , <i>Curcuma longa</i> Antidiabetic Plants – <i>Gymneme sylvestire</i> , <i>Costus igneus</i> Immunity Booster formulations – Nilavembu Kashayam, Kabasura Kudineer	15

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.

Online Resources

1. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4204033/>(Pharmacognosy: Science of natural products in drug discovery)
2. <https://everything.com/chemotaxonomy> (CHEMOTAXONOMY|DEFINITION CLASSIFICATION SIGNIFICANCE)
3. <https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/secondary-metabolite> (Secondary metabolites)
4. <https://www.sciencedirect.com/science/article/abs/pii/S0273230012000633> (guidelines and Pharmacopoeial standards for pharmaceutical impurities: overview and critical assessment)
5. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3459456/>(*Ferula asafoetida*: Traditional uses and pharmacological activity)

6. <https://www.webmd.com/vitamins/ai/ingredientmono-953/ashwagandha-> (Withania somnifera - Overview)
7. <https://www.google.com/search?q=skm+nilavembu+kudineer> (Kabasura Kudineer)

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	5	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	Collection and processing of crude drugs- harvesting, drying, garbling, packing and storage of crude drugs	3	Lecture	Green Board
2.1	Drugs adulteration- types of adulterants	4	Chalk & Talk	Green Board
2.2	Methods of drug evaluation (Physical, chemical, biological and organoleptic)	4	Chalk & Talk	Green Board
2.3	Evaluation and Pharmacopoeia standards	4	Chalk & Talk	Green Board
Unit -3				
3.0	Products derived from plants (Secondary metabolites)	3	Chalk & Talk	Green Board
3.1	Pharmaceutically important products, their classification, properties, isolation and medicinal uses of Alkaloids	4	Discussion	
3.2	Pharmaceutically important products, their classification, properties, isolation and medicinal uses of Tannins and phenols	4	Chalk & Talk	Green Board
3.3	Pharmaceutically important products, their classification, properties, isolation and medicinal uses of Resins and Gums	4	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> , <i>Cinnamomum verum</i> & <i>Santalum album</i>	3	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>	3	Chalk & Talk	Green Board
4.2	Medicinal uses of lower plants – Botanical names, common and vernacular names, morphology of the useful parts and medicinal uses of Buds & flowers - <i>Syzygium aromaticum</i>	3	Chalk & Talk	Green 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>	2	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>	2	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 asa-foetida</i>	2		
Unit -5				
5.0	Botanical name, common name, family, chemical constituents and uses of Anticancer Plants – <i>Catharanthus roseus</i> , <i>Curcuma longa</i>	4	Lecture	Green Board
5.1	Botanical name, common name, family, chemical constituents and uses of Antidiabetic Plants – <i>Gymnema sylvestre</i> , <i>Costus igneus</i>	4	Chalk & Talk	Green Board

5.2	Immunity Booster formulations – Nilavembu Kashayam	4	Chalk & Talk	Green Board
5.3	Immunity Booster formulations Kabasura Kudineer	3	Chalk & Talk	Green Board
	Total	75		

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 LOCF)

(For those students admitted during the 2021 - 22 and after)

PART – III : Discipline Specific Elective		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

No.	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	To acquire the concept of organic farming	K1, K2 & K3
CO 2	To apply the skills to prepare manures for organic farming	K1, K2 & K3
CO 3	To learn the application of bio controlling agence	K1, K2 & K3
CO 4	To study the organic crop production practices and cultivation methods	K1, K2 & K3
CO 5	To create the advanced organic forming technique and certify the organic products	K1, K2 & K3

K1-knowledge

K2-Understand

K3-Apply

Mapping of CLO with PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	9	3	3	3	3	3
CLO2	3	3	9	9	9	9	9
CLO3	3	9	9	9	9	9	9
CLO4	3	3	9	9	9	9	9
CLO5	3	3	9	9	9	9	9
	21	27	39	39	39	39	39

9-Strong

3-Medium

1-Low

Mapping of CLO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CLO1	3	3	3	9	9
CLO2	3	9	9	9	9
CLO3	3	9	9	9	9
CLO4	3	9	9	9	9
CLO5	3	9	9	9	9

9-Strong

3-Medium

1-Low

Syllabus

UNIT NO.	CONTENT	HOURS
UNIT I	Organic Farming: definition, types and role of farming - integrated farming system and mixed farming concept of different cropping systems	15

UNIT II	Composting: principles, methods, types and factors – sources of nutrients: farmyard manure - rural compost - city compost, oil cakes, animal wastes, types and method of vermicomposting - green manure – Panchagavya as foliar spray	15
UNIT III	Water and weed management practices – mulching and types: dry mulching, green mulching, live mulching & stone mulching	15
UNIT IV	Integrated plant protection management – biofence: definition and its companion plants – herbal pest repellants – neem and its formulations – bacterial and Fungal biocontrol agents	15
UNIT V	Organic products certification: guidelines - requirements – procedure – validity – labelling - marketing	15

Text Books

1. Dahama, A.K. (1997). Organic Farming for sustainable Agriculture, Second Enlarged Edition, Jodhpur.
2. Sambamurty, 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 (3rd 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

Online resources

1. [https://www.britannica.com/topic/organic-farming_\(organic_farming_agriculture\)](https://www.britannica.com/topic/organic-farming_(organic_farming_agriculture))
2. <http://www.hillagric.ac.in/edu/coa/agronomy/lect/agron-711/Lecture%201%20Farming%20system%20scope%20importance%20and%20concept.pdf>
3. <https://www.epa.gov/recycle/composting-home> (Composting)
4. https://agritech.tnau.ac.in/ta/org_farm/orgfarm_panchakavya.html (Panchakavya)

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				
1.1	Organic Farming: definition,	5	Chalk &	Green

	types and roll of farming.		Talk	Board
1.2	pure organic farming - integrated farming system	5	Chalk & Talk	Green Board
1.3	mixed farming concept of different cropping systems	5	Chalk & Talk	Green Board
UNIT II				
2.1	Composting- principles, methods, stages, types and factors.	3	Discussion	Green Board
2.2	Sources of nutrients for Organic Manure	3	Lecture	Green Board
2.3	farmyard manure - rural compost - city compost, oil cakes, animal wastes	3	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
UNIT III				
3.1	Water and weed management practices	4	Lecture	Green Board
3.2	mulching and types	4	Discussion	Green Board
3.3	dry mulching, green mulching	4	PPT	LCD
3.4	live mulching & stone mulching	3	Chalk & Talk	Green Board
UNIT IV				
4.1	Integrated plant protection management	3	PPT	LCD
4.2	Biofence: definition and its companion plants	3	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	3	Lecture	Green Board
UNIT V				
5.1	Organic crops certification	4	Discussion	Green Board
5.2	guidelines – requirements	4	Lecture	Green Board
5.3	procedure – validity	3	Discussion	Green Board
5.4	labeling- organic crops marketing	4	Discussion	Green Board

	Total	75		
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Course Designer (Name of the Course Teacher)	Head of the Department
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Dr. T. SELLATHURAI

Dr. V. RAMESH

DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and LOCF)
(For those students admitted during the 2021 - 22 and after)

PART – IV : Skill Enhancement Course	SEMESTER - V
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, published by uni. 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. A popular guide to the identification and study of our common fungi, with special emphasis on the edible fungi. - Marshall, Nina L, garden city pub. garden city, New York, 2010 Ed.

Online Resources

1. <https://www.slideshare.net/RAMESHVELCHAMY/mushroom-cultivation-238350659> (Mushroom Cultivation)

2. <https://www.slideshare.net/RAMESHVELCHAMY/mushroom-diseases-amp-managements> (Mushroom Diseases and Managements)
3. <https://www.slideshare.net/RAMESHVELCHAMY/mushroom-training-and-research-centers-in-tamil-nadu> (Mushroom Training and Research Centers In Tamil Nadu and India)
4. https://agritech.tnau.ac.in/farm_enterprises/Farm%20enterprises_%20Mushroom.html (Farm Enterprises :: Mushroom)

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

Dr. V. RAMESH

DEPARTMENT OF BOTANY

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

(For those students admitted during the 2021 -2022 and after)

PART – III : Core Course Theory		SEMESTER – VI
Course Title: Plant Biotechnology		
Course Code: 08CT61	Hours per week:5	Credit:4

CIA Marks: 25	ESE Marks: 75	Total Marks: 100
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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

CO Number	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	To learn the molecular tools and vectors in genetic engineering	K1, K2 & K3
CO2	To apply fermentation techniques for industrial production of potential products	K1, K2 & K3
CO3	To remember the values of biofertilizers and nitrogen fixation	K1, K2 & K3
CO4	To analyze biogas production, waste water treatment and bioremediation	K1, K2 & K3
CO5	To gain the knowledge of gene therapy and human health care products	K1, K2 & K3

K1 – Knowledge

K2 – Understand

K3 – Apply

Mapping of CLO with PLO

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7
CLO 1	9	9	3	9	9	9	3
CLO 2	9	9	3	9	9	9	3
CLO 3	9	9	3	9	9	9	3
CLO 4	9	9	3	9	3	9	3
CLO 5	9	9	3	9	3	9	3
	45	45	15	45	33	45	15

9-Strong

3-Medium

1-Low

Mapping of CLO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	9	9	9	9	9
CLO 2	9	9	3	9	9
CLO 3	9	9	9	9	9
CLO 4	9	9	9	9	9
CLO 5	9	9	9	9	9

9-Strong

3-Medium

1-Low

Syllabus

UNIT	CONTENT	HOURS
Unit – I	Tissue Culture: Scope and history – culture technique: MS media preparation, sterilization, explant preparation and callus induction - organogenesis: somatic embryogenesis,	15

	micropropagation, artificial seed, anther and protoplast culture-germplasm conservation and cryopreservation – Intellectual Property Rights (IPR) and Protection (IPP) – Biosafety guidelines and regulations	
Unit – II	Recombinant DNA Technology: Introduction of rDNA Technology - molecular tools: nomenclature and characteristics of Restriction Endonucleases & Ligases – Cloning vehicles: bacterial vectors (pBR322, Ti plasmid), – Brief account on strategies of gene cloning in Bacteria – Application of genetic engineering	15
Unit – III	Industrial Biotechnology: An introduction to fermentation process –Batch fermentation and continuous fermentations - Components of a typical bioreactor - Types of bioreactors - Industrial production of ethyl alcohol, and penicillin - Immobilization of enzymes and single cell proteins.	15
Unit – IV	Agricultural Biotechnology: 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 Biocontrol agents - (<i>Trichoderma</i> , <i>Pseudomonas fluorescence</i>)	15
Unit – V	Environmental Biotechnology: 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	15

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 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.

Online Resources:

1. https://onlinecourses.nptel.ac.in/noc20_bt21/course?user_email=ramesh.vnr09@gmail.com (Industrial Boitechnology)
2. <https://vlab.amrita.edu/?sub=3&brch=77&sim=694&cnt=1> (Restriction Digestion)
3. https://agritech.tnau.ac.in/farm_enterprises/Farm%20enterprises_%20biofertilizer.html (Farm Enterprises :: Biofertilizers)

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
UNIT I				
1.1	Scope and history – culture technique: MS media preparation, sterilization, explant preparation	4	Calk & Talk	Green Board & PPT, Online Virtual Lab
1.2	callus induction - organogenesis: suspension culture, somatic embryogenesis	3	Calk & Talk	Green Board & PPT, Online Virtual Lab
1.3	Artificial seed, anther and ovule culture, protoplast culture, somatic hybridization	3	Calk & Talk	Green Board & PPT, Online Virtual Lab
1.4	Germplasm conservation and cryopreservation	2	Calk & Talk	Green Board & PPT, Online Virtual Lab
1.5	Intellectual Property Rights (IPR) and Protection (IPP) – Biosafety guidelines and regulations	3	Calk & Talk	Green Board & PPT,
UNIT II				
2.1	Introduction of rDNA Technology	3	Calk & Talk	Green Board & PPT, Online Virtual Lab
2.2	molecular tools: nomenclature and characteristics of Restriction Endonucleases (Types I-IV and subtypes of II) & Ligases –	4	Calk & Talk	Green Board & PPT, Online Virtual Lab
2.3	Cloning vehicles: bacterial vectors (pBR322, pUC19, Ti plasmid), Viral vectors - M13, Cosmid, Shuttle vector, Eukaryotic Vectors (YAC)	4	Calk & Talk	Green Board & PPT, Online Virtual Lab
2.4	Brief account on Strategies of gene cloning in Bacteria – Application of genetic engineering.	4	Calk & Talk	Green Board & PPT, Online Virtual Lab
Unit – III				
3.1	An introduction to fermentation process	3	Calk & Talk	Green Board & PPT, Online Virtual Lab
3.2	Batch fermentation vs continuous fermentations	4	Calk & Talk	Green Board & PPT, Online Virtual Lab
3.3	Components of a typical bioreactor - Types of bioreactors: laboratory and production Fermenters	4	Calk & Talk	Green Board & PPT, Online Virtual Lab

3.4	Industrial production of ethyl alcohol, citric acid and penicillin - Immobilization of enzymes and single cell proteins	4	Calk & Talk	Green Board & PPT, Online Virtual Lab
Unit – IV				
4.1	Introduction to Biofertilizer	4	Calk & Talk	Green Board
4.2	Types of Potential Biofertilizers (Bacteria, BGA, <i>Azolla</i> & <i>Mychorrhiza</i>)	4	Calk & Talk	Field & Green Board
4.3	mechanism of Nitrogen Fixation with reference to <i>Rhizobium</i> – root nodulation – nif genes – regulation of Nif genes	4	Calk & Talk	Field teaching & Green Board
4.4	Brief account of Biopesticides	3	Calk & Talk	Field & Green Board
Unit – V				
5.1	Biological treatment of sewage: primary, secondary and tertiary treatment	4	Calk & Talk	Green Board & Online Virtual Lab
5.2	Biogas: biogas plant, methanogenesis: methanogenic bacteria & application of biogas	4	Calk & Talk	Green Board, PPT & Smart class
5.3	Biofuels from algae and higher plants	3	Calk & Talk	Green Board & Online Virtual Lab
5.4	Bioremediation of contaminated soil and Phytoremediation of water	3	Calk & Talk	Green Board & Online Virtual Lab
Total		60		

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

Dr. V. RAMESH

DEPARTMENT OF BOTANY

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

(For those students admitted during the 2021 - 22 and after)

PART – III : Discipline Specific Elective		SEMESTER -VI
Course Title: Biodiversity Conservation and Management		
Course Code: 08EP6A	Hours per week:5	Credit:5

CIA Marks: 25	ESE Marks: 75	Total Marks: 100
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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

Number	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	To understand the levels of biodiversity	K1, K2 & K3
CO2	To create awareness on the economic bowl of biodiversity resources	K1, K2 & K3
CO3	To learn the major threats of biodiversity loss	K1, K2 & K3
CO4	To gain the knowledge of biodiversity conservation strategies	K1, K2 & K3
CO5	To identify the biodiversity hotspots and the role of nodal boards	K1, K2 & K3

K1 – Knowledge

K2 – Understand

K3 – Apply

Mapping of CLO with PLO

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7
CLO 1	9	9	9	9	9	9	9
CLO 2	9	9	9	9	9	9	3
CLO 3	9	9	9	3	3	9	3
CLO 4	9	9	9	9	3	9	9
CLO 5	9	9	9	9	3	9	3
	45	45	45	39	27	45	27

9-Strong

3-Medium

1-Low

Mapping of CLO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	9	3	9	9	9
CLO 2	9	3	3	9	9
CLO 3	9	9	1	3	9
CLO 4	9	9	3	9	3
CLO 5	9	3	9	3	9

9-Strong

3-Medium

1-Low

Syllabus

UNIT NO	CONTENT	HOURS
Unit – I	Preliminaries in biodiversity conservation Definition: preservation, environmentalism, ecology and wildlife - Closer look at biodiversity - Levels of Biodiversity: Genetic (α , β	15

	and γ diversity), Species, Community and Ecosystem diversity - why biodiversity is rich in tropics? – Biodiversity at global, national (India) and local levels	
Unit – II	Economic Valuation of Biodiversity 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	15
Unit – III	Loss of Biodiversity 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	15
Unit – IV	Conservation of biodiversity Strategies followed in conservation – <i>In-situ</i> conservation: sacred groves, biosphere reserves, National parks and wild life sanctuaries. – <i>Ex-situ</i> 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	15
Unit – V	Conservation and management Activities 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.	15

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.

ONLINE RESOURCES:

1. [https://www.e-booksdirectory.com/details.php? \(ebook=3919\)](https://www.e-booksdirectory.com/details.php? (ebook=3919))
2. [https://www.researchgate.net/publication/328589475 \(Books_on_biodiversity_and_conservation\)](https://www.researchgate.net/publication/328589475 (Books_on_biodiversity_and_conservation))

3. <https://www.researchgate.net/publication/311649188>
(An_Advanced_Textbook_on_Biodiversity-_Principles_And_Practice)
4. <https://nptel.ac.in/content/storage2/courses/120108004/module1/lecture1.pdf>
5. <http://eagri.org/eagri50/ENVS302/pdf/lec06.pdf>
6. file:///C:/Users/BOTONY/Downloads/BIOANUAI_learning%20Resource%20Guide%20digital.pdf

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
UNIT I				
1.1	Definition –: preservation, environmentalism, ecology and wildlife - Closer look at biodiversity	4	Calk & Talk	Green Board & Filed
1.2	Levels of Biodiversity: Genetic (α , β and γ diversity), Species, Community and Ecosystem diversity	4	Calk & Talk	Green Board & Filed
1.3	Why biodiversity is rich in tropics?	4	Calk & Talk	Green Board & Filed
1.4	Biodiversity at global, national (India) and local levels	3	Calk & Talk	Green Board
Unit – II				
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)	4	Calk & Talk	Plant products , Field & Green Board
2.3	option values – Non use value	4	Calk & Talk	Field teaching & Green Board
2.4	Existence, Altruistic & Bequest Values	4	Calk & Talk	Plant products, Field & Green Board
Unit – III				
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	4	Calk & Talk	Field & Green

	threatened diversity			Board
3.3	Extinct, Extinct in wild, critically endangered, Endangered, Vulnerable, Near Threatened, Least concern	4	Calk & Talk	Field teaching & Green Board
3.4	Species richness and species index, and abundance	4	Calk & Talk	Field & Green Board
Unit – IV				
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	4	Calk & Talk	Green Board, PPT & Smart class
4.3	botanical gardens, pollen bank, gene bank, seed bank, tissue culture	4	Calk & Talk	Green Board & Online Virtual Lab
4.4	Ecotourism – organization involved in conservation activities: IUCN, NBPGR, BSI, MoEF & NBA	4	Calk & Talk	Green Board & Online Virtual Lab
Unit – V				
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	3	Calk & Talk	Green Board & PPT
5.4	biodiversity conservation of India: Environmental Protection Act	3	Calk & Talk	Green Board & e- Content
5.5	Forest conservation act & Biodiversity act	3	Calk & Talk	Green Board & PPT
Total		75		

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 LOCF)
(For those students admitted during the 2021 - 22 and after)

PART – III : Discipline Specific Elective		SEMESTER -VI
Course Title: Botanical Entrepreneurship		
Course Code: 08EP6B	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

Number	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO1	Explain the unique features of Nursery To know the techniques of nursery establishment Expertise in the field of organic manure preparation	K1, K2 & K3
CO2	Gain knowledge in floriculture Acquire the basic knowledge of ornamental plants	K1, K2 & K3
CO3	Familiarize in commercial vegetables and fruits Explain the relation between plants and human life.	K1, K2 & K3
CO4	Create understanding on various plant products the humanity depends on	K1, K2 & K3
CO5	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 CLO with PLO

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7
CLO 1	9	9	9	9	9	9	9
CLO 2	9	9	9	9	9	9	3
CLO 3	9	9	9	3	3	9	3
CLO 4	9	9	9	3	3	9	9
CLO 5	9	9	3	9	3	9	3
	45	45	39	33	27	45	27

9-Strong

3-Medium

1-Low

Mapping of CLO with PSO

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CLO 1	9	3	9	9	9
CLO 2	9	3	3	3	9
CLO 3	9	9	1	3	9
CLO 4	9	3	3	3	3
CLO 5	9	3	9	3	9

9-Strong

3-Medium

1-Low

Syllabus		
UNIT	CONTENT	HOURS
Unit – I	Nursery Establishment and Management 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	15
Unit – II	Ornamental Plants and Floriculture 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	15
Unit – III	Commercial vegetable and Fruits Management Nutritional values and economics of vegetable and Fruits crops – spoilage – Factors influencing of spoilage – preservation techniques (physical and chemical) - Cold storage techniques - Aseptic and Packaging for transportation	15
Unit – IV	Plant based products Survey on the demand and requirement of Herbal products / formulations – cosmetics: herbal face pack, mehandi, organic hair oil and dye - Preparation of health drinks: (sukkumalli coffee & malt) Botanical recipes: jam, jelly, pickle, vaththal, fruit salad – Preparation and marketing of palm craft	15
Unit – V	Entrepreneurship 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	15

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.

Online Resources

1. https://www.brainkart.com/article/Entrepreneurial-Botany_38321/ (Botanical Entrepreneur)

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
UNIT I				
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	3	Calk & Talk	Green Board & Filed
1.3	water management - identification of deficiency symptoms	3	Calk & Talk	Green Board & Filed
1.4	Field and post harvest diseases - remedial measures and nutritional management practices	3	Calk & Talk	Green Board
1.5	preparation and apply of farmyard and organic manure	3	Calk & Talk	Green Board & Field
Unit – II				
2.1	Propagation of plants for beautification:	4	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)	4	Calk & Talk	Plant material, Field & Green Board
2.3	Ornamental trees (Sarakkondrai, Kattuthimaram, fishtail palm and coral tree). Cut flowers – bonsai	4	Calk & Talk	Plant material & Green Board
2.4	Importance of flower shows and exhibitions	3	Calk & Talk	Plant material, Field & Green Board
Unit – III				
3.1	Nutritional values and economics of vegetable and Fruits crops	4	Calk & Talk	Chart, Plant material & Green Board
3.2	spoilage – Factors influencing of spoilage	4	Calk & Talk	Chart, Plant material &

				Green Board
3.3	preservation techniques (physical and chemical)	4	Calk & Talk	Plant material & Green Board
3.4	Cold storage techniques - Aseptic and Packaging for transportation	3	Calk & Talk	Plant material & Green Board
Unit – IV				
4.1	Survey on the demand and requirement of Herbal products / formulations	4	Calk & Talk	Plant material & Green Board
4.2	cosmetics: herbal face pack, mehandi, organic hair oil and dye	4	Calk & Talk	Green Board & plant material
4.3	Preparation of health drinks: (sukkumalli coffee & malt) Botanical recipes: jam, jelly, pickle, vaththal, fruit salat	4	Calk & Talk	Green Board & plant material
4.4	Preparation and marketing of palm craft	3	Calk & Talk	Green Board & Plant material
Unit – V				
5.1	Entrepreneurship opportunity, Necessity to promote Indian Traditional health Concept,	4	Calk & Talk	Green Board
5.2	Demand & opportunity for Herbal products Retailing	4	Calk & Talk	Green Board
5.3	Marketing techniques, Sales & Promotion	3	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		75		

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

Dr. V. RAMESH

DEPARTMENT OF BOTANY

Programme: B.Sc. BOTANY (CBCS and LOCF)
(For those students admitted during the 2021 - 22 and after)

PART – III : Core Course 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

CO Number	Course Outcome	Knowledge Level (according to Bloom's Taxonomy)
CO 1	To identify the Angiosperm plants	K1, K2 & K3
CO2	To analyze and apply the physiological role of plants	K1, K2 & K3
CO3	To apply the skills in microbiology	K1, K2 & K3
CO 4	To gain the basic aspects of plant biotechnological techniques	K1, K2 & K3
CO 5	To remember the plant products and instruments	K1, K2 & K3

K1-knowledge

K2-Understand

K3-Apply

Mapping of CLO with PLO

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7
CLO1	9	9	9	9	9	3	3
CLO2	9	9	3	9	3	9	9
CLO3	9	9	9	9	9	9	9
CLO4	9	3	9	9	3	9	9
CLO5	9	9	9	9	9	3	9
	45	39	39	45	33	33	39

9-Strong

3-Medium

1-Low

CLO-PSO Mapping

	PSO1	PSO2	PSO3	PSO4	PSO5
CLO1	9	3	9	9	9
CLO2	9	3	9	9	9
CLO3	9	9	9	9	9
CLO4	9	9	9	9	9
CLO5	9	9	9	9	9

9-Strong

3-Medium

1-Low

Syllabus

UNIT No.	CONTENT	HOURS
UNIT I	Taxonomy of Angiosperms & Economic Botany 1. Study of floral morphology and Identification of plants belonging to the families mentioned in the syllabus 2. Field study – plant collection – herbarium preparation – submission of 20 herbarium sheets with field report	20
UNIT II	Plant Physiology 1. Measurement of osmotic pressure by Chardakov's method 2. Determination of osmotic potential by plasmolytic method	30

	<ol style="list-style-type: none"> Measurement of rate of Transpiration – Ganong’s Potometer Transpiration equal absorption Effect of CO₂ concentration on Photosynthesis Respiration Quotient of the given material- Ganong’s Respirometer. Separation of leaf pigments – Paper chromatography 	
UNIT III	Microbiology <ol style="list-style-type: none"> Sterilization techniques and media preparation Isolation of microorganisms from natural sources by serial dilution and plating methods Growth curve of Bacteria Staining of Bacteria – Gram staining Study of Colony Characteristics of Bacteria Bacterial motility-Hanging drop method Antibiotic sensitivity test Demonstration of agglutination reactions by means of antigen and antibody Visit to microbiology divisions/Research Institute and submission of Report 	20
UNIT IV	Plant Biotechnology <ol style="list-style-type: none"> Plant tissue culture studies in medicinal plants Synthetic seed production Isolation of genomic DNA from plant tissues Agarose gel electrophoresis Isolation of Plasmid DNA <i>Rhizobium</i> stain identification by immunological methods Visit to tissue culture divisions/Research Institute and submission of Report 	15
UNIT V	<p>Taxonomy of Angiosperms & Economic botany: Fibres and fibre yielding plants - Spice and condiments - Resins and gums - Processing and extraction of sugar and tea</p> <p>Plant Physiology: Four leaf experiment - Foliar transpiration - Ganong’s Light screen - Ganong’s Respiroscope - Mohl’s half-leaf experiment - Evolution O₂ during Photosynthesis - Arc Auxanometer - Clinostat - Phototropism - Kuhen’s fermentation vessel - Plant growth hormones</p> <p>Microbiology: Inoculation loop - Autoclave - Inoculation chamber- Fermentor</p> <p>Plant Biotechnology: Callus - Somatic embryogenesis – Plasmid - Biogas plant - ELISA, Bioreactor</p>	5

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.

Online Resources

1. <http://www.colby.edu/info.tech/BI211/Families.html> (Taxonomy of Flowering Plants)
2. <https://vlab.amrita.edu/?sub=3&brch=69> (Immunology)
3. <https://vlab.amrita.edu/?sub=3&brch=73> (Microbiology)
4. <https://vlab.amrita.edu/?sub=3&brch=311> (Biotechnology)

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.	CONTENT	No. of Lectures	Content Delivery Method	Teaching Aids
UNIT I: Taxonomy of Angiosperms & Economic Botany				
1.1	Study of floral morphology and Identification of plants belonging to the families mentioned in the syllabus	15	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Plants material, Instrument, Lab. Exp
1.2	Field study – plant collection – herbarium preparation – submission of 20 herbarium sheets with filed reports	5		
UNIT II: Plant Physiology				
2.1	Measurement of OP by Chardakov’s method	5	Chalk & Talk	Green Board, Microscope
2.2	Determination of osmotic potential by	5		

	plasmolytic method			e, Photos, Glassware, Plants material, Instrument, Lab. Exp
2.3	Measurement of rate of Transpiration – Ganong's Potometer	4		
2.4	Transpiration equal absorption	4		
2.5	Effect of CO ₂ concentration on Photosynthesis	4		
2.6	Respiration Quotient of the given material- Ganong's Respirometer.	4		
2.7	Separation of leaf pigments – Paper chromatography	4		
UNIT III: Microbiology				
3.1	Sterilization techniques and media preparation	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Instrument, Lab. Exp
3.2	Isolation of microorganisms from natural sources by serial dilution and plating methods	2		
3.3	Pure culture techniques	2		
3.4	Growth curve of Bacteria	3		
3.5	Staining of Bacteria – Gram staining	2		
3.6	Study of Colony Characteristics of Bacteria	2		
3.7	Bacterial motility-Hanging drop method	2		
3.8	Antibiotic sensitivity test	3		
3.9	Demonstration of agglutination reactions by means of antigen and antibody	2		
-	Visit to microbiology divisions of an Industry			
UNIT IV: Plant Biotechnology				
4.1	Plant tissue culture studies in medicinal plants	2	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Plants material, Instrument, Lab. Exp
4.2	Synthetic seed production	2		
4.3	Isolation of genomic DNA from plant tissues	2		
4.4	Agarose gel electrophoresis	3		
4.5	Isolation of Plasmid DNA	3		
4.6	<i>Rhizobium</i> stain identification by immunological methods	3		
-	Visit to tissue culture divisions of an Industry			
UNIT V: Spotters				

5.1	Taxonomy of Angiosperms & Economic botany: Fibres and fibre yielding plants - Spice and condiments - Resins and gums - Processing and extraction of sugar and tea	5	Chalk & Talk	Green Board, Microscope, Photos, Glassware, Plants material, Instruments, Specimens
5.2	Plant Physiology: Four leaf experiment - Foliar transpiration - Ganong's Light screen - Ganong's Respiroscope - Mohl's half-leaf experiment - Evolution O ₂ during Photosynthesis - Arc Auxanometer - Clinostat - Phototropism - Kuhen's fermentation vessel - Plant growth hormones			
5.3	Microbiology: Inoculation loop - Autoclave - Inoculation chamber- Fermentor			
5.4	Plant Biotechnology: Callus - Somatic embryogenesis – Plasmid - Biogas plant - ELISA, Bioreactor			
TOTAL		75		

Course Designer (Name of the Course Teacher)	Head of the Department
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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)

PART – IV : Skill Enhancement Course		SEMESTER – VI
Course Title: Botany For Competitive Examinations		
Course Code: 08SB61	Hours per week:2	Credit:2
CIA Marks: 25	ESE Marks: 75	Total Marks: 100

Preamble

- ❖ To explore the core concept of lower plants diversity
- ❖ To know the higher plants diversity and its economic importance
- ❖ To acquire the basic knowledge about cellular organization, physical phenomenon biomolecules and ecological principles

Unit I: Plant diversity - I

Algae: range of structure, organisation, reproduction, life history and classification of algae, economic importance of algae – Fungi: Classification. range of structure, reproduction, life cycles, economic importance – Lichens - Bryophytes: classification, range of structure in gametophyte and sporophyte, reproduction and economic importance - Pteridophyte: classification, structure and development of gametophytes of the major groups

Unit II - Plant diversity – II & Economic Botany

Gymnosperms: classification, distribution of extinct and extant forms, comparative study of morphology, anatomy and reproductions, Economic importance – Angiosperms: morphology of the plant systems and classification-artificial system, natural system, phylogenetic system, ICBN, BSI, botanical nomenclature, herbarium techniques, critical study of important families, economic botany: food crops, cereals, millets, spices, beverage, timber yielding plant, resins, gums, tannin and rubber & fibre yielding plants

UNIT III - Cellular Organization

Membrane structure and function - structural organization and function of cellular organelles- organization of genes and chromosomes - cell cycle and cell division

UNIT IV – Plant Physiology & Biochemistry

Photosynthesis - Respiration and photorespiration- Nitrogen metabolism - Plant hormones- Sensory photobiology - Solute transport and photoassimilate translocation - Stress physiology - Chemistry and functions of carbohydrates, Lipids, Proteins, Enzymes – chemistry and biological significance of Nucleic acids

UNIT V - Ecological Principles

Importance of ecology, The Environment- Habitat and Niche- Species Interactions - Ecological Succession - Ecosystem Ecology, Biogeography: Age and Area Hypothesis & Wegner's theory of continental drift – Bioresources: use and management

Text Books

1. TNPSC, TRB PG Assistant Examinations Vol I & Vol II – N. Arumugam, Saras Publications, 2013 Ed.
2. Biochemistry and Molecular Biology - Buchanan B, John Wily & Sons, New Delhi, 2015 Ed.
3. Objective Botany – Ramesh Publishing House, New Delhi

Reference Books

1. CSIR-UGC NET/JRF/SET Life Sciences – Kumar pushkar, Upkar Prakashan, Agra
2. Objective Botany - Saxena NP, Krishna Prakashan Media, Meerut 2015 Ed.
3. Ecology: Global Insights and Investigations (Botany, Zoology, Ecology and Evolution) - **Peter Sterling**, Pearson Pub., 2nd Ed.
4. Plant Physiology and Development - Lincoln Taiz et a., Sinauer Associates, 6th Ed.

Online Resources

1. https://www.examrace.com/Sample-Objective-Questions/Botany- Questions/Botany-Mock-Test-3.html#pdfsection_7c254e96-page_10-locus_13 (MCQ Botany)
2. <https://www.erforum.net/2017/01/life-science-biology-handwritten-notes-for-competitive-exams.html> (**Botany Notes**)

Course Designer
(Name of the Course Teacher)

Dr. V. RAMESH

Head of the Department

Dr. V. RAMESH

DEPARTMENT OF BOTANY

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

(For those students admitted during the 2021 - 22 and after)

PART – IV : Skill Enhancement Course
Subject Title: Remote Sensing and GIS

Subject Code: 08SB62	Hours per week: 2	Credit: 2
CIA Marks: 25	Summative Marks: 75	Total Marks: 100

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

Online Resources

1. <https://www.slideshare.net/amalmurali47/seminar-28925946> (Remote sensing)
2. <https://www.slideshare.net/Dhwani7887/remote-sensing-66205597> (Remote sensing- Basic techniques)
3. <https://www.slideshare.net/MohitGoyal1/remote-sensing-75532608> (Remote sensing instruments and EM)

4. <https://www.slideshare.net/anurag170494/application-of-remote-sensing> (Remote sensing applications)
5. <https://sjce.ac.in/wp-content/uploads/2018/01/REMOTE-SENSING-AND-GIS-PPT.pdf> (Geographical Information System)
6. <https://www.slideshare.net/arniontech/gis-presentation-13885167> (GIS)
7. <https://www.slideshare.net/FayazAhamedAP/application-of-gis-geographical-information-system> (GIS applications)

Course Designer (Name of the Course Teacher)	Head of the Department
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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)

PART – IV : Skill Enhancement Course	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 Nanobiology
- ❖ 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 prLOCs 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. Chatteropadhyay, 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.

Online Resources

1. <https://www.azonano.com/article.aspx?ArticleID=1134> (Nanotechnology)
2. https://ec.europa.eu/health/scientific_committees/opinions_layman/nanomaterials/en/index.htm (Nanomaterials)
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4934206/> (Enzymes and protein based sensing)
4. <https://www.frontiersin.org/articles/10.3389/fchem.2018.00360/full> (Nanomedicine)

5. [https://www.researchgate.net/publication/325827657_Application_of_Nanotechnology_in Agriculture and_Food_Production_- _Nanofood_and_Nanoagriculture](https://www.researchgate.net/publication/325827657_Application_of_Nanotechnology_in_Agriculture_and_Food_Production_-_Nanofood_and_Nanoagriculture)
(Nanoagriculture)

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

Dr. V. RAMESH

DEPARTMENT OF BOTANY
Programme: B.Sc. BOTANY (CBCS and LOCF)
(For those students admitted during the 2021 - 22 and after)

PART – IV : Common Subject Theory
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Subject Title : Value Education		
Subject Code: VEUG61	Hours per week: 2	Credit: 2
Sessional Marks: 25	Summative Marks: 75	Total Marks: 100

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 – mental 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)

PART – V : Common Subject Theory		
Subject Title : Extension Activities		
Subject Code: EAUG61	Hours per week:	Credit: 1
Sessional Marks: 25	Summative Marks: 75	Total Marks: 100

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 Inmdian 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.

Online Resources

1. <https://www.sciencedirect.com/topics/biochemistry-genetics-and-molecular-biology/secondary-metabolite> (Secondary metabolites)

2. <https://www.sciencedirect.com/science/article/abs/pii/S0273230012000633> (guidelines and Pharmacopoeial standards for pharmaceutical impurities: overview and critical assessment)
3. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3459456/>(Ferula **asafoetida**: Traditional uses and pharmacological activity)

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.

Online Resources

1. <http://agrimoon.com/fundamentals-of-horticultur-pdf-book/>
2. <https://www.iaritoppers.com/p/horticulture-icar-ecourse-pdf-books.html>
3. <http://agrimoon.com/horticulture-icar-ecourse-pdf-books/>