HOLY CROSS COLLEGE (AUTONOMOUS)
Affiliated to Bharathidasan University
Nationally Accredited(3rd Cycle) with 'A' Grade by NAAC
College with Potential for Excellence.
Tiruchirapalli - 620002.

PG AND RESEARCH DEPARTMENT OF BOTANY
Programme: B.Sc. Botany

PO No.	Programme Outcomes *Upon completion of the B.Sc. Degree Programme, the graduate will be able to*
PO-1	Obtain quality education in the basic areas of Botany
PO-2	Acquire practical skills to gather information, assess, create and execute new ideas to develop entrepreneurial skills
PO-3	Receive training in pedagogy, research skills and methodology
PO-4	Develop a local, regional, national and international perspective and be competent enough in the area of plant science, genetic engineering and nanotechnology
PO-5	Learn to respect and conserve nature and the environment
PO-6	Identify the angiosperms by applying keys
PO-7	Learn the basic principles of food science

PSO No.	Programme Specific Outcomes *Upon completion of these courses the student would*
PSO-1	Acquire academic excellence with an aptitude for higher studies, research and to meet competitive exams
PSO-2	Become aware about plant diversity and its conservation through plant tissue Culture
PSO-3	Obtain Knowledge in the internal structure and functions of various plant components, inheritance of characters and techniques of plant breeding
PSO-4	Apply statistical skills and analyze the biological data
PSO-5	Acquire knowledge on traditional herbal plants for common ailments and aware of nutritive plant foods
PSO-6	Obtain Knowledge through taxonomical studies will help them to emerge as fundamental taxonomists
PSO-7	Acquire knowledge on food preservation, food additives and food laws
PSO-8	Analyse the phytoconstituents of plants and plant drug adulteration

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF BOTANY

CHOICE BASED CREDIT SYSTEM

UG COURSE PATTERN 2018-19

Sem	Part	Course	Title of the course	Code	Hrs/ week	Credit	Mark
I	I	Language	Tamil PaperI/ Hindi Paper I/ French Paper I	U19TL1TAM01/ U18HN1HIN01/ U16FR1FRE01	6	3	100
	II	English	English Paper-I	U15EL1GEN01	6	3	100
	III	Major Core- 1	Plant Diversity I	U15BO1MCT01	7	5	100
		Allied -1	Allied Optional Paper I- Biodiversity Conservation and Management	U15BO1AOT01	4	4	100
		Allied – 2	Allied Optional Paper II- Mushroom cultivation	U15BO1AOT02	4	3	100
	IV	Environmental Studies	Environmental studies	U18RE1EST01	1	1	100
		Value Education	Ethics I/ Bible studies I/ Catechism I	U15VE2LVE01/ U15VE2LVB01/ U15VE2LVC01	1	-	-
			TOTAL		**30**	**20**	**600**
II	I	Language	Tamil Paper II/ Hindi Paper II/French Paper II	U19TL2TAM02/ U19HN2HIN02/ U16FR2FRE02	5	3	100
	II	English	English Paper-II	U15EL2GEN02	6	3	100
	III	Major Core- 2	Plant Diversity II	U15BO2MCT02	6	6	100
		Major Core - 3	Practical 1- Plant Diversity I & II	U15BO2MCP03	4	3	100
		Allied – 3	Allied Optional Paper III – Stress Physiology	U15BO2AOT03	4	3	100
	IV	Skill Based Elective -1	Soft Skill Development	U18RE2SBT01	2	2	100
		Skill Based Elective -2	Sustainable RuralDevelopment and Student Social Responsibility	U18RE2SBT02	2	2	100
		Value Education	Ethics I/ Bible studies I/ Catechism I	U15VE2LVE01/ U15VE2LVB01/ U15VE2LVC0	1	1	100

				1			
	Internship/Field Work/Field Project 30 hours- **Extra Credit**			U18SP2E CC01		2	100
			TOTAL		**30**	**23**	**800**
III	**I**	Language	Tamil PaperIII/ Hindi Paper III/ French PaperIII	U15TL3TAM 03/ U18HN3HIN0 3/ U16FR3FRE0 3	6	3	100
	II	English	English Paper-III	U15EL3GEN03	6	3	100
	III	Major Core – 4	Cell biology, Biostatistics and Bioinformatics	U15BO3MCT04	5	5	100
		Major Elective – 1	Microbiology and Plant Pathology/ Forest Resources and their utilization	U15BO3MET01/ U15BO3MET04	5	5	100
		Allied – 4 (Compulsory)	Paper I -Plant Diversity, Taxonomy,Anatomy, Embryology, Ecology and Physiology	U15BO3ACT04	4	3	100
	IV	Skill Based Elective - 3	Botanical skills for Chemical Sciences (Lab cum Theory for Chemistry students)	U17BO3SBT03	2	2	100
		Gender Studies	Gender Studies	U15WS3GST01	1	1	100
		Value Education	Ethics II/ Bible studiesII/ Catechism II	U15VE2LVE0 1/ U15VE2LVB0 1/ U15VE2LVC0 1	1	-	-
			TOTAL		**30**	**22**	**700**
IV	**I**	Language	Tamil PaperIV/ Hindi Paper IV/ French PaperIV	U15TL4TAM04/ U18HN4HIN04/ U16FR4FRE04	5	3	100
	II	English	English Paper-IV)	U15EL4GEN04	6	3	100
	III	Major Core – 5	Anatomy, Embryology and Seed Technology	U15BO4MCT05	5	5	100
		Major Core- 6	Practical 2- Cell biology, Biostatistics, Anatomy, Embryology and Seed Technology	U16BO4MCP06	5	5	100
		Allied – 5 (Compulsory)	Paper-II Bioprospecting and Plant Biotechnology	U15BO4ACT05	4	4	100
		Allied – 6 (Compulsory)	Paper-III.Practical-1. Plant Diversity, Taxonomy,Anatomy, Embryology, Ecology, Physiology, Bioprospecting & Plant Biotechnology	U15BO4ACP06	4	3	100
	IV	Value	Ethics II/ Bible studies II/ Catechism	U15VE4LVE02/ U15VE4LVB02/	1	1	100

		Education	II	U15VE4LVC02			
	VI	Extension Activity outside the class hours from Semester I –IV		Any one activity based on the Student's choice (15Activities)	-	1	
		Internship/Field Work/Field Project 30 hours- **Extra Credit**		U18SP4ECC 01	-	2	10 0
			TOTAL		**30**	**24**	**700**
V	**III**	Major Core – 7	Genetics and Plant Breeding	U15BO5MCT07	5	4	100
		Major Core - 8	Morphology, Taxonomy of Angiosperms and Ethnobotany	U15BO5MCT08	5	4	100
		Major Core – 9	Pharmacognosy	U15BO5MCT09	5	4	100
		Major Core – 10	Practical 3- Genetics, Plant Breeding, Morphology, Taxonomy of Angiosperms, Ethnobotany and Pharmacognosy	U17BO5MCP10	5	4	100
		Major Elective 2	Plant Foods/Horticulture and Integrated Pest Management	U15BO5MET02/ U15BO5MET05	5	5	100
	IV	NME –1			2	2	100
		Skill Based Elective-4	Botanical skills for Physical Sciences (Lab cum Theory for Physics students)	U17BO5SBT04	2	2	100
	IV	Value Education	Ethics III/ Bible studies III/ Catechism II	U15VE4LVE 02/ U15VE4LVB 02/ U15VE4LVC 02	1	-	-
			TOTAL		**30**	**25**	**700**
VI	**III**	Major Core -11	Plant Physiology and Biochemistry	U15BO6MCT11	6	5	100
		Major Core -12	Plant Tissue Culture, Genetic Engineering and Nanotechnology	U15BO6MCT12	6	5	100
		Major Core -13	Practical 4 - Plant Physiology, Biochemistry,Plant tissue culture, Genetic Engineering and Nanotechnology	U15BO6MCP13	6	5	100
		Major Elective 3	Instrumentation and Botanical Techniques / Plants in Human Health Care	U15BO6MET03/ U15BO6MET06	5	5	100
	IV	Non Major Elective –2			2	2	100
		Skill Based Elective-5	Techniques in Botany	U15BO6SBP05	2	2	100
		Skill based Elective - 6	Introduction to Research Methodology	U15DS6SBT06	2	2	100
		Value Education	Ethics III/ Bible studies III/ Catechism III	U15VE6LVE 03/ U15VE6LVB 03/ U15VE6LVC	1	-	-

				03			
	V	Extension Activity	RESCAPES -Impact study of project	U15RE6ETF01	-	1	100
		Internship/Field Work/Field Project 30 hours -**Extra Credit**		U18SP6ECC01	-	2	100
			TOTAL		**30**	**27**	**800**
GRAND TOTAL(I-VI SEMESTERS)					**180**	**141**	**4300**

List of Non-Major Elective Courses

Offered by the Department of Botany to Other Students

UG

Sem	**Part**	**Course**	**Title of the course**	**Code**	**Hrs/ week**	**Credits**	**Marks**
V	**IV**	Non Major Elective -1	Food Science & Technology	U15BO5NMT01	2	2	100
VI		Non Major Elective -2	Herbal Remedies	U15BO6NMT02	2	2	100

Certificate Course offered by the Department of Botany

Title of the course	**Hrs/week**	**Marks**
Certificate Course on Urban Gardening and Cultivation of Microgreens	2	100

(For Candidates admitted from 2019 onwards)

HOLY CROSS COLLEGE (Autonomous), Tiruchirappalli - 620 002.

PG & RESEARCH DEPARTMENT OF TAMIL

First Year - Semester – I

Course Title	தமிழ்த்தாள் - 1
Total Hours	**90**
Hours/Week	**6 Hrs Wk**
Code	**U19TL1TAM01**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

தமிழ் இலக்கியப் பரப்பையும், பாரம்பரியத்தையும் அறிமுகப்படுத்துதல்.

- To find out the ways to handle the Tamil language effectively and productively.
- To introduce the tradition and grammar of Tamil language.
- To encourage the creative development.
- Creating curiosity to live a better life .
- Helps in creating healthy thoughts.

Course Objectives:

CO No.	Course Objectives
CO-1	தமிழ் இலக்கியப் பரப்பையும்,விழுமியங்களையும் அறிமுகப்படுத்துதல்.
CO-2	தமிழ் மொழியின் தொன்மை, தாய்மொழிப்பற்று, தன்னம்பிக்கை சூழல்களை எதிர்கொள்ளும் திறன் முதலியவற்றை அறிந்து கொள்வர்.
CO-3	கவிதையின் வாயிலாக அன்பு உணர்வினை வளர்க்கச் செய்தல்.
CO-4	கலைச்சொற்கள் வாயிலாக பிறமொழிச் சொற்களை ஆராயும் தன்மைப் பெறுவர்.
CO-5	படைப்பாற்றல் திறனை வளர்த்துக்கொள்வர்.

அலகு:1 செய்யுள்

1. பாரதியார் கவிதைகள் - தமிழ்
   கண்ணன் என் சேவகன்
2. பாரதிதாசன் கவிதைகள் - உலகம் உன்னுடையது
3. உமர்கய்யாம் - உமர்கய்யாம் பாடல்கள்
4. பட்டுக்கோட்டையார் - செய்யும் தொழிலே தெய்வம் **18 Hrs**
5. ந. பிச்சமூர்த்தி – ஒளியின் அழைப்பு
6. வைரமுத்து – ஐந்து பெரிது ஆறு சிறிது
7. சிற்பி – ஒரு கிராமத்து நதி

key Words (Extra Reading)

1. ந. காமராசு கவிதைகள்
2. தமிழன்பன் கவிதைகள்

அலகு:2 செய்யுள்

8. கல்யாண்ஜி -பேசும்பார் என் கிளி
9. நிர்மலா சுரேஷ் -தைலச்சிமிழும் தச்சன் மகனும்
10. இரா. மீனாட்சி -ஒரு கோதை **18Hrs**
11. விஜி -குரங்கு மனிதன்
12. பா. சத்திய மோகன் -எங்கெங்கு காணினும்
13. ஹைகூ கவிதைகள்

key Words (Extra Reading)

1. ந.முத்துக்குமார் கவிதைகள்
2. செனட்ரியூ கவிதைகள்

அலகு:3 **18Hrs**

தமிழ் இலக்கிய வரலாறு
தமிழாய்வுத்துறை வெளியீடு 20-ஆம் நூற்றாண்டு (தற்காலம்)

key Words (Extra Reading)

தமிழ் இலக்கிய வரலாறு -மு.வரதராசன்

அலகு:4

படைப்பிலக்கியம் - சிறுகதைத் தொகுப்பு(துறை வெளியீடு) **18Hrs**

அலகு:5

பொதுப்பகுதி - கலைச்சொற்கள் **18Hrs**

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	To evaluate the importance of Tamil in terms of patriotism, self-discipline and unity.	PSO 1	U
CO-2	To evaluate poems and enrich knowledge in religious faith, preserving nature, social atrocities against women and resistance.	PSO 2	E
CO-3	To enhance the creative spirit among the youth through the present Tamil literatures	PSO 2	AN
CO-4	To be aware about human rights and humanism through short stories	PSO 3	AP
CO-5	To learn the culture of different languages	PSO 4	U

பார்வை நூல்கள்

பாட நூல்கள்

செய்யுள் - தமிழாய்வுத்துறை வுத்துறை வெளியீடு

தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறை வெளியீடு

சிறுகதைத் தொகுப்பு - தமிழாய்வுத்துறை வெளியீடு

கலைச்சொற்கள் - தமிழாய்வுத்துறை வெளியீடு

(For the candidates admitted from June 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002
DEPARTMENT OF HINDI

SEMESTER – I

Course Title	**PART – I LANGUAGE HINDI – I PROSE, SHORT STORY AND GRAMMAR –I**
Total Hours	**90**
Hours/Week	**6Hrs/Wk**
Code	**CODE: U18HN1HIN01**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objective : To enable the students to understand the importance of human values andpatriotism

Course Objectives (CO):

The learner will be able to:

CO No.	**Course Objectives**
CO -1	Evaluate Self Confidence, Human values
CO- 2	Understand and analyze Gandhian Ideology
CO- 3	Understand Indian Culture, custom
CO- 4	Analyze communal Harmony and Unity in Diversity
CO- 5	Evaluate Friendship

UNIT – I **(18 Hours)**

1. Aatma Nirbharatha
2. Idgah
3. Sangya

Extra Reading (Key Words): Takur ka kuvam, Bhuti Kaki

UNIT- II **(18 Hours)**

1. Mahatma Gandhi
2. Vusne Kaha Tha
3. Sarva Naam

Extra Reading (Key Words): Chandradhar Sharma Guleri, Gandhian Ideology

UNIT- III **(18 Hours)**

1. Sabhyata Ka Rahasya
2. Karva Va Ka Vrat
3. Visheshan

Extra Reading (Key Words): Sabhyata Aur Sanskriti, Yashpal ki Sampoorna khaniyan

UNIT- IV **(18 Hours)**

1. Bharat Ek Hai
2. Sharandhata
3. Kriya

Extra Reading (Key Words): Ramante Tatra Deavata, Badala

UNIT- V **(18 Hours)**

1. Mitrata
2. Vapasi
3. Ling Aur Vachan

Extra Reading (Key Words): Aacharya Ramachandra Shukla,Usha Priyamvadha ki kahaniyan

Note :Texts given in the Extra Reading (Key Words) must be tested only through Assignmentand Seminars.

Course Outcomes:

The learner will be able to:

CO No.	Course Outcomes	Cognitive Level
CO -1	Compare human values of present and past generations	E
CO- 2	Test for Gandhian Ideology in the literary works.	U, An
CO- 3	Interpret Indian Culture in a scientific manner	U
CO- 4	Assess casteless and classless India	An
CO- 5	Value the interests of one's friend.	E

CO- Course Outcome; R- Remember; U- Understand; Ap- Apply; An- Analyze; E- Evaluate; C- Creat

Reference Books :

- GadyaSudha: Edt. Dr. M. SaleemBaig; RakaPrakashan; Ilahabad. U.P.

- Hindi GadyaPrabhakar:Edi. Dr.Hiranmay; ShikshaBharathi; Kashmiri Gate; Delhi .
- KahaniVividha;RajkamalPrakashan; Ilahabad.; New Delhi.
- Vyakaranpradeep; Dr. Ram Dev. M.A; LokBharathiPrakashan ;Illahabad

(For candidates admitted 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF FRENCH

SEMESTER I

Course Title	**PART I – LANGUAGE - FRENCH PAPER I** (GRAMMAR & CIVILISATION (ÉCHO A1 2e édition)
Total Hours	90
Hours/Week	6Hrs/Wk
Code	U16FR1FRE01
Course Type	Theory
Credits	3
Marks	100

General Objective: To enable the students to learn the fundamentals of French Grammar and Cultural aspects ofFrance.

Course Objectives(CO):

The learner will be able to

CO1	remember alphabets, numbers, nationalities and professions; understand the term Francophone, a brief introduction of France and oneself.
CO2	remember and understand verb conjugation and articles and apply the same in first contact
CO3	remember the pronouns placed after prepositions; analyse and evaluate leisure time activities in France and across the world.
CO4	apply past tensein writing personal diaries; comparison and adjectives in sketching travel journals
CO5	understand the usage of articles and inversion in interrogation and analyse the food habit of the French.

Unit 1 Parcours d'initiation ;Vouscomprenez (15Hours)

La différence entre le prénom et le nom, les nationalités, les nombres, les professions

La présentation, le genre et le nombre d'un nom, l'interrogation et la négation – l'identité, les lieux de la ville, les mots du savoir-vivre – saluer, remercier – l'espace francophone.

Extra Reading (Key Words): La carte de la France et La carte du monde francophone

Unit 2 Autravail! (15Hours)

La conjugaison des verbes du 1er groupe, des accords, les articles – l'état civil, des personnes et des objets caractéristiques d'un pays – exprimer ses gouts – première approche de la société française.

Extra Reading (Key Words): *Fiches de renseignement de ses parents*

Unit 3 Onsedétend! (15Hours)

La conjugaison des verbes irréguliers, le future proche, les pronoms après une préposition – les loisirs – proposer, accepter, refuser, demander une explication – première approche de l'espace de France, repérages de quelques lieux de loisirs

Extra Reading (Key Words): Lieux de loisirs que l'étudiant apprécie

Unit 4 Racontez-moi ! ; Bonvoyage! (30Hours)

Le passé composé, la date et l'heure – les moments de la journée, de l'année, les événements liés au temps – dire ce qu'on a fait – les rythmes de vie en France, des personnalités du monde francophone.

La comparaison, les adjectifs démonstratifs et possessifs – les voyages et les transports – négocier une activité, faire les recommandations – les transports en France

Extra Reading (Key Words):La vie des personnalités célèbres

Unit 5 Bonappétit! (15Hours)

L'emploi des articles, la forme possessive – la nourriture, les repas, la fête – les situations pratiques à l'hôtel et au restaurant – les habitudes alimentaires en France.

Extra Reading (Key Words): Recette de la crêpe et des tartes

Course outcomes	**Cognitive level**
Introduce oneself to the class and classify Francophone countries in the world map.	Ap, E
Demonstrate regular verb conjugation	U, Ap
List out pronouns placed after prepositions	R, U
Survey leisure time activities in European countries	An
Develop personal diary	C
Outline the food habits of the French.	An

TEXT BOOKS :

ECHO A1 – METHODE DE FRANÇAIS & CAHIER PERSONNEL D'APPRENTISSAGE
Authors: J. Girardet and J. Pécheur Publication:
CLÉ INTERNATIONAL, 2013.

Books for Reference:

La Conjugaison – Nathan
French made easy – Beginners level - Goodwill Publishing House Je parle français I –Abhay Publications
Le français avec des jeux et des activités - ELI
Langue et la civilisation – I – Mauger Bleu

Note :Texts given in the Extra Reading (Key Words) must be tested only through Assignment andSeminars.

(for candidates admitted from June 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), Tiruchirapalli – 620002

PG AND RESEARCH DEPARTMENT OF ENGLISH

I YEAR UG – SEMESTER I

PART II – ENGLISH 1 - GENERAL ENGLISH I

HOURS : 6 **CODE : U15EL1GEN01**

CREDIT : 3 **MARKS: 100**

OBJECTIVES

- Students learn to use LSRW skills and advanced communication skills in the context required in their daily life.
- The students learn to analyze and express their self and their concern and responsibilities to the world around.
- The students learn how English is used in literary writing so as to imbibe the spirit of using the standard language for communication.

UNIT I - I, ME, MYSELF

Listening for **s**pecific information in instructions and directions

Speaking about oneself, family and friends, likes, dislikes, strengths, weaknesses, profession,

talents, emotions, feelings, incidents, reactions, opinions, views, aim, vision.

Reading for comprehension of routine work.

Writing -Paragraph guided

Grammar- Articles, Prepositions, Punctuation

Vocabulary-Meanings, Synonyms, Antonyms

Composition –GuidedCreative writing

TEXTS

This is the Photograph of me by Margaret Atwood - Poem **(Internal Testing)**

1. *The Mayonnaise Jar*
2. *In Prison* by Jawaharlal Nehru (edited)
3. An extract from Shakespeare's *Othello* Act V Scene II

UNIT II -MY FAMILY AND FRIENDS

Listening to identify the persons/ places/ things from descriptions

Speaking -Describing incidents, favorite places, traits of a person, analyzing the nature of a

person.

Reading to get specific information and to analyze characters

Writing -Letters (personal),paragraphs-family profile and history

Grammar -adjectives and verbs

Vocabulary-synonyms and antonyms in context

Composition - Guided paragraph

TEXTS

Night of the Scorpion by Nissim Ezekiel - Poem **(Internal Testing)**

1. *The Old Folks at Home* by Alphonse Daudet (edited)
2. *Will you, Daddy?* (Story from Reader's Digest)
3. An extract from Shakespeare's *King Lear Act I Scene I*

UNIT III -THE WORLD AROUND ME

Listening To identify specific information

Speaking –Discussing and expressing opinions

Reading To infer meaning

Writing Descriptive and Diary writing

Grammar Uses of 'be' Verbs – subject verb concord

Vocabulary Coining new words with Prefix and suffix- converting one part of speech to another

Composition - Essay writing

TEXTS

Snake by D.H. Lawrence – Poem **(Internal Testing)**

1. *Floating Fantasy* by Vinu Abraham (Prose)
2. *Discovery by Herman Ould* (Play)
3. *A Handful of Dates* by Tayeb Salih (Short story)

UNIT IV - MY CONCERN AND RESPONSIBILITIES

Listening to short speeches and getting main concern- Global comprehension

Speaking Expressing opinions, concerns and responsibilities

Reading To detect one's perspective

Writing Debate and Dialogue

GrammarSentence patterns (5 basic types)

VocabularyAppropriate words in the context ,coinage of new words , use of phrases

Composition-Imaginative writing

TEXTS

I have a Dream by Martin Luther King Jr - **(Internal Testing)**

1. *What I have lived for?*by Bernard Russell
2. *Three days to see* by Helen Keller(edited)
3. An extract from Shakespeare's *The Merchant of Venice Act IV Scene I*

UNIT V - MY PROFESSIONAL WORLD

Listening to short profile to get details –global comprehension

Speaking Discussion on secrets of success learnt from success stories

Reading to infer meaning – to trace the development and analyze the ratio of development

Writing resume and E-mail writing

Grammar- Four Types of sentences

Vocabulary-Idioms and phrases- meaning

Composition – Formal and imaginative writing

TEXTS

Profile of a successful personality **(Internal Testing)**

1. Extract from a profile and an Interview of Indra Krishnamoorthy Nooyi
2. *The Verger* by Somerset Maugham
3. Profile of Bill Gates

PRESCRIBED BOOK:

English for Communication –PoGo publication Trichy

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HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019 onwards
First Year - Semester – I

Course Title	MAJOR CORE 1- PLANT DIVERSITY - I
Total Hours	105
Hours/Week	7 Hrs /Wk
Code	U15BO1MCT01
Course Type	Theory
Credits	5
Marks	100

General Objectives:

To enable the students to understand the classification, study of the genera belonging to various classes of algae, fungi & lichens, their habitat, thallus structure, reproduction and economic importance.

Course Objectives:
The learner will be able to

CO No.	Course Objectives
CO-1	Understand the thallus organisation, reproduction and life cycle patterns of various genera of algae
CO-2	Remember and understand the structure, reproduction and life cycles of various algae evaluate and apply the techniques related to the cultivation of freshwater algae.
CO-3	Remember and understand the morphology and reproduction of the various genera of fungi.
CO- 4	Describe the morphology, reproduction and lifecycle of Pteridophytes and apply the economic importance of fungi.
CO- 5	Remember and understand the classification and different types of lichens and apply the economic importance of lichens.

UNIT – I Algae **21 Hrs**

Outline classification of Algae (Fritsch, 1979). Salient features of various classes of algae. Thallus organization in algae. Structure, reproduction and life cycle patterns of the following genera:
Nostoc, Chlamydomonas, Chlorella, Volvox, Ulva and *Cladophora*.
Extra reading/Key words:*Nitrogen fixation, Pollution indicators*

UNIT – II Algae **21 Hrs**

Structure, reproduction and life cycle patterns of the following genera: *Caulerpa, Diatom, Dictyota* and *Polysiphonia*. Techniques in algae:Cultivation of freshwater algae – Spirulina (SCP). Economic importance of algae.
Extra reading/Key words:*Life cycle patterns of parasitic algae, seaweeds*

UNIT – III Fungi **21 Hrs**

Outline classification of fungi (Ainsworth, 1971). Salient features of the main classes of fungi. Morphology and reproduction of the following genera: *Albugo, Saccharomyces* and *Penicillium.*

Extra reading/Key words:*Pathogenic fungi, Fungal Sinusitis.*

UNIT – IV Fungi **21 Hrs**

Morphology and reproduction of the following genera: *Peziza, Puccinia* and *Polyporus.* Techniques in fungi: Cultivation and identification of fungi – soil, water and spoiled foods. Economic importance of fungi.

Extra reading/Key words: *Cultivation and identification of yeast.*

UNIT – V Lichens **21 Hrs**

Classification & types of lichens. Structure (External and Internal) & reproduction of *Usnea.* Economic importance of lichens.

Extra reading/Key words: *Dust lichens, sulphur dust lichens, wart lichens*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the thallus organization in algae.	PSO-1, PSO-3	R, U
CO-2	Describe the structure, reproduction and life cycles of various algae.	PSO-1, PSO-3	R, U
CO-3	Discuss the techniques related to the cultivation of freshwater algae.	PSO-1	U
CO-4	List the salient features of the main classes of fungi.	PSO-1	R
CO-5	Describe the morphology and reproduction of the various genera of fungi.	PSO-1, PSO-3	U
CO-6	Discuss the cultivation and identification methods of fungi	PSO-1	U
CO-7	Explain the classification and different types of lichens	PSO-1	R, U
CO-8	Summarize the economic importance of lichens	PSO-1	U
CO-9	Develop the employability skills by cultivating the algae and fungi	PSO-1	C

References

Text Books:

1. Vashishta, B. R. 2010. Botany for degree students Algae. S. Chand and Company Ltd, New Delhi.
2. Vashista, B. R. and Sinha, A. K. 2016. Botany for degree students Fungi. S. Chand and Company Ltd, New Delhi.

Reference Books:

1. Alexopoulos, C. J. 1971. Introductory Mycology – John Wiley and Sons Inc. New York, London.
2. Kumar, H. D. and Singh, H. N. 1982. A text Book on Algae, Affiliated East West Press Pvt. Ltd. New Delhi.
3. Smith, G. M. 1978. Cryptogamic Botany Vol – 1. Tata Mc Graw- Hill Pub. Company Ltd. New Delhi.
4. Webster, J. 1993. Introduction to Fungi – Cambridge University press, Cambridge.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

PG AND RESEARCH DEPARTMENT OF BOTANY

B.Sc. BOTANY SYLLABUS 2019 onwards
First Year - Semester – I

Course Title	**A1 ALLIED OPTIONAL PAPER I – BIODIVERSITY CONSERVATION AND MANAGEMENT**
Total Hours	60
Hours/Week	**4Hrs /Wk**
Code	**U15BO1AOT01**
Course Type	**Theory**
Credits	**5**
Marks	**100**

General Objectives:

The aim of the study of biodiversity conservation is to protect the existing flora and fauna for enhancing the beauty of our planet earth mother and to pass it on for our future generation with all the conserved resources for maintaining environment friendly sustainable development.

Course Objectives:
The learner will be able to

CO No.	Course Objectives
CO-1	Understand the types of biodiversity, biosphere reserves and botanical gardens.
CO-2	Remember, understand and apply the biodiversity assessment and inventory programme and methods for species identification and classification.
CO-3	Remember, understand and apply the conservation of biodiversity and national and international initiatives and organizations.
CO- 4	Describe the biodiversity informatics, biodiversity databases and biodiversity registers.
CO- 5	Remember and understand the global biodiversity information System, biodiversity data management project and bioethics.

UNIT - I Biodiversity- Definition- Types of biodiversity – protected areas. Biosphere reserves – national parks, wild life sanctuaries and Botanical gardens.

Extra reading/Key words: *Terrestrial Biodiversity, Biodiversity Hotspots*

UNIT – II Biodiversity assessment and inventory programme: Morphological and molecular characterization of biodiversity – methods for species identification and classification.

Extra reading/Key words:*Habitat relationship, Cluster Analysis*

UNIT – III Conservation of biodiversity – Conservation through in-situ and ex-situ methods. National and international initiatives – IUCN categories – Endangered, Threatened, Vulnerable and extinct species. Organizations-WHO and UNESCO.

Extra reading/Key words:*National Wildlife Corridors Plan, National Landcare Program*

UNIT – IV Biodiversity informatics – Documenting biodiversity – Biodiversity databases – Red book – Blue book and green book – Biodiversity registers.

Extra reading/Key words:*Ecological Information, Taxonomic Information*

UNIT – V Global biodiversity information System – species 2000 and Tree of life – Overview of the UNEP/GEF biodiversity data management project (BDM) – CBD and bioethics.

Extra reading/Key words:*Biodiversity Information Standards, Encyclopedia of Life*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the types of biodiversity, biosphere reserves and botanical gardens	PSO-1, PSO-3	R, U
CO-2	Describe the biodiversity assessment and inventory programme and methods for species identification and classification.	PSO-1, PSO-3	R, U
CO-3	Explain the conservation of biodiversity and national and international initiatives and organizations.	PSO-1	U
CO-4	Describe the biodiversity informatics, biodiversity databases and biodiversity registers.	PSO-1	R
CO-5	Discuss the global biodiversity information System, biodiversity data management project and bioethics.	PSO-1, PSO-3	U

References

Text books:

1. Agarwal K.C., Biodiversity.
2. Kumar, 2005, Biodiversity Principles and Conservation, Internation Book Distributors, Dehradun.

Reference Books:

1. Kevin J. Canton and John I Spicer, An introduction of Biodiversity.
2. Global Biodiversity, 1992, Status of the Earth Living Resources, Water Conservation and monitoring Center, Chapman hall, London.
3. Forey. P. L., Humphries C.J. and Vane R.I., Wright (eds, 1994, Systematics and Conservation Evolution.
4. Hawksworth D.I., 1995, (ed), Biodiversity, Measurement and Estimation, Chapman and Hall, London.
5. Kandya A.K., 2007, Biodiversity Conservation and Legal Aspects, International Book Distributors, Dehradun.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

PG AND RESEARCH DEPARTMENT OF BOTANY

B.Sc. BOTANY SYLLABUS 2019 onwards
First Year - Semester – I

Course Title	**A2 - ALLIED OPTIONAL PAPER II - MUSHROOM CULTIVATION**
Total Hours	60
Hours/Week	**4Hrs /Wk**
Code	**U15BO1AOT02**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

It deals with the importance of mushroom in the nutritious diet. It also gives knowledge on different steps involves in the cultivation of edible mushroom, post harvest technology and various recipes of mushrooms. It also encourages students to produce mushrooms at their home level (micro entrepreneurship).

Course Objectives:
The learner will be able to

CO No.	**Course Objectives**
CO-1	Understand the life cycle of common edible mushrooms.
CO-2	Remember, understand and apply the construction of mushroom cultivation sheds
CO-3	Remember, understand and apply the cultivation of mushrooms and their nutritive values.
CO- 4	Understand and Describe the Post harvest technologies of mushrooms.
CO- 5	Remember and understand the scenario of mushroom cultivation and scope.

UNIT – I Introduction: Life cycle of common edible mushrooms – Agaricusand Pleurotus.

Extra reading/Key words: *Lentinula edodes, Tremila fusciformis*

UNIT –II Construction of mushroom cultivation sheds. Cultivation – isolation, spawn production and growth media.

Extra reading/Key words: *Hydroponics Tent, Urban Mushroom Farm*

UNIT – III Mushroom cultivation - spawns running and harvesting of mushrooms and nutritive value of mushrooms.

Extra reading/Key words: *Potential health risk, Weight management*

UNIT – IV Post harvest technology: Freezing, dry freezing, drying, packaging, marketing, recipes of mushrooms.

Extra reading/Key words: *Post harvest Shelf life, Post harvest Physiology*

UNIT – V Scenario of mushroom cultivation – prospects and scope in small scale industry.

Extra reading/Key words:*Global Production, Indian Scenario*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the life cycle of common edible mushrooms.	PSO-1, PSO-3	R, U
CO-2	Describe the construction of mushroom cultivation sheds.	PSO-1, PSO-3	R, U
CO-3	Explain the cultivation practices of mushrooms and their nutritive values	PSO-1	U
CO-4	Describe the Post harvest technologies of mushrooms.	PSO-1	R
CO-5	Discuss the scenario of mushroom cultivation and scope.	PSO-1, PSO-3	U

References:

1. Sharma, B.B. 1993. A Guide to home Gardening. Ministry of information and broadcasting, Govt. of India.

(For candidates admitted from 2019 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2

/B.Sc./B.Com/B.R.SC/B.C.A/ B.B.A DEGREE EXAMINATION

SEMESTER I / V

Course Title	**ENVIRONMENTAL STUDIES**
Total Hours	**15**
Hours/Week	**1**
Code	**U18RE1EST01/ U18RE5EST01**
Course Type	Theory
Credits	**1**
Marks	**100**

General Objectives:

The Student will be able to understand the concept of ecosystem, biodiversity, conservation, disaster management, analyse the prospects of natural resources, evaluate the effect and control of pollution

Course Objectives:

The student will be able to

1. understand the prospects of the various naturalresources.
2. analyse the concept and need forbiodiversity
3. evaluate the effect of the different types ofpollution.
4. understand the need for disastermanagement
5. understand the Environment and SocialIssues

Unit I – Awareness andNaturalResources **3hrs**

Awareness of Environmental issues and management strategies – need of the hour
Renewable and non-renewable resources - uses, present status and management of forest, water, land and energy resources.

Extra reading (Key Words):*Non renewable sources- location in India*

Unit II – EcosystemsandBiodiversity **3hrs**

Ecosystem – concepts, structure and types – concept of food chains and food web – causes and effects of weakening food chains - Biodiversity – concept of genetic, species and ecological biodiversity – ecological and economic values – India, a megadiversity country, hotspots – threats to biodiversity and conservation measures

Extra reading (Key Words): *Red list (any 10 plants and animals)*

Unit III –EnvironmentalPollution **3hrs**

Causes, effects and control of water, and air pollution – global warming – ozone depletion – nuclear hazards.

Population growth at national and global level

World food production – effects of modern agriculture on land ecosystems – GMOs and related issues

.Environmental pollution and diseases – malaria, chikungunya

Extra reading (Key Words): *Environmental factors affecting human behaviour*

Unit IV –DisasterManagement **3hrs**

Bomb Threat – Earthquake – Explosion – Hazardous material spill / release – campus shooting – Terrorist incidence – Financial emergency – a sudden health emergency, unexpected loss of income, death in the family or other family emergency. Rent in arrears and risk of eviction. Natural disasters

Extra reading (Key Words): *Causative factors of any 2 disasters*

Unit V – Environment andSocialIssues **3hrs**

Rich – poor wide – at national and global levels

Urbanization – slums

Changing value systems – AIDS Family welfare programs

Extra reading (Key Words): *Scholarships and funds benefitting the welfare of the family*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

1. Explain the importance of the various naturalresources.
2. Analyze the concepts, structure and types ofecosystem. Addnote on the biodiversityconcepts
3. Evaluate the effect of the different types ofpollution
4. Explains the various disastermanagement.
5. Discuss the need of environment and the socialissues

REFERENCES:

Agarwal, K.C. (2001). Environmental Biology, Nidi Publication Ltd. Bikaner.

Chairas, D.D. (1985). Environmental Science. TheBenjaminCummings Publishing company.,Inc.

Clarke George, L. (1954). Elements of Ecology. Hohn Wiley and SONS, Inc.

Hodges, L. (1977). Environmental Pollution, II Edition. Holt, Rinehart and Winston, New York. Krebs, C.J. (2001).Ecology.VI Edition.Benjamin Cummings.

Nebel, B.J. and Wright, R.T.(1996). Environmental Science, Prentice Hall, New Jersey

Odum, E.P.(2008) Fundamentals of Ecology.Indian Edition. Brooks / Cole.

Sharma, B.K. and Kaur (1997). Environmental Chemistry. Goel Publishing House, Meerut. Sharma, B.K. and Kaur, (1997). An Introduction to Environmental Pollution. Goel Publishing House, Meerut.

Sinhe, A.K. Boojh, R. and Vishwanathan, P. N. (1989). Water Pollution Conservation and Management, Gyansdaya Prakashan, Nainital.

(For Candidates admitted from 2019 onwards)

HOLY CROSS COLLEGE (Autonomous), Tiruchirappalli - 620 002.

PG & RESEARCH DEPARTMENT OF TAMIL

First Year - Semester – II

Course Title	தமிழ்த்தாள் - **II**
Total Hours	**75**
Hours/Week	**5 Hrs Wk**
Code	**U19TL2TAM02**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

இறைச்சிந்தனை வழி மாணவர்களை ஒருமுகப்படுத்துதல்.

- To harmonize the students in Religious thoughts.
- To Introduce the specialties of Tamil laureates
- To infuse the friendly nature in students
- To improvise good habits among students

Course Objectives:

CO No.	Course Objectives
CO-1	இறைச்சிந்தனை வழி மாணவர்களை ஒருமுகப்படுத்துதல்.
CO-2	மதநல்லிணக்கத்தை உருவாக்குதல்.
CO-3	ஆளுமைத்திறனை வளர்த்தல்
CO-4	படைப்பாற்றல் திறனை ஊக்கப்படுத்துதல்.
CO-5	பிழையின்றி எழுதவும் படிக்கவும் மாணவர்களை தயார்ப்படுத்துதல்.

அலகு:1செய்யுள் **15 Hrs**

1. தேவாரம் - சுந்தரர் (திருமழப்பாடி)
2. திருவாசகம் - மாணிக்கவாசகர் (குயில் பத்து)
3. திருமந்திரம் - திருமூலர்
4. திருப்பாவை - ஆண்டாள்
5. நாலாயிர திவ்யப்பிரபந்தம் - குலசேகராழ்வார் (பெருமாள் திருமொழி)

key Words (Extra Reading)

1. அற்புதத்திருவந்தாதி - காரைக்கால் அம்மையார்
2. திருவாய்மொழி - நம்மாழ்வார்

அலகு:2செய்யுள் **15 Hrs**

6. மீனாட்சியம்மை பிள்ளைத்தமிழ் - குமரகுருபரர்
7. இரட்சணிய யாத்திரிகம் (சிலுவைப்பாடு) - எச்.ஏ.கிருட்டிணப்பிள்ளை
8. வேதநாயக சாஸ்திரியார் பாடல்கள் - - வேதநாயசாஸ்திரியார்
9. நபிகள்நாயக மான்மியமஞ்சரி - செய்குதம்பிப்பாவலர்

key Words (Extra Reading)

1. நந்திக்கலம்பகம்
2. குற்றாலக்குறவஞ்சி –திரிகூடராசப்பக்கவிராயர்

அலகு:3 **15 Hrs**

தமிழ் இலக்கிய வரலாறு –

பல்லவர்காலம்

நாயக்கர்காலம்

அலகு:4 **15Hrs**

படைப்பிலக்கியம் - புதினம்

கல்கி - பார்த்திபன் கனவு

key Words (Extra Reading)

வில்லோடு வா நிலவே – வைரமுத்து

அலகு:5 **15 Hrs**

கடிதம் எழுதுதல்

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	to evaluate the religious works and the growth of religious literature	PSO 1	U
CO-2	to bring-out the similarities in religious teachings and to ensure unity	PSO 2	AN
CO-3	to learn about the personalities about the Kings and their personalities	PSO 2	AP
CO-4	to enrich literature by reading, increase creativity and strengthen the vocabulary	PSO 3	U
CO-5	To learn the art of writing	PSO 4	U

பார்வை நூல்கள்

செய்யுள் - தமிழாய்வுத்துறை வெளியீடு

தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறை வுத்துறை வெளியீடு

நாவல்

கல்கி - பார்த்திபன் கனவு

கடித இலக்கியம் - பயிற்சி ஏடு

(For the candidates admitted from June 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002
DEPARTMENT OF HINDI

SEMESTER – II

Course Title	**PART – I LANGUAGE** **HINDI – II DRAMA , NOVEL AND GRAMMAR –II**
Total Hours	**75**
Hours/Week	**5Hrs/Wk**
Code	**CODE: U19HN2HIN02**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objective : To enable the students to appreciate and critically evaluate the prescribedliterary works

Course Objectives (CO):

The learner will be able to:

CO No.	**Course Objectives**
CO -1	Critically evaluate moral values in the drama
CO- 2	Critically appreciate and evaluate the novel in an ethical perspective.
CO- 3	Understand and apply tense and case
CO- 4	remember and apply adverbs and prepositions
CO- 5	comprehend the usage of conjunctions and interjections

UNIT – I **(15 Hours)**

1. Ashad ka ek dhin
2. Gaban
3. Kaal

Extra Reading (Key Words): Mohan Rakesh, Laharon Ke Rajahams

UNIT- II **(15 Hours)**

1. Ashad ka ek dhin
2. Gaban
3. Karak

Extra Reading (Key Words): *Premchand, Nirmala*

UNIT- III **(15 Hours)**

1. Ashad ka ek dhin

2. Gaban
3. Kriya Visheshan

Extra Reading (Key Words): Seva Sadhan, Aadhe Adhure

UNIT- IV **(15 Hours)**

1. Ashad ka ek dhin

2. Gaban
3. Sambandha Bodhak

Extra Reading (Key Words): Andhere Bandh Kamare, Mispal

UNIT- V **(15 Hours)**

1. Ashad ka ek dhin

2. Gaban

3. Yojak(Samuchaya Bhodak) Aur Dhyodak (Vismyadhi Bhodak) *Extra Reading (Key Words): Poos Ki Raat, Shatranj Ke Khiladi*

Note :Texts given in the Extra Reading (Key Words) must be tested only through Assignmentand Seminars.

Course Outcomes:

The learner will be able to:

CO No.	Course Outcomes	Cognitive Level
CO -1	Appraise moral values in the Society	E
CO- 2	Distinguish necessity and luxury	E
CO- 3	To make use of present, past and future tense and build stories.	U, Ap
CO- 4	Utilize adverbs and prepositions in a text.	R, Ap
CO- 5	Rephrase using conjunctions and interjections.	U

CO- Course Outcome; R- Remember; U- Understand; Ap- Apply; An- Analyze; E- Evaluate; C- Create

Reference Books :

- Ashadka ek dhin : Mohan Rakesh;Rajpal and Sons,Delhi.
- Nirmala: Premchand;Sri Jwalaji Books Educational Enterprises,New Delhi.
- Vyakaran pradeep; Dr. Ram Dev. M.A; LokBharathiPrakashan ;Illahabad.
- Manak Hindi Vyakaran: ChandraBhan ‘Rahi’;SreyaPrakashan, Illahabad

(For candidates admitted 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
DEPARTMENT OF FRENCH

SEMESTER II

Course Title	**PART I – LANGUAGE - FRENCH PAPER II** **(**GRAMMAR, CIVILISATION & TRANSLATION (ÉCHO A1 2e édition)
Total Hours	75
Hours/Week	5 Hrs/Wk
Code	U16FR2FRE02
Course Type	Theory
Credits	3
Marks	100

General Objective: To enable the students to learn French Grammar and Cultural aspects of France.

Course Objectives (CO):

The learner will be able to

CO1	understand pronominal verbs and apply the same in narrating one's own everyday activities.
CO2	remember prepositions and understand climate in France and dwelling place.
CO3	apply past tenses in a biography and analyse relationships and family structure in France
CO4	understand object pronouns and evaluate savoir-vivre in France.
CO5	understand the usage of relative pronouns and secondary tenses and remember SOS and evaluate French style

Unit 1 Quellejournée! (15Hours)

La conjugaison pronominale, l'impératif, l'expression de la quantité – les activités quotidiennes, les achats et l'argent – demander des nouvelles de quelqu'un – le comportement en matière d'achat et d'argent.

Extra Reading (Key Words): lettre amicale, compléter un dialogue

Unit 2 Qu'on est bienici! (12Hours)

Les prépositions et les adverbes, les verbes exprimant un déplacement – le logement, la localisation, l'orientation, l'état physique, le temps qu'il fait – demander de l'aide, exprimer une interdiction – le climat en France, les cadres de vie (ville et campagne)

Extra Reading (Key Words): des affiches et des panneaux

Unit 3 Souvenez-vous ? (12Hours)

Emplois du passé composé et de l'imparfait – les moments de la vie, la famille, les relations amicales, amoureuses, familiales – demander/donner des informations sur la biographie d'une personne – le couple et la famille.

Extra Reading (Key Words): la biographie d'une personne importante

Unit 4 Ons'appelle ? (12Hours)

Les pronoms compléments directs et indirects – les moyens de la communication – aborder quelqu'un, exprimer une opinion sur la vérité d'un fait – les conseils de savoir-vivre en France.

Extra Reading (Key Words):le savoir vivre en Inde

Unit 5 Un bon conseil ! ; Parlez-moi devous! (24Hours)

L'expression de déroulement de l'action, les phrases rapportées – le corps, la santé et la maladie – téléphoner, prendre rendez-vous, exposer un problème – les conseils pour faire face aux situations d'urgence.

La place de l'adjectif, la proposition relative, la formation des mots – la description physique et psychologique des personnes, les vêtements et les couleurs – demander/donner une explication – quelques styles comportementaux et vestimentaires en France.

Extra Reading (Key Words): SOS en Inde, les marques internationales des vêtements.

Course outcomes:	**Cognitive level**
Make use of pronominal verbs to sketch one's routine.	U, Ap
Illustrate habitat in France.	An
Utilize a biography to identify past tenses.	E
Compare family structure in France and in India.	E
Apprise savoir-vivre in class room.	Ap, An
Examine « Style » in a French context.	An
Relate SOS in India and in France.	E

TEXT BOOKS :

ECHO A1 – METHODE DE FRANÇAIS & CAHIER PERSONNEL D'APPRENTISSAGE
Authors: J. Girardet and J. Pécheur Publication:
CLÉ INTERNATIONAL, 2013.

Books for Reference:

La Conjugaison – Nathan
French made easy – Beginners level - Goodwill Publishing House Je parle français II - Abhay Publications
Le français avec des jeux et des activités – ELI
Langue et la civilisation – I – Mauger Bleu

Note :Texts given in the Extra Reading (Key Words) must be tested only through Assignment andSeminars.

(for candidates admitted from June 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), Tiruchirapalli – 620002

PG AND RESEARCH DEPARTMENT OF ENGLISH

I YEAR UG – SEMESTER I

PART II – ENGLISH 2 - GENERAL ENGLISH II

HOURS : 6 **CODE : U15EL2GEN02**

CREDIT : 3 **MARKS: 100**

OBJECTIVES

- Students learn to use LSRW skills and advanced communication skills in the context required in their daily life.
- The students learn to analyze and express their self and their concern and responsibilities to the world around.
- The students learn how English is used in literary writing so as to imbibe the spirit of the standard language for communication.

UNIT I – SELF

Listening- Specific information from demonstration and instructions, transfer of information.

Speaking - Sharing expressions, dreams and expressing opinions.

Reading -Skimming and Scanning for specific information, reading for local comprehension.

Writing - Story Writing

Grammar - Articles and Sentence Pattern

Vocabulary - Meanings, Synonyms, Antonyms

Composition - Transfer of information: Paragraph to Bar graph/pie chart

General Essay - Courage is the key to success

TEXTS

1. *The Far and the Near* by Thomas Wolfe (Short Story)

2. *The Owl who was a God* by James Thurber (Short Story)

3.*Wings of Fire – Chapter I*by Dr. A.P.J. Abdul Kalam (Prose)

UNIT II – STRENGTHS

Listening - Listening to a process

Speaking - Telephone Etiquette

Reading - Loud reading with pause, intonation and expression in dialogue form

Writing - Writing about oneself (strengths& weaknesses, Have's & Have not's)

Grammar- Subject verb agreement, Prepositions

Vocabulary- One word substitute in the context

Composition- Letter Writing - informal letters

General essay – A bird in hand is worth two in bush.

TEXTS

1. *The Robe of Peace* by O' Henry (Short Story)

2. An extract from *Androcles and the Lion* by George Bernard Shaw (Play)

UNIT III - POSITIVE SHORTCOMINGS

Listening - Listening to facts and opinions and trying to differentiate it

Speaking - Pair Work – about have's & have not's, understanding the strengths and overcoming the weaknesses

Reading - Reading newspapers, articles, magazines, anecdotes for global and specific in analytical thinking

Writing - Filing Complaints, Travelogues

Grammar - Tenses, Direct and Indirect Speech

Vocabulary - Compound words

Composition - Dialogue Writing

General essay – Adversity is the seed of success.

TEXTS

1. *Six Thinking Hats* by Edward de Bono (Prose)

2. *A Cup of Tea* by Katherine Mansfield (Short Story)

3. An Extract from Shakespeare's *As You Like It (Act II Scene I lines 12 -17)*

UNIT IV POTENTIALS

Listening - Listening to the description of personalities, historical places and monuments

Speaking - Group Discussion – Totally controlled, partially controlled, Free

Reading - Parallel Reading, reading for pleasure

Writing - Letter writing – formal letters

Grammar - Adjectives, Degrees of Comparisons

Vocabulary - Idioms and Phrases

Composition - Debates and Discussions

General essay – My potentials

TEXTS

1. *Easy Ways to Avoid an Argument* by Sam Horn (Prose)

2. *Pygmalion* by George Bernard Shaw (Play)

3. My Heart Leaps up when I behold by William Wordsworth (Poem)

4. The Flower by Alfred Lord Tennyson (Poem)

UNIT V ACHIEVEMENTS

Listening - Listening to comparisons and arguments

Speaking - Performance

Reading - In-depth reading

Writing - Script writing of story to play

Grammar - Question Tags

Vocabulary - Homophones

Composition - Essay Writing

General essay - The reward of hard work.

TEXTS

1.*On Saying Please* by A.G. Gardiner (Prose)

2. *A Time of Green* by Anna Stillaman (Play)

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HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019 onwards
First Year – Semester – II

Course Title	MAJOR CORE 2- PLANT DIVERSITY – II
Total Hours	90
Hours/Week	6 Hrs /Wk
Code	U15BO1MCT02
Course Type	Theory
Credits	6
Marks	100

General Objectives:

To enable the students to understand the classification, morphology, structure, reproduction and life cycle of Bryophytes, Pteridophytes and Gymnosperms.

Course Objectives :
The learner will be able to

CO No.	Course Objectives
CO-1	Remember and understand the classification, structure and reproduction, ecology and apply the economic importance of the main classes of bryophytes.
CO-2	Classify the pteridophytes by their characteristic features.
CO-3	Remember and understand the stelar evolution, types of fossils, geological time scale and apply the economic importance of pteridophytes..
CO-4	Remember and understand the salient features of Gymnosperm morphology and reproductive characters of important genus of gymnosperm.
CO-5	Understand and apply the significance of important genus of fossil gymnosperm

UNIT – I Bryophytes **18 Hrs**

Outline classification of Bryophytes (Rothmaler, 1951). Salient features of the main classes of Bryophytes. Structure and reproduction of Hepaticopsida – *Marchantia*, Anthocerotopsida – *Anthoceros*, and Bryopsida – *Funaria* (development excluded). Ecology and economic importance of Bryophytes.

Extra reading/Key words:*Comparative study of gametophyte and sporophyte, spore dispersal*

UNIT – II Pteridophytes **18 Hrs**

Classification of Pteridophytes (Reimers, 1975). Salient features of main classes of Pteridophytes. Morphology, structure, reproduction and life cycle of *Selaginella,Equisetum, Adiantum* and *Marsilea.*

Extra reading/Key words:*Phytoliths, evolutionary trends of pteridophytes.*

UNIT – III Pteridophytes **18 Hrs**

Evolution of heterospory and seed habit. Stelar evolution. Economic importance of Pteridophytes. Fossils and Fossilization.Types of fossils. Geological time scale.- eras, periods & epoch. Carbon dating. Significance of fossils, oil deposits. Geological distribution and reconstructed structure – form genera *Rhynia* and *Calamites*.

Extra reading/Key words:*Phytoremediation, environmental fluctuations*

UNIT – IV Gymnosperms **18 Hrs**

Classification of gymnosperms (K.R.Sporne, 1965). Salient features of main classes of gymnosperms. Morphology, structure and reproduction of *Pinus.*

Extra reading/Key words:*Cypress, Taxus.*

UNIT – V Gymnosperms **18 Hrs**

Morphology, structure and reproduction of Gnetum. Angiospermic characters of *Gnetum*, Economic importance of Gymnosperms. Geological distribution and reconstructed structure – form genus *Williamsonia*.

Extra reading/Key words: *Fossil- Metasequia, Zoidogamy in fossil Gymnosperm*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the classification, structure and reproduction of the main classes of bryophytes.	PSO-1, PSO-3	R, U
CO-2	List the economic importance of bryophytes.	PSO-1	R
CO-3	Classify the pteridophytes by their charecteristic features	PSO-1	U, Ap
CO-4	Describe the stelar evolution, types of fossils, geological time scale	PSO-1, PSO-3	R, U
CO-5	List the economic importance of pteridophytes	PSO-1	R
CO-6	Discuss the salient features of Gymnosperm morphology	PSO-1, PSO-3	U
CO-7	Illustrate the reproductive characters of important genus of gymnosperm	PSO-1, PSO-3	R, U
CO-8	Explain the significance of important genus of fossil gymnosperm	PSO-1	R, U
CO-9	Develop the Employability skills by learning the life cycle patterns of Bryophytes, Pteridophytes and Gymnosperms	PSO-1	C

References

Text Books:

1. Vashista, B. R. Bryophyta. 2010. S. Chand and Company Ltd, New Delhi.

2. Vashista, B. R. Pteridophyta. 2010. S. Chand and Company Ltd, New Delhi.
3. Vashista, B. R. Gymnosperms. 2010. S. Chand and Company Ltd, New Delhi.

Reference Books:

1. Rashid, A. 1976. An introduction to Pteridophytes. Vikas Publishing House Pvt. Ltd, New Delhi.
2. Sporne, K. R. 1965. Morphology of Gymnosperms. Hutchinson and Company Ltd. London.
3. Sporne, K. R. 1970. Morphology of Pteridophytes. Hutchinson and Company Ltd. London.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019onwards
First Year - Semester – II

Course Title	MAJOR CORE 3- PRACTICAL-1 PLANT DIVERSITY – I & II
Total Hours	60
Hours/Week	4 Hrs /Wk
Code	U15BO2MCP03
Course Type	Practical
Credits	3
Marks	100

General Objectives:

To enable the students to understand thallus organization, internal and the reproductive structures of algae, fungi, lichen, bryophytes, pteridophytes and gymnosperms.

Course Objectives:
The learner will be able to

CO No.	Course Objectives
CO-1	Remember, understand and apply the thallus organization, internal structure and reproduction of algae.
CO-2	Remember and understand the internal structure and reproduction of fungi.
CO-3	Understand the morphology of thallus & apothecium of Usnea and structure of bryophytes
CO-4	Remember, understand and apply the morphology, anatomy and reproductive structures of Pteridophytes and fossil forms.
CO-5	Understand the morphology and anatomical features in Gymnosperms.

UNIT – I **12 Hrs**

Algae: Observation andidentification of the algal forms: *Nostoc* filament, *Chlamydomonas*, *Chlorella* and *Volvox* coenobium with daughter colony, *Ulva* thallus, *Cladophora* filaments, *Caulerpa* thallus, *Diatom*, *Dictyota* thallus with oogonial sorus and *Polysiphonia* with carposporophyte.

Sectioning: *Ulva* thallus and *Caulerpa* rhizome

UNIT – II **12 Hrs**

Fungi: Observation and identification of the fungal forms: *Albugo*- infected crucifer leaf, *Sacchromyces*, *Penicillium* conidia, *Peziza* apothecium, *Polyporus* basidiocarp, *Puccinia* infected leaves showing uredia, telia, pycnidia and aecidia.

Sectioning: *Albugo* infected leaves.

UNIT – III **12 Hrs**

Lichens: Observation & identification of lichen form **:** *Usnea***–** Morphology of thallus & apothecium.

Bryophytes: Observation and identification of morphological sructure of *Marchantia, Anthoceros, Funaria*. Identification of permanent slides (*Marchantia*- thallus V.S, sporophyte L.S, *Anthoceros* – Capsule-L.S and *Funaria*- antheridial head, archegonial head, capsule L.S)

UNIT – IV **12 Hrs**

Pteridophytes: Study of the morphology, anatomy and reproductive structures of the following:*Selaginella, Equisetum, Adiantum* and *Marsilea*.Spore germination studies in ferns. Observation and study of permanent slides of fossil plants – *Rhynia* and *Calamites*.

UNIT – V **12 Hrs**

Gymnosperms: Morphological and anatomical study of the vegetative and reproductive parts of *Pinus* and *Gnetum.*

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Identify important algal forms by their morphological and anatomical features	PSO-1, PSO-3	R, U
CO-2	Describe the morphology and reproduction of the various genera of fungi.	PSO-1, PSO-3	R
CO-3	Illustrate the structure and reproduction in lichens	PSO-1, PSO-3	U
CO-4	Observe and identify the morphological structure of bryophytes	PSO-1, PSO-3	R, U
CO-5	Identify the permanent slides of bryophytes	PSO-3	R
CO-6	Describe the morphology, anatomy and reproductive structures of Pteridophytes	PSO-1, PSO-3	U
CO-7	Examine the germination of spores in ferns	PSO-1, PSO-3	R, U
CO-8	Illustrate the morphological and anatomical structures of gymnosperms	PSO-1, PSO-3	R, U
CO-9	Develop the practical skills by observing the morphological, anatomical and reproductive structures of plant diversity	PSO-1	C

(For the candidates admitted from 2019onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI

B.A/B.Sc./B.Com/B.R.SC/B.C.A/ B.B.A DEGREE EXAMINATION SEMESTER- II

Course Title	**SKILL – BASED ELECTIVE 1: SOFT SKILL DEVELOPMENT**
Total Hours	**30**
Hours/Week	**2**
Code	**U15RE2 SBT01**
Course Type	Theory
Credits	**2**
Marks	**100**

General Objective:

The student understands the need for the development of self esteem, team spirit andcommunicative skills to prepare themselves for selfdevelopment.

Course Outcomes:

The student will be able to

1. Understand the importance of self awareness, values and leadership skills in capacitybuilding
2. Understand and analyze the factors affecting interpersonalskills
3. Understand and evaluate the concepts of vision, mission and goals for corporateskills
4. Understand, apply and analyze the importance of body language, time management andstress management
5. Understand the concept and need for self development plan

UNITI: 6hrs

Individual Capacity Building

Self awareness- building self-esteem- importance of having a strong self – esteem – developing positive attitude-. Anchoring on principles: Universal principles and values – forming & inculcating values- Leadershipskills.

Extra reading / Key Words: *Biographies of any 2 Indian leaders*

UNITII: 6hrs

Interpersonal skills

Trust-trustworthiness-interpersonal communication –art of listening, reading and writing –art of writing –building relationship-empathy.

Extra reading / Key Words: *Tips for building relationship*

UNITIII: **6hrs**

Corporate skills

Vision, mission and goals: Concepts, vision setting, goal setting, Individual and Group goals, Concept of synergy, team building, group skills.

Extra reading / Key Words: *Group dynamics and communication skills*

UNITIV: **6hrs**

Management skills

Developing Body Language – Practicing etiquette and mannerism –Stress Management – Time Management Prioritization Importance and urgent activities- Time management to move towards life vision.

Extra reading / Key Words: *Polite conversations and dialogue skills*

UNITV: **6 hrs**

Self Development Plan

Concept and Need for Self Development Plan – Preparing Self Development Plan 9 Format is used to complete the self development Plan), Monitoring and Evaluation of self Development plan – Developing indicators for self development introduction to National Skill Development Mission.

Extra reading / Key Words: *Case study*

Note: Extra reading/Key words are only for internal testing(Seminar/Assignment) Course Course

Outcome:

1. explain the importance of self awareness, values and leadership skills in capacitybuilding
2. analyze the factors affecting interpersonalskills
3. evaluate the concepts of vision, mission and goals for corporateskills
4. apply and analyze the importance of body language, time management and stressmanagement
5. summarize the concept and need for self developmentplan

REFERENCES:

Alex K.(2012) Soft Skills – Know Yourself & Know the World, S. Chand & Company Ltd., New Delhi Meena K. Ayothi V. (2013). A Book on Development of Soft Skills (Soft Skills: A Road Map to Success), P.R. Publishers & Distributors,Trichy.

Francis Thamburaj S.J. (2009). Communication soft skills for Professional Excellence, 1st

Ed., Grace Publishers, Rathan Reddy B.(2005). Team Development and Leadership, Jaico Publishing House, Mumbai.

(For candidates admitted from 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2 B.A./ B.Sc.,/B.Com./BCA & BBA, DEGREE EXAMINATION

SEMESTER II / III

Course Title	**SKILL – BASED ELECTIVE 2: SUSTAINABLE RURAL DEVELOPMENT AND STUDENT SOCIAL RESPONSIBILITY**
Total Hours	**30**
Hours/Week	**2**
Code	**U18RE2SBT02/ U18RE3SBT02**
Course Type	Theory
Credits	**2**
Marks	**100**

General Objective:

The Student will be able to understand the concept of natural resources and resource mapping of villages and strengthen their leadership qualities, keeping in mind their responsibilities towards society.

Course Objectives:

The student will be able to:

1. understand the functioning of NGO's andSHG's
2. educate themselves about the different farmingmethods.
3. practice alternative agriculturalmethods
4. understand the need for social responsibility throughNCC.
5. understand the Leadership and ManManagement

Unit–I **6hrs**

Village – Survey of natural resources and resource mapping of villages , village level Participating Approach (VLPA) – Role of NGO'S and SHG'S – Impact of the Green Revolution.

Extra reading/Key word: *resource mapping tools*

Unit–II **6hrs**

Alternative agriculture models – Traditional Farming – Organic Farming – Zero budget farming – Precision Farming ,Terrace Farming and Kitchen garden.

Extra reading / Key word: *Practices in India*

Unit–III **6hrs**

Elements in Alternative Agriculture models ,Vermicompost,Azolla, Amirthakarasal,Mulligai Puchiviratti and neemproducts

Extra reading/Key word*:Government policy for* Alternative Agriculture farming.

UnitIV- **6hrs**

Aims of NCC , MOTTO , Cardinal Principles, Equivalent Rank (Army, Navy ,Airforce)

Extra reading/Key word*: Benefits of being an NCC cadet.*

Unit-V **6hrs**

Leadership and Man Management – duties of citizen, leadership Training – Types, qualities – Discipline, Duty, Moral – Man Management, Civil Defense – Aims, Types, Services, Problems **Extra reading/Key word:** *Defense recruitment modes.*

Note: Extra Reading/ keywords are only for Internal Testing (Seminar/ Assignments) Course

Outcome:

1. Explain the functioning of NGO's andSHG's
2. Summarize themselves about the different farmingmethods.
3. Explain the alternative agriculturalmethods
4. Point out the need for social responsibility throughNCC.
5. Evaluate the Leadership and ManManagement

REFERENCES:

1. Packages of organic practices from Tamil Nadu Center for Indian Knowledge System(CIKS)
2. Tracey, S. andAnne, B. (2008). Sustainable development linking economy,society, environment. OECDinsights.

www.fao.org.in

(For Candidates admitted from June 2019 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2 B.A/B. Sc/B.Com /B.C.A-DEGREE COURSES

LIFE ORIENTED EDUCATION

ETHICS – I: RELIGIONS AND VALUE SYSTEMS

HRS /WK:1 **CODE:U15VE2LVE01**

CREDITS:1 **MARKS :100**

OBJECTIVES:

- To enable the students to understand and appreciate all Religions andCulture
- To help the students tobecom
- To aware of the negative forces ofreligions.

UNIT – I: RELIGION

God – Faith, Religion, Definition, Nature, Characteristics and Basic values of different religions. Impact of Globalization on religion – Importance of worship in holy places – celebration, Communion (come-union) – Socialization

UNIT – II: DIFFERENT RELIGIONS

Basic characteristics and basic thoughts of different religions: Buddhism, Christianity, Hinduism, Islam, Jainism and Sikhism

UNIT –III: UNITY OF RELIGION

Unity of Vision and Purpose- Respect for Other Religions, Inter Religious Co-operation, Religious Pluralism as a fact and Religious Pluralism as a value

UNIT – IV: FUNDAMENTALISM, COMMUNALISM AND SECULARISM

Meaning and impact of Fundamentalism, Communalism, Violence and Terrorism – Tolerance – Secularism – Individualism

UNIT – V: VALUE SYSTEMS

Value and Value Systems - Moral Values -Individuals and the need to stand for values in the context of Globalization – Consumerism - Will power to live up to your values - Healthy body for empowerment – Physical health and Mental hygiene, food andexercises

REFERENCES:

1. Social Analysis (a course for all first year UG students), 2001. Department of Foundation Courses, Loyola College,Chennai-34.
2. Special topics on Hindu Religion, 2001.Department of Foundation Courses, Loyola College, Chennai-34.
3. Religion: the living faiths of the world, 2001. Department of Foundation Courses, Loyola College,Chennai-34.
4. Sydney Am Meritt, 1997. Guided meditations foryouth.
5. MarieMigon Mascarenhas,1986. Family life education- Value Education, A text book for College students.

(For Candidates admitted from June 2019 onwards)
HOLY CROSS COLLEGE(AUTONOMOUS) TRICHIRAPALLI-2.

B.A/B.Sc/B.Com /B.C.A-DEGREE COURSES LIFE ORIENTED EDUCATION

BIBLE STUDIES – I: NEW TESTAMENT

HRS / WK:1 **CODE:U15VE2LVBO1**

CREDIT:1 **MARKS :100**

OBJECTIVE:

- To enable the students to develop the passion for the Word of God – Jesus and inculcate the thirst of Missionaries being a disciple ofChrist.

UNIT – I: BIBLE – THE WORD OF GOD

- Books of the Bible – Division into Old Testament and New Testament – History of the Bible-
- Messianic Prophecies (Isaiah 9:6,40:3,53:1-12,61:1-3,Micah5:2)
- The Birth and Ministry of John the Baptist (Luke 1:1-80,Mat3:1-17,14:1-12)
- The Birth, Passion, Death and Resurrection of Jesus (Luke 1:26-80,2:1-52,John 1:18-21)

UNIT – II: MINISTRY OF JESUS

- Miracles (Mark 2:1-12,Luke 4:38-41,6:6-11,7:1-17,8:26-56,John2:1-12)
- Parables (Luke6:46-49,8:4-15,10:25-37,15:1-32)
- Preaching
  - Sermon on the mount (Mat5-7)
  - Lord's Prayer (Luke 11:1-13)
  - Kingdom of God (Mat 13:24-50)
- Prayer life of Jesus (Luke 5:12-16,John 11:41-45,17:1-26,Mark14:32-42)
- Rich and Poor (Luke 16: 19-31,21:1-4)
- Women Liberation (John4:1-30,8:1-4)
- Women in the NewTestament
- Martha & Maria (Luke 10: 38- 42, John 11:1-46)

UNIT – III: CHURCH – BIRTH AND GROWTH

- EarlyChurch
- Birth (Acts2:1-41)
- Unity and sharing (Acts2:42-47,4:1-37,5:1-11)
- Witnessing life (Acts 3:1-26,5:12-42,8:26-40,16:20-34)

- Comparison between early Church and presentChurch.

UNIT – IV: DISCIPLES AND APOSTLES

- Mother Mary (Mother of Jesus) (Luke 1: 27-35, John 2: 1-12, 19:35, Acts 1:13-14)
- St. Peter (Luke 22:1-7,Acts2:1-41,12:1-17)
- St. Andrew (Mat 4:18-20,John1:35-42,6:1-14)
- St. Stephen (Acts6,7)
- St. Paul (Acts 8,9,14,17,26 and28)
- St. Thomas (John20:24-31)

UNIT – V: ST. PAUL'S LETTERS AND THE MESSAGE

- I & IICorinthians
- Galatians
- Ephesians
- Philippians
- I & IITimothy
- Titus

REFERENCES:

1. HolyBible
2. John Stott, 1994, **"Men with a Message"**, Angus Hudson Ltd.London.

(For Candidates admitted from June 2019 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI -2 B.A/B. Sc /B.Com/ B.C.A-DEGREE COURSES

LIFE ORIENTED EDUCATION
CATECHISM – I: GOD OF LIFE

HRS / WK:1 **CODE:U15VE2LVC01**

CREDIT:1 **MARKS :100**

OBJECTIVES:

- To enable the students to know God and his Salvific acts through HolyBible
- To enable the students to know about the PaschalMystery

UNIT – I: CREATION AND COVENANT

Study from petty catechism - Genesis - God revealed himself in creation -God who preserves creation throughcovenants

(Pentateuch) -Our response to God's covenant -Reason for its success and failure -The relationship of God with Israel -Image of God in Old Testament-God and me

UNIT – II: GOD OF THE PROPHETS

God's care for the humanity through Prophets-Major (Isaiah, Jeremiah) Minor (Amos) and Women (Deborah) Prophets-Their life and mission - Theology of Prophets -Concept of sin and collective sins expressed by prophets and God's saving love.

UNIT – III: GOD OF WISDOM

God experience through wisdom Literature, its origin and growth

UNIT – IV: SYNOPTIC GOSPELS

Synoptic Gospels and John's Gospel – Author –historical background –Chief message of each Gospel and for whom it was written - A few passages for the study of parallelism in the Synoptic Gospels.

UNIT – V: LUKE'S GOSPEL

Study of Luke's Gospel in detail – speciality of the Gospel – main emphasis of themessage – meaning and blessing of suffering and paschal joy in one's life - Passion – PaschalMystery

REFERENCES:

1. Catechism of the Catholic Church published by Theological Publications in India for the Catholic Hierarchy of India,1994
2. The Holy Bible Revised Standard Version with Old and New Testaments Catholic Edition forIndia.
3. Vaazhvin Vazhiyil – St. John's Gospel- Fr.Eronimus
4. God's Word nourishes A catholic approach to the Scriptures Dr. Silvano Renu Rita,O.C.V. STD and Dr. Mascarenhas Fio S.J. D.mim. Catholic Bible I
5. Documents of Vatican II – St. Paul's Publications, Bombay1966.

(For Candidates admitted from 2019 onwards)

HOLY CROSS COLLEGE (Autonomous), Tiruchirappalli - 620 002.

PG & RESEARCH DEPARTMENT OF TAMIL

Second Year - Semester – III

Course Title	தமிழ்த்தாள் - **III**
Total Hours	**90**
Hours/Week	**6 Hrs Wk**
Code	**U15TL3TAM03**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

வாழ்வியல் நெறிகளாகிய அறம், பொருள், இன்பம், வீடுபேறு ஆகியவற்றின் சிறப்பினை எடுத்துரைத்தல்

- To explain the greatness of the values such as dharma, knowing the meaning of life
- To create awareness about social life.
- To strengthen the religious ideologies.

Course Objectives:

CO No.	Course Objectives
CO-1	வாழ்வியல் நெறிகளாகிய அறம், பொருள், இன்பம், வீடுபேறு ஆகியவற்றினை எடுத்துரைத்தல்
CO-2	சமயங்கள் உணர்த்தும் அறக்கருத்துக்களை அறிந்து கொள்ளச்செய்தல்.
CO-3	சோழர்கால காப்பிய இலக்கியங்கள் மற்றும் இலக்கண நூல்களை வகைப்படுத்துதல்.
CO-4	நாடகம் நடிப்பதன் வாயிலாக மாணவர்களின் திறன்களை வளர்த்தல்.
CO-5	தமிழக கோயில்களின் கலைநுட்பங்களையும், பண்பாட்டுச் சிறப்புகளையும் விவரித்தல்

அலகு:1 செய்யுள் **18 Hrs**

1. சிலப்பதிகாரம் - கடலாடு காதை
2. மணிமேகலை – உலகவறவி புக்க காதை
3. கம்பராமாயணம் - கங்கைப் படலம்

key Words (Extra Reading) சீவகசிந்தாமணி

அலகு:2 செய்யுள் **18 Hrs**

4. இரட்சணிய யாத்திரிகம் - மரணப்படலம்
5. சீறாப்புராணம் - ஒட்டகை பேசிய படலம்

அலகு:3 **18 Hrs**

தமிழ் இலக்கிய வரலாறு

சோழர் காலம்

அலகு:4 **18Hrs**

நாடகம்

சத்திய வேள்வி – அய்க்கண்

key Words (Extra Reading) யாருக்கும் வெட்கமில்லை - சோ

அலகு:5 **18 Hrs**

கோயிற்கலை

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	To learn the life of the people through the epic stories	PSO 1	U
CO-2	to learn the values taught by religion	PSO 2	AN
CO-3	To study about the period of The King Chola, its epics, literature and grammar books	PSO 2	R
CO-4	to learn about the dramatic skills	PSO 3	U
CO-5	to teach students to evaluate the art, culture and other aspects of the temples in Tamil Literature.	PSO 4	U

பாட நூல்கள்

1. செய்யுள் - தமிழாய்வுத்துறை வுத்துறை வெளியீடு
2. தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறை வுத்துறை வெளியீடு
3. நாடகம்

அய்க்கண் - சத்திய வேள்வி

4. கோயிற்கலை - தமிழ்நாட்டிலுள்ள ஆலயங்களைக் கலை நுணுக்கத்துடன் காணுதல்

(For the candidates admitted from June 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002

DEPARTMENT OF HINDI

SEMESTER – III

Course Title	**PART – I LANGUAGE** **HINDI- III-MEDIEVAL–MODERN POETRY AND HISTORY OF HINDI LITERATURE-1** **(Veergadha Kal Aur Bakthi Kal)**
Total Hours	**90**
Hours/Week	**6Hrs/Wk**
Code	**CODE: U18HN3HIN03**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objective : To enable the students to appreciate and critically evaluate Spirituality inHindi Literature.

Course Objectives (CO):

The learner will be able to

CO No.	**Course Objectives**
CO -1	remember, understand and evaluate the Poetry of the masters.
CO- 2	understand and analyse the history of Hindi literature in the literary works.
CO- 3	understand and analyse the cause and consequence on revolution in literature.
CO- 4	Evaluate various streams of Bhakthi kaal.
CO- 5	appreciate and analyse the works of Bihari.

UNIT – I **(18 Hours)**

1. Kabir Das
2. Todathi pathar
3. Veergatha Kal

(Pravarithiyan, Kavi, Rachanayean)

Extra Reading (Key Words):*PrithviRaj Rasoo, Jago phir ek bhar*

UNIT- II **(18 Hours)**

1. Thulasi Das
2. Anal Kireet
3. BhaktiKal – Gnanashrayi Sakha

Extra Reading (Key Words):*Kabir, Ramdhari Singh Dinakr*

UNIT- III **(18 Hours)**

1. Rahim Ke Dohe
2. Jhoote Patte
3. BhaktiKal – Prem Margi Sakha **Extra Reading**
4. **(Key Words)**:*Rahim*

UNIT-IV

1. Raskhan
2. Aavo phir se gaaon basayen
3. BhaktiKal –Ram Bhakti Sakha

Extra Reading (Key Words):

UNIT- V **(18 Hours)**

1. Bihari Ke Dohe
2. Sipahi
3. BhaktiKal – Krishna Bhakthi Sakha **Extra Reading (Key Words):** *Bihari satsai*

Note :Texts given in the Extra Reading (Key Words) must be tested only through Assignmentand Seminars.

Course Outcomes

The learner will be able to:

CO No.	Course Outcomes	Cognitive Level
CO -1	Recite the poems of Kabir Das	R,U,E
CO- 2	Distinguish necessity and luxury Place Bhakthi kaal in Hindi Literature	U, An
CO- 3	Debate on pros and cons of a revolution	U, An
CO- 4	Summarize the four streams of Bhakthi kaal	E
CO- 5	Examine the powerful words of Bihari	An

CO- Course Outcome; R- Remember; U- Understand; Ap- Apply; An- Analyze; E- Evaluate; C- Create

Prescribed Books

- History Of Hindi Literature ; Aacharya Ramachandra Shukla, Delhi.
- Kavya Surabh: Pub.Dakshina Bharat Hindi Prachar Sabha , Cheenai.

Reference Books :

- Nai Sadhi Mein Kabir- Edi. Dr. M. Firoz Khan- Krishang Publication, Delhi.
- Dharmaveer Bharathi Ki Kavitha – Dr.Vibha shukla.;Aastha associates, Illahabad.

(For candidates admitted 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF FRENCH

SEMESTER III

Course Title	**PART I – LANGUAGE - FRENCH PAPER III (**LANGUAGE & CIVILISATION (ÉCHO A2 2e édition)
Total Hours	90
Hours/Week	6 Hrs/Wk
Code	U16FR3FRE03
Course Type	Theory
Credits	3
Marks	100

General Objective: To enable the students to understand the French cultural aspects and apply the grammar learnt in appropriate situations.

Course Objectives (CO):

The learner will be able to

CO 1	understand the French education system and evaluate the same across the world.
CO 2	understand the usage of pronouns that denote quantity and place and apply them in answers; analyse extracts from magazines and work conditions in France.
CO 3	remember the rules of construction and usage of subjunctive mode and apply the same in sentences; evaluate French politics.
CO 4	understand gerund, adverbs, relative pronouns and evaluate press and media in France.
CO 5	remember the usage of tenses and analyse the benefits of learning a foreign language.

Unit 1 Vivementdemain! (18Hours)

Le futur, la comparaison des qualités, des quantités et des actions – la santé – le travail dans trenteans – la vie quotidienne - l'éducation et la formation (l'enseignement en France) – faire des projets.

Extra Reading (Key Words): le système éducatif en France.

Unit 2 Tu as duboulot? (18Hours)

Le pronom « en » et « y » - exprimer une condition : si + présent, si + passé composé, exprimer des préférences – les emplois de demain - des idées pour créer une entreprise – l'économie en France - le travail en dix points

Extra Reading (Key Words): l'organnigramme d'une enterprise.

Unit 3 Qu'enpensez-vous? (18Hours)

L'emploi du subjonctif , l'expression de la quantité – revue de presse – entrée en politique – la naissance des départements – la région 'Poitou- Charentes' - la vie politique

Extra Reading (Key Words): étude comparée de la politique en France et en Inde

Unit 4 C'est tout unprogramme! (18Hours)

Les propositions relatives, la formation des adverbes, la forme « en + participe présent » - parler de la télévision et de la radio - comment les Français s'informent (la télévision et la presse en France)

Extra Reading (Key Words):TV5 Monde, les journaux français.

Unit 5 Onse retrouve (18Hours)

L'emploi et la conjugaison de l'indicatif – parler de son apprentissage du français langue étrangère – les rencontres : modes et comportements – une vraie vie de quartier grâce à Internet – formules pour un premier contact par écrit.

Extra Reading (Key Words): Paris, la capital de la mode!

Course outcomes	**Cognitive level**
Contrast French education system to that of India.	E
Examine press and work conditions in India	An
Label subjunctive mode and its usages	U, Ap
Interpret politics in France	E
Categorize French media and press	E
Simplify "FLE"	An

TEXT BOOKS :

ECHO A2 – METHODE DE FRANÇAIS & CAHIER PERSONNEL D'APPRENTISSAGE
Authors: J. Girardet and J. Pécheur Publication:
CLÉ INTERNATIONAL, 2013.

Books for Reference:

La Conjugaison – Nathan
French made easy – Intermediate level – Goodwill Publishing House Je parle
français III – Abhay Publications
Le français avec des jeux et des activités – ELI
Langue et la civilisation – I – Mauger Bleu

Note :Texts given in the Extra Reading (Key Words) must be tested only through Assignment andSeminars.

(for candidates admitted from June 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), Tiruchirapalli – 620002

PG AND RESEARCH DEPARTMENT OF ENGLISH

I YEAR UG – SEMESTER I

PART II – ENGLISH 3 - GENERAL ENGLISH III

HOURS : 6 **CODE : U15EL3GEN03**

CREDIT : 3 **MARKS: 100**

GROWING WITH VALUES

Objectives:

1. To acquaint students with fine pieces of literature thereby enhancing their communicative skills.
2. To develop both receptive (reading, listening) and productive (speaking, writing) skills through communicative classes
3. To create interest among students for self-learning
4. To create a general awareness among students regarding the importance of humanistic values in the modern world.
5. To acquire proficiency in oral and written language.

UNIT I – Love, Faith and Hope

Listening for comprehension and general significance

Speaking about one's fear and hope

Reading for specific and global comprehension.

Writing – creative writing

Grammar – reporting speeches

Vocabulary – shades of meaning, Idioms and phrases (10)

Composition – Writing Paragraphs

TEXTS

"Hope" by Emily Dickinson **(Internal Testing)**

1. An extract from the Nobel Lecture by Mother Teresa

2. Angels Never Say "Hello!" by Dottie Walters

3. The Treasure by Alice Grey (Taken from Plant the seed by Timothy Kendrick)

UNIT II – Perseverance

Listening- for distinguishing / convert / summarize/(interview)

Speaking- a role play on the theme of perseverance (enactment of fables/ folk tales based on the theme)

Reading – read the passage (from encyclopedia) and draw a flowchart / tree diagram [main idea]

Writing- parallel writing

Grammar – descriptive discourse – degrees of comparison (describing person, city, places, things, weather climate)

Vocabulary – antonyms, idioms and phrases (10)

Composition – Creative writing

TEXTS

Mother to Son by Langston Hughes**(Internal Testing)**

1.**The Perseverance of a Spider.**

2. Two Gentlemen of Verona by A.J Cronin

3. Faith of determination and perseverance (about Walt Disney)

UNIT III – Tolerance/Benevolence/Compassion

Listening- for developing / relating (speech)

Speaking- simulate any personality related to humanity

Reading – scan the passage (life of …) and write down key phrases to sum up [figurative languages]

Writing- case study / letter writing (personal)

Grammar –writing reports of events and processes (voices)

Vocabulary – Suffixes, idioms and phrases

Composition – imaginative writing

TEXTS:

Portrait of Gandhiji by Will Durant (1st Para) **(Internal Testing)**

1. Gitanjali (Poem No. 11) Leave this chanting – Rabindranath Tagore
2. The Selfish Giant – Oscar Wilde
3. The Price of a Miracle in *Rainbows follow rain* by Dan Clark

UNIT IV – Essential Life Skills/ Resilience

Listening- for deducing/ illustrating / subdivide to make notes (newspaper article)

Speaking- interviewing (gap activity) / picture description

Reading – in-depth reading to classify/ categorize [point of view]

Writing- Situational writing

Grammar – analysis of sentences – simple, compound, complex

Vocabulary – compound words, idioms and phrases

Composition – essay writing (proverb as title)

TEXTS:

The story of Rosa Parks **(Internal Testing)**

1. Life of Nelson Mandela
2. It's cool to be kechi by Juliet Hindell
3. 'Home they brought Her warrior dead' by Alfred Lord Tennyson

UNIT V – The Art of Living

Listening- for comparing and contrasting (personality/lives of two people)

Speaking- reporting from the magazine / newspaper

Reading - read the passage to draw inference / parallel reading [making connections]

Writing- creative writing

Grammar –'If' clause

Vocabulary – coinage, idioms and phrases

Composition – creative writing/imaginative writing

TEXTS:

"A Psalm of Life" by H.W. Longfellow **(Internal Testing)**

1. The Power of Limitless living - by Robin Sharma.
2. The Art of Understanding Other People by Clarence Hall
3. "Leisure" by William Henry Davies

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HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019 onwards
Second Year – Semester – III

Course Title	MAJOR CORE 4 – CELL BIOLOGY, BIOSTATISTICS AND BIOINFORMATICS
Total Hours	75
Hours/Week	5 Hrs /Wk
Code	U15BO3MCT04
Course Type	Theory
Credits	5
Marks	100

General Objective:

To enable the students to understand the ultra structure of plant cell, its organelles, cell cycle, cell division and the structure of genetic material, fundamental ideas about the collection of data, significance of central tendency and interpretation of data, biological databases and its applications.

Course Objectives :
The learner will be able to

CO No.	Course Objectives
CO-1	Remember and understand the cell biology through the knowledge of cell theory , ultra structure of plant cell and its organelles.
CO-2	Understand and apply the knowledge of cell cycle and cell division, evaluate the changes in the chromosome.
CO-3	Understand and analyse the structure of genetic material and the mechanism of DNA replication.
CO-4	Calculate the mean, median, mode, standard deviation and standard error.
CO-5	Understand the bioinformatics basics and it's application in biology.

UNIT – I Cell Biology: **15hrs**

Cell theory. Structure and functions of cell wall, plasma membrane- fluid mosaic model. Ultra structure and functions of cell organelles – chloroplast, mitochondria, endoplasmic reticulum, golgi complex, ribosomes (70s and 80s). Ultra structure of nucleus – nuclear envelope, nucleolus, chromatin reticulum.

Extra reading /Key Words:*lysosomes, sphaerosomes*

UNIT – II Cell cycle and Cell division: **15hrs**

Cell Cycle. Cell division – mitosis, meiosis and their significance. Ultra structure and functions of chromosomes. Changes in the chromosome – structure, number and their genetic effects. Giant chromosomes – salivary and lampbrush. Mutation- types of mutation.

Extra reading /Key Words:*genetical disorders, causes of mutation*

UNIT – III Structure of genetic material: **15hrs**

Structure and organization of DNA double helix (Watson and Crick model). DNA replication- semi-conservative replication mechanism. Proof for DNA (A.D. Hershey and M.H. Chase) and RNA as genetic material (Fraenkel Conrat and Stanley in TMV)

Extra reading /Key Words:*Structure of RNA, Types of RNA*

UNIT – IV Biostatistics: **15hrs**

Collection, classification and presentation of data. Frequency table, frequency curve, frequency polygon and histogram bar diagram. Measures of central tendencies – mean, median and mode. Measures of dispersion – Range, standard deviation and standard error.

Extra reading /Key Words:*Questionnaire preparation, biostatistical tools.*

UNIT – Vbioinformatics: **15hrs**

Introduction, biological databases- General and specialized. Premier Institutes maintaining data bases – NCBI, EMBL and DDBJ. Tools for analysis of biological sequences – sequence alignment, similarity searching (BLAST), gene finding.

Extra reading /Key Words:*Datamining, drug designing.*

Note: Texts given in the Extra reading /Key wordsmust be tested only through Assignment and Seminars.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Describe thecell theory, ultra structure of plant cell and its organelles.	PSO 1, PSO 3	R, U
CO-2	Explain the cell cycle and types of cell division.	PSO 1, PSO 3	R, U
CO-3	Discuss the changes in the chromosome.	PSO 1, PSO 3	R, U
CO-4	Explain the structure of genetic material and the mechanism of DNA replication.	PSO 1, PSO3	R, U
CO-5	Calculate the mean, median, mode, standard deviation and standard error.	PSO 1, PSO 4	R, U
CO-6	Describe the bioinformatics basics and it's application in biology.	PSO 1 PSO 4	R, U
CO-7	Develop the Employability skills by understanding the ultra structures of plant organelles, collection and interpretation of data and applications of biological database	PSO-1	C

Reference

Text Books:

Power, C. B. 1997. Cell Biology. Himalaya publishing House, Bombay.

Reference Books:

Sundarajan, S. 2000. Cytogenetics. Anmol publications pvt. Ltd., New Delhi.

Gardner, F. J. 1972. Principles of Genetics. Wiley Eastern Pvt. Company Ltd., New Delhi.

Gupta, P. K. 1974. Cytology, Genetics and Evolution. Rastogi publications, Meerut.

Satguru Prasad. 1992. Fundamentals of Biostatistics. Emkay publications, New Delhi.

Lohar, P.S. 2009. Bioinformatics.MJP Publishers, Chennai.

Cell And Molecular Biology. 2017. 8Ed (Pb 2017) Paperback – 2017by De Robertis E.D.P. (Author)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019 onwards
Second Year – Semester – III

Course Title	**MAJOR ELECTIVE 1 – MICROBIOLOGY AND PLANT PATHOLOGY**
Total Hours	**75**
Hours/Week	**5 Hrs /Wk**
Code	**U15BO3MET01**
Course Type	**Theory**
Credits	**5**
Marks	**100**

General Objectives:

This paper deals with history of microbiology, structure, nutrition and reproduction of bacteria, types of virus and their structure and reproduction. It imparts the knowledge on methods of studying microbes and applied aspects of microbiology on milk, food, beverages, antibiotics and enzymes. It also deals with the role of microbes in plant diseases.

Course Objectives :
The learner will be able to

CO No.	**Course Objectives**
CO-1	Classifies microbe based on morphological characters
CO-2	Describes the structure, nutrition and reproduction of bacteria and viruses
CO-3	Analyze and apply the quality of milk, fermented foods, single cell protein & it's preservation methods
CO-4	Understand the uses of microbes with reference to beverages, antibiotics, vaccines & tanning
CO-5	Understand and analyse the disease cycle of bacterial and fungal pathogens of plants.

UNIT – I History of Microbiology: 15hrs

Discovery of microbes (Anton Von Leeuwenhoek). Theory of spontaneous generation. Theory of Biogenesis vs. Abiogenesis (Louis Pastuer) Fermentation, pasteurization. Discovery of vaccination (Edward Jenner). Development of vaccines for Anthrax and Rabies. Discovery of diseases (Robert Koch's Postulates). Germ theory. Discovery of antibiotics (Alexander Fleming). Microbial diversity – general classification of microbes. Whittaker's Five kingdom concept.

Extra reading/Key words:: *two kingdom and three kingdom concepts*

UNIT – II Microorganisms: 15hrs

Bacteria: Morphology – size, shape, motility. Ultra structure of a bacterial cell – cell inclusions. Bacterial nutrition – phototrophs, chemotrophs. Reproduction: Asexual – fragmentation and binary fission. **Viruses:** Types, structure, reproduction and life cycle of bacteriophages (T-even phages) and plant viruses (TMV). Knowledge about phycoviruses and mycoviruses.

Extra reading/Key words:: *Arboviruses, FMDV*

UNIT – III Food Microbiology: **15hrs**

Microbiology of milk – sources and types. Pasteurization of milk (reductase and phosphatase test) Milk products – processing and production of cheese. Fermented foods – idly and bread. Microbial protein: Fungal SCP – commercial production and use of yeast. Food spoilage: Food poisoning and food intoxication. Food preservation methods: Physical and Chemical.

Extra reading/Key words: *Dualistic activity of Enterococcus in food, Listeriasis.*

UNIT – IV Industrial Microbiology: **15hrs**

Structure and use of fermentor. Large scale production and importance: ethanol (cane bagasse), Beverages – wine and beer, Antibiotics – narrow spectrum (Penicillin) and broad spectrum (streptomycin). Vaccine – polio. Enzyme: amylase – brewing (*Bacillus subtilis*) Protease – tanning (*Aspergillus oryzae*)

Extra reading/Key words:*Biofilm, Industrial work horse*

UNIT – V Plant Pathology: **15hrs**

Concept and pathogenesis. Etiology, Causative organism, symptoms and control measures of the following diseases. Fungal disease – red rot of sugarcane, tikka disease of ground nut, bacterial disease – citrus canker and viral disease – tobacco mosaic.

Extra reading/Key words:*innate mechanism in plants, Crown Oomycetes.*

Note: Texts given in the Extra reading /Key wordsmust be tested only through Assignment and Seminars.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Classifies microbe based on morphological characters	PSO 1, PSO 5	R, U
CO-2	Describes the structure, nutrition and reproduction of bacteria and viruses	PSO 1, PSO 5	R
CO-3	Analyze the quality of milk and fermented foods	PSO 1, PSO 3, PSO 6	U
CO-4	Explain cultivation and purification of single cell protein.	PSO 1, PSO3	R
CO-5	Relate the uses of microbes with reference to beverages, antibiotics, vaccines & tanning	PSO 1, PSO 5	R,U
CO-6	Illustrate the disease cycle of bacterial and fungal pathogens of plants.	PSO 1 PSO 6	U
CO-7	Develop the employability skills by learning the structure, reproduction and applied aspects of microbes	PSO-1	C

Text Books:

1. Tauro, P., Kapoor, K. K. and Yadav, K. S. 1997. An introduction to Microbiology. Wiley eastern Company Ltd., New Delhi.
2. Sharma, P. D. 1993. Microbiology and Plant Pathology. Rastogi Publications.
3. Balachandar. D. 2007. Introductory Microbiology, New India Publishing. P.312.

4. Prakash S. Bisen, Mousumi Debnath, G. B. Prasad. 2012. Microbes: Concepts and Applications. John Wiley & Sons Publishers. P. 716
5. Jacquelyn G. Black. 2008. Microbiology: Principles and Explorations. 7th Edition. John Wiley & Sons Publishers. P.422.

Reference Books:

1. Powar and Daginawala. 1993. General Microbiology Vol I and II. Himalaya Publishing house, New Delhi.
2. Tortora, G.J., Funke, B.R. and Case, C.L. 2004. Microbiology – An Introduction. 8th Edition. Pearson education Pvt. Ltd. New Delhi.
3. Geffery Manners J. 1993. Principles of Plant Pathology. Cambridge University Press.
4. Rangaswami G and Mahadevan A.2003. Diseases of crop plants in India. Prentice Hall of India Pvt. Ltd.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019 onwards
Second Year – Semester – III

Course Title	**MAJOR ELECTIVE 1 –FOREST RESOURCES & THEIR UTILIZATION**
Total Hours	**75**
Hours/Week	**5 Hrs /Wk**
Code	**U15BO3MET01**
Course Type	**Theory**
Credits	**5**
Marks	**100**

Course Objectives:

This paper explains in detail about various forest resources like fiber, fodder, oil, waxes , rubber, tannins, dyes, resins and gums, their processing and utilization by human beings for various purposes in a sustainable and eco-friendly manner.

The learner will be able to

CO No.	**Course Objectives**
CO-1	Apply the properties and importance of wood
CO-2	Describes the economic importance of wood
CO-3	Analyze and apply the sources of fibres and fodders
CO-4	Understand and apply the sources, properties and uses of Oils, Waxes & rubber
CO-5	Understand the sources, properties and uses of tannin, dye, resin and gums

UNIT-I **15hrs**

Wood and Cork.: Properties of wood. Factors affecting the properties of wood. Importance of wood – Fuel (Acacia sps). Matches and match boxes (Ailanthus malabarica).Agriculture implements (Syzygium cumini). Boat and ships (Dalbergia sissoo).Electric poles (Eucalyptus citriodona).

UNIT –II **15hrs**

Wood in furniture making (Tectona grandis). Mathematical and musical instruments (Artocarpus integrifolia). Packing boxes (Mangifera indica).Railway carriage and sleepers (Shorea robusta). Sports goods (Morus alba). Toys (Juglans regia) Cork (Quercus suber).

UNIT- III **15hrs**

Fiber and fodder: Sources of fibre plants. Processing and uses in rope making (Agave , Cocos nucifera). Weaving fibres - hats (hat palm -Sabal causium). Mats (Cyperus tegetiformis).
Baskets (raffia palm- Raffia pedunculata). Wickerwork (Bambusa). Fodder – grasses (Panicum). Leaves of young branches and shrubs (Acalypha hispida). Trees (Acacia catechu).

UNIT IV **15hrs**

Oils, Waxes & rubber: Sources, properties, parts used and the process of obtaining essential oils (Eucalyptus oil). Waxes (wax palm – Copernicia cerifera). Rubber (Heavea brasiliensis).

UNIT V **15hrs**

Tannins, dyes, resins & gums: Sources, properties, parts used and the process of obtaining tannins Oak (Quercus incana). Dye - Henna – (Lawsonia inermis) Resin (asafetida- Ferula assafoetida) Gum arabic (Acacia senegal).

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the properties of wood	PSO 1, PSO 5	R, U
CO-2	Describes the economic importance of wood	PSO 1, PSO 5	R
CO-3	Analyze the sources of fibres and fodders	PSO 1, PSO 3, PSO 6	U
CO-4	Explain the sources, properties and uses of Oils, Waxes & rubber	PSO 1, PSO3	R
CO-5	Explain the sources, properties and uses of tannin, dye, resin and gums	PSO 1, PSO 5	R,U

References:
Text Books:

1. Hill, A.F. and Sharma, O.P. 1996. Economic Botany – Tata McGraw –Hill Publishing Company Ltd. New Delhi.
2. Krishnamurthy, T. 1993. Minor Forest products of India. Oxford & IBH Publishing Co. Pvt. Ltd. New Delhi.

Reference Books:

1.Negi, S.S. 1992. Text Book of Forest utilization (Wood and non- wood forest products) Bishen Singh Mahendra Pal Singh, Dehra Dun, India.

(for candidates admitted from 2019 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS),TIRUCHIRAPPALLI – 2
PG AND RESEACH DEPARTMENT OF BOTANY
B.Sc. BOTANY

Second Year Allied - Semester – III

Course Title	**AC 4 - PAPER I- PLANT DIVERSITY, TAXONOMY, ANATOMY, EMBRYOLOGY, ECOLOGY AND PHYSIOLOGY**
Total Hours	**60**
Hours/Week	**4 Hrs /Wk**
Code	**U15BO3ACT04**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

To enable the students to understand the basic concepts and fundamentals of various branches of botany like algae, fungi, bryophytes, pteridophytes and gymnosperm, taxonomy, anatomy, embryology, ecology and physiology.

Course objectives :

CO No.	Course Objectives
CO-1	Remember and understand the general characteristics of algae and fungi
CO-2	Remember and understand the life cycle pattern of bryophytes, pteridophytes and gymnosperms
CO-3	Understand, apply and analyse the internal structure of dicot plants and development of embryo
CO- 4	Understand and analyse the floral taxonomy of angiosperms
CO- 5	Understand and apply the different physiological and biochemical reactions in the higher plants

UNIT – I Algae and Fungi: **12 Hrs**

General characteristics of Algae and Fungi.Structure, reproduction, uses and life cycle of algae – *Nostoc* and *Ulva*. Structure, reproduction and life cycle of fungi – *Penicillium* and *Agaricus*. Economic importance of algae and fungi.

Extra reading (Key Words): (Key words): SCP production, mushroom cultivation

UNIT –II Bryophyte, Pteridophyte and Gymnosperm: **12 Hrs**

General characteristics of Bryophyte, Pteridophyte and Gymnosperm. Structure, reproduction and life cycle of Bryophyte - *Funaria*. Pteridophyte - *Nephrolepis*. Gymnosperm - *Cycas*.

Extra reading (Key Words): (Key words): stelar evolution, molecular phylogeny

UNIT – III Anatomy and Embryology: **12 Hrs**

Anatomy- Primary and secondary structure of dicot stem and root. Embryology – structure of anther, microsporogenesis and male gametophyte. Structure of dicot embryo, Structure of ovule, megasporogenesis and female gametophyte. Double fertilization.

Extra reading (Key Words): (Key words): wood anatomy, poly embryony

UNIT – IVTaxonomy of Angiosperms: **12 Hrs**

General outline classification of Bentham and Hooker. Detailed study of the following families and their economic importance: Annonaceae, Rutaceae, Rubiaceae, Amaranthaceae and Poaceae.

Extra reading (Key Words): Euphorbiaceae, Meliaceae

UNIT - V Physiology and Ecology: **12 Hrs**

Absorption of water – mechanism. Transpiration – mechanism of stomatal transpiration. Photosynthesis – light reaction (cyclic and non - cyclic). Dark reaction (Calvin cycle). Respiration – Aerobic (Glycolysis, Kreb's cycle and Electron transport chain). Morphological and anatomical adaptations of hydrophytes, halophytes and xerophytes.

Extra reading (Key Words): photorespiration, CAM pathway, stress physiology

Note: Texts given in the Extra reading /Key wordsmust be tested only through Assignment and Seminars.

Course Outcomes (CO): The learners will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Recall and relate the general characters of algae and fungi	PSO 1, PSO 3	R, U

CO-2	Explain the life cycle patterns of bryophyte and pteridophytes	PSO 1, PSO 3	U
CO-3	Compare the reproductive patterns of cryptogamic plants	PSO 1, PSO 3	U, An
CO-4	Outline the internal structure of dicot plants	PSO3	R, U
CO-5	Explain the developmental process of dicot embryo	PSO 1, PSO 3	U
CO-6	Compare and contrast the floral characters of different families	PSO 1 PSO 6	U, An
CO-7	Explain the photosynthetic system of plants	PSO 1	U
CO-8	Explain the respiration process of plants.	PSO 1	U

PO – Programme Outcomes; CO – Course Outcome; R- Remember; U- Understand; Ap Apply; An – Analyse; E- Evaluate; C – Create

References

Text Books:

1. Ganguli, H. G. , Kumud Shankar Das and Chittatosh Dutta, 2011. College Botany. Vol –I and II. New Central Book Agency, Calcutta.
2. Verma, V. 1985. A text book of Plant Physiology. Emkay Publications, New Delhi.

Reference Books:

1. Sharma, P.D. 1992. Ecology and environment. Rastogi Publication, Meerut.
2. Agarwal, S.K. 1992. Fundamentals of ecology. Ashish Publishing House, New Delhi.
3. Pandey, B. P. 1984. Plant Anatomy. S. Chand and Company Ltd, New Delhi.
4. Bhojwani, S. S. and Bhatnagar, S. P. 1978. The Embryology of Angiosperms. Vikas Publishing House Pvt. Ltd,
5. Shukla and Chandel, 1994. Plant ecology and soil Science . S. Chand and Company Ltd., New Delhi.
6. Pandey, B. P, 2010. College Botany. Vol. III. S. Chand and Company Ltd, New Delhi.

(For Candidates admitted from 2019 onwards)

HOLY CROSS COLLEGE (Autonomous), Tiruchirappalli - 620 002.

PG & RESEARCH DEPARTMENT OF TAMIL

Second Year - Semester – IV

Course Title	தமிழ்த்தாள் - **IV**
Total Hours	**75**
Hours/Week	**5 Hrs Wk**
Code	**U15TL4TAM04**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

வாழ்வியல் நெறிகளாகிய அறம், பொருள், இன்பம், வீடுபேறு ஆகியவற்றின் மேன்மையை எடுத்துரைத்தல்

- Make the student to understand the cultural and tradition of Tamilians.
- Student will learn to understand the different religions
- Understand the depth of Tamil Literature & Culture.
- Know about the structure of the family, manners and discipline.
- Know about the rights of equality.

Course Objectives:

CO No.	Course Objectives
CO-1	அறம், பொருள், இன்பம், வீடுபேறு ஆகியவற்றின் மேன்மையை உணர்த்துதல்.
CO-2	இலக்கியங்களின் வாயிலாக வாழ்க்கைத் தத்துவத்தினை அறியச் செய்தல்.
CO-3	தமிழ் இலக்கிய வரலாற்றின் வாயிலாகத் தமிழரின் பண்பாடு, கலாச்சாரத்தை அறியச் செய்தல்.
CO-4	மனிதநேய சிந்தனைகளை உருவாக்குதல்.
CO-5	மொழிப்பெயர்ப்புத்திறனை வளர்த்தல்.

அலகு:1 செய்யுள் **15 Hrs**

1. குறுந்தொகை

1. கொங்கு தேர் வாழ்க்கை அஞ்சிறைத் தும்பி - இறையனார்
2. யாரும் இல்லை தானே கள்வன் - கபிலர்
3. வேம்பின் பைங்காய்என் தோழி தரினே – மிளைக்கந்தன்
4. உள்ளது சிதைப்போர் உளரெனப் படாஅர் - பாலை பாடிய பெருங்கடுங்கோ
5. நோற்றோர் மன்ற தோழி – குறுங்குடி மருதன்

2. நற்றிணை

1. மனையுறை புறவின் செங்கால் பேடை
2. நீள்மலைக் கலித்த பெருங்கோற் குறிஞ்சி - பாண்டியன் மாறன் வழுதி
3. ஆய்மலர் மழைக்கண் தெண்பனி உறைப்பவும் - நல்விளக்கனார்

4. சிறுவீ முல்லைப் பெரிது கமழ் அலரி - மதுரை பேராலவாயர்

3. கலித்தொகை

1. எறித்தரு கதிர்தாங்கி ஏந்திய குடைநீழல் - கபிலர்
2. பாடுகம் வா வாழி தோழி - கபிலர்

அலகு:2 **15 Hrs**

அகநானூறு

1.வானம் வாய்ப்பக் கவினிக் கானம் - சீத்தலைச் சாத்தனார்

2. எம்வெங் காம மியைவதாயின் - மாமூலனார்

5.புறநானூறு

1. நின் நயந்து உறைநர்க்கும் - பெருஞ்சித்திரனார்
2. காய்நெல் அறுத்துக் கவளம் கொளினே - பிசிராந்தையார்
3. படைப்புப் பலபடைத்து - பாண்டியன் அறிவுடைநம்பி
4. கேட்டல் மாத்திரை – கோப்பெருஞ்சோழன்
5. ஈன்று புறந்தருதல் என்தலைக் கடனே - பொன்முடியார்

6. பதிற்றுப்பத்து - ஐந்தாம் பத்து

1. சுடர் வீ வேங்கை
2. தசும்பு துளங்கு இருக்கை
3. ஊன்துவை அடிசில்

7. திருக்குறள்

1. அறத்துப்பால் - இனியவை கூறல்
2. பொருட்பால் - வினை செயல்வகை
3. காமத்துப்பால் - புலவி நுணுக்கம்

அலகு:3 **15 Hrs**

தமிழ் இலக்கிய வரலாறு

சங்ககாலம் - சங்கம் மருவியகாலம்

எட்டுத்தொகை, பத்துப்பாட்டு, பதினெண்கீழ்க்கணக்கு நூல்கள்

அலகு:4 **15 Hrs**

வாழ்க்கை வரலாறு

அன்னை தெரசா - பா. தீனதயாளன்

key Words (Extra Reading)

அக்னி சிறகுகள் - அப்துல் கலாம்

அலகு:5 **15 Hrs**

பொது– மொழிப்பெயர்ப்பு

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	To develop an attitude to consider other living beings as equals	PSO 1	U
CO-2	To learn about the life style of traditional Tamil literature	PSO 2	AN

CO-3	to be inspired by the traditional culture and values	PSO 2	R
CO-4	To study about the dedicated service of mother Theresa and to practice the same	PSO 3	U
CO-5	to enhance skills in translation	PSO 4	C

1. செய்யுள் - தமிழாய்வுத்துறை வெளியீடு
2. தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறை வெளியீடு
3. வாழ்க்கை வரலாறு
   பா.தீனதயாளன் - அன்னை தெரசா
4. மொழிப்பெயர்ப்பு - தமிழாய்வுத்துறை வெளியீடு

(For the candidates admitted from June 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002

DEPARTMENT OF HINDI
SEMESTER – IV

Course Title	**PART – I LANGUAGE** **HINDI -IV FUNCTIONAL HINDI &** **TRANSLATION**
Total Hours	**75**
Hours/Week	**5Hrs/Wk**
Code	**CODE: U18HN4HIN04**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objective : To enable the students to Learn the Language Skills.

Course Objectives (CO):

The learner will be able to

CO No.	Course Objectives
CO -1	apply technical translation in Functional Hindi
CO- 2	understand and evaluate global marketing
CO- 3	create general essays
CO- 4	apply the formats and create office orders
CO- 5	apply translation techniques in a text.

UNIT – I **(15 Hours)**

1. Personal Letters
2. Technical Terms
3. Translation Ex-1
4. General Essay - Pollution

UNIT- II **(15 Hours)**

1. Commercial Letters
2. Technical Terms
3. Translation Ex-4
4. General Essay – Globalisation

Extra Reading (Key Words): *Vyavasayikata*

UNIT- III **(15 Hours)**

1. Office Memorandum
2. Technical Phrases
3. Translation Ex-6
4. General Essay – Self Employment **Extra Reading (Key Words):** *Kisan*

UNIT- IV*:* **(15 Hours)**

1. Office Order
2. Technical Phrases
3. Translation Ex-13
4. General Essay – India – Unity in Diversity **Extra Reading (Key Words):** *Hamara Bharat*

UNIT-V

1. Circular
2. Reminder
3. TranslationEx-15
4. General Essay – My Favourite Author

Extra Reading (Key Words): *Jayashankar Prasad, Premchand*

Note :Texts given in the Extra Reading (Key Words) must be tested only through Assignmentand Seminars.

Course Outcomes:

The learner will be able to:

CO No.	Course Outcomes	Cognitive Level
CO -1	Utilize technical terms in translating a text.	Ap
CO- 2	Mark the global brands and their countries.	U, E
CO- 3	Develop an essay on any social issue.	E, C
CO- 4	Formulate an office order for the university	Ap, C
CO- 5	Make use of translation techniques in a text.	Ap

CO- Course Outcome; R- Remember; U- Understand; Ap- Apply; An- Analyze; E- Evaluate; C- Create

Prescribed Books

- Vyavaharik Hindi,by Dr. Mahendra Mittal,Shabari Sansthan, Delhi.
- Aalekhan Aur Tippan: Prof.Viraj, M.A; Raj Pal And Sons;Kashmiri Gate,Delhi.
- Anuvad Abhyas : Bholanath Tiwari; Lokbharathi Prakashan; New Delhi.

Reference Books :

- Raj Bhasha Hindi Aur Vuska Swaroop- Shanthi kumar Syal; Parampara Prakasha, Delhi.
- Vyaharopayogi evam kam kaji Hindi – Ananth Kedharea .;Sahityayan Prakashan; Kanpur.

(For candidates admitted 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
DEPARTMENT OF FRENCH

SEMESTER IV

Course Title	**PART I – LANGUAGE - FRENCH PAPER IV** (LANGUAGE & CULTURE (ÉCHO A2 2e édition)
Total Hours	75
Hours/Week	5 Hrs/Wk
Code	U16FR4FRE04
Course Type	Theory
Credits	3
Marks	100

General Objective: To enable the students to analyse and evaluate French cultural aspects and use the accumulated vocabulary and grammatical aspects in creative writing.

Course Objectives (CO):

The learner will be able to

CO1	Apply pronouns and create texts; appreciate and analyse French cuisine and festivals
CO2	critically evaluate the art forms of 20th century and apply conditional present tense in a text
CO3	remember savoir-faire in France and apply reported speech in story writing
CO4	analyse the consequences of immigration, sports and adventures; apply passive voice in a text
CO5	understand the usage of possessive pronouns and analyse the rhythm of life in France

Unit 1 C'est lafête! (18Hours)

Les pronoms objets directs et indirects – parler d'une fête – exprimer des goûts et des préférences – fêtes sans frontières – plats des fêtes – les jours fériés – les saisons

Extra Reading (Key Words): étude comparée des fêtes françaises et indiennes.

Unit 2 Vousplaisentez! (18Hours)

Le conditionnel présent, la distinction du futur et du conditionnel – le mouvement en général – raconter une anecdote – journée de détente – la naissance d'un chef d'œuvre - l'art au début du 20e siècle – le plaisir de jeux de mots.

Extra Reading (Key Words): Histoire du monde au début du 20e siècle.

Unit 3 On s'entendbien! (18Hours)

Les constructions « faire + verbe » et « laisser + verbe », le discours rapporté – décrire le caractère ou le comportement, exprimer l'accord et le désaccord – le langage des couleurs – sujets deconversation – sujets d'étonnement.

Extra Reading (Key Words): les taboos

Unit 4 À vos risqué etpérils! (18Hours)

Le subjonctif présent, la voix passive – l'aventure d'aujourd'hui – travailler pour la planète – réussites et échecs - marathon de Paris – plaisir des sports – les sports les plus regardés et pratiqués - les français et les sports.

Extra Reading (Key Words):les sportifs français

Unit 5 La vieest dure (18Hours)

Les pronoms possessifs, les adjectifs, les pronoms indéfinis – parler de ses activités quotidiennes, exprimer la confiance ou la méfiance – les taches ménagères – la France insatisfaite - sans travail.

Extra Reading (Key Words): entretien d'une personne.

Course outcomes	**Cognitive level**
Design a text using pronouns	C
Discover a French recipe	An
Narrate an anecdote	C
Critically evaluate modern art forms	E
Infer reported speech and passive voice in a story	C
Explain the influence of immigration on sports	An
Examine the rhythm of life in France	An

TEXT BOOKS :

ECHO A2 – METHODE DE FRANÇAIS & CAHIER PERSONNEL D'APPRENTISSAGE
Authors: J. Girardet and J. Pécheur Publication: CLÉ INTERNATIONAL, 2013.

Books for Reference:

La Conjugaison – Nathan
French made easy – Intermediate level - Goodwill Publishing House Je parle français III – Abhay Publications
Le français avec des jeux et des activités - ELI Langue et la civilisation – I – Mauger Bleu

Note :Texts given in the Extra Reading (Key Words) must be tested only through Assignment andSeminars.

(for candidates admitted from June 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), Tiruchirapalli – 620002

PG AND RESEARCH DEPARTMENT OF ENGLISH

I YEAR UG – SEMESTER I

PART II – ENGLISH 4 - GENERAL ENGLISH IV

HOURS : 6 **CODE : U15EL4GEN04**

CREDIT : 3 **MARKS: 100**

EMPLOYABILITY SKILLS

OBJECTIVES:

1. To develop both receptive (reading, listening) and productive (speaking, writing) skills through communicative classes.
2. To acquire proficiency in oral and written language.
3. To train the students for employability skills such as team skills, communication skills and presentation skills.
4. To acquire values related to personal integrity and excellence in work propagated in the literary works.
5. To create interest among students for self-learning.

UNIT I – Personal integrity –Honesty, dependability, adaptability and loyalty.

Listening to identify a person's attitude, values, situation and the decision made.

Speaking about one's action, expressing opinions, character analysis.

Reading for comprehension(inferring a character's method of managing a situation, adaptability and the like).

Writing recommendations.

Grammar – use of appropriate adjectives and adverbs in contexts and reporting speeches

Vocabulary – differentiating shades of meaning, use of idioms and phrases in sentences

Composition – Your thoughts are the architects of your destiny – David O' Mckay

Honesty is the first chapter in the book of wisdom – Thomas Jefferson

TEXTS

1. *"How far is the river"* by Ruskin Bond
2. *The Pie and the Tart* by Hugh Chesterman.
3. An excerpt from Shakespeare's *"Julius Caesar"* Act III Scene II Lines 13 - 33– Antony's speech

UNIT II – Key to success – Self-esteem, perfection and excellence

Listening to differentiate dutyfrom obligation.

Speaking – Discussing one's knowledge about different subjects, learning skills, thirst for knowledge, learning form experiences.

Reading for comprehension exhibiting higher perception of life's experiences.

Writingparagraphs with cause and reason, analyzing motives behind people's actions and behavior.

Grammar – use of cohesive devices

Vocabulary – figures of speech– simile, metaphor.

Composition –

1. Excellence is not a destination, it is a continuous journey that never ends – Brian Tracy

2. To be perfect is to change often – Winston Churchill

TEXTS

1. Our urgent need for self-esteem by Nathaniel Brandon.
2. Five senses by Judith Wright
3. Three questions by Leo Tolstoy

UNIT III – Team skills

Listening to speaker's ideas, opinions, and suggestions and analyzing their character.

Speaking –Discussing, questioning, interacting, respecting, sharing and participating.

Reading for comprehension – absorbing the attitude of the people.

Writing – personal essays and report writing

Grammar – use of inverted structures

Vocabulary –New words in current usage.

Composition –1. "Talent wins games, but teamwork and intelligence wins championships."

2. "It takes two flints to make a fire."

TEXTS

1. "The Little Black Boy" by William Blake

2.How to get cooperation by Dale Carnegie.

UNIT IV – Communication skills for interpersonal relationship

Listening to specific information and guessing.

Speaking –Facing interview and situational speeches (Master of ceremony, felicitation and the like).

Reading for comprehension to identify the methods of persuasion.

Writingformal letters and invitations.

Grammar – Transformation of sentences.

Vocabulary – Words related to technical registers.

Composition –1. "Communication is an art form that is crafted throughout our lives."

2. Birds of same feather flock together.

TEXTS

1.The Refund by Fritz Karinthy

UNIT V –Presentation skills

Listening to commands,information, announcements, and discussions in a meeting.

Speaking –role play in panel discussion, mock parliament and public speaking.

Reading for comprehension.

Writingagenda, minutes, memo, notice, circular, project proposal.

Grammar – use of simple, compound, complex, imperative sentences and punctuations.

Vocabulary – Business terms.

Composition – writing a project.

TEXTS

1.An excerpt from Abraham Lincoln's speech in Gettysburg.

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HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. SYLLABUS 2019 onwards
Second Year - Semester – IV

Course Title	MAJOR CORE 5 - ANATOMY, EMBRYOLOGY AND SEED TECHNOLOGY
Total Hours	75
Hours/Week	5 Hrs /Wk
Code	U15BO4MCT05
Course Type	Theory
Credits	5
Marks	100

General Objectives:

To enable the students to understand the anatomical features of the root, stem and the leaves, developmental stages of the plant and development of the anther, ovule, male and female gametophytes and embryo.

Course Objectives:
The learner will be able to

CO No.	Course Objectives
CO-1	Remember and understand knowledge of plant anatomy through tissue systems and analyse the structure of stomata, sclereid, raphide and laticifers.
CO-2	Understand and apply the structure of root, shoot and nodal types of dicot plants.
CO-3	Remember and understand the knowledge of embryologythrough microsporogenesis and megasporogenesis.
CO- 4	Remember and understand the pollination, fertilization, types of endosperm and structure & development of embryo
CO- 5	Remember, understand and apply the structure of seed, reserve food, longevity and viability through selected seed technologies, concept of seed certification, inspection and legislation.

UNIT – I PlantAnatomy: **15hrs**

Tissue systems in plants: Introduction of various tissue systems in plants. Simple and complex tissues. Meristems – characteristics of meristem, classification based on origin, position and function. Developmental anatomy: Organisation and importance of Shoot apex (Tunica Corpus theory) and Root apex (Korper – Kappe theory). Microscopic studies on the distribution, structure, types and functions of stomata (dicots and monocots), sclereids, raphides (*Colocasia*), cystolith (*Ficus* leaf) and starch grains (rice). Laticifers: Distribution, structure and types.

Extra reading /Key Words:*origin of root, shoot*

UNIT – II: PlantAnatomy: **15hrs**

Study of the primary structure of dicot stem (*Vernonia*)**,** root (*Cicer*) and leaf (Sunflower) and monocot stem (*Bambusa*) and root (*Canna*). Nodal types of dicot plants - Uni, tri, multi lacunar). Study of normal secondary growth in dicot stem and root (*Vernonia*). Study of Anomalous secondary growth in the dicot stem of *Bignonia* and *Boerhaavia*. Anomalous structure of *Nyctanthes* stem. Ecological anatomy:Study of adaptive anatomical features of Hydrophyte (*Nymphaea* petiole) and Xerophyte (*Nerium* leaf).

Extra reading /Key Words:*anatomy of epiphytic root, phylloclade*

UNIT – III Embryology: **15hrs**

Introduction and scope of embryology. Anther structure and development. Microsporogenesis. Male gametophyte and its development. Pollen grains – morphology, aperture types,Number, Position and Characters (NPC) classification (Erdtman, 1969). Types and structure of ovule. Megasporogenesis, Structure and development of female gametophyte. Types of embryosac with special reference to Polygonum type.

Extra reading /Key Words:*obturator, endothelium*

UNIT – IV:Embryology: **15hrs**

Pollination- types. Fertilization:Pollen germination, pollen tube- growth, entry into ovule and discharge and Double fertilization. Types, structure and function of endosperm (Nuclear, Helobial, Cellular and Ruminate). Structure and development of dicot embryo (*Capsella*) and monocot embryo (*Zea mays*).

Extra reading /Key Words:*Triploid production, sexual incompatibility*

UNIT – V Seed technology: **15hrs**

Structure of seed. Types of seed – monocot, dicot, endospermic and perispermic. Seed storage: Storage behaviour of seeds based on maturation drying – orthodox and recalcitrant seed. Storage reserves in seeds – carbohydrates, proteins and lipids. Seed longevity – Factors affecting seed longevity in seed storage. Seed drying (sun drying & force air drying). Seed viability – tetrazolium test and its advantages and disadvantages. Concept of seed certification and specific crop standard for seed certification. Seed inspection, seed legislation and seed law enforcement (quarantine).

Extra reading /Key Words:*Seed dormancy, Synthetic Seed*

Note: Texts given in the Extra reading /Key words must be tested only through Assignment and Seminars.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the tissue systems, structure of stomata, sclereid, raphide and laticifers.	PSO 1 PSO 3	R, U
CO-2	Describe the structure of root, shoot and nodal types of dicot plants.	PSO 1 PSO 3	R, U
CO-3	Illustrate the structure of anther.	PSO 1 PSO 3	R, U
CO-4	Discuss the microsporogenesis and megasporogenesis.	PSO 1 PSO 3	R, U
CO-5	Discuss the types of pollination, endosperm and embryo.	PSO 1 PSO 3	R, U
CO-6	Explain the process of fertilization.	PSO 1 PSO 3	R, U
CO-7	Describe the structure of monocot and dicot seed.	PSO 1 PSO 3	R, U
CO-8	Expalin the reserve food, longevity and viability.	PSO 1 PSO 2 PSO 5	R, U
CO-9	Discuss the concept of seed certification, inspection and legislation.	PSO 1 PSO 2 PSO 5	R, U
CO-10	Develop the employability skills by learning the anatomical features of different parts of plant and developmental stages of reproductive parts of plant	PSO-1	C

References

Text Books:

Maheswari, P. 1950. An introduction to the Embryology of Angiosperms. Vikas Publishing House Pvt. Ltd.

Reference Books:

Cutter, E. G. 1978. Anatomy part I – The English Language Book Society and Edward Arnolds Ltd. London.

Eames, A. J. and Mac Daniels, l. H. 1947. An introduction to plant Anatomy. MC Graw and Hill Book Company, INC., New York, London.

Agarwal, S. B. 1972. Embryology of angiosperms. Sahitya Bhavan, Agra.

Bhojwani, S. S. and Bhatnagar, S. P. 1978. The Embryology of Angiosperms. Vikas Publishing House Pvt. Ltd,

Agrawal, R.L. 1982. Seed technology. Oxford and IBH Publishing CO.

Remington John Stewart. 1993. Seed testing. Printwell, Jaipur.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019 onwards
Second Year – Semester – IV

Course Title	MAJOR CORE 6 – PRACTICAL 2 – CELL BIOLOGY, BIOSTATISTICS, ANATOMY, EMBRYOLOGY AND SEED TECHNOLOGY
Total Hours	75
Hours/Week	5 Hrs /Wk
Code	U16BO4MCP06
Course Type	Practical
Credits	5
Marks	100

General Objectives:

To enable the students to understand the ultra structure of plant cell organelles, cell division and internal organization of root, stem and types of stomata, structure of anther, embryo sac, endosperm, embryo and seed and the fundamental ideas about the central tendency and deviation

Course Objectives :
The learner will be able to

CO No.	Course Objectives
CO-1	Analyze the structure of cell organelle and apply the knowledge of cell cycle and cell division and calculate the mean, median, mode, standard deviation.
CO-2	Understand and analyze the structure of stomata types and the root, shoot of dicot plants.
CO-3	Understand the adaptive anatomical features and analyze the anomalous structure and nodal types of dicot plants.
CO- 4	Remember and understand the knowledge on the pollen morphology and pollen germination, types of endosperm and embryo
CO- 5	Apply and analyze the seed germination, seed leachate and viability tests.

Unit – I. Cell biology and Biostatistics: 15hrs

Observing the photo micrographs of cell organelles – chloroplast, mitochondria, nucleus, and endoplasmic reticulum. Squash preparation of mitotic cells of *Allium cepa* – root tip. Smear preparation of meiotic cells in *Rheo* flower bud. Frequency curve, frequency polygon and histogram bar diagram. Calculation of arithmetic mean, median, mode, standard deviation and standard error.

UNIT – II Anatomy:15hrs

Identification of stomatal types (Dicot –anomocytic, anisocytic, paracytic and Monocot – Graminaceous type) primary and normal secondary structure of Dicot stem (*Vernonia*) and root (*Cicer*), Monocot stem (*Bamboo*) and root (*Canna*).

UNIT – III Anatomy:15hrs

Study of adaptive anatomical features of Hydrophyte (*Nymphaea* petiole) and Xerophyte (*Nerium* leaf). Anomalous secondary structure in the stem of *Bignonia, Boerhaavia* and *Nyctanthus*. Nodal types of dicot plants - Uni, tri and multi lacunar. Microscopical study of Epidermal hairs, Sclereids, Raphides, Cystolith and Starch grains.

UNIT – IV:Embryology: 15hrs

Analysis and identification of pollen morphology using locally available plant. Evaluation of pollen germination percentage in *Vinca*, *Datura* and *Hibiscus*.Observation of T.S of anther (*Lilium*), Embryosac – *Lilium*. Endosperm (Nuclear – *Sagittaria*, Cellular – *Cananga*, ruminate – *Psychotria*). Dicot & monocot embryos – slides. Dissection of Dicot embryo (*Tridax*).

UNIT- V: Seed technology: 15hrs

Seed germination test (paper towel method). Seed viability test (Tetrazolium test). Seed leachate test.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Describe the structure of cell organelles, and identify the stages of mitotic and meiotic division.	PSO 1 PSO 3	R, U
CO-2	Calculate the mean, median, mode, standard deviation	PSO 1 PSO 3	R, U
CO-3	Describe the structure of stomata, root, shoot and nodal types of dicot plants	PSO 1 PSO 3	R, U
CO-4	Describe the microscopical study of epidermal hairs, sclereids, raphides, cystolith and starch grains.	PSO 1 PSO 3	R, U
CO-5	Illustrate the structure of anther.	PSO 1 PSO 3	R, U
CO-6	Describe the embryosac, endosperm and embryo.	PSO 1 PSO 3	R, U
CO-7	Describe the structure of monocot and dicot seed.	PSO 1 PSO 3	R, U
CO-8	Examine the seed germination and viability tests.	PSO 1 PSO 2	R, An
CO-9	Develop the practical skills by illustrating the ultra structure of plant cell organelles, cell division, structure of anther, embryo sac, endosperm, embryo and examine the seed testing and calculate the central tendency and deviation	PSO-1	C

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019ONWARDS
Second Year Allied- Semester – IV

Course Title	ALLIED CORE 5 – PAPER II – BIOPROSPECTING AND PLANT BIOTECHNOLOGY
Total Hours	60
Hours/Week	4 Hrs /Wk
Code	U15BO4ACT05
Course Type	Theory
Credits	4
Marks	100

General Objectives:

To enable the students to understand the utilization of plants as food, medicine and cosmetics. It also emphasizes the various biotechnological tools involved in plant biotechnology.

Course Objectives:
The learner will be able to

CO No.	Course Objectives
CO-1	Understand and apply their knowledge on cultivation practices, economic products and uses of various plants.
CO-2	Understand, apply and analyze the sources and uses of vegetables, fruits, fibre, wood and rubber
CO-3	Remember, understand and analyze the sources, extraction and uses of certain exudates of plants
CO- 4	Understand and analyze the sources, extraction and uses of different plant products
CO- 5	Understand, apply and analyze the plants through biofertilizer, SCP and various biotechnological methods.

UNIT – I Bioprospecting: 12 Hrs

Cultivation practices, economic products and uses of the following plants. Main economic products and their uses: cereals (*Oryza*), Pulses (*Cajanus*), Sunflower oil (*Helianthus*), Sugarcane (*Saccharum*), Beverage (*Coffea*).

Extra reading (Key Words): sugarcane industries in Tamil nadu

UNIT – IIBioprospecting: 12 Hrs

Sources and uses of the following: Vegetable (*Moringa* – leaf & unripe fruit), Fruit – Banana (*Musa*), Fibre (*Gossypium*). Wood – structure, seasoning and use of Teak (*Tectona grandis*) and Sandal wood (*Santalum album*).Rubber – Morphology of the plant, tapping, processing, grading, packing and use of *Hevea brasiliensis.*

Extra reading (Key Words): jute and silk

UNIT – IIIBioprospecting: 12 Hrs

Source and extraction and use of the following: Medicine – Alkaloid (*Cinchona*) and antioxidants (Green tea). Essential oil – extraction and use of Eucalyptus. Paper and pulp – Source, manufacture and use of papers (Bamboo and bagasse). Coir – Source, process and use of coconut.

Extra reading (Key Words): lycopene, quinolizidine alkaloid

UNIT – IV Bioprospecting: 12 Hrs

Sources ,extraction and uses of the following: Sago – *Manihot utilissima*, Tannins – fruit of *Terminalia chebula*. Dyes – Henna (*Lawsonia inermis*), rhizome of turmeric (*Curcuma domestica*). Gums – neem (*Azadirachta indica*).

Extra reading (Key Words): phenolic compounds, volatile oils

UNIT – V Plant Biotechnology: 12 Hrs

Regeneration of plants through micropropagation .Production of transgenic plant- insect pest resistance (*Bt* cotton). Benefits and risks of GMOs. Large scale production of biofertilizer – (*Rhizobium*). Commercial production of SCP (*Spirulina*) and its nutritive value, advantages and uses. Patent – IPR and its importance.

Extra reading (Key Words): synthetic seed production, azolla cultivation

Note: Texts given in the Extra reading /Key wordsmust be tested only through Assignment and Seminars.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the cultivation practices, economic products and uses of various plants	PSO 1	R, U
CO-2	Explain the method of cultivation of paddy to increase the yield into manifold	PSO 1	R, U
CO-3	Analyze the sources and uses of vegetables, fruits, fibre, wood and rubber	PSO1, PSO 5	U, An
CO-4	Explain the extraction methodology of various phytoconstituents	PSO1, PSO 5	U, An
CO-5	Summarize the sources, extraction and uses of different plant products	PSO1, PSO 5	R, U
CO-6	Utilize the biotechnological methods to develop plants using *in vitro* propagation	PSO1, PSO 2	U, Ap
CO-7	Develop the employability skills by understanding the utilization of plants as food, medicine and cosmetics	PSO-1	C

References

Text Books:

1. Pandey, B.P. 2007. Economoic Botany. S.Chand & Company LTD. New Delhi.
2. Dubey. R. C. 2006. Text book of biotechnology. S. Chand and Company Ltd. New Delhi.
3. Rajni Gupta and Tarun Rajpal, 2012. Concise notes on Biotechnology, Mc Grew –Hill publishing company Limited,New Delhi.

Reference Books:

1. Hill.A.F, 1996. Economic Botany –Tata Mc Grew –Hill publishing company Limited,New Delhi.

2. Kumaresan, V. 2004. Biotechnology. SARAS Publication.
3. Kochhar, S. L, 2016. Economic Botany. 5th Edition- A Comprehensive study.
4. Firdose Alam Khan, 2016. Biotechnology Fundamentals. CRC Press.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019 ONWARDS
Second Year – Semester – IV

Course Title	**ALLIED COMPULSORY 6 – PAPER III– PRACTICAL PAPER – I PLANT DIVERSITY, ANATOMY, EMBRYOLOGY, TAXONOMY OF ANGIOSPERM, PLANT PHYSIOLOGY, ECOLOGY, BIOPROSPECTING AND PLANT BIOTECHNOLOGY**
Total Hours	**60**
Hours/Week	**4 Hrs /Wk**
Code	**U15BO4ACP06**
Course Type	**Practical**
Credits	**3**
Marks	**100**

General Objectives:

To enable the students to give the practical exposure on the basic structure and life cycle pattern of primitive forms such as Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms. It also provides knowledge on anatomy, embryology, floral taxonomy of angiosperms and different physiological reactions in the higher plants. Morphological and anatomical structures of hydrophytes, xerophytes and halophytes.

Course Objectives :
The learner will be able to

CO No.	Course Objectives
CO-1	Remember and understand the general characteristics of algae and fungi, life cycle pattern of bryophytes, pteridophytes and gymnosperms
CO-2	Understand, apply and analyse the internal structure of dicot plants and development of embryo
CO-3	Understand and analyse the floral taxonomy of angiosperms
CO- 4	Understand and apply the different physiological and ecological adaptations in the higher plants
CO- 5	Understand and analyze the economic products and uses of various plants, SCP and plant tissue culture techniques.

UNIT – I Algae and Fungi: 12 hrs

Structure of *Nostoc*, *Ulva*, vegetative and reproductive structure of *Penicillium* and *Agaricus*. **Bryophyte, Pteridophyte and Gymnosperm:** Structure of gametophytes, and sporophytes of *Funaria, Nephrolepis* and *Cycas*.

UNIT- II Anatomy and Embryology: 12 hrs

Primary and secondary structure of dicot stem (*Vernonia*) and root (Primary-*Cicer*, Secondary- *Vernonia*). Structure of mature anther and anatropous ovule.

UNIT – III Taxonomy of Angiosperms : 12 hrs

Dissecting and drawing the floral parts and flower M.L.S and floral diagram of the following families: Annonaceae, Rutaceae, Rubiaceae, Amaranthaceae and Poaceae.

UNIT – IV Physiology and Ecology : 12 hrs

Experiments on absorption (osmosis) photosynthesis (test tube funnel), transpiration (Ganong's potometer) respiration (Ganong's respiroscope). Morphological and Anatomical structures of hydrophytes (*Hydrilla*-Stem), xerophytes (*Nerium*-Leaf). Morphology of halophytes (*Avicennia*- pneumatophore and Viviparous germination of seedling).

UNIT – V Bioprospecting and Plant Biotechnology: 12 hrs

Oryza, Cajanus, Helianthus, Saccharum, Musa, Coffea and *Gossypium*. Tissue culture techniques –Sterilization, medium preparation, inoculation and micropropagation. SCP – Spirulina.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Recall, relate and explain the general characters of algae and fungi, the life cycle patterns of bryophyte and pteridophytes	PSO 1, PSO 3	R, U
CO-2	Outline and explain the internal structure of dicot plants, the developmental process of dicot embryo	PSO 1, PSO3	R, U
CO-3	Compare and contrast the floral characters of different families	PSO 1 PSO 6	U, An
CO-4	Explain the photosynthetic system of plants and the respiration process of plants.	PSO 1	U
CO-5	Explain and Utilize the, economic products and uses of various plants, biotechnological methods to develop plants using *in vitro* propagation	PSO 1 PSO 2	U, Ap
CO-6	Develop the practical skills by observing the basic structure and life cycle patterns of plant diversity and morphological and anatomical features of higher plants	PSO-1	C

References

Text Books:

1. Pandey, B.P. 2007. Economoic Botany. S.Chand & Company LTD. New Delhi.
2. Dubey. R. C. 2006. Text book of biotechnology. S. Chand and Company Ltd. New Delhi.
3. Rajni Gupta and Tarun Rajpal, 2012. Concise notes on Biotechnology, Mc Grew –Hill publishing company Limited,New Delhi.
4. Ganguli, H. G. , Kumud Shankar Das and Chittatosh Dutta, 2011. College Botany. Vol –I and II. New Central Book Agency, Calcutta.
5. Verma, V. 1985. A text book of Plant Physiology. Emkay Publications, New Delhi.

Reference Books:

1. Hill.A.F, 1996. Economic Botany –Tata Mc Grew –Hill publishing company Limited,New Delhi.
2. Kumaresan, V. 2004. Biotechnology. SARAS Publication.
3. Kochhar, S. L, 2016. Economic Botany. 5th Edition- A Comprehensive study.
4. Firdose Alam Khan, 2016. Biotechnology Fundamentals. CRC Press.

5. Sharma, P.D. 1992. Ecology and environment. Rastogi Publication, Meerut.
7. Agarwal, S.K. 1992. Fundamentals of ecology. Ashish Publishing House, New Delhi.
8. Pandey, B. P. 1984. Plant Anatomy. S. Chand and Company Ltd, New Delhi.
9. Bhojwani, S. S. and Bhatnagar, S. P. 1978. The Embryology of Angiosperms. Vikas Publishing House Pvt. Ltd,
10. Shukla and Chandel, 1994. Plant ecology and soil Science . S. Chand and Company Ltd., New Delhi.
11. Pandey, B. P, 2010. College Botany. Vol. III. S. Chand and Company Ltd, New Delhi.

(For Candidates admitted from June 2019 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2

B.A. /B.Sc. / B.Com. / BBA/ B.C.A. DEGREE COURSE LIFE ORIENTED EDUCATION

ETHICS – II: EMPOWERMENT OF WOMEN

HRS / Wk:1 **CODE:U15VE4LVE02**

CREDIT : 1 **MARKS : 100**

OBJECTIVES:

- To make the learners aware of various gender and social issues and CyberCrimes.
- To make the learners understand and appreciate the role of media, in facing the challenges on various lifeissues.
- To enable the learners to understand the ways of empowering women and cyber crime againstwomen

UNIT – I: GENDER ISSUES

Feminism, Responsibilities of men and women towards Egalitarian society, Gender Identity-Factors contributing to gender identity (Family values, culture, tradition, religion, societal values, mass media)

UNIT – II: SOCIAL ISSUES RELATED TO WOMEN

Eve teasing, Rape, Dowry, Harassment in marriage, Divorce and Widows Remarriage, HIV & AIDS, Transgender, Female Genocide, sex workers, trafficking, fugitive, Female foeticide, handicapped children and women and evils of drug abuse.

UNIT – III: WOMEN AND MEDIA

Portrayal of women in media world - News paper, Magazine, Cinema, TV, Video and Advertisements - Morality in Media and Right use of Media

UNIT – IV: WAYS OF EMPOWERING WOMEN

Need for empowerment –Skills required for empowerment and Career Oriented Skills, Women's bill- Property rights, Models of Empowered Women- St. Teresa of Kolkata, Indira Gandhi, Helen Keller, Chanu Sharmila and Malala

UNIT – V: CYBER CRIME AGAINST WOMEN

Harassment and Spoofing via e-mail, Cyber Stalking, Cyber Pornography, Morphing. Cyber Laws, Social network: Face book, Twitter and Whatsapp

REFERENCES:

1. Dr.M.Arumairaj et al., 1999, "Marching towards the Milleniumahead".
2. Thomas Anjugandam, 1999, "Grow Free Live Free" SalesianPublicaiton.
3. H.C Pretti Nandhini Upretti, jaipur 2000 "Women and problems ofGender Discrimination".
4. Thomas B.Jayaseelan, 2002, "Women: Rights and law" Indian Social Institute, NewDelhi.
5. Reni Jacob vol I & II, April- June 2004, "Vikasimi – The journal ofWomen's Empowerment,Ed,"

(For Candidates admitted from June 2019 onwards)
HOLY CROSS COLLEGE(AUTONOMOUS) TRICHIRAPALLI-2.

B.A/B.Sc./B.Com /B.C.A – DEGREE COURSES LIFE ORIENTED EDUCATION

BIBLE STUDIES – II: OLD TESTAMENT

HRS /Wk :1 **CODE: U15VE4LVBO2**

CREDIT : 1 **MARKS : 100**

OBJECTIVE:

- To enable the students to understand the desires of God through Prophetic revelation and to become sensitive to the heart beat ofGod.

UNIT – I: PURPOSE OF LIFE

Creation of man – fall of man (Gen 1-4) Plan of redemption through the life of :

- Noah (Gen 6-9); Abraham (Gen12-18);
- Joseph (Gen 37-40); Moses (Exo4-5);
- Joshua (Joshua1-8)

UNIT – II: JUDGES AND KINGS

- Judges: Deborah (Judges 4); Samson (Judges 6-8); Gideon (Judges13-16)
- Kings**:** David (I Sam 17-31, II Sam 1-12); Solomon (I Kings1-11)

UNIT – III: MINOR PROPHETS

Brief Life History and teachings of

- Amos
- Jonah
- Micah
- Nahum
- Habakkuk

UNIT – IV: MAJOR PROPHETS

Brief Life History and teachings of

- Isaiah (Is1,6,11,36-38,40-42,44,50,53,61)
- Jeremiah (Jer1-3,7-12,18-19,23)
- Ezekiel (chapters 1,2,3,5,8,12visions)
- Daniel (Daniel1-6)

UNIT – V: WOMEN IN THE BIBLE

Women in the Old Testament

- Eve (Gen3)
- Ruth (Ruth1-4)
- Hannah (I Sam1:1-28)
- Esther (Esther1-6)

REFERENCES:

1. Russell Fueller (1999) The Text book of the Twelve Minor Prophets. Wipf&Stock Publishers,UK.
2. Willis Judson Beecher (2002) The Prophets and The Promise. Wipf & StockPublishers, UK

(For Candidates admitted from June 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2 B.A./ B.Sc./ B.Com/ BBA/ B.C.A - DEGREE COURSES

LIFE ORIENTED EDUCATION CATECHISM – II: CHURCH AND SACRAMENTS

HRS / Wk:1 **CODE : U15VE4LVC02**

CREDIT : 1 **MARKS : 100**

OBJECTIVES:

- To enable the students to understand the ways of Christian living with theChurch
- To understand God's gift of the HolySpirit.
- To understand the methods of building relationship withJesus.
- To learn the life of Sacraments andPrayer
- To enrich our devotion to Mother Mary andSaints.

UNIT – I: MISSION OF THE CHURCH

What is church (attributes) – Interpretation: body of Christ- Bride of Christ, goal of all things- Historical as well as spiritual- Mystery and Sacrament-Pilgrim Church.

UNIT – II: PARTICIPATORY CHURCH

Work of the Holy Spirit- Salt and leaven in the world "Church of modern World" Church as community – Its important aspect, early Christian Church – People of God as Church- Its characteristics andstructure

UNIT – III: THE FUNCTIONARY CHURCH AND I

Ministerial Church – Relating Church –Parish Church- Role of lay faithful in the Church – Its challenges – Church and I.

UNIT – IV: SACRAMENTS

Sacraments – Initiation– Healing – Service (all the seven) – Emphasis on Confession, Confirmation and Holy Communion. Sacramental: holy "things" used –Their sanctity.

UNIT – V: MARY AND SAINTS

Mary as a young virgin- Disciple- Her role in the Catholic Church-Annual feasts- Pilgrimages- Devotion to Mary, Dogmas. Saints in the Church- Prominent Women in the old testament

REFERENCES:

1. "Vatican II Revised" Archbishop Angelo Fernandes Published by X.Diax de Rio S.J. Gujarat Sahitya Prakash, P.O.Box. 70, Gujarat, 388001, India.
2. "The Sacraments The Word of God at the Mercy of the Body" Claretian Publications, Malleswaram, Bangalore560055.
3. Documents of Vatican II – St. Paul's Publications, Bombay1966.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019 ONWARDS
Third Year-SEMESTER V

Course Title	**MAJOR CORE -7 GENETICS AND PLANT BREEDING**
Total Hours	**75**
Hours/Week	**5** Hrs/Wk
Code	**U15BO5MCT07**
Course Type	**Theory**
Credits	**4**
Marks	**100**

General Objectives:

To enable the students to understand Mendel's ratios and deviation, blood groups, linkage and crossing over, the conventional methods of plant breeding, role of hybridization, mutation, and polyploidy in plant breeding.

Course Objectives:
The learner will be able to

CO No.	Course Objectives
CO-1	understand, apply and evaluate the laws of Mendel in classical genetics and deviations from Mendelian ratios.
CO-2	remember and understand the different types of Gene interaction.
CO-3	understand and analyse linkage, crossing over and sex determination
CO-4	understand and apply the concepts of cytoplasmic inheritance and mutation, evaluate the significance of Hardy Weinberg law.
CO-5	remember, analyse and apply the principle involved in conventional methods of plant breeding, polyploidy, and the organizations involved in plant improvement.

UNIT- I Classical genetics: **15 hrs**

Mendel's experiments. Law of segregation, law of Independent assortment (mono, di and trihybrid crosses). Back cross-dominant and recessive. Biological significance of Mendel's laws. Deviations from Mendelian ratios: Incomplete dominance - flower colour in *Mirabilis jalapa*. Codominance - coat colour in cattle. Lethality: dominant lethal – coat colour in mice, recessive lethal – leaf colour in maize.

Extra reading/Key words:*Aneuploidy, chromosomal rearrangement*

UNIT – II Gene interaction: **15hrs**

Complementary factor - flower colour in sweet pea, Epistasis: dominant epistasis - fruit colour in *Cucurbita*, recessive epistasis – petiole length in Tobacco, Duplicate factor - seed shape in shepherd's purse. Multiple alleles -coat colour in rabbit and blood grouping. Polygenic or quantitative inheritance - kernel colour in wheat.

Extra reading/Key words*:Karyotype, Duplicate gene*

UNIT – III Linkage, crossing over and sex determination: **15 hrs**

Linkage -complete and incomplete linkage, linkage groups. Crossing over and recombination - cytological basis of crossing over, types, theories, significance and factors affecting crossing over. Chromosome mapping. Sex determination in plants (*Melandrium* and *Zea mays*), Sex linkage: Inheritance of X – linked genes - *Drosophila* (eye colour) & human being (colour blindness and Haemophilia).
Extra reading/Key words:*Male sterility,recombination frequency*

UNIT – IV Cytoplasmic inheritance and mutation: 15hrs

Cytoplasmic inheritance in diploid organisms (plastid transmission in plants, kappa particles transmission in *Paramecium*), Cytoplasmic inheritance in haploid organisms (yeast), Significance of cytoplasmic inheritance. Mutation- Types, induction of mutation (physical and chemical mutagens) and detection of mutation (*Neurospora*). Hardy Weinberg law & its significance.
Extra reading/Key words:*Polymorphic gene,Pleiotropy*

UNIT – V Plant breeding: 15hrs
Objectives (Breeding for crop improvement to increase yield, quality, adaptation to different environment and disease resistance). A brief study of conventional methods of plant breeding (mass selection and pure line selection). Principles and techniques in plant breeding. Hybridization types. Polyploidy – Types. Heterosis – theories of heterosis. Role of mutation and polyploidy in plant breeding. Role of ICAR, IARI and CRRI in crop improvement.
Extra reading/Key words:*somatic hybridization, plant domestication*

Note: Texts given in the Extra reading /Key wordsmust be tested only through Assignment and Seminars.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the laws of Mendel in classical genetics and deviations from Mendelian ratios.	PSO 1	U
CO-2	Describe the complementary factor,epistasis and duplicate factor.	PSO 1	R
CO-3	Discuss linkage, crossing over and sex determination.	PSO 1 PSO 3	U
CO-4	Explain the concepts of cytoplasmic inheritance and mutation	PSO 1 PSO 3	U
CO-5	Evaluate the significance of Hardy Weinberg law.	PSO 1 PSO 3	U
CO-6	Paraphrase the conventional methods of plant breeding.	PSO 1 PSO 3	U
CO-7	Summarise the types of polyploidy	PSO 3	,U
CO-8	Describe the role of organizations involved in plant improvement.	PSO 3	R
CO-9	Develop the employability skills by understanding Mendel's ratios and deviation, linkage and crossing over and the conventional methods of plant breeding	PSO-1	C

Text Books:

Verma, P.S. and Agarwal, V.K. 2007. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand & Company Ltd. New Delhi.

Gupta, P.K. 2002. Cytology, Genetics and Evolution. Rastogi Publications, Meerut, India.

Leland Hartwell and Michael, L.Goldberg, 2018. Genetics: From Genes to Genomes- Access 6th edition. Mc Graw – Hill Publishing Company.

Reference Books:

Gardner, F. J. 1972. Principles of Genetics. Wiley Eastern Pvt. Company Ltd., New Delhi.

Gupta, P. K. 1974. Cytology, Genetics and Evolution. Rastogi publications, Meerut.

Allard. R. W. 1960. Principles of plant breeding. John Wiley and Sons, Inc., New York, London.

Sarin, C. 2001. Genetics. Tata McGraw – Hill Publishing Company Limited, New Delhi.

(for candidates admitted from 2019 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS),TIRUCHIRAPPALLI – 2
PG AND RESEACH DEPARTMENT OF BOTANY
B.Sc. BOTANY

Third Year - Semester – V

Course Title	**MAJOR CORE – 8 MORPHOLOGY, TAXONOMY OF ANGIOSPERMS AND ETHNOBOTANY**
Total Hours	**75**
Hours/Week	**5 Hrs /Wk**
Code	**U15BO5MCT08**
Course Type	**Theory**
Credits	**4**
Marks	**100**

General Objectives:

To enable the students to understand the morphological variation of the plant, the significance of angiosperm taxonomy, botanical nomenclature, vegetative and floral characters of Angiosperms and their economic value, in addition, ethnobotanical applications and traditional medicine

Course Objectives:
The learner will be able to

CO No.	Course Objectives
CO-1	Understand, apply the morphological variation and modifications of the plant parts
CO-2	Understand and apply the importance of botanical nomenclature and herbariums and its importance
CO-3	Apply the knowledge gained in studying the classification of Bentham and Hooker and others and plants belonging to the families Annonaceae to Apiaceae
CO- 4	Apply the knowledge gained in studying the plants belonging to the families rubiaceae to poaceae
CO- 5	Understand and apply the relationship and human and plants, and evaluate the origin and application of traditional medicine system

UNIT – I Morphology: **15hrs**

Root types and modifications: Adventitious – *Ruellia*, Tap root– *Daucus*. Stem modifications: Aerial-phylloclade - *Opuntia*, cladode- *Asparagus*, underground – ginger. Leaf: Types : Simple – *Hibiscus*, Compound : Pinnate – *Cassia*, Palmate – *Manihot*. Venation & Phyllotaxy, Modifications : Phyllode - *Acacia*. Leaf tendril – *Gloriosa*. Leaf pitcher -*Nepenthes*. Inflorescence types with examples. Flower – Technical description of flower. Fruit - types with examples.

Extra reading/Key words: General morphological characters of leaf, stem.

UNIT - II Taxonomy of Angiosperms: **15hrs**

Systems of classification: Broad outline of Bentham and Hooker and Takhtajan. Binomial Nomenclature. Elementary knowledge of ICBN and its significance. Citation of authors. Floras: definition, identification, collection and uses. Herbarium techniques : Methodology of preparation, management and role of herbarium. Important herbaria and Botanical gardens of India.

Extra reading/Key words: *digital herbaria, Kew botanical garden, PLANTS Databases*

UNIT - III Taxonomy: **15hrs**

Systematic position (Bentham and Hooker), diagnostic features (vegetative and floral) and economic importance of the following dicot families: Annonaceae, Capparidaceae, Sterculiaceae, Brassicaceae, Rutaceae, Anacardiaceae, Leguminosae - (Fabaceae and Caesalpiniaceae), Cucurbitaceae and Apiaceae.

Extra reading/Key words:*Mimosaceae, Key preparation, field note book*

UNIT–IV Taxonomy: **15hrs**

Rubiaceae, Asteraceae, Asclepiadaceae, Acanthaceae, Lamiaceae, Amaranthaceae, Euphorbiaceae, Orchidaceae, Liliaceae, and Poaceae.

Extra reading/Key words:*Musaceae, National tropical botanical garden, field note book*

UNIT –V Ethnobotany 15 hrs

Definition and Scope of Ethnobotany. Interdisciplinary approaches in Ethnobotany. Ethnic groups of India. Study of plants used by tribals (Foods, Medicine and Fodder). Role of medicinal plants in Indian system of medicine - Siddha, Ayurvedic and Unani. Basic principles in relation to ethnobotany. Role of ethnobotany in the conservation - Sacred groves. (religious belief, social custom and Taboos) and domestication of native plant genetic resources. Role of Herbaria in ethnobotany.

Extra reading/Key words:*Ecotourism, validation of ethnomedicine*

Note: Texts given in the Extra reading /Key wordsmust be tested only through Assignment and Seminars.

Course Outcomes (CO):

The learners will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Differentiate the morphological variation of the plant parts	PSO 1 PSO 6	R, U
CO-2	List the importance of botanical nomenclature	PSO 1 PSO 6	R
CO-3	Indicate the importance of herbariums	PSO 1 PSO 6	U
CO-4	Outline the classification of Bentham and Hooker and others	PSO 1 PSO 6	R
CO-5	Illustrate the salient features of plants belonging to the families Annonaceae to Apiaceae	PSO 1 PSO 6	An
CO-6	Distinguish the plants belonging to the families rubiaceae to poaceae	PSO 1 PSO 6	U
CO-7	Correlate relationship and human and plants	PSO 1 PSO 5	R, An
CO-8	Evaluate the origin and application of traditional medicine system	PSO 1 PSO 5	U

PO – Programme Outcomes; CO – Course Outcome; R- Remember; U- Understand; ApApply;An – Analyse; E- Evaluate; C – Create

References

Text Books:

1. Pandey, S.N. and Misra, S.P. 2008. Taxonomy of Angiosperms. Ane Books, India, New Delhi.
2. Singh and Jain. 1987. Taxonomy of Angiosperms. Rastogi Publications, Meerut, India.
3. Jain, S.K. 1987. A Manual of Ethnobotany- Scientific publishers , Jodhpur.

Reference Books:

1. Lawrence. 1955. An introduction to Plant Taxonomy. Central Book Depot. Allahabad.
2. Paul and Jain 1998. Tribal Medicine – Oxford and IBH Publishing Co., New Delhi.
3. Sharma, O.P. 2017.Plant Taxonomy. 2nd Edition. McGraw Hill Education.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019 onwards
Third Year – Semester – V

Course Title	**MAJOR CORE – 9 PHARMACOGNOSY**
Total Hours	**75**
Hours/Week	**5 Hrs /Wk**
Code	**U15BO5MCT09**
Course Type	**Theory**
Credits	**4**
Marks	**100**

General Objectives:
To enable the students to learn the classification, constituents, collection, processing and uses of crude drugs obtained from various plant parts.

Course Objectives :
The learner will be able to

CO No.	Course Objectives
CO-1	Understand the types of natural drugs, it's collection and processing
CO-2	Analyse the phytoconstituents of therapeutic values
CO-3	Analyse and evaluate the drug adulteration
CO- 4	Remember the indegenous traditional drugs
CO- 5	Understand and apply the pharmaceutical aids of plants

UNIT – I Pharmacognosy: 15 hrs
Definition and importance. Sources of natural drugs. Classification of crude drugs – morphological, therapeutical and chemical. Collection and processing of crude drugs. Aroma therapy and its significance.
Extra reading/Key words:*History of pharmacognosy in china, Forensic and eco pharmacognosy*
UNIT – II Drug constituents: 15 hrs
Carbohydrates, glycosides, lipids – fixed oils, volatile oils, resins, gums, alkaloids, tannins and polyphenols.
Extra reading/Key words:*Plant metabolomics,harmones.*

UNIT –III Drug adulteration: 15 hrs
Definition and types. Methods of drug evaluation– physical, morphological and microscopical. Preliminary detection of Alkaloids, glycosides and tannins.
Extra reading/Key words:*drug Quality control, detection of flavanoids*
UNIT – IV Indigenous traditional drugs of India: 15 hrs
A study on the distribution, biological source, characters, chemical constituents and medicinal uses of the following: Amla (*Emblica officinalis*), Brahmi (*Hydrocotyl asiatica*), Tulasi *(Ocimum sanctum*), Garlic (*Allium sativum*), Vasaka (*Adhatoda vasica*), Ginger (*Zingiber officinale*), Clove (*Syzygium aromaticum*), Pepper (*Piper nigrum*), Sandal wood (*Santalum album*), Cinchona (*Cinchona officinalis*) and Lemon grass oil (*Cymbopogon citratus*).
Extra reading/Key words:*Psychoactive drugs,plants as neutraceuticals.*

UNIT – V Plant resources as technical products and Pharmaceutical aids: 15 hrs

Natural plant pesticides (Pyrethrum and Neem). Allergenic extracts and their effects (pollen and fungal extracts). Fibers: Vegetable fibres –Cotton and Jute; Animal fibre –Silk. Surgical dressings & sutures.

Extra reading/Key words:*hemp, wool, garlic inseticide spray, tomato leaf insecticide spray.*

Note: Texts given in the Extra reading /Key wordsmust be tested only through Assignment and Seminars.

Course Outcomes:

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Define the types of natural drugs	PSO 1 PSO 5	R, U
CO-2	Explain the collection and processing of crude drugs.	PSO 1 PSO 5	U
CO-3	Summarize and analyse the phytoconstituents of therapeutic values of plant drugs	PSO 1 PSO 8	U, An
CO-4	Analyse the drug adulteration	PSO 1 PSO 8	An
CO-5	Lists the indegenous traditional drugs	PSO 1 PSO 5	R
CO-6	Explain the medicinal properties of traditional drug	PSO 1 PSO 5	R, U
CO-7	Discuss the various plants as technical products	PSO 1 PSO 5	R, U
CO-8	Describe the plants as pharmaceutical aids	PSO 1 PSO 5	R, U
CO-9	Develop the employabilty by learning the classification, constituents, collection, processing and uses of crude drugs obtained from various plant parts	PSO-1	C

Text Books

1. Roseline, A. 2011. Phamacognosy. MJP Publishers, Chennai.
2. Kokate, C. K., Purohit, A. P. & Gokhale, S. B. 1998. Pharmacognosy. Nirali Prakashan, Pune.

Reference Books:

1. Wallis, T. E. Text book of Pharmacognosy. CBS Publishers & Distributers. Jain Bhawan, New Delhi.
2. Hill.A.F, 1996. Economic Botany –Tata Mc Grew –Hill publishing company Limited,New Delhi.
3. Mohammed Ali. Text book of Pharmacognosy. CBS Publishers & Distributers, New Delhi.
4. Edwin Jerald, E and Sheeja Edwin Jerald, 2007. Text book of Pharmacognosy and Phytochemistry. CBS Publishers and Distributors Pvt. Ltd.
5. Biren N. Shah and Seth, A. K. 2010.Text book of Pharmacognosy and Phytochemistry. Elsevier Publishers.
6. Michael Heinrich, Joanne Barnes, Jose M. Prieto Garcia, Simon Gibbons and Elizabeth M. Williamson. 2018. Fundamentals of Pharmacognosy and Phytotherapy. Elsevier Publishers.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019 onwards
Third Year – Semester – V

Course Title	MAJOR CORE 10 – PRACTICAL III GENETICS, PLANT BREEDING, MORPHOLOGY, TAXONOMY OF ANGIOSPERMS, ETHNOBOTANY AND PHARMACOGNOSY
Total Hours	75
Hours/Week	5 Hrs /Wk
Code	U15BO5MCP10
Course Type	Practical
Credits	4
Marks	100

General Objectives:

To enable the students learn problems in genetics with examples, practical knowledge on technical description of vegetative and floral parts of the families and basic aspects of pharmacognosy.

Course Objectives :
The learner will be able to

CO No.	Course Objectives
CO-1	Understand, apply and evaluate the laws of Mendel in classical genetics and deviations from Mendelian ratios.
CO-2	Understand, apply the morphological variation and modifications of the plant parts.
CO-3	Apply the knowledge gained by studying the plants belonging to Polypetalae
CO- 4	Apply the knowledge gained by studying the plants belonging to Gamopetalae and Monocot
CO- 5	Understand and apply the pharmaceutical aids of plants

UNIT – I Genetics **15hrs**

Simple problems in monohybrid and dihybrid ratios, back cross-dominant and recessive, incomplete dominance, lethal gene, gene interaction, multiple allele, codominant allele. Plant breeding – hybridization technique.

UNIT – II Plant Morphology **15hrs**

Root modification –Tap root – carrot, adventitious root – *Ruellia*. Stem – cladode (*Asparagus*), phylloclade (*Muehlenbeckia*, *Opuntia*). Leaf modification – phyllode – *Acacia*, leaf pitcher – *Nepenthes.* Leaf tendril – *Gloriosa*.

UNIT – III Taxonomy **15hrs**

Study of the following families (locally available) Description of plants in technical terms. Identification of economic products from the families. Field study of flora. Polypetalae:Annonaceae, Capparidaceae, Sterculiaceae, Rutaceae, Anacardiaceae, Leguminosae (Fabaceae, Caesalpiniaceae, Mimosaceae), Cucurbitaceae,

UNIT – Taxonomy **15hrs**

Gamopetalae:Rubiaceae, Asteraceae, Asclepiadaceae, Acanthaceae, Lamiaceae. Monochalmydeae and Monocots:Amaranthaceae, Euphorbiaceae, Liliaceae, Poaceae.

UNIT – V Ethnobotany and Pharmacognosy **15hrs** The traditional usage of few medicinal plants. Preliminary phytochemical detection of alkaloids, glycosides and tannins. Detection of adulterants of market samples of mustard seeds, coriander powder, pepper, tea dust, coffee powder, chilli powder, turmeric powder and sooji.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the laws of Mendel in classical genetics and deviations from Mendelian ratios.	PSO 1 PSO2	R, U
CO-2	Describe the morphological variation of the plant parts	PSO 1 PSO 2	U
CO-3	Illustrate the salient features of plants belonging to Polypetalae.	PSO 1 PSO 2	U
CO-4	Illustrate the salient features of plants belonging to Gamopetalae.	PSO 1 PSO 2	U
CO-5	Illustrate the salient features of plants belonging to Monocotyledons.	PSO 1 PSO 3	U
CO-6	Analyse the drug adulteration	PSO 1 PSO 3	An
CO-7	Evaluate the origin and application of traditional medicine system	PSO 5 PSO 6	R
CO-8	Describe the medicinal properties of traditional drug	PSO 5 PSO 6	R, U
CO-9	Develop the practical skills by learning problems in genetics with examples, technical description of vegetative and floral parts of various families and basic aspects of pharmacognosy	PSO-1	C

(for candidates admitted from 2019 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS),TIRUCHIRAPPALLI – 2
PG AND RESEACH DEPARTMENT OF BOTANY
B.Sc. BOTANY

Third Year - Semester – V

Course Title	**MAJOR ELECTIVE – 2 FOOD AND NUTRITION**
Total Hours	**75**
Hours/Week	**5 Hrs /Wk**
Code	**U19BO5MET02**
Course Type	**Theory**
Credits	**5**
Marks	**100**

General Objectives:

To enable the students to learn the various aspects of foods, their nutritive value, preservation, processing of food and food-adulteration, laws and standard.

Course Objectives :

The learners will be able to

CO No.	Course Objectives
CO-1	Understand, apply the knowledge on different classes of food and their functions
CO-2	Remember the nutritive value and sources of food products
CO-3	Understand various methods of food preservation
CO- 4	Apply and evaluate the toxic substances in food and food adulteration,types of additive
CO- 5	Outline food safety measures.

UNIT – I Food as a source of energy: 15hrs

Energy value of food, major classes of food – carbohydrates, proteins, fats, oils, minerals (Ca, Fe & I) & vitamins – fat soluble (A,D,E, K) & water soluble (Vit – C, Vit- B - riboflavin, niacin & thiamine) –

sources, requirements, recommended Dietary allowances for nutrients, functions & deficiency symptoms.

Extra reading/Key words:*human milk oligosaccharides(HMO)*

UNIT – II Food& food products : **15 hrs**

Nutritive value. Plant as source of food: Cereals- rice, wheat & their products. Pulses – black & green gram. Fruits - Banana, Guava & Citrus. Vegetables – *Amaranthus*, Brinjal, lady's finger & oils – sun flower oil, bran oil & vanaspathi. Cooked foods: types of cooking, loss of nutrients in cooking.

Extra reading/Key words:*millets, olive oil, musturd oil*

UNIT – III Food preservation: **15hrs**

Importance, principles of preservation. Methods of preservation- low, high temperature, drying, concentration, fermentation & radiation. Uses of oil & spices. Salt & sugars as preservatives. Preparation of Jam, Jellies, Pickles & squashes.

Extra reading/Key words:*ultrasonics, cold plasma*

UNIT – IV Food additives: **15 hrs**

Definition, need & types. Food toxicants: Naturally occurring toxicants in food, fluorosis. Food adulteration: Toxic substances in certain foods. Simple physical tests for detection of food adulterants. Fast foods –problems and diseases.

Extra reading/Key words: *packed junk foods, nanopacking*

UNIT – V Food safety: **15 hrs**

Sanitation & hygiene, Food borne diseases – microorganisms and moulds. Food poisoning. Food laws & Food standards. Knowledge about consumer council & consumer protection. Food allergy. Role of International & National Agencies like FAO, WHO, UNICEF, CFTRI & FSSAI.

Extra reading/Key words*:food safety acts*

Note: Texts given in the Extra reading /Key wordsmust be tested only through Assignment and Seminars.

Course Outcomes (CO): The learners will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Distinguish the different classes of food.	PSO 1PSO 6	R, U
CO-2	Summarize the functions of food	PSO 1 PSO 7	U,An
CO-3	Describe the nutritive value and sources of food products	PSO 1 PSO 5	U

CO-4	Discuss the various methods of food preservation	PSO 1 PSO 5	R, U
CO-5	Classify the toxic substances in food and food adulteration	PSO 1 PSO 7	An
CO-6	Describe the different types of food additives	PSO 1 PSO 5	R, U
CO-7	Discuss the role of International & National Agencies	PSO 1 PSO 5	R, U

PO – Programme Outcomes; CO – Course Outcome; R- Remember; U- Understand; Ap – Apply;An – Analyse; E- Evaluate; C – Create

Text books:

1.Sumathi, R., Madambi & Rajagopal, M. v. 1997. Fundamentals of foods & nutrition. New Age International Pvt. Ltd., New Delhi.

Reference Books:

1. Swaminathan, M. 1985. Advanced text book in food & nutrition Vol. I & II. The Bangalore Printing & Publishing Co. Ltd., Bangalore.
2. The art & Science of Cooking – A student manual. 1993. Department of food & nutrition. Blackwell publisher, New Delhi.
3. Sree Lakshmi, B. 1997. Food Science. New Age International Pvt. Ltd., New Delhi.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019 ONWARDS
Third Year – Semester – V

Course Title	**MAJOR ELECTIVE – 2 HORTICULTURE AND INTEGRATED PEST MANAGEMENT**
Total Hours	**75**
Hours/Week	**5 Hrs /Wk**
Code	**U15BO5MET05**
Course Type	**Theory**
Credits	**5**
Marks	**100**

Course Objectives:
This paper gives knowledge about concept of horticulture, plant diseases, development of diseases, pathogenesis, defense mechanisms and control of plant diseases. Study of certain fungal, bacterial , mycoplasmal and viral diseases is also highlighted.

Course Objectives :
The learner will be able to

CO No.	Course Objectives
CO-1	Understand, apply the knowledge on the importance of Horticulture
CO-2	Remember the concept and apply the importance and classification of plant diseases
CO-3	Understand the morphological, structural & biochemical defense mechanisms in plants
CO- 4	Understand the causative organism, symptoms, etiology & control measures of the bacterial and viral diseases
CO- 5	Remember the concept of Integrated Pest Management

UNIT – I Horticulture **15 hours**

Importance of horticulture, Soil types and soil organic matter. Preparation of soil. Home manures, compost and fertilizers. Propagation of plants by seeds, cuttings, layering and grafting. Role of growth hormones in horticulture.Kitchen garden: Lay outs and establishment.Bonsai culture. Floriculture: production of cut flowers, cultivation of roses. Cultivation of fruits: Banana and Citrus. Horticulture Organizations: IIHR, NBH.

UNIT – IIPlant diseases **15 hours**

Concept, importance and classification. Effect of environment & nutrition on disease development. Dissemination of plant pathogens. Koch's postulates. Pathogenesis – penetration & entry of plant pathogens – development inside the host tissue. Enzymes & toxins in plant disease development.

UNIT – III **15 hours**

Defense mechanisms in plants – morphological, structural & biochemical defense mechanisms. Control of plant diseases – chemical (fungicides) & biological methods. Causative organism, symptoms, etiology & control measures of fungal diseases. Wilt of cotton, tikka disease of groundnut, ergot of cholam, red rot of sugarcane & damping off seedlings.

UNIT – IV **15 hours**

Study of the causative organism, symptoms, etiology & control measures of the bacterial diseases – blight of paddy & angular leaf spot of cotton; Mycoplasmal disease – little leaf of brinjal ; Viral diseases – cucumber mosaic & bhendi yellow leaf banding.

UNIT – V Integrated Pest Management **15 hours**

Principles and components of IPM – Chemical & Biological methods of pest control. Pest management through innovative approaches; biotechnological methods. Integrated approach in controlling post harvest diseases and improving shelf life of products.

Course Outcomes:

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the importance of Horticulture	PSO 1PSO 6	R, U
CO-2	Describe the concept, importance and classification of plant diseases	PSO 1 PSO 7	U,An
CO-3	Explain the morphological, structural & biochemical defense mechanisms in plants	PSO 1 PSO 5	U
CO-4	Describe the causative organism, symptoms, etiology & control measures of the bacterial and viral diseases	PSO 1 PSO 5	R, U
CO-5	Explain the chemical & Biological methods of pest control.	PSO 1 PSO 7	An

References:

Text Books:

1. Edmond, J. B., Senn, T. L. & Andrews, F. S. 1964. Fundamentals of Horticulture. Tata McGraw – Hill Publishing Company Ltd., New Delhi.
2. Manibushan Rao, K. 1991. Text Book of Horticulture. Mac Millan India Ltd., Madras.
3. Rengaswami, G. 1972. Diseases of crop plants in India. Prentice – Hall of India, Pvt. Ltd., India.
4. Horsefall, J. G. and Dimond, A. E. 1959. Plant Pathology – An advanced treatise, Academic press, New York, London.

Reference Books:

1. Edward Reiley, H. & Carroll Shry, J. C. 1979. Introductory Horticulture. Van Nostrand Reinhold Company, London.

2. Bilgrami, K. S. and Dube, H. C. 1976. A text book of modern plant pathology. Vikas Publishing House, Pvt. Ltd., New Delhi.

3. Mehrotra, R.S. 1980. Plant Pathology. Tata McGraw – Hill Publishing company Ltd., New Delhi.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019 onwards
Third Year – Semester – V

Course Title	**NON MAJOR ELECTIVE 1 – FOOD SCIENCE AND TECHNOLOGY**
Total Hours	**30**
Hours/Week	**2 Hrs /Wk**
Code	**U15BO5NMT01**
Course Type	**Theory**
Credits	**2**
Marks	**100**

General Objectives:

To enable the students to learn the basic principles of the major classes of nutrients and nutritive values of food. Preservation of food and food additives, safety measures and food laws.

Course Objectives :
The learner will be able to

CO No.	**Course Objectives**
CO-1	Understand, apply and evaluate the major classes of food, and their nutrients of selected examples
CO-2	Remember and understand the different types of cooking, and apply the knowledge of loss of nutrients
CO-3	Apply, analyse and evaluate the types of food additives and role of international agencies.
CO- 4	Understand various methods of food preservation
CO- 5	Apply food preservation techniques in various food preparation

UNIT – I Major classes of food, and their nutrients: **6 hrs**

Cereals and products (Rice- carbohydrates), Pulse (red gram – protein), fats and oils (vanaspathi and sunflower oil), fruits and vegetables (vitamins A, C and minerals).

Extra reading/Key words:*macro nutrients, micro nutrients.*

UNIT – II Types of cooking: **6 hrs**

Wet methods of cooking – boiling, simmering, poaching, stewing, blanching, steaming and pressure cooking. Dry methods – roasting, grilling, toasting, baking salting and frying. Loss of nutrients.

Extra reading/Key words:*Seasoning, Shrivelling*

UNIT – III Food additives: **6 hrs**

Definition, types of additives (any seven). Food adulteration: definition, types of adulterants – intentional, incidental and metallic contaminants. Role of international agencies like FAO and WHO – major objectives in eradicating poverty.

Extra reading/Key words:*Role of IFAD, WF*

UNIT – IV Food preservation technology: **6 hrs**

Definition, importance, principles of preservation, methods of preservation – low, high temperature and drying. Oil, spices, salt and sugars as preservatives. Food laws and standards.

Extra reading/Key words:*ultrasonics, cold plasma*

UNIT – V Food processing technology: **6 hrs**

Introduction, importance and advantages of food processing. Preparation of jam – mixed fruit jam and pineapple jam. Preparation of squashes – orange squash and grape crush.

Extra reading/Key words:*fermentation, radiation*

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	List the major classes of food, and their nutrients.	PSO 1	R, U
CO-2	Differentiate types of cooking.	PSO 1	U, An
CO-3	Explain the loss of nutrients during cooking.	PSO 1 PSO 7	U
CO-4	Classify the types of food additives .	PSO 1 PSO 7	U
CO-5	List the different role of international agencies.	PSO 1 PSO 7	R, U
CO-6	Summarize various methods of food preservation	PSO 1 PSO 7	U
CO-7	Discuss food preservation techniques in various food preparation	PSO 1 PSO 7	U, Ap
CO-8	Develop the entreprenuer skills by learning the nutritive values of food, processing and preservation of food	PSO-1	C

References :

Text books:

Sumathi, R., Madambi and Rajagopal, M. V. 1997. Fundamentals of foods and nutrition. New Age International Pvt. Ltd., New Delhi.

Sree Lakshmi, B. 1997. Food Science. New Age International Pvt. Ltd., New Delhi.

Reference Books:

Swaminathan, M. 1985. Advanced text book in food and nutrition Vol. I and II. The Bangalore Printing and Publishing Co. Ltd., Bangalore.

Visakh P. M., Laura B. Iturriaga., Pablo Ribotta and Sabu Thomas. 2013.Advances in Food Science & Nutrition. Vol. II. Scrivener Publishers.

Roday, S. 2007. Food Science and Nutrition. Oxford University Press.

Jose m. Saavedra and Anne M. Dattilo, 2016.Early Nutrition and long term health. Woodhead publishers.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019ONWARDS
Third Year – Semester – VI

Course Title	**MAJOR CORE 11 – PLANT PHYSIOLOGY AND BIOCHEMISTRY**
Total Hours	**90**
Hours/Week	**6Hrs /Wk**
Code	**U15BO6MCT11**
Course Type	**Theory**
Credits	**5**
Marks	**100**

General Objectives:

To enable the students to learn the fundamentals of plant physiology and biochemistry such as physiological activities like absorption, transpiration, respiration, photosynthesis, nitrogen metabolism and plant growth regulators and structure, types, chemistry and significance of various biomolecules.

Course Objectives :
The learner will be able to

CO No.	Course Objectives
CO-1	Understand, apply and analyse the concept of water and mineral absorption in plant system and their role
CO-2	Understand and analyse the various pathways involved in respiration and photosynthesis and the significance of different factors in photosynthesis
CO-3	Understand and analyze the mechanism of biological nitrogen fixation, nitrogen cycle, plant growth regulators and their applications related to various physiological acitivites.
CO- 4	Remember, understand and analyse the nature of atom, micro & macromolecules and their properties
CO- 5	Remember, understand and apply the significance of aminoacids, proteins, enzymes, vitamins and alkaloids.

UNIT – I Physiology: **18hrs**

Diffusion, Osmosis and Imbibition- Osmotic pressure, significance of Osmosis and Plasmolysis. Water absorption – passive and active absorption. Apoplast and Symplast concept. Ascent of sap: root pressure and transpiration pull. Transpiration: types, mechanism of stomatal movement. Guttation, antitranspirants.Absorption of mineral solutes – active and passive. Mineral nutrition: Sources, functions and deficiency symptoms of essential elements. Water and sand culture experiments.

Extra reading/Key words:*Soil-Plant Atmosphere Continum (SPAC), precision farming*

UNIT – IIPhysiology: **18hrs**

Glycolysis, Kreb's cycle, Electron transport and oxidative Phosphorylation and Pentose phosphate pathway. Photosynthesis: Photosynthetic pigments. Emerson enhancement effect, photochemical reactions- photophosphorylation, dark reactions- C_3, C_4 fixations and CAM plants. Factors affecting photosynthesis.

Extra reading/Key words:*chemiosmosis, carbon sequestration, anaerobic respiration*

UNIT – III Physiology **18hrs**

Nitrogen metabolism: Sources of nitrogen, biological nitrogen fixation, nitrogen cycle. Aminoacids – reductive amination, transamination. Protein synthesis. Growth: stages of growth and growth curve. Plant growth regulators – Indoles, gibberellins, cytokinins, ethylene, abscissic acid. Photoperiodism. Plant rhythms and Biological clock. Vernalization, Seed dormancy and senescence.

Extra reading/Key words:*Circadian rhythm, tissue culture, horticultural techniques*

UNIT – IVBiochemistry: **18hrs**

Structure of atoms, molecules and chemical bonds. Carbohydrates: Nomenclature , structure (aldoses and ketoses) of Monosaccharides, Isomerism, properties of Monosaccharides. Compounds derived from monosaccharides. Disaccharides: Structure and properties of reducing and non – reducing disaccharides. Polysaccharides: Structure of starch, cellulose and pectin. Biological significance of carbohydrates. Lipids: Composition of lipids – saturated and unsaturated fatty acids, compound lipids and derived lipids. Biological significance of lipids.

Extra reading/Key words:*Biosynthesis of fatty acids, carbohydrate metabolism*

UNIT – Vbiochemistry: **18hrs**

Classification and properties of Amino acids. Classification and structure of proteins. Properties and biological significance of proteins. Enzymes: Classification, properties, Mode of action of enzymes, Factors affecting enzyme activity. Secondary metabolites- alkaloids. Vitamins: types, sources, deficiency disorders and biological significance.

Extra reading/Key words:*Storage proteins, vitamin B17*

Note: Texts given in the Extra reading /Key wordsmust be tested only through Assignment and Seminars.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the concept of water and mineral absorption in plant system and their role.	PSO 1 PSO 3	R, U
CO-2	Explain the various pathways involved in respiration and photosynthesis	PSO 1 PSO 3	R
CO-3	Differentiate C_3 and C_4 cycle	PSO 1 PSO 3	U, An
CO-4	Explain CAM plants and factors affecting photosynthesis	PSO 1 PSO 3	R
CO-5	Illustrate the mechanism of biological nitrogen fixation, nitrogen cycle, plant growth regulators and its applications related to various physiological acitivites.	PSO 1 PSO 3	An
CO-6	Outline the structure of an atom	PSO 1 PSO 3	U
CO-7	Explain the structure, properties and biological significance of carbohydrates	PSO 1 PSO 3	R, U
CO-8	Describe the significance of aminoacids and proteins	PSO 1 PSO 3	U
CO-9	Discuss the importance of enzymes, vitamins and alkaloids	PSO 1 PSO 3	U

CO-10	Develop the employability skills by learning the fundamentals of plant physiology and biochemistry	PSO-1	C

References

Text Books:

1. Verma, V. 1985. A text book of Plant Physiology. Emkay Publications, New Delhi.
2. Pandey, S. N. and Sinha, B. K. 1972. Plant Physiology. Vikas Publishing House Pvt. Ltd., New Delhi.
3. Jain, V. K. 1990. Fundamentals of Plant Physiology. S. Chand and Company Ltd., New Delhi.
4. Jain, J. L. and Sunjay Jain 2016. Fundamentals of Biochemistry. S. Chand and Company Ltd., New Delhi.
5. Srivastava. 1987. Introduction to biochemistry. Rastogi publications, Meerut, India.
6. Jain, V. K. 2017. Fundamentals of Plant Physiology. Nineteenth Edition. S. Chand and Company Ltd., New Delhi.

Reference Books:

1. Noggle, G. R. and Fritz, G. J. 1992. . Introductory Plant Physiology. Prentice – Hall of India Pvt. Ltd., New Delhi.
2. Conn, E. E. and Stumpf, P. K. 1976. Outlines ofBiochemistry**.** Wiley Eastern Ltd., New Delhi.
3. Hans-Walter Heldt Professor Em and Birgit Piechulla. 2010. Plant Biochemistry, Kindle edition.

(For candidates admitted from 2019 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY
Third Year - Semester – VI

Course Title	**MAJOR CORE 12 - PLANT TISSUE CULTURE, GENETIC ENGINEERING AND NANOTECHNOLOGY**
Total Hours	**90**
Hours/Week	**6 Hrs/Wk**
Code	**U15BO6MCT12**
Course Type	**Theory**
Credits	**5**
Marks	**100**

General Objectives:

To enable the students to learn the basic and recent trends of plant tissue culture, recombinant DNA technology and nanotechnology.

Course Objectives:
The learner will be able to

CO No.	Course Objectives
CO-1	understand, apply the tissue culture techniques in mico propagation of rare and medicinal plants
CO-2	remember and understand the alternative techniques for mass propagation
CO-3	understand and apply the tools and techniques adopted in production of transgenic plants
CO- 4	understand the concept of GMOs in the field of medicine, agriculture and bioremediation.
CO- 5	understand and apply the basics of nanotechnology and its role in agriculture, medicine and environment

UNIT – I: Plant tissue culture: 18 hrs

Introduction,Cellular totipotency, basic principles, infrastructure of plant tissue culture laboratory. Sterilization of glassware, culture medium and explants. Culture medium: Definition, types, composition and preparation of MS medium. Micropropagation – methods & their significance. Organogenesis – direct and indirect methods and their significance.

Extra Readings/Key words:*Micropropagation of orchids, Germplasm conservation*

UNIT–II: Plant tissue culture: 18 hrs

Somatic embryogenesis- Principle, types, protocol and importance. Synthetic seed preparation and its application. Haploid culture- anther and pollen culture and their significance. Cell suspension culture: Principle, methods and applications. Plant protoplast culture: principle, isolation, fusion & culture of protoplasts and its importance.

Extra Readings/Key words:*Embryo culture, Cybridization*

UNIT–III:Genetic engineering: 18 hrs

Introduction, principle and applications of genetic engineering. Vectors: Plasmid – Ti plasmid, pBR 322 - definition, nomenclature, structure and uses. Enzymes – restriction endonucleases & DNA ligase and their applications. Gene cloning: Isolation of desired gene and vector, construction of recombinant DNA, transformation and multiplication of recombinant DNA, selection of clones by colony hybridization. PCR: Principles and applications of PCR. Gene libraries: Construction and uses of genomic and cDNA library.

Extra Readings/Key words:*Shot gun method, RT-PCR*

UNIT – IV: **Genetically Modified Organisms (GMO's): 18 hrs**

Production of recombinant hormone (insulin), hormone (somatotropin), vaccine (Hepatitis B virus). Construction and role of superbug (*Pseudomonas putida*) in bioremediation.

Transgenic plants: *Agrobacterium* mediated gene transfer, production of herbicide resistant plants (Glyphosate), pest resistant plant (Bt toxin) and improvement of nutritional quality of crop plants (sweet protein - thaumatin).Biohazards of GMOs.

Extra Readings/Key words:*Updation of GMOs*

UNIT – V: Nanotechnology: 18 hrs

Introduction, history, bio-nano tools, types of nano materials, applications of nanotechnology – environment, agriculture and medicine. Safety and limitations of nanotechnology.

Extra Readings/Key words:*RFID, Kuppfer cells, Nano farming*

Note: Texts given in the Extra reading /Key wordsmust be tested only through Assignment and Seminars.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Discuss the tissue culture techniques in mico propagation of rare and medicinal plants	PSO 1 PSO 2	U
CO-2	Describe the alternative techniques for mass propagation	PSO 1 PSO 2	R
CO-3	Distinguish the tools and techniques adopted in production of transgenic plants	PSO 1 PSO 2	U,
CO-4	Explain the production of recombinant hormone, vaccine	PSO 1 PSO 2	U
CO-5	Enumerate the role of GMOs in the field of medicine, agriculture and bioremediation.	PSO 1 PSO 2	R
CO-6	Summarize the basics of nanotechnology and its role in agriculture, medicine and environment	PSO 1 PSO 2	U
CO-7	Develop the employability skills by understanding the basic and recent trends of plant tissue culture, recombinant DNA technology and nanotechnology	PSO-1	C

References

Text Books:

1. Dubey. R. C. 2006. Text book of biotechnology. S. Chand and Company Ltd. New Delhi.
2. Desmond, S and Nicholl, T. 2018. Ann Introduction to Genetic Engineering. Cambridge University Press, Cambridge, United Kingdom.

Reference Books:

1. Gupta, P. K.1999. Elements of biotechnology. Rastogi Publications, Meerut.
2. John E. Smith. 1988. Biotechnology – II Edition. Cambridge University Press, London.
3. Jogdand, S.N. 2006. Gene Biotechnology. Himalaya Publishing House. M. Balakrishna Rao and M.Krishna Reddy, 2007. Nanotechnology and Society. Campus Books International, New Delhi.
4. Kumaresan, V. Text book of biotechnology. Saras Publications.
5. Joy Deep Dutta and Anil K.Rao, 2008. Introduction to Nanoscience. CRC Press, London

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019ONWARDS
Third Year - Semester – VI

Course Title	MAJOR ELECTIVE 3 – INSTRUMENTATION AND BOTANICAL TECHNIQUES
Total Hours	75
Hours/Week	5Hrs /Wk
Code	U15BO6MET03
Course Type	Theory
Credits	5
Marks	100

General Objectives:

To enable the learner to undersatand the botanical techniques, working principles and applications of biological instruments.

Course Objectives:
The learner will be able to

CO No.	Course Objectives
CO-1	remember, understand and apply the instrumentation of microscopy and micrometry.
CO-2	understand and apply the working principles and applications of Colorimeter and pH meter
CO-3	understand and apply the instrumentation of centrifuge, Dialysis and chromatography
CO- 4	understand and apply the botanical techniques, microtomy, and staining for preparing permanent slides.
CO- 5	understand and apply the basic techiques of DNA and protein studies and also localization of carbohydrates, proteins and lipids

UNIT – I Instrumentation: **15 hrs**

Microscopy– working principle of light microscope – magnification, resolution, numerical aperture and refractive index. Micrometry – ocular and stage. Standardization and measurement of fibre, stomatal pore etc.

Extra Reading /Keywords: working principle of *Dark field microscope, flourescence microscope*

UNIT – II Instrumentation: **15 hrs**

Colorimeter, spectrophotometer – working principle (Beers and Lamberts law) and their applications. pH meter – principles and application. Preparation of buffers.

Extra Reading/Keywords*:UV Spectrophotometer, flame photometer*

UNIT – III Chromatography: **15 hrs**

Working principle, types – paper, thin layer and column chromatography and their applications. Dialysis - principles and application. Centrifuge - principle, types - table top, high speed and Ultra centrifuge and their applications.

Extra Reading/ Keywords:*GCMS, industrial centrifuge, HPLC*

UNIT – IVBotanical techniques: 15 hrs

Collection, fixation (fixative FAA) and processing (dehydration, clearing, infiltration and embedding) of plant materials. Hand sectioning of plant material. Microtomy and its types, Staining - Double staining with safranin and fast green.

Extra Reading/Keywords:*Ultramicrotome, authenticity*

UNIT – VHistochemical analysis: 15 hrs

Localization and identification of carbohydrates, proteins and lipids. **Electrophoresis:** Principles and techniques. Separation of DNA – Agarose gel, Protein separation – SDS PAGE.

Extra Reading /Keywords:*genomics, proteomics, histochemistry*

Note: Texts given in the Extra reading /Key wordsmust be tested only through Assignment and Seminars.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the principle and working mechanism of light microscope	PSO 1PSO 3	R, U
CO-2	Describe the ocular and stage micrometer	PSO 1 PSO3	R, U
CO-3	Explain the working principles and applications of Colorimeter and pH meter	PSO 1 PSO 3	U
CO-4	Describe the working principle **o**f Dialysis and chromatography centrifuge	PSO 1 PSO 3	R,U
CO-5	Explain the botanical techniques, microtomy, and staining for preparing permanent slides	PSO 1 PSO 3	R, U
CO-6	Describe the basics techiques of DNA and protein studies and also localization of carbohydrates, proteins and lipids	PSO 1 PSO 2	U
CO-7	Develop the employability skills by understanding the botanical techniques, working principles and applications of biological instruments	PSO-1	C

References

Text Books:

1. Machve K. K. 2007. A text book of Bio – Instrumentation. Manglam Publishers & Distributors, Delhi.

Reference Books:

1. Keith Wilson & John Walker, 1994. Practical Biochemistry Principles &

Techniques. Rekha Printers Pvt. Ltd. New Delhi.

3. Avinash U., Kakoli U. and Nirmalendu N. 1998. Biophysical Chemistry. Himalaya Publishing House, Mumbai.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019ONWARDS
Third Year - Semester – VI

Course Title	MAJOR ELECTIVE 3 – PLANTS IN HUMAN HEALTH CARE
Total Hours	75
Hours/Week	5Hrs /Wk
Code	U15BO6MET06
Course Type	Theory
Credits	5
Marks	100

Course Objectives: This paper deals with the sources, energy and nutritive values, balanced and recommended dietary allowances of carbohydrates, proteins, lipids, vegetables and fruits in health care. Their role in regulating body functions and combating nutritional deficiencies in human health. In addition, it also deals with the medicinal values of plants, plant products, pigments, vitamins, minerals and antioxidants.

Course Objectives:
The learner will be able to

CO No.	Course Objectives
CO-1	remember, understand and apply the energy value of carbohydrates
CO-2	understand the importance of pulses in Human nutrition
CO-3	understand and apply the Nutritive and fibre value of greens and vegetables
CO- 4	understand and apply the Nutritive and antioxidant value of fruits
CO- 5	understand and apply the Medicinal values of plants and its products

UNIT – I Energy value of carbohydrates 15hours

Sources (botanical name, family, common name and morphology of the useful parts of the following and nutritive values). Cereals and millets – rice, wheat, oats, ragi and pearl millet. Root – tapioca, stem tuber – potato). Source and uses of lipids: Sesame, ground nut and sunflower oil. Balanced and recommended dietary allowances for different age groups and its role in regulating body functions (malnutrition, diabetics and hypertension).Impact of lipids in obesity, diabetics and cardiovascular diseases.

UNIT – II Pulses in Human nutrition **15hours**

Sources (botanical name, family, common name and morphology of the useful parts of the following and nutritive values). Nutritive value of germinated and sprouted pulses (green gram and Bengal gram). Balanced and recommended dietary allowances for different age groups and its role in regulating body functions. Malnutrition - Kwashiorkor. Loss of nutrients (soaking, cooking processes, blanching).

Utilization of pulses **–** mature seeds (red gram and black gram), fresh seeds (peas) and immature pods (beans).

UNIT – III Nutritive and fibre value of greens and vegetables **15hours**

Sources (botanical name, family, commom name and morphology of the useful parts of the following and nutritive values) Greens (leafy vegetables): agathi, drumstick, fenugreek, spinach and cabbage. Other vegetables:brinjal, lady's finger, bitter gourd, bottle gourd, tomato, onion, garlic, cucumber, carrot, beet root. Role of pigments, minerals, vitamins and vegetable fibres in human health. Use of vegetable as salads and soups.

UNIT – IV Nutritive and antioxidant value of fruits **15hours**

Sources (botanical name, family, common name and morphology of the following and nutritive values) - banana, grapes, guava, pine apple, mango, citrus fruits (orange, sweet lime), papaya, water melon, pomegranate and sapota. Role of antioxidants, minerals and vitamins of fruits in human health. Fruit salad and its importance.

UNIT – V Medicinal values of plants and its products **15hours**

Sources (botanical name, family, common name and morphology of the useful parts for the following ailments) indigestion (coriander and mentha leaves, cumin, pepper, ginger), laxatives (castor oil, senna leaves), cough and cold (tulsi, **Coleus**) mouth ulcers - black night shade (Solanum nigrum), tooth ache (clove and Mexican cress (Spilanthes calva), dandruff shampoo (shoe flower and soap nut), massage oil - Indian sarasaparilla (Hemidesmus indicus) and Indian madder (Rubia cordifolia), diabetes (fenugreek and jambolan seed powder), antioxidants (green tea and beet root), herb drinks (juice of amla and lime).

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the energy value of carbohydrates	PSO 1PSO 3	R, U
CO-2	Describe the importance of pulses in Human nutrition	PSO 1 PSO3	R, U
CO-3	Explain the nutritive and fibre value of greens and vegetables	PSO 1 PSO 3	U
CO-4	Describe the Nutritive and antioxidant value of fruits	PSO 1 PSO 3	R,U
CO-5	Explain the Medicinal values of plants and its products	PSO 1 PSO 3	R, U

References

Text Books:

1. Sumathi, R., Madambi and Rajagopal, M. v. 1997. Fundamentals of foods and nutrition. New Age International Pvt. Ltd., New Delhi.

2. Sree Lakshmi, B. 1997. Food Science. New Age International Pvt. Ltd., New Delhi.

Reference Books:

1. Sree Lakshmi, B. 2009. Nutrition Science. New Age International Pvt. Ltd., New Delhi.

2. Shakunttala Manay, N. and Shadaksharaswamy, M. 1987. Foods Facts and principles, New Age International (P) Limited, Publishers, New Delhi.

3. Hill.A.F, 1996. Economic Botany –Tata Mc Graw –Hill publishing company Limited,New Delhi.

4. Swaminathan, M. 1985. Advanced text book in food and nutrition Vol. I and II. The Bangalore Printing and Publishing Co. Ltd., Bangalore.

5. The art and Science of Cooking – A student manual. 1993. Department of food and nutrition. Blackwell publisher, New Delhi.

6. Anuradha Subramanian. 1998. Concise food science. Soundariya Publication, Erode.

7. Parvinder, S. Bali. 2009. Food production operations. Oxford University Press, New Delhi.

8. Norman N.Potter and Joseph H. Hotchkiss. 1996. Food Science Fifth edition. CBS Publishers and distributors, New Delhi.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019onwards
Third Year - Semester – VI

Course Title	**MAJOR CORE -13 PRACTICAL IV PLANT PHYSIOLOGY, BIOCHEMISTRY, PLANT TISSUE CULTURE, GENETIC ENGINEERING AND NANOTECHNOLOGY**
Total Hours	**90**
Hours/Week	**6 Hrs /Wk**
Code	**U15BO5MCP13**
Course Type	**Practical**
Credits	**5**
Marks	**100**

General Objectives:

To enable the students on the preparation of solutions, to carry out the experiments on plant physiology, biochemistry and plant tissue culture.

Course Objectives:
The learner will be able to

CO No.	**Course Objectives**
CO-1	Understand, analyse and apply the mechanism of osmosis, plasmolysis, and transpiration.
CO-2	Understand and analyze the mechanism of respiration and photosynthesis.
CO-3	Understand and analyze the mechanism of ascent of sap, root pressure and remember the separation of plant pigments.
CO- 4	Remember, understand and apply the estimation of starch, reducing sugar, total lipids, total soluble protein, ascorbic acid and enzyme activity.
CO- 5	Remember, understand and apply the preparation of medium, sterilization and inoculation of explants and incubation.

UNIT – I Physiology: **18 Hrs**

Potato osmoscope, DPD of *Rhoeo* leaf peel by plasmolytic method, Determination of water absorption and transpiration ratio, rate of transpiration, determination of transpiration index.

UNIT – II Physiology: **18 Hrs**

Determination of respiration rate by Ganong's respiroscope. Effect of quality of light on photosynthesis, Rate of photosynthesis under varying concentrations of CO_2, Effect of intensity of light on O_2 evolution during photosynthesis using Wilmott's bubbler.

UNIT – III Physiology: **18 Hrs** Separation of plant pigments by paper chromatography. Experiments for demonstration – Ascent of sap, Root pressure, Kuhn's Fermentation apparatus, thin layer chromatography, water culture experiments (hydroponics), growth curve.

UNIT – IVBiochemistry: 18 Hrs

Estimation of starch by colorimetric method, Reducing sugar by Benedict's method, Total lipids by gravimetric method. Total soluble protein by Biuret's method, Ascorbic acid by titrimetric method, Enzyme activity measurement - Amylase activity. Estimation of secondary plant product – phenol by colorimetric method. Experiments for demonstration – dialysis. Working principles of centrifuge and colorimeter.

UNIT – V Plant tissue culture, Genetic Engineering and Nanotechnology: 18 Hrs

Preparation of medium, sterilization and inoculation of explants and incubation. Callus induction with the help of different explants, plantlet production through micropropagation and synthetic seed production. Isolation of protoplast. GMOs and Nanoparticles.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Describe the mechanism of water absorption, plasmolysis, and transpiration.	PSO 1 PSO 3	R, U
CO-2	Determine the respiration rate by Ganong's respiroscope and the quality of light on photosynthesis.	PSO 1 PSO 3	R
CO-3	Identify the plant pigments by various separation techniques.	PSO 1 PSO 3	U, An
CO-4	Calculate the quantity of primary and secondary metabolites of plant by standard procedures.	PSO 1 PSO 3	An
CO-5	Demonstarte the working principle of dialysis, centrifuge and colorimeter.	PSO 1 PSO 3	An
CO-6	Describe the preparation of medium, sterilization and inoculation of explants and incubation.	PSO 1	R
CO-7	Develop the employability and practical skills by learning the experiments on plant physiology, preparation of solutions on biochemistry and plant tissue culture techniques	PSO-1	C

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019 onwards
Third Year NME - Semester – VI

Course Title	**NON MAJOR ELECTIVE 2 - HERBAL REMEDIES**
Total Hours	**30**
Hours/Week	**2 Hrs /Wk**
Code	**U15BO6NMT02**
Course Type	**Theory**
Credits	**2**
Marks	**100**

General Objectives:

To enable the students to learn the basic principles of Indian system of medicine, home remedies for common ailments and body care by natural means, preparation of herbal medicines.

Course Objectives:
The learner will be able to

CO No.	Course Objectives
CO-1	Understand, apply and analyze the importance of Indian system of medicine.
CO-2	Understand and apply the alternate herbal remedies for common ailments.
CO-3	Understand and apply the skin, hair care and uterus problems by natural ways.
CO- 4	Apply and evaluate the knowledge on herbal gardening.
CO- 5	Understand, apply and evaluate the herbal preparations.

UNIT I Indian system of medicine: 6 hrs

Introduction and scope. Basic principles of Indian system of medicine. Ayurveda, Siddha and Unani.

Extra reading/Key words:*Naturopathy, Accupuncture, homeopathy*

UNIT – II Herbal home remedies for the common ailments: 6 hrs

Herbal home remedies for the common ailments of intestine, mouth affections and respiratory problems.

Extra reading/Key words:*FenguFu Therapy, easy releive of pain*

UNIT – III Herbal home remedies: 6 hrs

Skin and hair care by natural means. Herbal remedies for uterus problems.

Extra reading/Key words:*Guide for breast cancer*

UNIT – IV Herbal gardening 6 hrs

Essentials of herbal gardening. Harvesting, drying and storage of herbs.

Extra reading/Key words:*Kitchen gardening, terrace gardening*

UNIT – V Herbal preparations: **6 hrs**

Herbal preparations – decoctions,tea, infusions, oils and powders.

Extra reading/Key words:*ethnobotany, policies*

Note: Texts given in the Extra reading /Key wordsmust be tested only through Assignment and Seminars.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Write the scope and importance of herbal medicine	PSO 1 PSO 5	R, U
CO-2	Discuss the importance of Indian system of medicine.	PSO 1 PSO 5	R, U
CO-3	Explain the alternate herbal remedies for common ailments.	PSO 1 PSO 5	U
CO-4	Relate the skin, hair care and uterus problems by natural ways.	PSO 1 PSO 5	U, An
CO-5	Design the herbal garden.	PSO 1 PSO 5	U, Ap
CO-6	Demonstrate the herbal preparations.	PSO 1 PSO 5	U, An
CO-7	Develop the practical skills by learning herbal medicine, home remedies for common ailments and designing the herbal garden	PSO-1	C

Text Books:

1. Girija Khanna.1986. Herbal Remedies –Vikas Publishing house Ltd, New Delhi.
2. Roseline, A. 2011. Phamacognosy. MJP Publishers, Chennai.

Reference Books:

1. Karen Phillip, 1994, Everyday Aromatherapy – Brock Hampton press, Italy.
2. Kurian- Medicinal plants, 2007.
3. Kokate, C. K., Purohit, A. P. & Gokhale, S. B. 1998. Pharmacognosy. Nirali Prakashan, Pune.
4. http:// www.thegoodtrade.com
5. Nigel C. Veitch, Michael Smith, 2013. Herbal Medicines Fourth edition. Pharmaceutical Press.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019 onwards
Second Year – Semester – III

Course Title	**SBE- 3 BOTANICAL SKILLS FOR CHEMICAL SCIENCES (THEORY CUM LAB) FOR CHEMISTRY STUDENTS**
Total Hours	**30**
Hours/Week	**2 Hrs /Wk**
Code	**U17BO3SBT03**
Course Type	**Theory cum Lab**
Credits	**2**
Marks	**100**

General Objectives:

To enable the students to learn the basic and recent skills on the fundamental organization of plants and their function, and also mass propagation of protein rich products and to become entrepreneur

Course Objectives :
The learner will be able to

CO No.	**Course Objectives**
CO-1	Understand the basic build of plants
CO-2	Understand and apply the structure and function of plant anatomy with practical skills
CO-3	Understand the basic Physiological function of plants and biochemcial nature & phytoconstituents
CO- 4	Apply the knowledge and skills in production of protein rich products
CO- 5	Understand, apply the tissue culture techniques in micro propagation

Unit I- Biological System: **6 hrs**

Organization of Plant system- Cells – cell organelles – tissues –Internal structure of dicot stem and root.
Lab exercise: Observation of internal features of dicot stem & root.
Extra reading/Key words: *Monocot leaves, stem, root*

UNIT II – Cytology: **6 hrs**

Cell division- mitosis- Prophase, Metaphase, Anaphase & Telophase.
Lab exercise: Observation of different stages of mitosis in onion root tip by squash technique.
Extra reading/Key words: *Meiosis, Karyogamy*

UNIT III –Physiology: **6 hrs**

Translocation of water and minerals, Osmosis and its significance.
Lab exercise: Ascent of sap, Thistle Funnel Experiment.

Extra reading/Key words: *Transpiration, Respiration*

UNIT IV –Mass production of Protein-rich products: **6 hrs**

SCP algal protein – Spirulina cultivation- Fungal protein- Mushroom cultivation

Lab exercise: Spirulina & mushroom cultivation

Extra reading/Key words: *Industrial visit, establishment of small units*

UNIT V- Plant Tissue Culture : **6 hrs**

Methods- Callus culture- Synthetic seed preparation-

Lab exercise: Callus induction, Synthetic seed preparation.

Extra reading/Key words:*Somatic hybridization, Germplasm conservation*

Note: Texts given in the Extra reading /Key wordsmust be tested only through Assignment and Seminars.

Course Outcomes:

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the basic organization in plants	PSO 1	R, U
CO-2	Illustrate the structure of dicot root and stem	PSO 1 PSO 3	U
CO-3	Explain the basic Physiological function of plants	PSO 1 PSO 3	R, U
CO-4	Explain the steps involved in production of protein rich organism	PSO 1 PSO 2	U
CO-5	Bring out the salient features of tissue culture techniques in micro propagation	PSO 1 PSO 2	U, An
CO-6	Develop the practical skills by learning the fundamental organization of plants and cultivation of protein rich products to become an entrepreneur	PSO-1	C

Reference Books:

1. De Robertis, E.D.P. and De Robertis, E.M.F. (1995) Cell and Molecular Biology, Saunders College, PA.
2. Powar, C.B. 2002. Cell Biology, Himalaya Publishing House, Mumbai, India.
3. Jain, V. K. 1990. Fundamentals of Plant Physiology. S. Chand and Company Ltd., New Delhi.
4. Dubey. R. C. 2006. Text book of biotechnology. S. Chand and Company Ltd. New Delhi.
5. Sharma, B.B. 1993. A Guide to home Gardening. Ministry of information and broadcasting, Govt. of India.

(For candidates admitted from 2019 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2 B.A./B.Sc./ B.Com./B.C.A./B.B.A DEGREE COURSE

SEMESTER – III / VI

Course Title	GENDER STUDIES
Total Hours	15
Hours/Week	1
Code	U15WS3GST01 / U15WS6GST01
Course Type	Theory
Credits	1
Marks	100

General Objective:

To help students to realize their strengths and weaknesses in leading an ethically enriched life and to enjoy a gender-balancedambience

Course Objectives:

The student will be able to

1. understand the conceptsofgender.
2. differentiate women studies fromgenderstudies
3. analyze the areas ofgenderdiscrimination
4. analyze and evaluate the initiative and policies forwomenempowerment
5. remember the women's movements andsafeguardingmechanisms

UnitI **3 hrs**

Concepts of Gender:

Sex-Gender-Biological Determination-Patriarchy-Feminism-Gender Discrimination-Gender Division of Labour -Gender stereotyping – Gender Sensitivity-Gender Equity – Equality – Gender Mainstreaming –Empowerment.

Extra reading /Key Words: *Acts on gender*

UnitII **3 hrs**

Women's Studies Vs Gender Studies:

UGC's Guidelines – VII to XI Plans – Gender Studies: Beijing Conference and CEDAW- Exclusiveness and Inclusiveness.

Extra reading /Key Words: *Origin of Women's studies in India*

Unit–II **3hrs**

Areas of Gender Discrimination:

Family – Sex Ratio – Literacy – Health – Governance – Religion Work Vs Employment – Market – Media – Politics – Law – Domestic Violence – Sexual Harassment – State Politics and Planning.

Extra reading / Key Words: *Survey of level of discrimination*

Unit–IV **3hrs**

Women Development and Gender Empowerment:

Initiatives – International Women's Decade – International Women's Year – National Policy for Empowerment of Women – Women Empowerment Year 2001 – Mainstreaming Global Policies. **Extra reading/Key Words:** *Case study*

Unit–V **3hrs**

Women's Movements and Safeguarding Mechanism: In India National / State Commission for Women (NCW) – All Women Police Station – Family Court – Domestic Violence Act – Prevention of Sexual Harassment at Work Place Supreme Court Guidelines – Maternity Benefit Act – PNDT Act – Hindu Succession Act 2005 – Eve Teasing Prevention Act – Self Help Groups – 73_{rd} Amendment for PRIs.

Extra reading / Key Words: *Laws on gender equality*

Note: Extra Reading/ keywords are only for Internal Testing (Seminar/ Assignments)

Course Outcome:

2. evaluate the concepts of gender discrimination.
3. compare women's studies with genderstudies.
4. describe the areas of genderdiscrimination.
5. evaluate the initiative and policies for womenempowerment.
6. Explain the different womenmovement.

REFERENCES:

Manimekalai. N & Suba. S (2011), Gender Studies, Publication Division, Bharathidasan University, Tiruchirappalli

Jane, P. & Imelda, W. (2004), 50 Key Concepts in Gender Studies.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019 onwards
Third Year - Semester – V

Course Title	**SBE- 4 BOTANICAL SKILLS FOR PHYSICAL SCIENCES (THEORY CUM LAB) FOR PHYSICS STUDENTS**
Total Hours	**30**
Hours/Week	**2 Hrs /Wk**
Code	**U17BO5SBT04**
Course Type	**Theory cum Lab**
Credits	**2**
Marks	**100**

General Objectives:

To enable the students to learn the basic and recent skills on the fundamental organization of plants and their function, and also mass propagation of protein rich products and to become entrepreneur.

Course Objectives :
The learner will be able to

CO No.	**Course Objectives**
CO-1	Understand the basic build of plants
CO-2	Understand and apply the structure and function of plant anatomy with practical skills
CO-3	Understand the basic Physiological function of plants and biochemcial nature & phytoconstituents
CO- 4	Apply the knowledge and skills in production of protein rich products
CO- 5	Understand, apply the tissue culture techniques in mico propagation

Unit I-Biological System: **6 hrs**
Organization of Plant system- Cells – cell organelles – tissues –Internal structure of dicot stem and root.
Lab exercise: Observation of internal features of dicot stem & root.
Extra reading/Key words: *Monocot leaves, stem, root*

UNIT II – Cytology: **6 hrs**
Cell division- mitosis- Prophase, Metaphase, Anaphase & Telophase.
Lab exercise: Observation of different stages of mitosis in onion root tip by squash technique.
Extra reading/Key words: *Meiosis, Karyogamy*

UNIT III –Physiology & Phytochemistry: **6 hrs**
Translocation of water and minerals, Osmosis and its significance. Phytoconstituents- Tannins & Polyphenols.
Lab exercise: Ascent of sap, Tests for the presence of Tannins & Polyphenols in plant extract.
Extra reading/Key words: *Transpiration, Respiration*

UNIT IV –Mass production of Protein-rich products: **6 hrs**
SCP algal protein – Spirulina cultivation- Fungal protein- Mushroom cultivation
Lab exercise: Spirulina & mushroom cultivation

Extra reading/Key words: *Industrial visit, establishment of small units*

UNIT V-Plant Tissue Culture: **6 hrs**

Methods- Callus culture- Synthetic seed preparation-

Lab exercise: Callus induction, Synthetic seed preparation.

Extra reading/Key words: *Somatic hybridization, Germplasm conservation*

Note: Texts given in the Extra reading /Key wordsmust be tested only through Assignment and Seminars.

Course Outcomes:

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the basic organization plants	PSO 1	R, U
CO-2	Illustrate the structure of dicot root and stem	PSO 1 PSO 3	U
CO-3	Explain the basic Physiological function of plants	PSO 1 PSO 3	R, U
CO-4	Explain the steps involved in production of protein rich organisms	PSO 1 PSO 2	U
CO-5	Bring out the salient features of tissue culture techniques in mico propagation	PSO 1 PSO 2	U, An
CO-6	Develop the practical skills by learning the fundamental organization of plants and cultivation of protein rich products to become an entrepreneur	PSO-1	C

References

1. De Robertis, E.D.P. and De Robertis, E.M.F. (1995) Cell and Molecular Biology, Saunders College, PA.
2. Powar, C.B. 2002. Cell Biology, Himalaya Publishing House, Mumbai, India.
3. Jain, V. K. 1990. Fundamentals of Plant Physiology. S. Chand and Company Ltd., New Delhi.
4. Dubey. R. C. 2006. Text book of biotechnology. S. Chand and Company Ltd. New Delhi.
5. Sharma, B.B. 1993. A Guide to home Gardening. Ministry of information and broadcasting, Govt. of India.
6. Mohammed Ali. Text book of Pharmacognosy. CBS Publishers & Distributers, New Delhi.
7. Roseline, A. 2011. Phamacognosy. MJP Publishers, Chennai.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF BOTANY
B.Sc. BOTANY SYLLABUS 2019ONWARDS
Third Year - Semester – VI

Course Title	**SBE – 5 TECHNIQUES IN BOTANY**
Total Hours	**30**
Hours/Week	**2 Hrs /Wk**
Code	**U15BO6SBP05**
Course Type	**Theory cum Lab**
Credits	**2**
Marks	**100**

General Objectives:
To enable the students to give skills on the preparation of solutions, measurement of stomata and epidermal hairs using micrometer, fresh hand sections and localization of organic compounds, microtome sectioning, DNA separation through electrophoresis and application of statistics and bioinformatics in botany.

Course Objectives :
The learner will be able to

CO No.	Course Objectives
CO-1	Understand and apply the preparation of chemical solutions
CO-2	Understand and analyze the phytochemicals in plant tissues
CO-3	Apply the knowledge and skills in microtome sectioning
CO- 4	Understand the method of isolation of DNA from plant cell
CO- 5	Apply the SPSS package in data analysis

Unit – I Preparations of chemical solutions: 6 hrs
Stock solutions: molar, normal, percentage, ppm. Preparation of buffer solutions (Phosphate and acetate).

Unit – II Micrometry and Histochemistry: 6 hrs
Measurements and drawing of stomata, epidermal hairs and pollen of different species using Camera Lucida and digital camera. Histochemical localization of starch, Protein & lipid.

Unit – III Sectioning and staining: 6 hrs
Hand section- Double staining with safranin and fast green.Sectioning using rotary microtome – Fixing specimens and preparation of paraffin blocks and affixing ribbons.

Unit – IV Biotechnology: 6 hrs
Isolation of DNA, separation of DNA (saliva/cauliflower)- Agarose gel electrophoresis.

Unit – V Biostatistics and Bioinformatics: 6 hrs
Statistical calculation through SPSS. Alignment- Pair-wise, BLAST.

Course Outcomes:
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the preparation of different chemical solution	PSO 1	U, Ap
CO-2	Demonstrate the methods of measuring plant parts and histochemical localization of phytochemicals	PSO 1 PSO 8	U, An

CO-3	Explain the method of microtome sectioning	PSO 1 PSO 3	U, AP
CO-4	Describe the isolation and identification of DNA	PSO 1 PSO 3	U, AP
CO-5	Evaluate the statistical data through SPSS	PSO 1 PSO 4	U, An
CO-6	Develop the employability and practical skills by learning the preparation of solutions, measurement of plant organs using micrometer, microtome sectioning, electrophoretic techniques, application of statistical data and bioinformatics	PSO-1	C

Text Books

1. Gahan P.B.1984. Plant histochemistry & cytochemistry – An introduction. Academic Press, London.
2. Wilson K. & Walker J. 1994. Practical biochemistry. 4th edition, Cambridge University, London.
3. Krishnamurthy, K.V. 1988. Methods in Plant Histochemistry.Viswanathan Publishers, Madras.
4. Ramakrishnan, P. 2003. Biostatistics. Saras Publications, Nagercoil.

Reference Books

1. Van Norman R.W. 1971. Experimental biology. IInd Edition, Prentice Hall, Inc., New Jersey.
2. Berlyn & Mische, 1976. Botanical microtechnique & cytochemistry. Iowa State University Press.
3. Plummer, D. T. 1982. An introduction to Practical biochemistry. Tata Mc Graw – Hill publishing company, Ltd, New Delhi.
4. Mani. K. and Vijayraj. D., 2002. Bioinformatics to beginners, Kalaikathir pathippagam, Coimbatore.

(For candidates admitted from 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2

SEMESTER VI

Course Title	**SKILL BASED ELECTIVE 6 : RESEARCH METHODOLOGY**
Total Hours	**30**
Hours/Week	**2**
Code	**U15DS6SBT06**
Course Type	(Theory cum Project)
Credits	**2**
Marks	**100**

General Objective:

Students get introduced to concept of research and to carry out research projects.

Course Objective:

The student will be able to

1. understand the different types ofresearch.
2. analyze the research objectives and frames thehypothesis
3. understand the structure ofdissertation.
4. evaluate their research work.

UnitI **6Hrs**

Introduction to research: Concept of research – types of research – introduction to research literature base – collection of research information from different sources; maintenance of information.

Extra reading / Key Words: *Primary data, Secondary data collection*

UnitII **6Hrs**

Research focusing: identifying research area – drawing objectives\ hypothesis – designing the work – data collection – analysis.

Extra reading / Key Words: *Test of Hypothesis and Levels of significance.*

UnitIII **6Hrs**

Preparation of dissertation: Structure of dissertation – editing – bibliography.

Extra reading / Key Words: *Summarizing any Two research article.*

Unit IVProject work **12Hrs**

Note: 1.Extra reading/Key words are only for internal testing(Seminar/Assignment)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B.A. /B.Sc. / B.Com. / BBA/ B.C.A. DEGREE COURSE LIFE ORIENTED EDUCATION

ETHICS – III: FAMILY AND CAREER DEVELOPMENT

HRS / Wk:1 **CODE:U15VE6LVE03**

CREDIT : 1 **MARKS : 100**

OBJECTIVES:

- To help the students acquire skills, knowledge and talents to lead a meaningfullife.
- To make the students learn skills of nurturing family andchildren.
- To make the students aware of emotional intelligence and choose theircareer.

UNIT – I: PERSONAL COMPETENCE

Emotional Intelligence for Professional growth, Management Vs Leadership-Management and Leadership Skills - Conflict Management - Tips for Professional growth

UNIT – II: MARRIAGE AND FAMILY

Family Vision - Family Values, Family relationship, Family Management, Sex in Marriage, Emotional Balance and Imbalance, Compatibility between Husband and Wife

UNIT – III: PARENTHOOD

Bringing up Children - Development stages (Eric Ericson model), Spirituality: Spirituality in Family - Prayer, God's Will , Role ofMother

UNIT – IV: PERSONALITY DEVELOPMENT

Self Analysis; interpersonal relation, introspection – Character formation towards positive personality- Values, self and college motto, punctuality, good moral, poverty, honesty, politeness, humanity, gentleness, friendship, fellowship and patriotism

UNIT – V: CAREER CHOICE

Career Choice according to Personality, Preparation for Competitive Exams, Sources of Knowledge, Memory Techniques, Mind Mapping

REFERENCES:

1. Tony B and Barry Buzan(2003), The mind map book, BBC world wide limited,London.
2. Susan Nash(2005), Turning team performance inside out, Jai CO. publishing House,New Delhi.
3. Fr. Ignacimuthu (1999) "Values for Life", VaigaraiPathipagam.
4. Grose. D.N. (2000), "A text book on Value Education", DominantPublishers.

HOLY CROSS COLLEGE(AUTONOMOUS) TRICHIRAPALLI-2.
B.A/B.SC/B.COM/ B.C.A – DEGREE COURSES LIFE ORIENTED EDUCATION

BIBLE STUDIES – III: ESSENCE OF CHRISTIAN LIVING

HRS / Wk:1 **CODE:U15VE6LVBO3**

CREDIT : 1 **MARKS : 100**

OBJECTIVE:

- To prepare the students to practice Christian principles in family, church and society as youngwomen

UNIT – I: ESSENTIALS OF CHRISTIAN FAITH

- Salvation – Deliverance from sin (Is 53),Assurance of salvation and New life (II Cor5:17)
- Sacraments – Baptism (Luke 3: 6-14), Lord's Supper (I Cor 10: 16,17; 11:23-29)
- Trinity – One in three and three in one. Illustrations from the Bible. (John 14:16,17)
- Heaven and Eternal life (John 14: 13, 3:13-21)

UNIT – II: MARRIAGE AND FAMILY LIFE

- Finding the God's Will - Issac (Gen24)
- Man and woman as Partners – Abraham and Sarah (Gen 16-18,22), Aquila and Priscilla (Acts 18:1-3,26)
- Evils to be avoided – Premarital Sex, Extramarital Sex, Homosexuality, Abortion(Heb 13: 4, Psalm 127 :4)
- Ideal Wife – Sarah (I Peter 3: 1-6), Ruth,(Eph5)

UNIT – III: CHRISTIAN HOME

- Parental Responsibilities and bringing up children – Abraham (Gen 22), Eli (I Sam 2: 24- 36,3: 11- 18), Mary, Mother of Jesus (Luke 2:51,52)
- Caring for the Aged (I Sam 2:31,32)

UNIT – IV: CHRISTIAN ETHICS

- Holiness – Joseph (Gen 39:9) Levi 11: 45, Ecc12
- Obedience to God - Abraham (Gen 12) ; St.Paul (Acts9)
- Freedom andAccountability
- Justice andLove
- Choices in Life – Making Decisions (Studies, job, lifePartner)
- Model to follow – Who is your model? (John 15:1-17)
- Social Evils – Dowry, Caste discrimination, Accumulation ofwealth

UNIT – V: MISSIONARIES DOWN THE LANE

- William Carrie(Calcutta)
- Pandithar Rama Bai(Karnataka)
- Amy Carcheal(Dohnavur)
- Dr. Ida Scuddar(Vellore)
- Devasagayam(Nagercoil)
- St. John De Britto(Oriyur)
- Graham Staines & Family(Odisha)
- St. Mother Teresa(Calcutta)

REFERENCES:

1. Alban Douglass (1982) One Hundred Bible Lessons. Gospel Literature Service,Mumbai.
2. Derek Prince (1993) Foundations for Righteous Living. Derek Prince Ministries-South Pacific, NewZealand.
3. Derek Prince and Ruth Prince (1986) God is a Match maker. Derek Ministries,India.
4. Ron Rhodes(2005) Hand book on Cults.Amazon.com
5. Stanley.R. (1997) With God Again. Blessing Youth Mission,India.
6. Taylor.H. (1993) Tend My Sheep. SPCK,London.

(For Candidates admitted from June 2019 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
B.A./B.Sc./B.Com/BBA./B.C.A - DEGREE COURSES

LIFE ORIENTED EDUCATION CATECHISM –
III: LITURGY AND CHRISTIAN LIFE

HRS / Wk:1 **CODE:U15VE6LVC03**

CREDIT : 1 **MARKS : 100**

OBJECTIVES:

- To prepare the students to participate meaningfully in the liturgical celebrationand experience GOD in their day todaylife.
- To enable the students to become living witnesses to Jesus Christ in their personal, family and sociallife.

UNIT – I: LITURGY

Personal prayer (Know oneself) – Vocal prayer – Community prayer – Meditation – Contemplation – Knowing the prayers : Our Father – Hail Mary – Holy Rosary – Mysteries of the Rosary- Litany of Mary – Family prayer-Popular devotion

UNIT – II: HOLY SACRIFICE OF THE MASS

Significance – Meaning and need for spiritual growth – Mass prayers – Part of the mass – Liturgical year, its division and its significance. – The Creed – Act of contrition – Discernment of spirits – Counseling – Spiritual direction.

UNIT – III: CHRISTIAN VOCATION AS DISCIPLE FOR THE KINGDOM OF GOD

Who am I as a Christian? – Christian dignity and others – The values of the Kingdom opposing to the values of the World – Christian social conscience – Christian in the reformation of the world – A call to be salt and light in today's context.

UNIT – IV: CHRISTIAN FAMILY

Holy Family- Characteristic of good family – Bible centered, Prayer centered, Christian centered– Responsibilities of parents and children in the family –Laws of the Church towards marriage-Pro life (Abortion, Euthanasia) – Lay Vocation – Lay Participation – Lay associates.

UNIT – V: CONSECRATED LIFE

"Come and follow me" – special disciples - Religious vocation – "I have called you to be mine"- Role of Nuns and Priest - called to be prophets and agents for God's Kingdom – nucleus of the church – Eschatological signs of the God's Kingdom.

REFERENCES:

1. Compendium – Catechism of the Catholic Church Published by Vaigarai Publishing House for the Catholic Church ofIndia.
2. You are the light of the World, A course on Christian living for II year Religion published by Department of Foundation Courses, St. Joseph's College (Autonomous), Tiruchirappalli– 620002.
3. Documents of Vatican II – St. Paul's Publications, Bombay1966.

3. **The students will be evaluated internally by a test for 50 marks. The Project will be evaluated by an external evaluator and a viva- voce will be conducted for 50 marks. The students can carry out their projects individually or ingroups.**

REFERENCES:

Blaxter, L., Hughes, C. aned Tight (1999) How to research? Viva Book private Limited

Kothari, C.R. (2004) research Methodology- Methods and Technioques, New Age International Publishers, India

Lal, B.(2002) Research Methodology, ABD Publishers. India