

**HOLY CROSS COLLEGE**  
**(AUTONOMOUS),**  
**TIRUCHIRAPPALLI**  
**DEPARTMENT OF BOTANY**  
**B.Sc BOTANY**  
**SYLLABUS 2017-18**

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**

**DEPARTMENT OF BOTANY**

**CHOICE BASED CREDIT SYSTEM**

**UG COURSE PATTERN 2017-18**

Sem	Part	Course	Title of the course	Code	Hrs/ week	Credit	Mark
<b>I</b>	<b>I</b>	Language	Tamil Paper I/ Hindi Paper I/ French PaperI	U15TL1TAM01 U15HN1HIN01 U15FR1FRE01	6	3	100
	<b>II</b>	English	English Paper-I	U15EL1GEN01	6	3	100
	<b>III</b>	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
	<b>IV</b>	Environmental Studies	Environmental Studies	U15RE1EST01	2	2	100
		Value Education	Ethics /Bible Studies/ Catechism	U15VE2LVE01 U15VE2LVB01 U15VE2LVC01	1	-	-
			<b>TOTAL</b>		<b>30</b>	<b>20</b>	<b>600</b>
<b>II</b>	<b>I</b>	Language	Tamil Paper II/ Hindi Paper II/ French Paper II	U15TL2TAM02 U15HN2HIN02 U15FR2FRE02	5	3	100
	<b>II</b>	English	English Paper-II	U15EL2GEN02	6	3	100
	<b>III</b>	Major Core- 2	Plant Diversity II	U15BO2MCT02	6	6	100
		Major Core - 3	Practical I- Plant Diversity I & II	U15BO2MCP03	4	3	100
		Allied – 3	Allied Optional Paper III – Stress Physiology	U15BO2AOT03	4	3	100
	<b>IV</b>	Skill Based Elective -1	Soft Skill Development	U15RE2SBT01	2	2	100
		Skill Based Elective -2	Rural Enrichment and Sustainable Development	U15RE2SBT02	2	2	100
Value Education		Ethics I /Bible Studies I/ Catechism I	U15VE2LVE01 U15VE2LVB01 U15VE2LVC01	1	1	100	
			<b>TOTAL</b>		<b>30</b>	<b>23</b>	<b>800</b>
<b>III</b>	<b>I</b>	Language	Tamil Paper III/ Hindi PaperIII/	U15TL3TAM03			

			French Paper III	U15HN3HIN03 U15FR3FRE03	6	3	100
	<b>II</b>	English	English Paper-III	U15EL3GEN03	6	3	100
	<b>III</b>	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
	<b>IV</b>	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 /Bible Studies / Catechism	U15VE4LVE02 U15VE4LVB02 U15VE4LVC02	1	-	-
			<b>TOTAL</b>		<b>30</b>	<b>22</b>	<b>700</b>
<b>IV</b>	<b>I</b>	Language	Tamil Paper IV/ Hindi PaperIV/ French PaperIV	U15TL4TAM04 U15HN4HIN04 U15FR4FRE04	5	3	100
	<b>II</b>	English	English Paper-IV)	U15EL4GEN04	6	3	100
	<b>III</b>	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
	<b>IV</b>	Value Education	Ethics II/Bible Studies II/ Catechism II	U15VE4LVE02 U15VE4LVB02 U15VE4LVC02	1	1	100
	<b>VI</b>	Extension Activity outside class hours from Semesters( I –IV)	Any 1 activity based on the student's choice (11 Activities)	-	1	--	
			<b>TOTAL</b>		<b>30</b>	<b>24</b>	<b>700</b>
<b>V</b>	<b>III</b>	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
	<b>IV</b>	NME –1			2	2	100
		Skill Based Elective-4	Botanical skills for Physical Sciences (Lab cum Theory for Physics students)	U17BO5SBT04	2	2	100
	<b>IV</b>	Value Education	Ethics /Bible Studies / Catechism	U15VE6LVE03 U15VE6LVB03 U15VE6LVC03	1	-	-
			<b>TOTAL</b>		<b>30</b>	<b>25</b>	<b>700</b>
<b>VI</b>	<b>III</b>	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
	<b>IV</b>	Non Major Elective –2			2	2	100
		Skill Based Elective-5	Techniques in Botany	U15BO6SBP05	2	2	100
		Skill based Elective - 6	Research Methodology	U15DS6SBT06	2	2	100
		Value Education	Ethics III /Bible Studies III / Catechism III	U15VE6LVE03 U15VE6LVB03 U15VE6LVC03	1	-	-
	<b>V</b>	Extension Activity	RESCAPES -Impact study of project	U15RE6ETF01	-	1	100
			<b>TOTAL</b>		<b>30</b>	<b>27</b>	<b>800</b>
<b>GRAND TOTAL(I-VI SEMESTERS)</b>					<b>180</b>	<b>141</b>	<b>4300</b>

**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
<b>V</b>	<b>IV</b>	Non Major Elective -1	Food Science & Technology	U15BO5NMT01	2	2	100

<b>VI</b>		Non Major Elective -2	Herbal Remedies	U15BO6NMT02	2	2	100
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**Certificate Course offered by the Department of Botany**

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

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

TAMIL DEPARTMENT

BA/ B.SC/ B.COM DEGREE

Part - I : Language: Tamil Paper - 1

Total Hours : 90

Hrs : 6Hrs /Wk

Credit : 3

Code : U15TL1TAM01

Marks : 100

**நோக்கங்கள்:**

1. தாய்மொழியை வலுவோடும், பொலிவோடும் கையாளும் வழி முறைகளைக் கண்டறியச் செய்தல்.
2. தமிழ் இலக்கியப் பரப்பையும், பாரம்பரியத்தையும் அறிமுகப்படுத்துதல்.
3. படைப்பாற்றலை வளர்த்துக் கொள்ள ஊக்கம் அளித்தல்.
4. உயர்ந்த பண்பாடுகளின் அடிப்படையில் வாழ்க்கையை அமைத்துக் கொள்ளும் உள்ளார்ந்த விருப்பத்தைத் தோற்றுவித்தல்.
5. மனித உரிமைகளை வலியுறுத்தி மனித நேயத்தை வளர்த்தல்.
6. நாம் வாழும் நாட்டையும், உலகையும் பற்றிய விழிப்புணர்வை ஊட்டி சமய நல்லிணக்கத்தையும், சமூக நல்லுறவையும் பேணிக்காக்கத் துணைப்புகிறதல்.
7. ஆரோக்கியமான சிந்தனைகள் வளர ஆக்கம் அளித்தல்.

**பயன்கள்:**

1. தற்காலத் தமிழ் இலக்கிய வரலாற்றை வளர்க்க வழிகாட்டல்.
2. மாணவர்களின் தன்னம்பிக்கையை வளர்த்தல்
3. வாழ்வியல் நெறிகளை உணர்த்தல்.
4. பிழையின்றி எழுத பேச பயிற்சி அளித்தல்.

**பாடத்திட்டம்**

**அலகு:1** செய்யுள்

1. பாரதியார் கவிதைகள் - தமிழ்  
கண்ணன் என் சேவகன்
2. பாரதிதாசன் கவிதைகள் - உலகம் உன்னுடையது
3. உமர்கய்யாம் - உமர்கய்யாம் பாடல்கள்
4. பட்டுக்கோட்டையார் - செய்யும் தொழிலே தெய்வம்
5. ந. பிச்சமுர்த்தி - ஒளியின் அழைப்பு

6. வைரமுத்து – ஐந்து பெரிது ஆறு சிறிது
7. சிற்பி – ஒரு கிராமத்து நதி

**அலகு:2** செய்யுள்

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

**அலகு:3**

தமிழ் இலக்கிய வரலாறு

20-ஆம் நூற்றாண்டு (தற்காலம்)

தமிழாய்வுத்துறை வெளியீடு

**அலகு:4**

படைப்பிலக்கியம் - சிறுகதைத் தொகுப்பு

**அலகு:5**

பொதுப்பகுதி - கலைச்சொற்கள்

தமிழாய்வுத்துறை வெளியீடு

**பாட நூல்கள்**

- |                      |                            |
|----------------------|----------------------------|
| செய்யுள்             | - தமிழாய்வுத்துறை வெளியீடு |
| தமிழ் இலக்கிய வரலாறு | - தமிழாய்வுத்துறை வெளியீடு |
| சிறுகதைத் தொகுப்பு   | - தமிழாய்வுத்துறை வெளியீடு |
| கலைச்சொற்கள்         | - தமிழாய்வுத்துறை வெளியீடு |

(for the candidates admitted from June 2015 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002**  
**DEPARTMENT OF HINDI**  
**PART – I LANGUAGE HINDI FOR B.A, B.Sc & B.Com**  
**HINDI PAPER-I SHORT STORY, PROSE, GRAMMAR**  
**SEMESTER – I**

**HRS/WEEK : 6**

**CODE: U15HN1HIN01**

**CREDITS : 3**

**MARKS : 100**

**UNIT – I** : Purasakar, Sukamaya Jeevan, Ganga Singh, Machuye Ki Beti,  
Maharaj Ka Ilaj

**UNIT- II** : Maatru vandana, Chandini, Thitalii, Divali, Seekho.

**UNIT- III** :Sadak Ke Niyam, Bhagavan mahaveer, Prithvi Ka swarga,Mahan  
ganithagya Ramanujam, Birbal Ki Chathuraye.

**UNIT- IV** :General Grammar  
(Sanghya, Visheshan, ling, Vachan, Kriyavisheshan)

**UNIT- V** : Anuvad Abhyas–II

Books Prescribed :

- Galpa Sanchayan - D.B.H.P. Sabha Publishers, Chennai-17
- Naveen Hindi Patamala – I- D.B.H.P. Sabha Publishers, Chennai-17
- Naveen Hindi Patamala – II- D.B.H.P. Sabha Publishers, Chennai-17
- Sugam Hindi Vyakaran - D.B.H.P. Sabha Publishers, Chennai-17 -
- Anuvad Abhyas – II D.B.H.P. Sabha Publishers, Chennai-17



**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2**

**DEPARTMENT OF FRENCH**

**SYLLABUS**

**SEMESTER I**

**PART I – LANGUAGE - FRENCH PAPER I [GRAMMAR & CIVILISATION**

(ÉCHO A1 2e édition)]

(For candidates admitted 2016 onwards)

**HRS/WEEK : 6**

**CREDIT : 3**

**CODE : U16FR1FRE01**

**MARKS : 100**

**Unit 1 Parcours d'initiation ; Vous comprenez**

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.

**Unit 2 Au travail!**

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

**Unit 3 On se détend!**

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

**Unit 4 Racontez-moi ! ; Bon voyage !**

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

**Unit 5 Bon appétit!**

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.

**TEXT BOOKS :**

ECHO A1 – METHODE DE FRANÇAIS & CAHIER PERSONNEL D'APPRENTISSAGE

Authors: J. Girardet and J. Pécheur

Publication: CLÉ INTERNATIONALE, 2013.

(for candidates admitted from June 2017 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2.**  
**I YEAR UG – SEMESTER I**  
**PART II – ENGLISH 1 - GENERAL ENGLISH I**

**HOURS : 6**  
**CREDIT : 3**

**CODE : U15EL1GEN01**  
**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 specific 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

**Grammar** Sentence patterns (5 basic types)

**Vocabulary** Appropriate 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**

**DEPARTMENT OF BOTANY**

**B.Sc. BOTANY SYLLABUS 2017 onwards**

**SEMESTER I**

**MAJOR CORE 1 – PLANT DIVERSITY - I**

**Hours 7**  
**Credits 5**

**Code: U15BO1MCT01**  
**Marks: 100**

**Course Objectives:**

This includes classification, detailed study of the genera belonging to various classes of algae, fungi & lichens, their habitat, thallus structure, reproduction and economic importance.

**UNIT – I Algae:** 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*.

**UNIT – II** 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.

**UNIT – III Fungi:** 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*.

**UNIT – IV** 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.

**UNIT – V Lichens:** Classification & types of lichens. Structure (External and Internal) & reproduction of *Usnea*. Economic importance of lichens.

**References**

**Text Books:**

1. Pandey, B. P. 1993. Text Book of Botany, Vol –1. S. Chand and Company Ltd, New Delhi.
2. Vashishta, B. R. 1984. Botany for degree students. Vol. 1 – Algae. S. Chand and Company Ltd, New Delhi.
3. Vashista, B. R. 1984. Botany for degree students Fungi. S. Chand and Company Ltd, New Delhi.
4. Vashista, B. R. 2001. Botany for degree students Bryophytes. 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. Watson, E. V. 1974. The structure and life of Bryophytes. B.I. Publication, Bombay.
5. Webster, J. 1993. Introduction to Fungi – Cambridge University press, Cambridge.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**

**DEPARTMENT OF BOTANY**

**B.Sc. BOTANY SYLLABUS 2017 onwards SEMESTER I**

**A1 ALLIED OPTIONAL PAPER I – BIODIVERSITY CONSERVATION AND**

**MANAGEMENT**

**Hours 4**

**Code: U15BO1AOT01**

**Credits 4**

**Marks: 100**

**Course 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.

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

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

**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.

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

**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.

**References**

**Text books:**

1. Agarwal K.C., Biodiversity.
2. Kumar, 2005, Biodiversity Principles and Conservation, International 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**

**DEPARTMENT OF BOTANY**

**B.Sc. BOTANY SYLLABUS 2017 onwards SEMESTER I  
A2 - ALLIED OPTIONAL PAPER II - MUSHROOM CULTIVATION**

**Hours 4**

**Code: U15B01AOT02**

**Credits 3**

**Marks: 100**

**Course Objectives:**

It deals with the importance of mushroom in the nutritious diet. It also gives knowledge on different steps involved 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).

**UNIT – I** Introduction: Life cycle of common edible mushrooms – Agaricus and Pleurotus.

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

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

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

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

**References:**

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

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2**  
**B.A /B.Sc./B.Com/B.R.SC/B.C.A/B.B.A DEGREE EXAMINATION**  
**SEMESTER I**  
**ENVIRONMENTAL STUDIES**

**Hrs– 2/Week**

**CODE: U15RE1EST01**

**CREDITS:2**

**Unit I – Awareness and Natural Resources**

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.

**Unit II–Ecosystems and Biodiversity**

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 mega diversity country, hotspots–threats to biodiversity and conservation measures.

**Unit III–Environmental Pollution**

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

**Unit IV–Human population and Environment**

Population growth at national and global level.

World food production-Effects of modern agriculture on land and Eco systems-GMOs and related issues

Environmental pollutions and diseases-malaria- chikungunya

**Unit V–Environment and Social Issues Rich– poor**

**wide–at national and global levels**

Urbanization –slums

Changing value systems–AIDS Family welfare programs

**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

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

**TAMIL DEPARTMENT**

**BA/ B.SC/ B.COM DEGREE**

Part - I : Language: Tamil Paper - II

**Total Hours : 75**  
**Hrs : 5Hrs /Wk**  
**Credit : 3**

**Code : U15TL2TAM02**  
**Marks : 100**

**நோக்கங்கள்:**

1. இறைச் சிந்தனை வழி மாணவர்களை ஒருமுகப்படுத்துதல்.
2. தமிழ்ச் சான்றோர்களின் சிறப்புகளை அறிமுகப்படுத்துதல்.
3. மாணவர்களின் நல்லெண்ணங்களை மேம்படுத்துதல்.
4. நட்புணர்வை மாணவர்கள் மனதில் பதியவைத்தல்.

**பயன்கள்:**

1. இப்பாடம் மாணவர்களிடையே ஆன்மீக அறிவு அறிமுகமாகவும், வளரவும், ஆழப்படவும் துணைபுரிகின்றது. இது ஓர் இயற்கைப் பூங்கா.
2. தமிழை நேசித்து, தமிழ்ச் சான்றோர்களின் மீது மதிப்புக் கொள்ளவும், தானும் சான்றோர் ஆகவும் இது ஒரு பாலமாக பயன்படுகிறது.
3. ஊற்றுக்களாய் மாணவிகளிடையே மறைந்து கிடக்கும் நல்லெண்ணங்களை வெளிக்கொணரவும் நேர்மறைச் சிந்தனைகள் தோன்றவும் பயன்படுவதால் இது ஒரு நூலகமாகும்.
4. வாழ்க்கையில் நட்பின் தேவையை உணர வைக்கும் வழிகாட்டியாகத் திகழ்கிறது. இது வாழ்க்கைப் பெட்டகம்.

**பாடத்திட்டம்**

**அலகு:1செய்யுள்**

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

திருமொழி)

**அலகு:2செய்யுள்**

6. மீனாட்சியம்மை பிள்ளைத்தமிழ் - குமரகுருபரர்
7. இரட்சணிய யாத்திரிகம் - எச்.ஏ.கிருட்டிணப்பிள்ளை



8. வேதநாயகம் சாஸ்திரியார் பாடல்கள் - வேதநாயகம் பிள்ளை  
9. நபிகள் நாயக மான்மிய மஞ்சரி - செய்கு தம்பிப் பாவலர்

**அலகு:3**

**தமிழ் இலக்கிய வரலாறு** - தமிழாய்வுத்துறை வெளியீடு

பல்லவர்காலம்

நாயக்கர்காலம்

**அலகு:4**

**படைப்பிலக்கியம்** - புதினம்

கல்கி - பார்த்திபன் கனவு

**அலகு:5**

**கடிதம் எழுதுதல்**

**பாட நூல்கள்**

- செய்யுள் - தமிழாய்வுத்துறை வெளியீடு  
தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறை வெளியீடு  
கல்கி - பார்த்திபன் கனவு  
கடித இலக்கியம் - பயிற்சி ஏடு.

(for the candidates admitted from June 2015 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002**  
**DEPARTMENT OF HINDI**  
**PART – I LANGUAGE HINDI FOR B.A, B.Sc & B.Com**  
**HINDI PAPER-II PROSE, DRAMA, GRAMMAR-II, COMPREHENSION**  
**SEMESTER –II**

**HRS/WEEK : 5**  
**CREDITS : 3**

**CODE: U15HN2HIN02**  
**MARKS : 100**

**UNIT – I** : Bharat matha, Premchand, Taj mahal ki Aathma Kahani, Mahakavi Prasadh, Meritheertha yatra

**UNIT- II** : Sathyameva jayathe - Drama (chapter 1& 2)

**UNIT- III** :Sathyameva jayathe–Drama (chapter 3)

**UNIT- IV** :General Grammar (Sarvanaam, Kriya, Kaal, Karak, Ne Ka niyam)

**UNIT- V** : Comprehension–Prose passages

Books Prescribed :

- |  |   |
|--|---|
| <input type="checkbox"/> Naveen Gadhya Chayanika | – D.B.H.P. Sabha Publishers, Chennai-17 |
| <input type="checkbox"/> Sathyameva Jayathe      | – D.B.H.P. Sabha Publishers, Chennai-17 |
| <input type="checkbox"/> General Grammar         | – D.B.H.P. Sabha Publishers, Chennai-17 |

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2**

**DEPARTMENT OF FRENCH**

**SYLLABUS**

**SEMESTER II**

**PART I - LANGUAGE - FRENCH PAPER II [GRAMMAR, CIVILISATION &  
TRANSLATION (ÉCHO A1 2e édition)]  
(For candidates admitted 2016 onwards)**

**HRS/WEEK : 5**

**CODE : U16FR2FRE02**

**CREDIT : 3**

**MARKS : 100**

**Unit 1 Quelle journée !**

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.

**Unit 2 Qu'on est bien ici !**

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)

**Unit 3 Souvenez-vous ?**

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.

**Unit 4 On s'appelle ?**

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.

**Unit 5 Un bon conseil ! ; Parlez-moi de vous !**

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.

**TEXT BOOKS :**

ECHO A1 – METHODE DE FRANÇAIS & CAHIER PERSONNEL D'APPRENTISSAGE

Authors: J. Girardet and J. Pécheur

Publication: CLÉ INTERNATIONAL, 2013.

(for candidates admitted from June 2017 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2.**  
**I YEAR UG – SEMESTER II**  
**PART II – ENGLISH 2 - GENERAL ENGLISH II**

**HOURS : 6**  
**CREDIT : 3**

**CODE : U15EL2GEN02**  
**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**

**DEPARTMENT OF BOTANY**

**B.Sc. BOTANY SYLLABUS 2017 onwards**

**SEMESTER II**

**MAJOR CORE - 2 PLANT DIVERSITY - II**

**Hours 6**  
**Credits 6**

**Code: U15BO2MCT02**  
**Marks :100**

**Course Objectives:**

The nature of Bryophytes, Pteridophytes and Gymnosperms are illustrated with suitable examples in this paper. The phenomenon heterospory, stelar evolution are highlighted. Life history of Gymnosperms members *Pinus* and *Gnetum* are dealt in detail. It gives added information about types of fossils and fossilization and carbon dating.

**UNIT – I Bryophytes:** 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.

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

**UNIT – III** 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*.

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

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

**References**

**Text Books:**

1. Henry N. Andrews, Jr. 1961. Paleobotany. John Wiley and Sons, Inc., New York, London.
2. Pandey, B. P. 1997. A text Book of Botany Vol. II . S. Chand and Company Ltd, New Delhi.
3. Vashista, B. R. Pteridophyta. 1988. S. Chand and Company Ltd, New Delhi.
4. Vashista, B. R. Gymnosperms. 1988. 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  
DEPARTMENT OF BOTANY  
B.Sc. BOTANY SYLLABUS 2017 onwards  
SEMESTER II  
MAJOR CORE – 3 PRACTICAL- 1  
PLANT DIVERSITY – I & II

Hours 4  
Credits 3

Code: U15BO2MCP03  
Marks: 100

**Course Objectives:**

This paper deals with the thallus organization, internal and the reproductive structures of algae, fungi, lichen, bryophytes, pteridophytes and gymnosperms

**UNIT – I Algae:** Observation and identification 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 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 Lichens:** Observation & identification of lichen form :*Usnea*– Morphology of thallus & apothecium.

**Bryophytes:** Observation and identification of morphological structure 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 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 Gymnosperms:** Morphological and anatomical study of the vegetative and reproductive parts of *Pinus* and *Gnetum*.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**  
**DEPARTMENT OF BOTANY**  
**B.Sc. BOTANY SYLLABUS 2017 onwards**  
**SEMESTER II**

**A3 - ALLIED OPTIONAL PAPER III – STRESS PHYSIOLOGY**

**Hours 4**

**Code: U15BO2AOT03**

**Credits 3**

**Marks: 100**

**Course Objectives:**

To study the physiological changes in relation to stress on plants.

**UNIT – I Stress:** Definition, components of stress abiotic and biotic stresses. Causes of stresses: environment and manmade stresses. Consequences of stress.

**UNIT – II Water stress:** water deficit, water use efficiency, role of stomata, adaptation to water stress. Role of growth regulators in water stress. Antitranspirants: metabolism of plants during water stress.

**UNIT – III Flooding:** Effect of flooding on growth and development. Adaptation of plants to flooding. Salt stress: saline and alkaline soils. Salt stress injury: mechanism of salt tolerance.

**UNIT – IV Temperature stress:** High temperature. Heat shock protein: Chilling and frost injury, anti freeze agents. Mechanism of temperature stress tolerance.

**UNIT – V Light and oxidative stress:** metabolism during stress. Production of osmoregulators - proline, glycine betaine. Production of antioxidants. General aspects on genes regulating various stresses.

**References**

**Text Books:**

1. Kumar, 2005, Plant Physiology Fundamental and Applications, M/S. IBD Publishers, New Delhi.
2. Purohit, 2006, Plant Physiology, International Book Distributors, Dehradun.

**Reference Books:**

1. Lincoln Taiz and Eduardo Zeiger, 1998, Plant Physiology, Sinauer Associates, Inc. Sunderland Massachusetts.
2. Hopkins W.G., 1995, Introduction to plant physiology, John Wiley and Sons Inc.
3. Salisbury F.B and Cleon Ross, 1994, Plant Physiology.
4. Levitt J., 1984, Response of plants to environmental stresses.



(For the candidates admitted from 2015 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**B.A/B.Sc./B.Com/B.R.SC/B.C.A/B.B.A DEGREE EXAMINATION**  
**SEMESTER-II**  
**SBE-1 SOFT SKILL DEVELOPMENT**

Hrs – 2/Week

**CODE: U15RE2SBT01**

**CREDITS -2**

**General Objective:**

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

**UNIT I:**

**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-Leadership skills.

**UNIT II :**

**Interpersonal skills**

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

**UNIT III:**

**Corporate skills**

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

**UNIT IV:**

**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.

**UNIT V:**

**Self Development Plan**

Concept and Need for Self Development Plan–Preparing Self Development Plan. (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.

**REFERENCES:**

Alex K.(2012)Soft Skills–Know Yourself & Know the World, S. Chand &Company Ltd., New Delhi Meena K.AyothiV. (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).Communications of skills for Professional Excellence,1<sup>st</sup> Ed., Grace Publishers,

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

(For candidates admitted from 2015 onwards)

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI- 2**

**B.A./B.Sc./B.Com./BCA&BBA,DEGREEEXAMINATION**

**SEMESTER II**

**SBE- 2 RURAL ENRICHMENT AND SUSTAINABLE DEVELOPMENT**

**Hrs- 2/Week**

**CODE:U15RE2SBT02**

**CREDITS -2**

**Course Objective:**

The students are able to understand practically the Environmental concerns of rural areas and develop an alternative thinking through various field based intervention.

**Unit-I**

Village-Public Administration- Survey of natural resources and resource mapping of villages, village level Participating Approach (VLPA) – Role of NGO'S and SHG'S, Department of Rural development(central and state):

**Unit-II**

Green Revolution and industrialization cost climatic changes and mismanagement of natural resources- Reduced economic returns from agriculture-resultant social issues- poverty and farmer suicide- introduction to WTO, GATT and LPG and its impact on green Revolution. **Unit-III**

Sustainable Development-Concepts , Environmental , social and economic aspects of sustainable development, sustainable development as solution to address rural issue-successful case studies from India

**Unit-IV**

Elements in sustainable development-Comparison and Compliments of Traditional water shed and modern water shed management techniques-water shed management practices-rain water harvesting, managing existing rain water drainage canals, desilting, buns construction, check dams, micro irrigation, agro forestry and alternative agriculture models and agriculture implements – Afforestation- Honey Bee rearing-dairyfarming.

**Unit-V**

Elements in sustainable development –addressing agriculture issues-traditional farming technology- organic farming-Zero budget farming-organic manures vermicompost-azolla cultivation panchakavya- amirtha karaisal, organic pesticides mulikaipuchiviratti-neem products-natural management in soil- precision farming soil fertility. Ecological sanitation-bio-diversity and natural resource-terrace farming- seed banking and kitchen garden.

**REFERENCES:**

1. PackagesoforganicpracticesfromTamilNaduCenterforIndianKnowledgeSystem(CIKS)
- .2.www.fao.org.in

(For Candidates admitted from June 2015 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2**  
**B.A/B.Sc./B.Com/B.R.Sc/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 understand and appreciate other Religions and Culture
- To learn from other Religions and Culture
- To interact with all Religions and Culture to enhance my faith in my religion.
- To help the students to become aware of the negative forces of religions.

**UNIT – I: RELIGION**

God – Faith, Meaning, 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- Buddhism, Christianity, Hinduism, Islam, Jainism and Sikhism

**UNIT – III: UNITY OF RELIGION**

Unity of Vision and Purpose- Respect for Other Faiths, 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 and exercises

**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 for youth. Marie Migon Mascarenhas, 1986. Family life education- Value Education, A text book for College students.

**(For Candidates admitted from June 2015 onwards)**  
**HOLY CROSS COLLEGE(AUTONOMOUS) TRICHIRAPALLI-2.**  
**B.A/B.Sc./B.Com/B.R.Sc/B.C.A-DEGREE COURSES**  
**LIFE ORIENTED EDUCATION BIBLE STUDIES –**  
**I: NEW TESTAMENT**

**HRS /Wk :1**

**CODE:U15VE2LVBO1**

**CREDIT : 1**

**MARKS : 100**

**OBJECTIVE:**

- Developing the passion for the Word of God – Jesus and inculcating the thirst of Missionaries being a disciple of Christ.

**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 New Testament
- Martha & Maria (Luke 10: 38- 42, John 11:1-46)

**UNIT – III: CHURCH – BIRTH AND GROWTH**

- Early Church
- 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 present Church.

#### **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 (Acts 6,7)
- 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. John Stott, 1994, “**Men with a Message**”, Angus Hudson Ltd. London.

**(For Candidates admitted from June 2015 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-2**  
**B.A/B.Sc./B.Com/B.R.Sc/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 Holy Bible
- To enable the students to know about the Paschal Mystery

**UNIT – I: CREATION AND COVENANT**

Study from petty catechism - Genesis - God revealed himself in creation -God who preserves creation through covenants (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 – specialty of the gospel – main emphasis of the message – meaning and blessing of suffering and paschal joy in one's life.

**Passion – Paschal**

**mystery 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 for India.
3. Vaalvin Valizha – St. John's Gospel – Fr. Eronimus

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

TAMIL DEPARTMENT

BA/ B.SC/ B.COM DEGREE

Part - I : Language: Tamil Paper - III

Code : U15TL3TAM03

Marks : 100

Total Hours : 90

Hrs : 6Hrs /Wk

Credit : 3

**நோக்கங்கள்:**

1. வாழ்வியல் நெறிகளாகிய அறம், பொருள், இன்பம், வீடுபேறு ஆகியவற்றின் மேன்மையை எடுத்துரைத்தல்
2. சமூக வாழ்க்கைப் பற்றிய விழிப்புணர்வினைத் தோற்றுவித்தல்
3. ஆன்மீக உணர்வுகளை வலுப்படுத்துதல்

**பயன்கள்:**

1. காப்பியங்களைப் பயில்வதன் மூலமாக மாணவர்கள் அறக்கருத்துக்களை உணர்ந்து கொள்ளுதல்.
2. சமூக மாற்றங்களைக் கண்டறிந்து மேம்பாடுகளை உருவாக்கச் செய்தல்
3. கலைநுட்பங்களையும் பண்பாட்டுச் சிறப்புக்களையும் உணர்ந்து கொள்ளச் செய்தல்

**அலகு:1** செய்யுள்

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

**அலகு:2** செய்யுள்

4. இரட்சணிய யாத்திரிகம் - மரணப் படலம்
5. சீறாப்புராணம் - ஓட்டகை பேசிய படலம்

**அலகு:3**

தமிழ் இலக்கிய வரலாறு

சோழர் காலம்

**அலகு:4**

நாடகம்

சத்திய வேள்வி - அய்க்கண்

## அலகு:5

கோயிற்கலை - திட்டக்கட்டுரை, வினாடி வினா

### பாட நூல்கள்

1. செய்யுள் - தமிழ்த்துறை வெளியீடு
2. தமிழ் இலக்கிய வரலாறு - தமிழ்த்துறை வெளியீடு
3. நாடகம்  
அய்க்கண் - சத்திய வேள்வி
4. கோயிற்கலை - தமிழ்த்துறை வெளியீடு



**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002**  
**DEPARTMENT OF HINDI**  
**PART – I LANGUAGE HINDI FOR B.A, B.Sc & B.Com**  
**HINDI PAPER-III POETRY, PREDICS, HISTORY OF HINDI LITERATURE**  
**SEMESTER – III**

**HRS/WEEK : 6**  
**CREDITS : 3**

**CODE: U15HN3HIN03**  
**MARKS : 100**

**UNIT – I** : Shubhagaman, Man, Tere ghar ked war bahuth hym  
Memory poem : - Kabir das Ke Dohe - 6  
Thulasidas Ke Dohe - 6 Rahim Ke Dohe - 6

**UNIT- II** : History of Hindi Literature :  
Essay Type Questions : Veeragatha Kaal

**UNIT- III** :Bakthi Kaal

**UNIT- IV** :Poetics

- a. Ras : Shringar, karun, Hasya, Veer
- b. Alankar : Anupras, Yamak, Upama, Roopak
- c. Chand : Choupayee, Baravai

**UNIT- V** :Kavi Parichaya : Ayodiya singh upadyaya Harioudh, Maithili Sharan Gupth,Siyaram Sharan Gupth, Kabir, Thulasi das

Books Prescribed :

- Naveen Padhya Rathnakar– D.B.H.P. Sabha Publishers, Chennai-17
- Pracheen Padhya Sangrah– D.B.H.P. Sabha Publishers, Chennai-17
- Hindi Sahitya Ka Sanshitpta Itihas – Rajnath Sharma, Agrwal Publication, Uttar Prakash
- Kavya Pradeep – Ram Bahori Shukla, Hindi Bhavan, Illahabad.

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2**

**DEPARTMENT OF FRENCH**

**SYLLABUS**

**SEMESTER III**

**PART I - LANGUAGE - FRENCH PAPER III [LANGUAGE & CIVILISATION**

(ÉCHO A2 2e édition)]

(For candidates admitted 2015 onwards)

**HRS/WEEK : 6**

**CREDIT : 3**

**CODE : U16FR3FRE03**

**MARKS : 100**

**Unit 1 Vivement demain !**

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

**Unit 2 Tu as du boulot ?**

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

**Unit 3 Qu'en pensez-vous?**

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

**Unit 4 C'est tout un programme !**

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)

**Unit 5 On se retrouve**

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.

**TEXT BOOKS :**

ECHO A2 – METHODE DE FRANÇAIS & CAHIER PERSONNEL D'APPRENTISSAGE

Authors: J. Girardet and J. Pécheur

Publication: CLÉ INTERNATIONAL, 2013.

(for candidates admitted from June 2016 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2.**  
**II YEAR UG – SEMESTER III**  
**PART II – ENGLISH 3 - GENERAL ENGLISH III**

**HOURS : 6**  
**CREDIT : 3**

**CODE : U15EL3GEN03**  
**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 (1<sup>st</sup> 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**

**DEPARTMENT OF BOTANY**

**B.Sc. BOTANY SYLLABUS 2017 onwards**

**SEMESTER III**

**MC 4 - CELL BIOLOGY, BIOSTATISTICS AND BIOINFORMATICS**

**Hours 5**

**Code: U15BO3MCT04**

**Credits 5**

**Marks: 100**

**Course Objectives:**

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

**UNIT – I Cell Biology:** 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.

**UNIT – II Cell cycle and Cell division:** 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.

**UNIT – III Structure of genetic material:** 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).

**UNIT – IV Biostatistics:** 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.

**UNIT – V Bioinformatics:** 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.

**Reference**

**Text Books:**

1. Sundarajan, S. 2000. Cytogenetics. Anmol publications pvt. Ltd., New Delhi.
2. Gupta, P. K. 1985. Genetics. Rastogi publication, Meerut.
3. Power, C. B. 1997. Cell Biology. Himalaya publishing House, Bombay.
4. Ramakrishnan, P. 2003. Biostatistics. Saras publication, Nagercoil.
5. Mani. K. and Vijayraj. D., 2002. Bioinformatics to beginners, Kalaikathir pathippagam, Coimbatore.

**Reference Books:**

1. Gardner, F. J. 1972. Principles of Genetics. Wiley Eastern Pvt. Company Ltd., New Delhi.
2. Gupta, P. K. 1974. Cytology, Genetics and Evolution. Rastogi publications, Meerut.
3. Satguru Prasad. 1992. Fundamentals of Biostatistics. Emkay publications, New Delhi.
4. Lohar, P.S. 2009. Bioinformatics. MJP Publishers, Chennai.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF BOTANY  
B.Sc. BOTANY SYLLABUS 2017 ONWARDS  
SEMESTER III  
ME 1 - MICROBIOLOGY AND PLANT PATHOLOGY

Hours 5

Code: U15BO3MET01

Credits 5

Marks: 100

**Course 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.

**UNIT – I History of Microbiology:** Discovery of microbes (Anton Von Leeuwenhoek). Theory of spontaneous generation. Theory of Biogenesis vs. Abiogenesis (Louis Pasteur) 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.

**UNIT – II Microorganisms: 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.

**UNIT – III Food Microbiology:** 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.

**UNIT – IV Industrial Microbiology:** 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*)

**UNIT – V Plant Pathology:** 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.

**References**

**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.

**Reference Books:**

1. Powar and Dagainawala. 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. 8<sup>th</sup> 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**  
**DEPARTMENT OF BOTANY**  
**B.Sc. BOTANY SYLLABUS 2017 ONWARDS**  
**SEMESTER III**  
**MAIN ELECTIVE (ME -1) – FOREST RESOURCES & THEIR UTILIZATION**

**Hours 5**

**Code : U15BO3MET04**

**Credits 5**

**Marks:1 00**

**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.

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

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

**UNIT V** 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*).

**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.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**

**DEPARTMENT OF BOTANY**

**B.Sc. BOTANY SYLLABUS 2017 onwards**

**SEMESTER III**

**AC 4 - PAPER I- PLANT DIVERSITY, TAXONOMY, ANATOMY, EMBRYOLOGY, ECOLOGY AND PHYSIOLOGY**

**Hours 4**

**Code: U15BO3ACT04**

**Credits 3**

**Marks: 100**

**Course Objectives:**

This paper gives 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 and biochemical reactions in the higher plants.

**UNIT – I Algae and Fungi:** 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.

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

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

**UNIT – IV Taxonomy of Angiosperms:** General outline classification of Bentham and Hooker. Detailed study of the following families and their economic importance: Annonaceae, Rutaceae, Rubiaceae, Amaranthaceae and Poaceae.

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

**References**

**Text Books:**

1. Shukla and Chandel, 1994. Plant ecology and soil Science . S. Chand and Company Ltd., New Delhi.
2. Verma, V. 1985. A text book of Plant Physiology. Emkay Publications, 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,

**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. Ganguli, H. G. and Kar, A. K. College Botany. Vol –I and II. New Central Book Agency, Calcutta.



HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF BOTANY

SYLLABUS – 2017 onwards

SEMESTER III

SBE – 3 BIOLOGICAL SKILLS FOR PHYSICAL SCIENCES

(LAB FOR PHYSICS STUDENTS)

Hours 2

Credits 2

Code: U17BO3SBP03

Marks: 100

**Course Objectives:**

Students learn the skills of performing experiments, analyzing the results and discussing the observations.

**Unit - I Biological system:**

Observation of different types of animal cells

Observation of different types of animal tissues

Observation of different types of plant tissues of root and stem.

Observation of cell division (mitosis) & chromosomes in onion root tip.

**Unit – II Molecular biology:**

Determination/ Estimation of Haemoglobin in Blood

Measurement of their own blood pressure

Test for presence of sugar in urine/serum

Test for presence of albumin in urine/serum.

**Unit – III Genetics**

Survey of Mendelians Traits

Pedigree analysis

Syndrome and their Karyotypes Analyzing their Blood

Groups.

**Unit – IV Plant tissue culture& Phytochemistry**

Tissue culture techniques- Callus culture & Synthetic seed preparation

Identification and Isolation of Phytoconstituents- Tannins and Polyphenols **Unit – V Food and**

**Nutrition:**

Kitchen gardening- Concept

Nutritional value of vegetables

Nutritive values & mass cultivation of SCP- *Spirulina*

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2 B.A./B.Sc./  
B.Com./ B.C.A./B.B.A DEGREE COURSE  
II YEAR: SEMESTER - III  
(Students who are admitted from 2015 onwards)**

**GENDER STUDIES**

**Hours:1Hr/wk**

**CODE:U15WS3GST01  
CREDITS: 1**

**Objectives**

To make boys and girls aware of each other's strength and weakness

To develop sensitivity towards both genders in order to lead an ethically enriched life

To promote attitudinal change towards a gender balanced ambience and women empowerment

**Unit I**

**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.

**Unit II Women's Studies Vs Gender Studies:** UGC's Guidelines – VII to XI Plans – Gender Studies :Beijing Conference and CEDAW-Exclusiveness and Inclusiveness.

**Unit –III Areas of Gender Discrimination** : Family – Sex Ratio – Literacy – Health – Governance – Religion Work Vs Employment – Market – Media – Politics – Law – Domestic Violence – Sexual Harassment – State Politics andPlanning.

**Unit – IV 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.

**Unit – V**

**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<sup>rd</sup> Amendment for PRIs.

**BOOK FOR STUDY**

Manimekalai.N & Suba. S (2011), Gender Studies, Publication Division, Bharathidasan University, Tiruchirappalli

(For Candidates admitted from June 2015 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**

Eye 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 Prett Nandhini Upreti, 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 2015 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 of God.

**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 2015 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 the Church
- To understand God's gift of the Holy Spirit.
- To understand the methods of building relationship with Jesus.
- To learn the life of Sacraments and Prayer
- To enrich our devotion to Mother Mary and Saints.

**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 and structure

**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, Bangalore 560055.
3. Documents of Vatican II – St. Paul's Publications, Bombay 1966.

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

TAMIL DEPARTMENT

BA/ B.SC/ B.COM DEGREE

Part - I : Language: Tamil Paper - IV

Total Hours : 75  
Hrs : 5Hrs /Wk  
Credit : 3

Code : U15TL4TAM04  
Marks : 100

**நோக்கங்கள்:**

1. மாணவர்களுக்குத் தமிழர்தம் வாழ்வியல் விழுமியங்களை உணர்த்துதல்.
2. அறநெறிகள் வாழ்க்கைக்கு வழிகாட்டும் விதத்தினை எடுத்துரைத்தல்
3. சிகரம் தொட்ட சாதனையாளரின் வாழ்வியலைப் புலப்படுத்துதல்
4. மொழித்திறன் வளர்த்தல்.

**பயன்கள்:**

1. வாழ்க்கையின் பல்வகை நிலைகளையும் உணர்ந்து செயல்படச் செய்தல்
2. தன்னைத் தானே நெறிப்படுத்திக்கொள்ள, பயன்பாடடைய இலக்கியம் வழிகாட்டுவதை புரிந்துகொள்ளச் செய்தல்.
3. இடைவிடாத முயற்சியின் வெற்றிப்படிக்களைக் கண்டுணர்ந்து மேன்மை அடையச் செய்தல்.
4. இருமொழிப் புலமையை வளர்த்தல்.

**அலகு:1** செய்யுள்

**1. குறுந்தொகை**

1. கொங்கு தேர் வாழ்க்கை அஞ்சிறைத் தும்பி - இறையனார்
2. யாரும் இல்லை தானே கள்வன் - கபிலர்
3. வேம்பின் பைங்காய்என் தோழி தரினே - மிளைக் கந்தன்
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 வழிதி
3. ஆய்மலர் மழைக்கண் தென்பனி 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** செய்யுள்

**4.புறநானூறு**

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

#### 5. பதிற்றுப்பத்து - ஐந்தாம் பத்து

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

#### 6. திருக்குறள்

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

#### அலகு:3

தமிழ் இலக்கிய வரலாறு (துறை வெளியீடு)

சங்ககாலம் - சங்கம் மருவியகாலம்

எட்டுத்தொகை, பத்துப்பாட்டு, பதினெண்கீழ்க்கணக்கு நூல்கள்

#### அலகு:4

#### வாழ்க்கை வரலாறு

அன்னை தெரசா - பா. தீனதயாளன்

#### அலகு:5

பொது- மொழிபெயர்ப்பு

#### பாட நூல்கள்

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

(for the candidates admitted from June 2015 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002**  
**DEPARTMENT OF HINDI**  
**PART – I LANGUAGE HINDI FOR B.A, B.Sc & B.Com**  
**HINDI PAPER-IV FUNCTIONAL HINDI & TRANSLATION**  
**SEMESTER – IV**

**HRS/WEEK: 5**  
**CREDITS : 3**

**CODE: U15HN4HIN04**  
**MARKS : 100**

**UNIT – I** Functional Hindi

**UNIT- II** Adhunic Kaal

**UNIT- III** General Essays

Parishram Ka Mahatva, Anushasan, Paropakar, Jawaharlal Nehru, Deepavalli,  
Bharath Mein Computer

**UNIT- IV** Letter Writing

**UNIT- V** Anuvad Abhyas - III

Books Prescribed :

- |   |   |
|---|---|
| <input type="checkbox"/> General Essays       | - D.B.H.P. Sabha Publishers, Chennai-17 |
| <input type="checkbox"/> Abinava Patra Lekhan | - D.B.H.P. Sabha Publishers, Chennai-17 |
| <input type="checkbox"/> Anuvad Abhyas – III  | - D.B.H.P. Sabha Publishers, Chennai-17 |



**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2**

**DEPARTMENT OF FRENCH**

**SYLLABUS**

**SEMESTER IV**

**PART I - LANGUAGE - FRENCH PAPER IV [LANGUAGE & CULTURE  
(ÉCHO A2 2e édition)]**

(For candidates admitted 2015 onwards)

**MARKS : 100**

**Unit 1 C'est la fête !**

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

**Unit 2 Vous plaisantez !**

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 20<sup>e</sup> siècle – le plaisir de jeux de mots.

**Unit 3 On s'entend bien !**

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 de conversation – sujets d'étonnement.

**Unit 4 À vos risques et périls !**

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.

**Unit 5 La vie est dure**

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

**TEXT BOOKS :**

ECHO A2 – METHODE DE FRANÇAIS & CAHIER PERSONNEL D'APPRENTISSAGE

Authors: J. Girardet and J. Pécheur

Publication: CLÉ INTERNATIONAL, 2013.

(for candidates admitted from June 2016 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2.**  
**II YEAR UG – SEMESTER IV**  
**PART II – ENGLISH 4 - GENERAL ENGLISH IV**

**HOURS : 6**  
**CREDIT : 3**

**CODE : U15EL4GEN04**  
**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 duty from obligation.

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

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

**Writing** paragraphs 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.

**Writing** formal 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.

**Writing** agenda, 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

DEPARTMENT OF BOTANY  
B.Sc. SYLLABUS 2017onwards  
SEMESTER IV

MC 5 - ANATOMY, EMBRYOLOGY AND SEED TECHNOLOGY

Hours 5

Code: U15BO4MCT05

Credits 5

Marks: 100

**Course Objectives:**

This paper highlights the important aspects of plant anatomy, embryology and seed technology. The anatomical features of the root, stem and the leaves are explained. Embryology deals with the developmental stages of the plant. The development of the anther, ovule, male and female gametophytes and embryo are dealt with.

**UNIT – I Plant Anatomy:** 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.

**UNIT – II:** 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).

**UNIT – III Embryology:** 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.

**UNIT – IV:** 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 Ruminant). Structure and development of dicot embryo (*Capsella*) and monocot embryo (*Zea mays*).

**UNIT – V Seed technology:** 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).

**References**

**Text Books:**

1. Esau, K. 1953. Plant Anatomy. John Wiley and Sons, INC, New York, London.
2. Pandey, B. P. 1984. Plant Anatomy. S. Chand and Company Ltd, New Delhi.
3. Maheswari, P. 1950. An introduction to the Embryology of Angiosperms. Vikas Publishing House Pvt. Ltd.

**Reference Books:**

1. Cutter, E. G. 1978. Anatomy part I – The English Language Book Society and Edward Arnolds Ltd. London.
2. Eames, A. J. and Mac Daniels, I. H. 1947. An introduction to plant Anatomy. MC Graw and Hill Book Company, INC., New York, London.
3. Agarwal, S. B. 1972. Embryology of angiosperms. Sahitya Bhavan, Agra.
4. Bhojwani, S. S. and Bhatnagar, S. P. 1978. The Embryology of Angiosperms. Vikas Publishing House Pvt. Ltd,
5. Agrawal, R.L. 1982. Seed technology. Oxford and IBH Publishing CO.
6. Remington John Stewart. 1993. Seed testing. Printwell, Jaipur.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF BOTANY

B.Sc. BOTANY SYLLABUS 2017 onwards

SEMESTER IV

MC 6 – PRACTICAL 2 - CELL BIOLOGY, BIOSTATISTICS, ANATOMY,  
EMBRYOLOGY AND SEED TECHNOLOGY

Hours 5

Code: U16BO4MCP06

Credits 5

Marks:100

**Course Objectives:**

This paper deals with the internal organization of root, stem and types of stomata, study of anther, embryo sac, endosperm, embryo and seed.

**Practical:**

**Unit – I. Cell biology and Biostatistics:** 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:** Identification of stomatal types (Dicot -anomocytic, anisocytic, paracytic and Monocot – Gramineous type) primary and normal secondary structure of Dicot stem (*Vernonia*) and root (*Cicer*), Monocot stem (*Bamboo*) and root (*Canna*).

**UNIT – III** 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** 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*, ruminant – *Psychotria*). Dicot & monocot embryos – slides. Dissection of Dicot embryo (*Tridax*).

**UNIT- V Seed technology:** Seed germination test (paper towel method). Seed viability test (Tetrazolium test). Seed leachate test.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2 DEPARTMENT OF BOTANY**

**B.Sc. BOTANY SYLLABUS 2017 ONWARDS**

**SEMESTER IV**

**AC 5 – PAPER II – BIOPROSPECTING AND PLANT BIOTECHNOLOGY**

**Hours 4**  
**Credits 4**

**Code: U15BO4ACT05**  
**Marks: 100**

**Course Objectives:**

This paper highlights the utilization of plants as food, medicine and cosmetics. It also emphasizes the various biotechnological tools involved in plant biotechnology.

**UNIT – I Bioprospecting:** 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*).

**UNIT – II** 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*.

**UNIT – III** 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.

**UNIT – IV** 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*).

**UNIT – V Plant Biotechnology:** 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.

**References**

**Text Books:**

1. Pandey, B.P. 2007. Economic Botany. S.Chand & Company LTD. New Delhi.
2. Kumaresan, V. 2004. Biotechnology. SARAS Publication
3. Dubey. R. C. 2006. Text book of biotechnology. S. Chand and Company Ltd. New Delhi.

**Reference Books:**

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

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF BOTANY

B.Sc. BOTANY SYLLABUS 2017 ONWARDS

SEMESTER IV

AC 6 - PAPER III– PRACTICAL PAPER - I PLANT DIVERSITY, ANATOMY,  
EMBRYOLOGY, TAXONOMY OF ANGIOSPERM, PLANT PHYSIOLOGY, ECOLOGY,  
BIOPROSPECTING AND PLANT BIOTECHNOLOGY

Hours 4

Code: U15BO4ACP06

Credits 3

Marks: 100

**Course Objectives:**

This paper gives 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.

**UNIT - I Algae and Fungi:** 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:** 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 :**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 :** 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:***Oryza*, *Cajanus*, *Helianthus*, *Saccharum*, *Musa*, *Coffea* and *Gossypium*. Tissue culture techniques -Sterilization, medium preparation, inoculation and micropropagation. SCP – *Spirulina*.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF BOTANY

B.Sc. BOTANY SYLLABUS 2017 ONWARDS

SEMESTER V

MAJOR CORE -7 GENETICS AND PLANT BREEDING

Hours 5  
Credits 4

Code: U15BO5MCT07  
Marks: 100

**Course Objectives:**

This paper imparts knowledge about Mendel's ratios, deviation from Mendel's ratios, blood groups, linkage and crossing over. A knowledge about objectives and conventional methods of plant breeding, role of hybridization, mutation and polyploidy in plant breeding.

**UNIT- I Classical genetics:** 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.

**UNIT – II Gene interaction:** 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.

**UNIT – III Linkage, crossing over and sex determination:** 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).

**UNIT – IV Cytoplasmic inheritance and mutation:** 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.

**UNIT – V Plant breeding:** 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.

**References**

**Text Books:**

1. Verma, P.S. and Agarwal, V.K. 2007. Cell Biology, Genetics, Molecular Biology, Evolution and Ecology. S. Chand & Company Ltd. New Delhi.
2. Gupta, P.K. 2002. Cytology, Genetics and Evolution. Rastogi Publications, Meerut, India.
3. Gupta, P. K. 1996. Genetics. Rastogi publications, Meerut, India.
4. Chaudhuary, H. K. 1982. Introduction to plant breeding. Oxford and IBH Publishing Co., New Delhi.

**Reference Books:**

1. Gardner, F. J. 1972. Principles of Genetics. Wiley Eastern Pvt. Company Ltd., New Delhi.
2. Gupta, P. K. 1974. Cytology, Genetics and Evolution. Rastogi publications, Meerut.
3. Allard. R. W. 1960. Principles of plant breeding. John Wiley and Sons, Inc., New York, London.
4. Sarin, C. 2001. Genetics. Tata McGraw - Hill Publishing Company Limited, New Delhi



**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**  
**DEPARTMENT OF BOTANY**  
**B.Sc. BOTANY SYLLABUS 2017 ONWARDS**  
**SEMESTER V**  
**MAJOR CORE – 8 MORPHOLOGY, TAXONOMY OF ANGIOSPERMS AND**  
**ETHNOBOTANY**

**Hours 5**

**Code: U15BO5MCT08**

**Credits 4**

**Marks: 100**

**Course Objectives:**

This syllabus highlights the importance of ethnobotany. It describes the role of medicinal plants in Indian system of medicine. In addition this paper deals about the morphological variation of the plant parts, the significance of angiosperm taxonomy, botanical nomenclature, a detailed study of range of vegetative and floral characters of different dicot and monocot families and their economic value.

**UNIT – I Morphology:** 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 tendrils – *Gloriosa*. Leaf pitcher - *Nepenthes*. Inflorescence types with examples. Flower – Technical description of flower. Fruit - types with examples.

**UNIT - II Taxonomy of Angiosperms:** 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.

**UNIT - III Systematic position (Bentham and Hooker), diagnostic features (vegetative and floral) and economic importance of the following dicot families:** Annonaceae, Cappariaceae, Sterculiaceae, Brassicaceae, Rutaceae, Anacardiaceae, Leguminosae - (Fabaceae, Caesalpinaceae and Mimosaceae), Cucurbitaceae and Apiaceae.

**UNIT-IV** Rubiaceae, Asteraceae, Asclepiadaceae, Acanthaceae, Lamiaceae, Amaranthaceae, Euphorbiaceae, Orchidaceae, Liliaceae, Musaceae and Poaceae.

**UNIT –V Ethnobotany:** 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.

**References**

**Text Books:**

1. Pandey, S.N. and Misra, S.P. 2008. Taxonomy of Angiosperms. Ane Books, India, New Delhi.
2. Pandey, B. P. 2005. Taxonomy of Angiosperms for University students. S. Chand & Company Ltd. New Delhi.
3. Singh and Jain. 1987. Taxonomy of Angiosperms. Rastogi Publications, Meerut, India.
4. Jain, S.K. 1987. A Manual of Ethnobotany- Scientific publishers , Jodhpur.
5. Jain, S.K. 1981. Glimpses of Indian Ethnobotany- Oxford and IBH Publishing Co., New Delhi.

**Reference Books:**

1. Ganguli, H. G. and Kar, A. K. 1968. College Botany. Vol –I. New Central Book Agency, Calcutta.
2. Lawrence. 1955. An introduction to Plant Taxonomy. Central Book Depot. Allahabad.
3. Paul and Jain 1998. Tribal Medicine – Oxford and IBH Publishing Co., New Delhi.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**

**DEPARTMENT OF BOTANY  
B.Sc. BOTANY SYLLABUS 2017 ONWARDS  
SEMESTER V  
MAJOR CORE – 9 PHARMACOGNOSY**

**Hours 5  
Credits 4**

**Code: U15BO5MCT09  
Marks:100**

**Course Objectives:**

This paper deals with the classification, constituents, Significance of Aroma therapy and uses of crude drugs obtained from various plant parts. It gives description about the indigenous traditional drugs of India namely Amla, Vasaka, Brahmi, Ginger etc. It emphasizes on plant resources as technical products & pharmaceutical aids.

**UNIT – I Pharmacognosy:** 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.

**UNIT – II Drug constituents:** Carbohydrates, glycosides, lipids – fixed oils, volatile oils, resins, gums, alkaloids, tannins and polyphenols.

**UNIT – III Drug adulteration:** Definition and types. Methods of drug evaluation– physical, morphological and microscopical. Preliminary detection of Alkaloids, glycosides and tannins.

**UNIT – IV Indigenous traditional drugs of India:** A study on the distribution, biological source, characters, chemical constituents and medicinal uses of the following: Amla (*Embllica 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*).

**UNIT – V Plant resources as technical products and Pharmaceutical aids.** 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.

**References:**

**Text Books:**

1. Handa, S. S., & Kapoor, V. K. Pharmacognosy. Vallabh Prakashan, New Delhi.
2. Mohammed Ali. Text book of Pharmacognosy. CBS Publishers & Distributers, New Delhi.
3. Roseline, A. 2011. Phamacognosy. MJP Publishers, Chennai.
4. Edwin Jerald, E and Sheeja Edwin Jerald, 2007. Text book of Pharmacognosy and Phytochemistry. CBS Publishers and Distributors Pvt. Ltd.

**Reference Books:**

1. Kokate, C. K., Purohit, A. P. & Gokhale, S. B. 1998. Pharmacognosy. Nirali Prakashan, Pune.
2. Wallis, T. E. Text book of Pharmacognosy. CBS Publishers & Distributers. Jain Bhawan, New Delhi.
3. Hill. A. F., 1996. Economic Botany –Tata Mc Grew –Hill publishing company Limited, New Delhi.

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

B.Sc. BOTANY SYLLABUS 2017 onwards

SEMESTER V

MAJOR CORE 10 - PRACTICAL III

GENETICS, PLANT BREEDING, MORPHOLOGY, TAXONOMY OF ANGIOSPERMS, ETHNOBOTANY AND  
PHARMACOGNOSY

Hours 5  
Credits 4

Code: U17BO5MCP10  
Marks: 100

**Course Objectives:**

This paper includes problems in genetics with examples, practical knowledge on technical description of vegetative and floral parts of the families and basic aspects of pharmacognosy.

**UNIT – I Genetics:** 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:** 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:** 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, Caesalpinaceae, Mimosaceae), Cucurbitaceae,

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

**UNIT – V Ethnobotany and Pharmacognosy** - 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.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**  
**DEPARTMENT OF BOTANY**  
**B.Sc. BOTANY SYLLABUS 2017 ONWARDS**  
**SEMESTER V**  
**MAJOR ELECTIVE 2 – PLANT FOODS**

**Hours 5**  
**Credits 5**

**Code : U15BO5MET02**  
**Marks: 100**

**Course Objectives:**

It emphasizes the various aspects of foods, their nutritive value, preservation, processing of food & the impact of cooking on food. Microbes in food poisoning & food borne diseases are also dealt. A knowledge about food laws, food standard, adulteration & role of National & International agencies for food quality control is also given.

**UNIT – I Food as a source of energy** - 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.

**UNIT – II Food& food products** : 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.

**UNIT – III Food preservation:** 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.

**UNIT – IV Food additives:** 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.

**UNIT – V Food safety:**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.

**References:**

**Text books:**

1. Sumathi, R., Madambi & Rajagopal, M. v. 1997. Fundamentals of foods & 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. 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.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**  
**DEPARTMENT OF BOTANY**  
**B.Sc. BOTANY SYLLABUS 2017ONWARDS**  
**SEMESTER V**  
**MAJOR ELECTIVE –2 HORTICULTURE AND INTEGRATED PEST**  
**MANAGEMENT**

**Hours 5**

**Code: U15BO5MET05**

**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.

**UNIT – I Horticulture:** 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 – II Plant diseases** – 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 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** 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:** 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.

**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. Horsfall, 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**  
**DEPARTMENT OF BOTANY**  
**B.Sc. BOTANY SYLLABUS 2017 ONWARDS**  
**SEMESTER V**  
**NON MAJOR ELECTIVE 1 – FOOD SCIENCE AND TECHNOLOGY**

**Hours 2**  
**Credits 2**

**Code: U15BO5NMT01**  
**Marks: 100**

**Course Objectives:**

This paper highlights the major classes of nutrients and nutritive values of food. Preservation of food and food additives, safety measures and food laws.

**UNIT – I Major classes of food, and their nutrients:** Cereals and products (Rice- carbohydrates), Pulse (red gram - protein), fats and oils (vanaspathi and sunflower oil), fruits and vegetables (vitamins A, C and minerals).

**UNIT – II Types of cooking:** 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.

**UNIT - III Food additives:** 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.

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

**UNIT – V Food processing technology:** Introduction, importance and advantages of food processing. Preparation of jam - mixed fruit jam and pineapple jam. Preparation of squashes - orange squash and grape crush.

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

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**

**DEPARTMENT OF BOTANY**

**SYLLABUS – 2017 onwards**

**SEMESTER III**

**SBE – 4 BIOLOGICAL SKILLS FOR CHEMICAL SCIENCES**

**(LAB FOR PHYSICS STUDENTS)**

**Hours 2**

**Credits 2**

**Code: U17BO5SBP04**

**Marks: 100**

**Course Objectives:**

Students learn the skills of performing experiments, analyzing the results and discussing the observations.

**Unit - I Biological system:**

Observation of different types of animal cells

Observation of different types of animal tissues

Observation of different types of plant tissues of root and stem.

Observation of cell division (mitosis) & chromosomes in onion root tip.

**Unit – II Molecular biology:**

Determination/ Estimation of Haemoglobin in Blood

Measurement of their own blood pressure

Test for presence of sugar in urine/serum

Test for presence of albumin in urine/serum.

**Unit – III Genetics**

Survey of Mendelians Traits

Pedigree analysis

Syndrome and their Karyotypes Analyzing their Blood

Groups.

**Unit – IV Plant tissue culture & Phytochemistry**

Tissue culture techniques- Callus culture & Synthetic seed preparation

Identification and Isolation of Phytoconstituents- Tannins and Polyphenols **Unit – V Food and**

**Nutrition:**

Kitchen gardening- Concept

Nutritional value of vegetables Nutritive values & mass cultivation of SCP- *Spirulina*



**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**  
**DEPARTMENT OF BOTANY**  
**B.Sc. BOTANY SYLLABUS 2017ONWARDS**  
**SEMESTER VI**  
**MAJOR CORE 11 - PLANT PHYSIOLOGY AND BIOCHEMISTRY**

**Hours 6**  
**Credits 5**

**Code: U15BO6MCT11**  
**Marks: 100**

**Course Objectives:**

This paper throws light on the fundamentals of plant physiology and biochemistry. Physiological activities like absorption, transpiration, respiration, photosynthesis, nitrogen metabolism and plant growth regulators have been dealt in detail. In Biochemistry, structure, types, chemistry and significance of various biomolecules are highlighted.

**UNIT – I Physiology:** 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.

**UNIT – II Respiration:** Glycolysis, Krebs's cycle, Electron transport and oxidative Phosphorylation and Pentose phosphate pathway. Photosynthesis: Photosynthetic pigments. Emerson enhancement effect, photochemical reactions- photophosphorylation, dark reactions- C<sub>3</sub>, C<sub>4</sub> fixations and CAM plants. Factors affecting photosynthesis.

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

**UNIT – IV Biochemistry:** 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.

**UNIT – V 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.**

**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, V.K. 1995. Fundamentals of Biochemistry. S. Chand and Company Ltd., New Delhi.
5. Srivastava. 1987. Introduction to biochemistry. Rastogi publications, Meerut, India.

**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 of Biochemistry. Wiley Eastern Ltd., New Delhi.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**

**DEPARTMENT OF BOTANY**

**B.Sc. BOTANY SYLLABUS 2017 ONWARDS**

**SEMESTER VI**

**MAJOR CORE 12 - PLANT TISSUE CULTURE, GENETIC ENGINEERING AND NANOTECHNOGY**

**Hours 6**

**Credits 5**

**Code: U15BO6MCT12**

**Marks: 100**

**Course Objectives:**

It highlights the recent aspects such as plant tissue culture, recombinant DNA technology, use of plasmid DNA in cloning, production of transgenic plants and GMO's and their application in the field of medicine, agriculture and bioremediation. It also focuses the basics of nanotechnology and its application.

**UNIT – I: Plant tissue culture:** 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.

**UNIT–II:** 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.

**UNIT–III:Genetic engineering:** 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.

**UNIT – IV:** Genetically Modified Organisms (GMO's): Production of recombinant enzyme (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.

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

**References**

**Text Books:**

1. Dubey, R. C. 2006. Text book of biotechnology. S. Chand and Company Ltd. New Delhi.
2. Kumaresan, V. Text book of biotechnology. Saras Publications.
3. Joy Deep Dutta and Anil K.Rao, 2008. Introduction to Nanoscience. CRC Press, London.

**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.
4. M. Balakrishna Rao and M.Krishna Reddy, 2007. Nanotechnology and Society. Campus Books International, New Delhi.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**  
**DEPARTMENT OF BOTANY**  
**B.Sc. BOTANY SYLLABUS 2017 onwards**  
**SEMESTER VI**  
**MAJOR CORE -13 PRACTICAL IV**  
**PLANT PHYSIOLOGY, BIOCHEMISTRY, PLANT TISSUE CULTURE, GENETIC**  
**ENGINEERING AND NANOTECHNOLOGY**

**Hours 6**  
**Credits 5**

**Code: U15BO6MCP13**  
**Marks:100**

**Course Objectives:**

To train the students on the preparation of solutions, to carry out the experiments on plant physiology, Biochemistry and plant tissue culture.

**UNIT – I Physiology:** 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** Determination of respiration rate by Ganong's respiroscope. Effect of quality of light on photosynthesis, Rate of photosynthesis under varying concentrations of CO<sub>2</sub>, Effect of intensity of light on O<sub>2</sub> evolution during photosynthesis using Wilmott's bubbler.

**UNIT – III** 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 – IV Biochemistry:** 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:** 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.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**

**DEPARTMENT OF BOTANY**

**B.Sc. BOTANY SYLLABUS 2017 ONWARDS**

**SEMESTER VI**

**MAJOR ELECTIVE 3 – INSTRUMENTATION AND BOTANICAL TECHNIQUES**

**Hours 5**

**Code: U15BO6MET03**

**Credits 5**

**Marks:100**

**Course Objectives:** This paper deals with the botanical techniques, working principles and applications of biological instruments.

**UNIT – I Instrumentation:** 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.

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

**UNIT – III** Chromatography -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.

**UNIT – IV Botanical techniques:** 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.

**UNIT – V Histochemical analysis:** Localization and identification of carbohydrates, proteins and lipids. **Electrophoresis:** Principles and techniques. Separation of DNA – Agarose gel, Protein separation – SDS PAGE.

**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.
2. Avinash U., Kakoli U. and Nirmalendu N. 1998. Biophysical Chemistry. Himalaya Publishing House, Mumbai.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**  
**DEPARTMENT OF BOTANY**  
**B.Sc. BOTANY SYLLABUS 2017 ONWARDS**  
**SEMESTER VI**

**MAJOR ELECTIVE 3 – PLANTS IN HUMAN HEALTH CARE**

**Hours 5**

**Code: U15BO6MET06**

**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.

**UNIT – I Energy value of carbohydrates:** 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:** 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:** Sources (botanical name, family, common 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:** 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:** 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).

**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. Shakuntala 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**  
**DEPARTMENT OF BOTANY**  
**B.Sc. BOTANY SYLLABUS 2017 ONWARDS**  
**SEMESTER VI**  
**NON MAJOR ELECTIVE 2 - HERBAL REMEDIES**

**Hours 2**

**Code: U15BO6NMT02**

**Credit 2**

**Marks:100**

**Course Objectives:**

It deals with the principles of Indian system of medicine. Home remedies for common ailments and body care by natural means are given.

**UNIT I** Introduction and scope. Basic principles of Indian system of medicine. Ayurveda, Siddha and Unani.

**UNIT – II** Herbal home remedies for the common ailments of intestine, mouth affections and respiratory problems.

**UNIT – III** Skin and hair care by natural means. Herbal remedies for uterus problems.

**UNIT – IV** Essentials of herbal gardening. Harvesting, drying and storage of herbs.

**UNIT – V** Herbal preparations – decoctions, tea, infusions, oils and powders.

**Text Books:**

1. Girija Khanna. 1986. Herbal Remedies – Vikas Publishing house Ltd, New Delhi.
2. Karen Phillip, 1994, Everyday Aromatherapy – Brock Hampton press, Italy.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**  
**DEPARTMENT OF BOTANY**  
**B.Sc. BOTANY SYLLABUS 2017 ONWARDS**  
**SEMESTER VI**  
**SBE – 5 TECHNIQUES IN BOTANY**

**Hours 2**  
**Credits 2**

**Code: U15BO6SBP05**  
**Marks:100**

**Course Objectives:**

This paper gives 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.

**Unit - I Preparations of chemical solutions:** Stock solutions: molar, normal, percentage, ppm. Preparation of buffer solutions (Phosphate and acetate).

**Unit – II Micrometry and Histochemistry:** 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:** 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:** Isolation of DNA, separation of DNA (saliva/cauliflower)- Agarose gel electrophoresis.

**Unit – V Biostatistics and Bioinformatics:** Statistical calculation through SPSS. Alignment- Pair-wise, BLAST.

**Book for Study**

1. Gahan P.B. 1984. Plant histochemistry & cytochemistry – An introduction. Academic Press, London.
2. Wilson K. & Walker J. 1994. Practical biochemistry. 4<sup>th</sup> edition, Cambridge University, London.
3. Krishnamurthy, K.V. 1988. Methods in Plant Histochemistry. Viswanathan Publishers, Madras.
4. Ramakrishnan, P. 2003. Biostatistics. Saras Publications, Nagercoil.

**Book for Reference**

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 2015 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2**  
**SEMESTER VI**  
**RESEARCH METHODOLOGY**

**Credits -2**

**Hrs-2/Week**

**Code:U15DS6SBT06**

**General Objective:**

Students get introduced to concept of research and to carryout research projects.

**Unit I Introduction to research:**

Definition - Types – Nature and Scope of Research – Research Design – Plagiarism

**Unit II – Data Collection**

Types – Primary and Secondary data collection – Data processing –Hypothesis Testing

**Unit III – Plan and Execution**

Methodology – Work Plan and Execution – Analysis –Interpretation - Documentation

**Unit IV - Format and Presentation of Project Report** Art of

writing and Structure of Project report – Viva Voce **Unit – V Project**

–

Project Work ( Applying Real Expertise in the Project Work)

**The students will be evaluated internally by a test for 50marks. The Project will be evaluated by an external evaluator and a viva-voce will be conducted for 50marks.The students can carry out their projects individually or in groups.**

**REFERENCES:**

Blaxter,L., Hughes,C. and Tight(1999) How to research? Viva Book private Limited

Kothari,C.R.(2004)research Methodology-Methods and Techniques, New Age International Publishers, India

Lal,B.(2002) Research Methodology, ABD Publishers. India

**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 meaningful life.
- To make the students learn skills of nurturing family and children.
- To make the students aware of emotional intelligence and choose their career.

**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 of Mother

**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 Scudder(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 2015 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 celebration and experience GOD in their day today life.
- To enable the students to become living witnesses to Jesus Christ in their personal, family and social life.

**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 of India.
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, Bombay 1966.

