B.Sc. ZOOLOGY

(SPECIALIZATION IN BIOTECHNOLOGY)

(For students admitted from 2015 onwards)

COURSE PATTERN AND SYLLABUS - CBCS

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2

DEPARTMENT OF ZOOLOGY

CHOICE BASED CREDIT SYSTEM

UG COURSE PATTERN B.Sc. ZOOLOGY (SPECIALIZATION IN BIOTECHNOLOGY)

(FOR STUDENTS ADMITTED IN THE ACADEMIC YEAR 2015 onwards)

Semester	Part	Course	Title of the Paper	Code	Hrs/ Week	Credit	Marks
I	I	Language	Tamil paper I/ Hindi paper I / French paper I	U15TL1TAM01 U15HN1HIN01 U15FR1FRE01	6	3	100
	II	English	English Paper 1	U15EL1GEN01	6	3	100
	III	Major Core 1	Animal Diversity1:Invertebrata	U15ZO1MCT01	7	5	100
	III	Allied-1(Optional)	Basics in Biotechnology	U15ZO1AOT01	4	4	100
	III	Allied-2 (Optional)	Environmental Management	U15ZO1AOT02	4	3	100
	IV	Environmental studies	Environmental studies	U15RE1EST01	2	2	100
	IV	Value Education	Bible/Catechism/Ethics	U15VE2LVE01 U15VE2LVB01 U15VE2LVC01	1	-	-
				Total	**30**	**20**	**600**

Semester	Part	Course	Title of the Paper	Code	Hrs/ Week	Credit	Marks
II	I	Language	Tamil paper II/ Hindi paper II / French paper II	U15TL2TAM02 U15HN2HIN02 U15FR2FRE02	5	3	100
	II	English	English Paper II	U15EL2GEN02	6	3	100
	III	Major Core 2	AnimalDiversity-2: Chordata	U15ZO2MCT02	5	5	100
	III	Major Core 3	Practical-I (Animal Diversity I & II)	U15ZO2MCP03	5	4	100
	III	Allied-3 (Optional)	Basics in Bioinformatics	U15ZO2AOT03	4	3	100
	IV	Skill Based Elective-1	Soft Skill Development	U15RE2SBT01	2	2	100
	IV	Skill Based Elective-2	Rural Enrichment and Sustainable Development	U15RE2SBT02	2	2	100
	IV	Value Education	Bible/Catechism/Ethics	U15VE2LVE01 U15VE2LVB01 U15VE2LVC01	1	1	100
				Total	**30**	**23**	**800**

Semester	Part	Course	Title of the Paper	Code	Hrs/ Week	Credit	Marks
III	I	Language	Tamil paper III/ Hindi paper III/ French paper III	U15TL3TAM03 U15HN3HIN03 U15FR3FRE03	6	3	100
	II	English	English Paper III	U10EL3GEN 03	6	3	100
	III	Major Core 4	Cell & Molecular Biology	U15ZO3MCT04	5	5	100
	III	Major Core 5	Genetics	U15ZO3MCT05	5	5	100
	III	Allied-4 (Compulsory) for Botany students	Biology of Invertebrates and Chordates	U15ZO3ACT04	4	3	100
	IV	Skill Based Elective-3*	Biological Skills for Physical Sciences- (Lab for Physics Students) / Biological Skills for Physical Sciences-Advanced (Theory cum Lab for Physics Students)	U15BZ3SBP03/ U15ZO3SBT03	2	2	100
	IV	Gender Studies	Gender Studies	U15WS3GST01	1	1	100
	IV	Value Education	Bible/Catechism/ Ethics	U12VE4LVE02 U12VE4LVB02 U12VE2LVC02	1		
				Total	**30**	**22**	**700**

***Zoology students will take up SBE - 3 from Physics Department**

Semester	Part	Course	Title of the Paper	Code	Hrs/ Week	Credit	Marks
IV	I	Language	Tamil paper IV/ Hindi paper IV/ French paper IV	U15TL4TAM04 U15HN4HIN04 U15FR4FRE04	5	3	100
	II	English	English Paper IV	U13EL4GEN 04	6	3	100
	III	Major Core-6	Practical-II (Cellbiology, Genetics &Biochemistry)	U15ZO4MCP06	5	5	100
	III	Major Elective- 1	Biochemistry & Biostatistics / Aquaculture	U15ZO4MET01/ U15ZO4MET02	5	5	100
	III	Allied-5 (Compulsory for Botany students)	Zoology and Human Welfare	U15ZO4ACT05	4	4	100
	III	Allied-6 (Compulsory for Botanystudents)	Allied Zoology-Practical	U15ZO4ACP06	4	3	100
	IV	Value Education	Bible/Catechism/Ethics	U12VE4LVE02 U12VE4LVB02 U12VE2LVC02	1	1	100
				Total	**30**	**24**	**700**

Semester	Part	Course	Title of the Paper	Code	Hrs/ Week	Credit	Marks
V	III	Major Core-7	Developmental Biology & Evolution	U15ZO5MCT07	5	5	100
	III	Major Core-8	Fundamentals of Biotechnology	U15ZO5MCT08	5	4	100
	III	Major Core-9	Biological techniques	U15ZO5MCT09	5	4	100
	III	Major Core 10	Practical-III Developmental Biology, Evolution, Microbiology, Biotechnology& Bioinformatics	U15ZO5MCP10	5	4	100
	III	Major Elective-2	Microbiology & Bioinformatics/ Applied Entomology	U15ZO5MET03/ U15ZO5MET04	5	4	100
	III	Non-Major Elective - 1	Ornamental Fish Culture	U15ZO5NMT01	2	2	100
	IV	Skill BasedElective-4*	Biological Skills for chemical Sciences- (Lab for Chemistry students) / Biological Skills for chemical Sciences- Advanced (Lab cum theory for Chemistry students)	U15BZ5SBP04/ U15ZO5 SBT04	2	2	100
	IV	Value Education	Bible/Catechism/Ethics	U13VE6LVE03 U12VE6LVB03 U12VE6LVC03	1	-	
				Total	**30**	**25**	**700**

***Zoology students will take up SBE - 4 from Chemistry Department**

Semester	Part	Course	Title of the Paper	Code	Hrs/ Week	Credit	Marks
VI	III	MajorCore-11	Animal Physiology	U15ZO6MCT11	6	5	100
	III	MajorCore-12	Applied Biotechnology	U15ZO6MCT12	6	5	100
	III	MajorCore-13	Practical-IV Animal Physiology, Environmental Biology & Immunology	U15ZO6MCP13	6	5	100
	III	MajorElective-3	Immunology / Environmental Science	U15ZO6MET05/ U15ZO6MET06	5	5	100
	III	Non Major Elective-2	First Aid and Home Nursing	U15ZO6NMT02	2	2	100
	IV	Skill Based Elective-5	Animal Cell Culture Techniques (Theory cum Lab)	U15ZO6SBT05	2	2	100
	IV	Skill Based Elective-6	Research Methodology (Theory Cum Project)	U15DS6SBT06	2	2	100
	IV	Value Education	Bible/Catechism/Ethics	U13VE6LVE03 U12VE6LVB03 U12VE6LVC03	1		
	V	Extension Activities	RESCAPES-Impact study	U15RE6ETF01		1	100
				Total	**30**	**27**	**800**
				Grand Total	**180**	**141**	**4300**

புனித சிலுவை தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி – 620 002.
தமிழாய்வுத்துறை
இளங்கலை / இளமறிவியல் / இளம்வணிகவியல் / பட்டவகுப்பு
முதலாமாண்டு – முதற்பருவம் - நவம்பர் - 2015-16
தாள் - I

Total Hours : 90 **Code : U15TL1TAM01**
Hrs : 6Hrs /Wk **Marks : 100**
Credit : 3

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 துணைப்புரிதல்.
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 பாடல்கள
4. பட்டுக்கோட்டையார் - செய்யும் தொழிலே தெய்வம்
5. ந. பிச்சமூர்த்தி – 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

SEMESTER I

PART I – LANGUAGE - FRENCH PAPER I [GRAMMAR & CIVILISATION (ÉCHO A1 2e édition)]

(For candidates admitted 2013 onwards)

HRS/WEEK : 6 **CODE : U15FR1FRE01**
CREDIT : 3 **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 1er groupe, des accords, les articles – l'état civil, des personnes et des objets caractéristiques d'un pays – exprimer ses gouts – première approche de la société française.

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 INTERNATIONAL, 2012.

(for candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2.
2015 - 2016
I B.A., B.Sc., B.Com., B.R.Sc., B.C.A., B.B.A.,SEMESTER I
PART II - ENGLISH 1 - GENERAL ENGLISH PAPERI

HOURS – 6 PER WEEK **CREDIT : 3**
CODE : U15EL1GEN01
OBJECTIVES

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

UNIT I - I, ME, MYSELF
Listening for **s**pecific information in instructions and directions
Speaking about oneself, family and friends, likes, dislikes, strengths, weaknesses, profession, talents, emotions, feelings, incidents, reactions, opinions, views, aim, vision.
Reading for comprehension of routine work.
Writing -Paragraph guided
Grammar- Articles, Prepositions, Punctuation
Vocabulary-Meanings, Synonyms, Antonyms
Composition –GuidedCreative writing

TEXTS

Listening	-	*This is the Photograph of me* by Margaret Atwood
Speaking	-	*The Mayonnaise Jar*
Reading	-	*In Prison* by Jawaharlal Nehru (edited)
Writing	-	Othello's soliloquy (extract from Shakespeare's *Othello*)

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

Listening	-	*Night of the Scorpion* by Nissim Ezekiel
Speaking	-	*The Old Folks at Home* by Alphonse Daudet (edited)
Reading	-	*Will you? Daddy* (Extract from Reader's digest)
Writing	-	conversation among King Lear and his daughters professing their love for their father (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

Listening	-	*Snake* by D.H. Lawrence (poem)
Speaking	-	*Floating Fantasy* by Vinu Abraham (Prose)
Reading	-	*Discovery* (ed.) (play)
Writing	-	*A Handful of Dates* by Tayeb Salih (Short story)

UNIT IV - MY CONCERN AND RESPONSIBILITIES
Listening to short speeches and getting main concern- Global comprehension
Speaking Expressing opinions, concerns and responsibilities
Reading To detect one's perspective
Writing Debate and Dialogue
GrammarSentence patterns (5 basic types)
VocabularyAppropriate words in the context ,coinage of new words , use of phrases
Composition-Imaginative writing

TEXTS

Listening	-	*I have a Dream* by Martin Luther King Jr(edited)
Speaking	-	*What I have lived for?* by Bernard Russell
Reading	-	*Three days to see* by Helen Keller(edited)
Writing	-	Quality of Mercy (Portia court scene) (extract from Shakespeare's *The Merchant of Venice*)

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

Listening	-	Profile of a successful personality
Speaking	-	Success story of Indra Krishnamoorthy Nooyi
Reading	-	*The Verger* by Somerset Maugham

Prescribed Book:

English for Communication –PoGo publication Trichy

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B.Sc. ZOOLOGY (Specialization in Biotechnology)
(For the candidates admitted from 2015 onwards)
SEMESTER I
MAJOR CORE: 1- ANIMAL DIVERSITY 1: INVERTEBRATA

Hours/Week: 7 **Code:U15ZO1MCT01**
Credits: 5 **Marks:100**

Objective

Student learns the outline classification of invertebrates. Student classifies Phylum Protozoa, Porifera, Coelenterata, Platyhelminthes, Annelida, Arthropoda, Mollusca, Echinodermata and Hemichordata upto order. Describes their organization with examples of biological importance. Student gets an insight into coral wealth of India and nematode parasites of man. Student identifies local fauna and local mosquitospecies.

UNIT I Protozoa to Coelenterata

Concepts, Methods of grouping, Methods and Significance of Taxonomy
Phylum: Protozoa, Type study : Paramecium
Phylum: Porifera, Type study : Sponge
Phylum: Coelenterata, Type study : Obelia
Coral Wealth of India

UNIT II Platyhelminthes to Annelida

Phylum: Platyhelminthes, Type study : Tape worm
Phylum: Aschelminthes, Type study : Ascaris
Nematode Parasites of Man – Enterobius, Ancylostoma,Wuchereria, Dracunculus.
Phylum: Annelida, Type study : Leech

UNIT III Arthropoda

Phylum: Arthropoda- Classification of Phylum up to Classes
Class- Insecta –Classification up to Orders, Type study : Cockroach

UNIT IV Mollusca and Echinodermata

Phylum: Mollusca, Type study:Pila
Phylum: Echinodermata, Type study : Starfish

UNIT V Hemichordata and Phylogeny of Invertebrata

Phylum: Hemichordata, Typestudy:Balanoglossus. Phylogeny of Invertebrata, Levels of organization.

Note: General and Distinguishing characters of classes. An outline classification upto orders and study of the representative types. Applicable to all 5 units.

Text Book:

Ekambaranatha Ayyar.M and Ananthakrishnan.T.N. (1994). Manual of Zoology Vol.I. Part –I S. Viswanathan Pvt. Ltd. Madras.
Shipley, A. E. (2013). *Zoology of the Invertebrata: A Text-Book; For Students*. London: Forgotten Books. (Original work published 1929)

Reference Books:

Agarwal, V.K. (2000) Invertebrate Zoology . S. Chand & Co. New Delhi

Agarwal, V.K. and Gupta U. (2004) Animal Taxonomy. S. Chand & Co. New Delhi
Jordan,E.L.andVerma,P.S.(2009) Invertebrate Zoology S. 14Th Edition Chand & Co. New Delhi
Kotpal,R.L.(2011).Modern Text Book of Zoology, Invertebrates Animal Diversity –I,10th edition. Rastogi Publications
Mukerji, D (1977) Textbook of Zoology Vol I & II The New book stall, Calcutta.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
DEPARTMENT OF ZOOLOGY
(For candidates admitted from 2015 onwards)
SEMESTER I
ALLIED: 1 (Optional) – BASICS IN BIOTECHNOLOGY

Credits:4 **Code:U15ZO1AOT01**
Hours/Week:4 **Marks:100**

Objective
Students learns about the scope of biotechnology, biotechnology as an interdisciplinary pursuit, classifies prokaryotes and eukaryotes, structure of DNA, RNA, and proteins, techniques of genetic engineering and its importance in medicine, waste water treatment, plant and animal tissueculture.

UNIT I - Basics and Scope of Biotechnology

Scope of biotechnology- biotechnology as an interdisciplinary pursuit- Outline structure of prokaryotic and eukaryotic cell. Brief account of structure, synthesis and functions of DNA, RNA andproteins.

UNIT II - Methods in Biotechnology
Restriction enzymes, vectors (plasmid and bacteriophage) - Recombinant DNA technology: Isolation of DNA, linking of DNA, gene transfer technique, selection and screening of recombinant clones - genomic and cDNAlibrary.

UNIT III - Medical biotechnology -
Production of recombinant insulin and HBV vaccine. Monoclonal antibodies and their uses. Stem cell research. Gene therapy - protocol - ADA as an example.

UNIT IV - Plant Biotechnology
Plant tissue culture and transgenic plants. Biopesticides and Biofertilizers. Production of penicillin and single cell protein(SCP).

UNIT V - Environmental and AnimalBiotechnology
Sewage treatment. Superbug and oil degradation.Biofuels,biosensors, biochip. Animal cloning, Transgenic fish and livestock ,biopharming.

TEXT BOOK:

R. C. Dubey and D. K. Maheswari (1994) Text book of Biotechnology, Chand and Co. New Delhi.

REFERENCE BOOKS:
Gupta, P.K. (2004) Elements of Biotechnology, Rastogi Publication, Meerut.

Irfan Ali Khan and Athiya Khanum (2004) Fundamentals of Molecular biology, Genetic engineering and Biotechnology, Ukaaz Publication, Hyderabad

Old R.W. and Primrose. S.B. (1989) Principles of Gene Manipulations, Blackwell Scientific Publications.

Primrose. S.B. and R.M. Twyman (2006) Principles of Gene Manipulation and Genomics Blackwell Publishing, UK.

Satyanarayana (2006) Biotechnology, Books and Allied (P) Ltd., Lolkata.

Smith John.E. (1988) Biotechnology, Edward Arnold, London.

Walker, J.M. and Gingold, E.D. (Eds) (2012) Molecular Biology and Biotechnology, Panima Educational Book Agency. New Delhi

Watson, J.D., Michael G., Tam Witkowski and Mark Zollew (1999) Recombinant DNA, Scientific American Books, New Delhi

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
DEPARTMENT OF ZOOLOGY
(For candidates admitted from 2015 onwards)
SEMESTER I
ALLIED: 2 (Optional) - ENVIRONMENTAL MANAGEMENT

Hours/Week: 4 **Code:U15ZO1AOT02**
Credits:3 **Marks:100**

OBJECTIVE

The students learn about the global ecosystem, man‟s manipulation on environment, pollution, deforestation, sustainable environmental management, Ecotourism and biodiversity

UNIT I

Scope of environmental management

Global ecosystem and its components- Man‟s manipulation of environment and its impact on ecological balance Measures for sustainable environmental management-Abiotic factors- water; oxygen; carbon di oxide; temperature; light-photoperiodism; soil – types andprofile.

UNIT II

Community and Population

Ecological succession-concept, process, concept of climax community.
Animal Population: Concept, attributes-density, natality, mortality, growth form, fluctuations, equilibrium, self regulation.
World human population- industrialization, Urbanization and environmental Degradation, Biomagnification, Pest outbreak- IPM.

UNITIII

Pollution

Radiation pollution episodes: Hiroshima-Nagasaki, Chernobyl
Water Pollution : Effects, Minamata episode, Gulf war 1990, Bombay high oil slick 1993, Anaerobic and aerobic treatment of sewage water- sewageas resource-WHO standard for drinkingwater.
Air Pollution – acid rain, Stone leprosy and Taj Mahal, Bhopal Tragedy smog, global warming, ozone depletion and ecological disturbance-emission standards and control measures.

UNIT IV

Biodiversity and Conservation

Deforestation – causes, impact and management
Eco-tourism – India as a mega diversity nation – hot spots of biodiversity –

threats to biodiversity – endangered species of India and conservation measures.

UNIT V

Disaster Management and Environmental Economics

Earth quakes, floods and cyclones- Causes, magnitude, predictionsandcontrol measures.
International Environmental Organization andConventions
Environmental Economics – Environmental Auditing.
Environmental Acts of India.

TEXT BOOK:

Odum, E.P.(1971). Fundamentals of Ecology. W.B. Saunders Company, Phil. London.

REFERENCE BOOKS:

Agarwal, K.C. (2001). Environmental Biology, Nidi Publication Ltd. Bikaner.
Chairas, D.D. (1985). Environmental Science. The Benjamin Cummings Publishing company., Inc.
Clarke George, L. (1954). Elements of Ecology. Hohn Wiley and SONS, Inc.
Hodges, L. (1977). Environmental Pollution, II Edition. Holt, Rinehart and Winston, New York.
Krebs, C.J. (2001).Ecology.VI Edition.Benjamin Cummings.
Nebel, B.J. and Wright, R.T.(1996). Environmental Science, Prentice Hall, New Jersey
Odum, E.P.(2008) Fundamentals of Ecology.Indian Edition. Brooks / Cole.
Sharma, B.K. and Kaur (1997). Environmental Chemistry. Goel Publishing House, Meerut.
Sharma, B.K. and Kaur, (1997). An Introduction to Environmental Pollution. Goel Publishing House, Meerut.
Sinhe, A.K. Boojh, R. and Vishwanathan, P. N. (1989). Water Pollution Conservation and Management, Gyansdaya Prakashan,Nainital.

(For candidates admitted from 2015 onwards)
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 chain sand 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. The Benjamin Cummings Publishing company.,Inc.

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

Hodges,L. (1977). Environmental Pollution, II Edition. Holt, Rinehart and Winston, New York.

Krebs,C.J.(2001). Ecology.VI Edition. Benjamin Cummings.

புனித சிலுவை தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி – 620 002.

தமிழாய்வுத்துறை

இளங்கலை / இளம் அறிவியல் / இளம் வணிகவியல் பட்ட வகுப்பு

முதலாமாண்டு – இரண்டாம் பருவம் - ஏப்ரல் - 2015 - 2016

தாள் - II

Total Hours : 75 **Code : U15TL2TAM02**
Hrs : 5Hrs /Wk **Marks : 100**
Credit : 3

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:1 செய்யுள்

1. தேவாரம் - சுந்தரர் (திருமழப்பாடி)
2. திருவாசகம் - மாணிக்கவாசகர் (குயில் பத்து)
3. திருமந்திரம் - திருமூலர்
4. திருப்பாவை - ஆண்டாள்

5. நாலாயிர திவ்வியபிரபந்தம் - குலசேகராழ்வார் (பெருமாள் திருமொழி)

அலகு:2 செய்யுள்

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 **CODE: U15HN2HIN02**
CREDITS : 3 **MARKS : 100**

UNIT – I : Bharat matha, Premchand, Taj mahal ki Aathma Kahani, Mahakavi Prasadh, Meri theertha 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 :

- Naveen Gadhya Chayanika – D.B.H.P. Sabha Publishers, Chennai-17
- Sathyameva Jayathe – D.B.H.P. Sabha Publishers, Chennai-17
- General Grammar – D.B.H.P. Sabha Publishers, Chennai-17

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2

DEPARTMENT OF FRENCH

SEMESTER II

PART I - LANGUAGE - FRENCH PAPER II [GRAMMAR, CIVILISATION & TRANSLATION (ÉCHO A1 2e édition)]

(For candidates admitted 2013 onwards)

HRS/WEEK : 5 **CODE : U15FR2FRE02**

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, 2012.

(for candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2.
2015 - 2016
I B.A., B.Sc., B.Com., B.R.Sc., B.C.A., B.B.A.,SEMESTER II
PART II – ENGLISH II - GENERAL ENGLISH PAPER II

HOURS – 6 PER WEEK **CREDIT : 3**
CODE : U15EL2GEN02

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. *When I have fears* by John Keats (poem)
2. *Key to courage* by I.A.R. Wylie (prose)
3. *The Far and the Near* by Thomas Wolfe (Short Story)

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. *My early days* (An extract from *Wings of fire* by A.P.J. Abdul Kalam (prose)
2. *The robe of peace* by O. Henry (Short Story)
3. An extract from *Androcles and the lion* by G.B. Shaw (play)
4. *Give me the strength* by Tagore's *Gitanjali* (poem)

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. *The Ballad of father Gilligan* by Alexander Pope (poem)
2. *Six thinking hats* by Edward de Bono (prose)
3. *A cup of tea* by Katherin Mansfield (Short Story)
4. 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. *The flower* by Tennyson (poem)
2. *How to avoid argument* by Sam Horn (prose)
3. *The child is father of man* by Wordsworth (poem)
4. An extract from *Pygmalion* by G.B. Shaw

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. *The Garden* by Dom Moraes (poem)
2. *On saying please* by A.G. Gardiner (prose)
3. *One good turn* by A.E.M. Bayliss (play)

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HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
I B.Sc. ZOOLOGY (Specialization in Biotechnology)
SEMESTER II
(For candidates admitted from 2015 onwards)
MAJOR CORE: 2 - ANIMAL DIVERSITY- 2: CHORDATA

Hours/Week: 5 **Code :U15ZO2MCT02**
Credits: 5 **Marks:100**

Objective

Student learns the geological time scale, origin of chordates, and classification of vertebrates up to order giving their organization with examples of biological interest. They also identify a few locally available fishes of aqua cultural importance.

UNIT I

Origin of Chordates and classification of Prochordates

Geological time scale, Origin of chordates, Vertebrate relationships and basic structure.
Type study: Amphioxus
Prochordates- Classification, characters and relationship.

UNIT II

Pisces

General characters and outline classification upto orders with suitable examples of biological interest.
Type study: Shark
Identification and study of a few locally available fishes and fishes of aquaculture importance (Lab Cum theory).

UNIT III

Amphibia and Reptilia

General characters and outline classification up to orders with suitable examples of biological interest.
Type study: Frog and Calotes
Identification and study of a few Poisonous and non-poisonous snakes.

UNIT IV

Aves

General characters and outline classification up to orders with suitable examples of biological interest.
Type study: Pigeon
Arachaeopteryx, Significance of Arachaeopteryx, Flightless birds.

UNIT V

Mammalia

General characters and outline classification up to orders with suitable examples of biological interest.
Prototheria, Metatheria and Eutheria
Type study: Rabbit

TEXT BOOK

Kotpal , R.L. (2001)Modern Textbook of Zoology Chordates. Rastogi publications, Meerut.

Miller, A.S. and John P. Harvley, (1996). Zoology. 2nd Edition. Wm. C.Brown Publishers.

Ekambaranatha Ayyar, M. and Anantha Kriashnan, T. N. (1994). A Manual of Zoology Part II. (Chordata). S.Viswanathan Pvt.Ltd.

REFERENCE BOOKS:

Arnold, G. Kluge, (1971) Chordate structure and function. 2nd Edition. Macmillan.

Harvey, P.F., Christine, M.J., John,B.H 2006 Vertebrate Life, 6th edition. Pearson Education Pvt.Ltd

Jordan,E.L.andVerma,P.S.(2008) Chordate Zoology S. 14Th Edition Chand &Co.New Delhi

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2

I B.Sc. ZOOLOGY (Specialization in Biotechnology)

(For candidates admitted from 2015 onwards)

SEMESTER II

MAJOR CORE 3: PRACTICAL I -
ANIMAL DIVERSITY I & II

Hours/Week: 5 **Code:U15ZO2MCP03**
Credit: 4 **Marks:100**

Objective: Student learns the mounting of cockroach mouth parts, earthworm bodysetae and shark placoid scales. Virtual lab study of Earthworm, Cockroach andFrog digestive, nervous and reproductive system. They also learn the classification and Biological importance of few selected animals.

1. Cockroach, House fly, Head Louse and Mosquito– Mount and labelling of Mouth parts. Cockroach – Flag labelling of Digestive system, Nervous system and Reproductivesystem.
2. Earthworm- Nervous system, Reproductive system using virtual class study and Mountingof Bodysetae.
3. Shark – Mounting of Placoidscales
4. Frog- Digestive system, Circulatory system (Arterial and Venous system), Urinogenitalsystem using virtual class study. Nervous system – Flag labelling of Brain V, VII, IX and X cranial nerves and I spinal nervestudy.
5. Spotters: Animal Diversity I andII
   Identification of prepared slides and specimens of Biological importance.

A Record of the work done is to be submitted at the time of examination

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
DEPARTMENT OF ZOOLOGY
(For the candidates admitted from 2015onwards)
SEMESTER –II
ALLIED: 3 (Optional)– BASICS IN BIOINFORMATICS

Hours/Week:4 **Code:U15ZO2AOT03**
Credits:3 **Marks:100**

OBJECTIVE
Students understands the biomolecular structures, web browsing, structural data base (Protein and nucleic acids), molecular modeling database, Protein information sources, genomic information sources, sequence alignment, phylogeneticanalysis.

UNIT I
Basics and Scope
Bioinformatics- Definition, Scope. Biomolecular Structure (Primary, secondary, tertiary and quarternary) – Proteins and Nucleic acids.

UNIT II
Data bases

Web Browsing – Structural Data bases- Introduction, primary data base, protein data bank (PDB) - Nucleic acid structural data base (NDB) - Secondary or derived data base- Molecular modeling data base (MMDB).

UNIT III
Proteomics
Protein information resources (PIR) - Martinsried Institute for protein sequences (MIPS) – Swiss- Prot - Translated EMBL (TrEMBL) - Composite pattern Database- Structural classification of proteins (SCOP), ORF Prediction.

UNIT IV
Genomics

Genome Information Resource – European Molecular Biology Laboratories (EMBL) - DNA Data Bank Japan (DDBJ) - Gen Bank.

UNIT V
Sequence Alignment and Phylogenetic Analysis
Sequence Alignment- Multiple sequence alignment – Software used in sequence alignment. Phylogenetic analysis.

TEXT BOOK
Arthur, M.L. (2007). Introduction to Bioinformatics. Oxford Uni . Press, USA.

REFERENCE BOOKS
Irfan Ali Khan and Atiya Khanum. (2003). Fundamentals of Bioinformatics. Ukaaz Publications Hyderabad, AP, India.

Jonathan , P.(2009). Bioinformatics and Functional genomics, 2nd edition. Sinauer Associates,Inc.
Lovric, J. (2011). Introducing Proteomics: From concepts to sample separation, mass spectrometry and data analysis . Wiley.
Murthy, C. S. V. (2003). Bioinformatics. Himalaya Publishing House. Mumbai, Delhi, Nagpur. Bangalore, Hyderabad, India.
Subramanian, C. (2004). A Textbook of Bioinformatics**.** Dominant Publishers and Distributors. New Delhi, India.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI
B. A/ B. Sc./ B. Com/ B. R. SC/ B. C. A/ B. B. A
(For the candidates admitted from 2015onwards)
SEMESTER- II
SKILL – BASED ELECTIVE - 1: SOFT SKILL DEVELOPMENT

Hours/Week: 2 **Code: U15RE2SBT01**
Credits:2 **Marks:100**

OBJECTIVE:

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

UNIT I
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.

UNIT II
Interpersonal skills
Trust-trustworthiness-interpersonal communication –art of listening, reading and writing –art of writing,e-mails and e-mail etiquettes –building relationship-networking.

UNIT III
Corporate skills
Vision, mission and goals: Concepts, vision setting, goal setting- goals for roles. Group goal –concept of synergy – team building – group skills.
UNIT IV
Management skills
Developing Body Language – Practicing etiquette and mannerism –Stress Management –
Time Management: Important and urgent activities- time management to move towards life vision.

UNIT: V
Employability Skills
Writing Resume / CV –interview skills – Group Discussion –Mock Interview – Mock GD –Career Planning.

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

Reference Books:
Francis Thamburaj S.J. (2009). Communication soft skills for Professional Excellence, 1st Ed., Grace Publishers,
Rathan Reddy B.(2005). Team Development and Leadership,Jaico Publishing House, Mumbai.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI
B.A./B.Sc./ B. Com./ BCA
(For the candidates admitted from 2015onwards)
Semester II
SKILL-BASED ELECTIVE -2: RURAL ENRICHMENTAND SUSTAINABLE DEVELOPMENT

Hrs/Week:2 **Code:U15RE2SBT02**
Credit: 2 **Marks:100**

Unit I
Green revolution and industrialization-caused climatic changes and mismanagement of natural resources: effects of over exploitation of land and water, Monoculture practices, use of hybrid and genetically modified (GM) seeds, dumping of chemical fertilizers and pesticides - reduced economic returns from agriculture – resultant social issues- poverty-farmer suicide.

Unit II
Sustainable Development: Concept – environmental, social and economic aspects of sustainable development- Sustainable development as solution to address rural issues- successful case studies from India.

Unit III
Elements in sustainable development I: Water shed management- rain water harvesting, de-silting, bunds construction, check dams, managing rain water drainage canals
Alternate agricultural models –agro-forestry

Unit IV
Elements in sustainable development II: Addressing agricultural issues – biofertilizer- Azolla culture, vermicomposting, biopesticides- panchakavya, muligai puchiviratti, amrithakarasal
Addressing health and sanitation issues – health, nutrition, vaccination

Unit V
Survey of natural resources and resource mapping in villages, Village Level Participatory Approach (VLPA) – Role of SHGs and NGOs.
Introduction to disaster Management (fire and flood)

(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 COURSE LIFE ORIENTED EDUCATION ETHICS – I: RELIGION AND VALUE SYSTEMS

HRS / WK :1 **CODE: U15VE2LVE01**
CREDITS :1 **MARKS : 100**

OBJECTIVES:

- To Understand My and Other Religions and Culture
- To Appreciate My and Other Religions and Culture
- To Learn from other Religions and Culture
- To Interact with My and Other 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 – concept of faith, Faith, Meaning, Definition, Nature, Characteristics and Basic values of different religions. Impact of Globalization on religion – Importance of worship in holy places – celebration, 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's Faith, 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 concept 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.
5. 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: U15VE2LVB01**
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-
- Messiah Prophecies(Isaiah 9:6,40:3,53:1-12,61:1-3,Micah 5:2)
- The Birth and Ministry of John the Baptist (Luke 1:1-80,Mat 3:1-17,14:1-12)
- The Birth, Passion 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,John 2:1-12)
- Parables (Luke 6:46-49,8:4-15,10:25-37,15:1-32)
- Preaching
  - Sermon on the mount (Mat 5-7)
  - 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,Mark 14:32-42)
- Rich and Poor (Luke 16: 19-31,21:1-4)
- Women Liberation (John 4:1-30,8:1-4)
- Women in the New Testament
- Martha & Maria (Luke 10: 38- 42, John 11: 1-46)

UNIT – III: CHURCH – BIRTH AND GROWTH

- Early Church
- Birth (Acts 2:1-41)
- Unity and sharing (Acts 2:42-47,4:1-37,5:1-11)
- 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)
- Betrayal and the change in the life of St.Peter (Luke 22:1-7,Acts 2:1-41,12:1-17)
- St.Andrew (Mat 4:18-20,John 1:35-42,6:1-14)
- St.Stephen (Acts 6,7)
- St.Paul (Acts 8,9,14,17,26 and 28)

UNIT – V: MISSIONARIES AND EVANGELISTS

- St.Thomas (John 20:24-31) & Missionary to India\Pandithar Rama Bai
- William Carrie
- Dr.Ida Scuddar& St. Britto (Oriyur)
- Amy Carcheal
- Mother Teresa (Calcutta)
- Devasagayam (Nagercoil)
- Staines & Family

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-DEGEE 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. VaalvinValizha – St. John's Gospel – Fr. Eronimus

புனித சிலுவை தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி – 620 002.
தமிழாய்வுத்துறை
இளம் வணிகவியல் / இளங்கலை / இளம் அறிவியல் பட்ட வகுப்பு
இரண்டாம் ஆண்டு - மூன்றாம் பருவம் - நவம்பர் -2015 -2016
தாள் - III

Total Hours : 90 **Code : U15TL3TAM03**
Hrs : 6Hrs /Wk **Marks : 100**
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 - ஒட்டகை 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

(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-III POETRY, PREDICS, HISTORY OF HINDI LITERATURE

SEMESTER – III

HRS/WEEK : 6 **CODE: U15HN3HIN03**

CREDITS : 3 **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

SEMESTER III

PART I - LANGUAGE - FRENCH PAPER III [LANGUAGE & CIVILISATION (ÉCHO A2 2e édition)]

(For candidates admitted 2013 onwards)

HRS/WEEK : 6 **CODE : U15FR3FRE03**
CREDIT : 3 **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 – le travail en France.

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 vie politique - l'organisation administrative et politique de la France.

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, 2010

(for candidates admitted from 2014 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2.
2015 - 2016
I B.A., B.Sc., B.Com., B.R.Sc., B.C.A., B.B.A.,SEMESTER III
PART II – ENGLISH III - GENERAL ENGLISH PAPER III
HOURS – 6 PER WEEK **CREDIT : 3**
CODE :U10EL3GEN03

OBJECTIVES

To reinforce the LSRW skills of students.
To enhance their study skills and literary skills through a selection of prose extracts.
To develop soft skills such as presentation and group discussion skills.
To strengthen sub skills including vocabulary, grammar, comprehension, argumentative and imaginative writing

UNIT I
A Little Bit of What You Fancy :*Desmond Morris*

UNIT II
The Avenger :*Anton Chekov*

UNIT III
Know When to Say 'It's None of Your Business': *Mark McCormack*

UNIT IV
The Second Crucifixion: *Larry Collins and Dominique Lapierre*

UNIT V
General Essay – 5 topics given
Idioms and Phrases - 20 Idioms and phrases given

BOOKS FOR REFERENCE

Anand, Renu .,& Rajeevan, Geetha. *Images of Life:An Anthology of Prose*. New Delhi: Foundation Books, 2007. Print.

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List of Idioms and Phrases:

1. To tuck in
2. In tune with
3. To frown upon
4. In favour of
5. In vogue
6. To gloat at
7. On the contrary
8. Prompted by
9. To pale to nothing

10. To wax enthusiastic
11. To figure one out
12. Crystal clear
13. Grey area
14. To have second thoughts
15. On red alert
16. On a fool's errand
17. To be taken aback
18. To storm
19. Trouble spots
20. Flood of humanity

GENERAL ESSAY TOPICS

1. Women are not as intelligent as men.
2. The use of the internet and the computer.
3. Life in the next decade.
4. The ways of using the cell phone to minimize health hazards.
5. How will you save the planet?

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HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2
B.Sc. ZOOLOGY (Specialization in Biotechnology)
For Students Admitted from 2015 onwards)
SEMESTER III
MAJOR CORE: 4- CELL AND MOLECULAR BIOLOGY

Hours/Week: 5 **Code:U15ZO3MCT04**
Credits:5 **Marks:100**

OBJECTIVE
Student learns the ultra structural details and functions of cellular organelles such as cell membrane, lysosomes, mitochondria, ribosome, endoplasmic reticulum, Golgi complex, centrosome, nucleus and chromosomes. They also learn the cell division – mitosis and meiosis. Student also learns the structure and replications of DNA, transcription, post transcriptional modification, structure and functions of RNAs, translation and post translational modification.

UNIT I
Plasma Membrane: Ultrastructure -Unit membrane and Fluid mosaic models; Modifications; Permeability Functions- Passive, Facilitated, Active, Exo and Endocytosis; Introduction to signal transduction.
Mitochondria: Ultra structure – chemistry and functions.
Lysosome: Polymorphic forms, Cytochemistry – Functions.

UNIT II
Ribosomes: Structure – Composition and Assembly - Functions.
Endoplasmic Reticulum: Ultra structure - Types – Protein trafficking- Other functions.
Golgi Complex: Ultra structure - Role in cell secretion
Centrosome : Ultra structure and Functions.

UNIT III
Chromosomes: Organization - Chemistry- Functions.
Giant Chromosomes – Polytene and Lampbrush – Organization and functions.
Nucleus: Ultrastructural Organization – Functions.
Cell division: **Mitosis -** Stages- Spindle mechanics- mitotic inhibitors, **Meiosis** – Stages – Significance.

UNIT IV
DNA Structure and Replication: DNA – double helix – Watson and Crick model, DNA replication and semi-conservative method. Central dogma of molecular biology.
Transcription: Eukaryotic transcription, RNA polymerase-types, transcription factors, reverse transcription, transcription regulators.
Post-transcriptional modification: Processing of mRNA-capping, polyadenylation , splicing –introns and exons.

UNIT V
Structure and functions - mRNA, tRNA and rRNA.
Translation: Genetic code and its characteristics, Protein synthesis– initiation, elongation, termination in eukaryotes.
Post-translational modifications: Polypeptide to functional proteins (Glycosylation and, Phosphorylation)

TEXT BOOK:

Agarwal**,** V.K., (2000). Molecular Biology, S. Chand and Company Ltd., New Delhi
Verma P.S. & Agarwal V.K. (1998). Cell Biology, S.Chand and Company Ltd, New Delhi.

REFERENCE BOOKS:

Alberts B., Bray D., Lewis J., Raff M., Roberts K. & Watson J. (1994). Molecular Biology of the Cell , 3rd Edn, Garland Publishing Inc, New York & London.
Darnell, J., Lodish,H., and Baltimore, D. (1986) .Molecular Cell Biology. Scientific American Book Inc., USA.
De Robertis E.D.P. & De Robertis E.M.F. (1995).Cell and Molecular Biology, 8th Edition, Saunders College, PA.
Freifelder, D (1990) .Molecular Biology, Narosa Publishing House, New Delhi
Sheeler P. & Bianchi D.E. (1987) .Cell and Molecular Biology, III Edition, John Wiley & Sons.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPALLI-2
B.Sc. ZOOLOGY (With Specialization in Biotechnology)
(For the candidates admitted from 2015 onwards)
SEMESTER III
MAJOR CORE: 5- GENETICS

Hours/Week: 5 **CODE:U15ZO3MCT05**
Credits:5 **Marks:100**

OBJECTIVE

This course exposes the students to various concepts in Genetics viz. Mendelism, Multiple alleles, Linkage, Crossing over, Sex linkage, Polygenes and Cytoplasmic inheritance. The student studies some aspects of Human genetics like Genetic counseling, Syndromes and certain Genetic disorders. The student learns the mechanism of Sex determination, Mutation, Bacterial recombination, Control of gene expression and cancer genetics.

UNIT I

Mendelian traits in human-Pedigree charts.
Multiple alleles: Blood group inheritance-ABO, Rh-applications.
Linkage: Morgan‟s experiment.
Crossing over: Kinds, theories& cytological basis.
Gene map: Determination of map distance and gene order.
Polygenic inheritance – Skin colour in man.

UNIT II

Sex determination in animals.
Sex determination in man-sex determining genes - Lyon hypothesis.
Non-disjunction – types – gynandromorphism - origin.
Sex linked inheritance : X linked genes in man - colour blindness and haemophilia-
Y linked genes.
Sex limited genes and sex influenced genes.
Cytoplasmic inheritance: Kappa particles in *Paramecium* and shell coiling in *Limnaea*.

UNIT III

Introduction to gene function-Metabolic disorders associated with phenylalanine metabolism.
Thalassemia and Sickle cell anemia.
Genetic counselling: Prenatal diagnosis: Ultrasound scanning-amniocentesis-chorionic villus sampling - AFP test-management of genetic disorders.

UNIT IV

Mutation: Types, major molecular mechanisms; mutagens-radiation and chemical.
Mutation detection-ClB method.
Variation in chromosomes: Structural-deletion, duplication, inversion and translocation.

Numerical-aneuploidy-types, syndromes in man - Down, Turner and Klinefelter-polyploidy-types.
Population genetics: Hardy-Weinberg law and equilibrium and calculation of gene frequency for recessive alleles.

UNIT V

Recombination in bacteria: Transfer of genetic material-conjugation-F+,F- and Hfr strains, transformation, transduction andsexduction.

Operon model for transcriptional regulation in prokaryotes-lac operon in E.coli - promoter, operator, regulator, repressor, inducible and repressible operon.

Cancer genetics - oncogenes -activation of proto-oncogenes-anti oncogenes.

TEXT BOOK:

Verma,P.S. and Agarwal, V.K. (1988) Genetics. S.Chand & Company Ltd, New Delhi.

REFERENCE BOOKS:

Alice Marcus (2009) Genetics, MJP Publishers, Chennai.

Bhatnagar, Kothari & Mehta (1986) Essentials of human Genetics, Orient Longman Ltd.

Griffiths,A.J.F.(1993) An introduction to genetic analysis. Freeman company,NewYork.

Ricki, L (1994) Human genetics. WLBPublishers.

Robert H. Tamarin (2002). Principle of Genetics.McGraw Hill Publishers

Ursula Goodenough (1985) Genetics, Holt Reinhart and Winstan,NewYork.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-2
DEPARTMENT OF ZOOLOGY
(For the candidates admitted from 2015 onwards)
SEMESTER III
ALLIED ZOOLOGY: 4 (Compulsory for Botany students)
BIOLOGY OF INVERTEBRATES AND CHORDATES

Hours/Week: 4 **Code:U15ZO3ACT04**
Credits:3 **Marks:100**

OBJECTIVE
Students learn about the level of organization and general characters of various phyla of Invertebrates with examples. They also learn the general features of Pisces, Amphibia, Reptilia, Aves and Mammalia with examples.

BIOLOGY OF INVERTEBRATES

UNIT 1
General characters and levels of organization
*1.*Protozoa: Acellular organization- distinguishing features, detailed study of the structure and life history of*Plasmodium*
2.Coelenterata: Tissue grade of organization-Organization and life history of*Aurelia*.

UNIT II
Organ system level of organization.
Detailed study of the structure and life history of representative types of the following phyla.
1.Platyhelminthes: *Fasciola hepatica*
2 Annelida-Hirudinaria.

UNIT III
Detailed study of salient features and all the systems of the following type
1.Arthropoda-*Penaeus*
2. Mollusca-*Pila*
3. Echinodermata-*Asterias*

BIOLOGY OF CHORDATES

UNIT IV
Salient features of prochordates
Vertebrata : General features and type study of the following (excluding skeletal system)
Reptilia - Calotes

UNIT V
General features and type study of thefollowing
1.Aves– Pigeon 2.Mammalia –Rabbit

TEXT BOOK:
Ekambaranatha Iyer, M. & Ananthakrishnan, T.N.(1990) Outlines of Zoology (Viswanathan Publishers) Vol. I & II.

REFERENCE BOOKS:
Jordan,E.L. and Verma, P.S. (2012). Invertebrate Zoology. S. Chand & Co.
Jordan,E.L. and Verma, P.S. (2010). Chordate Zoology. S. Chand & Co.
Kotpal, R.L.(1997). Modern Text Book of Zoology Invertebrata. Rastogi company, Meerut (U.P.), India.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
DEPARTMENT OF ZOOLOGY
(for candidates admitted 2015 onwards)
SEMESTER III
SBE – 3 BIOLOGICAL SKILLS FOR PHYSICAL SCIENCES
(LAB FOR PHYSICS STUDENTS)

Hours: 2 **Code:U15BZ3SBP03**
Credits:2 **Marks:100**

OBJECTIVE:
Students learns the skills of performing experiments, analyzing the results and discussing the observations.

Unit I: Biological Systems
Observation of different types of animal cells.
Observation of different types of animal tissues.
Anatomy of plant stem.

Unit II: Physiology
Determination / Estimation of Heamoglobin 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 Karotypes.
Analyzing their Blood Groups.

Unit IV: Plant tissue Culture & Phytochemistry
Tissue culture techniques.
Identification and Isolation of Phytoconstituents.

Unit V: Food & Nutrition
Kitchen gardening-concept, nutritional value of vegetables.
Mass production of Spirulina.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
DEPARTMENT OF ZOOLOGY
(For candidates admitted from 2015 onwards)
SEMESTER III
SBE 3 – BIOLOGICAL SKILLS FOR PHYSICAL SCIENCES - ADVANCED
(Theory cum Lab for Physics Students)

Hours/Week:2 **Code:U15ZO3SBT03**
Credits:2 **Marks:100**

Objective: The student understands the principles of biological system, molecular biology, and computational tools including computer aided drug design.

UNIT I
Molecular Biology: Biomolecules – Proteins: Primary, secondary, tertiary and quarternary structure. DNA: Structure (Watson and Crick model)
Lab exercise: Estimation of protein, Isolation and separation of DNA.

Unit II
Recombinant-DNA technology – DNA as universal molecule- construction of r DNA- vector-cloning methods- examples for transgenic plants and animals.

Unit III
Structure elucidation of protein and Bioactive compounds: Crystal studies, IR, NMR, MASS, X-ray diffraction and X-Ray crystallography and 2-D Electrophoresis.

UNIT IV
Bioinformatics: Introduction to data bases and retrieval of information.
Introduction to Genomics- sequence alignment, gene finding.
Introduction to Proteomics- protein prediction, and visualization using various tools.
Applications of Bioinformatics

UNIT V
Molecular dynamic simulation of movement of atoms about rotatable bonds. Hidden Markov models -Neural Networks . Computational approaches involved in structure prediction : GOR, Chou-Fasman.

REFERENCE BOOKS:
Arthur M. Lesk. (2003) Introduction to Bioinformatics, Oxford University Press.
Attwood, T.K. and D.J. Parry-Smith, (2001). Introduction to Bioinformatics, Pearson Education (Singapore Pvt. Ltd., Delhi, India.)
De Robertis, E.D.P. and De Robertis, E.M.F.(1995) Cell and Molecular Biology. Saunders College, PA.
Mani K. and Vijayaraj N.(2003) Bioinformatics for Beginners, Kalaikathir Achchagam, Tamil Nadu.
Murray, R. K., Granner, D. K., Mayes, P. A., Rodwell, V. W. (2000). Harper‟s Biochemistry, Prentice Hall International Inc.
Palanichamy, S. & Manoharan,M. (1991) Statistical methods for biologists. Palani, Paramount Publications, Palani, Tamil Nadu.
Power,C.B. Cell Biology.(1990). Himalaya Publishing House, Mumbai, India

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 and Planning.

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_{rd} Amendment for PRIs.

BOOK FOR STUDY

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

புனித சிலுவை தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி – 620 002.

தமிழாய்வுத்துறை

இளம் வணிகவியல் / இளங்கலை / இளம் அறிவியல் பட்ட வகுப்பு

இரண்டாம் ஆண்டு – நான்காம் பருவம் - 2015 – 2016

தாள் - IV

Total Hours : 75 **Code : U15TL4TAM04**

Hrs : 5Hrs /Wk **Marks : 100**

Credit : 3

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 வெற்றிப்படிகளைக் 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 வழுதி
3. ஆய்மலர் மழைக்கண் தெண்பனி உறைப்பவும் - நல்விளக்கனார்
4. சிறுவீ முல்லைப் பெரிது கமழ் அலரி - மதுரை பேராலவாயர்

3. கலித்தொகை

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

அலகு:2 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 என்தலைக் கடனே - பொன்முடியார்

5. பதிற்றுப்பத்து - ஐந்தாம் பத்து

1. சுடர் வீ வேங்கை
2. தசும்பு 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 **CODE: U15HN4HIN04**

CREDITS : 3 **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 :

- General Essays - D.B.H.P. Sabha Publishers, Chennai-17
- Abinava Patra Lekhan - D.B.H.P. Sabha Publishers, Chennai-17
- Anuvad Abhyas – III - D.B.H.P. Sabha Publishers, Chennai-17

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2

DEPARTMENT OF FRENCH

SEMESTER IV

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

(For candidates admitted 2013 onwards)

HRS/WEEK : 5 **CODE : U15FR4FRE04**
CREDIT : 3 **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– le calendrier – les fêtes traditionnelles, importées, francophones.

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 20e 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 risqué 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– les jeunes issus de l'immigration.

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 taches ménagères – la France insatisfaite - sans travail – la chanteuse Diam's – le film 'Le Couperet de Costa-Gavras'.

TEXT BOOKS :

ECHO A2 – METHODE DE FRANÇAIS & CAHIER PERSONNEL D'APPRENTISSAGE
Authors: J. Girardet and J. Pécheur
Publication: CLÉ INTERNATIONAL, 2010.

(for candidates admitted from 2014 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2.

2015 - 2016

I B.A., B.Sc., B.Com., B.R.Sc., B.C.A., B.B.A.,SEMESTER IV

PART II – ENGLISH IV - GENERAL ENGLISH PAPER IV

HOURS – 6 PER WEEK **CREDIT : 3**

CODE :U13EL4GEN04

OBJECTIVES

To strengthen the LSRW skills of students through inter-active approaches, participatory methods and activity oriented exercises.

To develop skills required for referential and independent learning.

To focus on writing skills like creative and comparative writing and book reviews.

To reinforce sub skills including vocabulary, grammar, dialogue, report writing and note making.

UNIT I: READ AND COMMUNICATE: HISTORICAL SKETCHES

The Renaissance

India under the British Raj

UNIT II: READ AND COMMUNICATE : MODERN FABLES

Nonchi Nona and Kotiya the Cat

The Competition

UNIT III: READ AND COMMUNICATE : MODERN FABLES

The Nightingale and the Rose

The Butterfly that Stamped

UNIT IV -READ AND COMMUNICATE : BIOGRAPHIES AND MODERN FABLES

Napoleon Bonaparte

The Hiding Place

UNIT V

GRAMMAR - Tenses

COMPREHENSION - General

COMPOSITION - 1. Note making
2. Dialogue
3. Creative Writing
4. Narrative Writing
5. Imaginative Writing

GENERAL ESSAY – 5 TOPICS

1. Should capital punishment be abolished?
2. Is a corruption- free India a dream?
3. The nuclear family and its consequent changes in society.
4. The threat of terrorism.
5. If man becomes immortal…

THINK BETTER - READ AND COMMUNICATE : MODERN FABLES

1 – 10 for Internal Testing

BOOKS FOR REFERENCE

Oranee Jansz : EXPLORATIONS *A Course in reading, thinking and communication skills*. New delhi: Cambridge university press. 2004. Print.

*****

List of words \ compound words\phrases for making sentences:

1. Store house of knowledge
2. Genre
3. To be divided over
4. Taboo
5. To take over
6. Hump
7. Bushy
8. Tiered
9. To roll from side to side
10. Flickered
11. To sail through
12. To tremble all over
13. Ecstasy
14. Thunder-clap
15. Mousy-quite
16. Collision
17. Exiled
18. Revolution
19. To come round
20. To fight for a cause

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HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
II B. Sc. ZOOLOGY (With Specialization in Biotechnology)
(For the candidates admitted from 2015 onwards)
SEMESTER IV
MAJOR CORE 6 – PRACTICAL – II
(CELL BIOLOGY, GENETICS AND BIOCHEMISTRY)

Hours/Week: 5 **Code:U15ZO4MCP06**
Credits:5 **Marks:100**

OBJECTIVE
Student learns the skills of performing experiments, analyzing the results and discussing the observations pertaining to courses studied.

Cell Biology

Different types of cells.
Preparation of polytene chromosomes in salivary gland of Chironomous larva/ Drosophilalarva
Study of mitotic stage in onion roottip
Study of meiosis in Grasshoppertestis

Genetics

Blood group inheritance – A, B, O and Rh
Pedigree analysis
Syndromes and their karyotypes
Preparation of buccal cells
Hardy – Weinberg law Calculation of ABO, MN blood grouping and PTC tasters.
Observation of Drosophila life cycle using culture.
Drosophila mutants.
Operon model in E.coli using virtual class study.

Biochemistry

Quantitative estimation of proteins in a biological sample
Quantitative estimation of carbohydrates in a biological sample
Quantitative estimation of cholesterol in a biological sample
Quantitative estimation of urea and creatinine in a biological sample
Analysis of human urine for sugar and albumin
Analysis of sodium, potassium and calcium (minerals) using Flame photometer.

A record of the work done is to be submitted at the time of examination.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B. Sc. ZOOLOGY (With Specialization in Biotechnology)
(For the candidates admitted from 2015onwards)
SEMESTER IV
MAJOR ELECTIVE: 1 – BIOCHEMISTRY AND BIOSTATISTICS

Hours /Week:5 **Code:U15ZO4MET01**
Credits:5 **Marks:100**

BIOCHEMISTRY

Objectives: Students learn the structure, classification and metabolism of specified biomolecules like carbohydrates, proteins and lipids. Students learn the structure of nucleotide and understands the occurrence of biologically important nucleotides. Student learns the nomenclature, classification of enzymes, mechanisms and factors affecting enzyme action.

UNIT I

Structure and classification

Carbohydrates – Structure and classification – monosaccharides, disaccharides, oligosaccharides and polysaccharides.
Amino acids- Structure, classification and properties.
Proteins – Structure (primary, secondary, tertiary & quartenary) and classification.
Lipids- Structure and classification.

UNIT II

Metabolism

Carbohydrate – Glycolysis, Citric acid cycle, Glycogenesis, Glycogenolysis, Gluconeogenesis and HMPShunt.
Lipid- Biosynthesis of long chain fatty acids, Oxidation of fatty acids – β oxidation – Significance of omega fatty acids.
Protein- Transamination, deamination, decarboxylation, oxidative deamination and Urea cycle.

UNIT III

Nucleotide and Enzymes

Nitrogenous bases, nucleosides, nucleotides – Biologically important nucleotides.
Enzymes – Nomenclature, classification, Mechanism of enzyme action – Fischer‟s lock and key model and Koshland‟s induced fit model, Michaelis – Menten hypothesis, Factors affecting enzyme action, Coenzymes.

BIOSTATISTICS

Objective: Students learns the importance of statistical applications in biology. Student learns collection, classification, tabulation and presentation of data. The student learns the tools to describe the data. The student also learns the application of statistical tests to infer on the givendata.

UNIT IV

Descriptive Statistics
Definition and scope – Variables in biology – Data collection – Classification – Tabulation,
Diagrammatic representation – Bar, Pie and Histogram.
Measures of central tendency – Mean (Arithmetic)- Median – Mode
Measures of dispersion – Standard deviation, Standard error, Co-efficient of variance.

UNIT V

Inferential Statistics

Test of significance – hypothesis testing – Type 1 error – Type II error, Level of significance.

Student t test – comparison of mean of two samples.

Chi-square (χ^2) test – Test for goodness of fit.

Correlation – Graphic and Mathematical method (Karl Pearson‟s correlation coefficient)

Regression – simple linear regression.

BIOCHEMISTRY

TEXT BOOK:

Satyanarayanan, U (2004). Essentials of Biochemistry, Uppala Author – Publisher Interlinks, Vijayawada.

REFERENCE BOOKS:

Jain, J.L., Sunjay Jain and Nitin Jain (2007). Fundamentals of Biochemistry, S. Chand & Company Ltd., New Delhi.

Lehninger, A. L., Nelson, D. K., and Cox, M.M.(1993). Principles of Biochemistry. CBS Publishers and distributors, NewDelhi.

Murray, R.K., Granner, D. K., Mayes, P.A., Rodwell, V.W (2000). Harper‟s Biochemistry, Prentice Hall International Inc.,

Stryer, L (1988). Biochemistry. W.H. Freeman and Company, New York.

Veerakumari, L (2004). Biochemistry, MJP Publishers, Chennai.

BIOSTATISTICS

TEXT BOOK:

Jerold. H. Zar. 2010. Biostatistical analysis (Fifth Edition). Prentice Hall.

REFERENCE BOOKS:

Bailey, N.T.J. (1959) Statistical Method in Biology. The English Language book society and English University Press Ltd.

Snedecor, G.W. and William, G. (1975) Statistical Methods. Harvard University, Oxford & IBH Publication Co., Calcutta. Bombay, New Delhi.

Sokal, R. and James, F.R. (1973) Introduction to Bio-statistics, W.H. Freeman & Company, Toppan company, Ltd., Tokyo, Japan.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B.Sc. ZOOLOGY (With Specialization in Biotechnology)
(For candidates admitted from 2015 onwards)
SEMESTER IV
MAJOR ELECTIVE: 1 - AQUACULTURE

Hours/Week: 5 **Code:U15ZO4MET02**
Credits:5 **Marks:100**

OBJECTIVE

The students learn in detail about the methods of culturing economically viable species of fish. Prawn farming, oyster and clam farming are also introduced along with fish farming. Common fish diseases and methods of their control are also learnt.

Unit I:

Need and scope of aquaculture, Fresh water, brackish water and near shore resources of India for aquaculture: Qualities of fresh water and brackish water aquaculture - Environmental problems caused by aquaculture.

Unit II:

Different aquaculture practices – Selection of sites for aquaculture practices – Engineering aspects of fish pond construction. Preparation of fish ponds – Fertilization – Formulation and preparation of fish feeds – culture of live foodorganisms.

Unit III:

Culturable species of fin fish and shell fish and their characteristics. Composite fish culture – Murrel and Tilapia. Prawn and Tilapia farming – oyster and clam farming.

Unit IV:

Culture of cat fish, Integrated farming of fish with agriculture crops (i.e paddy cum fish culture and live stock – (Chick, duck, and pig) – Sewage fed fish culture.

Unit V:

Common fish diseases and methods of control. Induced breeding and fish seed production. Prawn seed production through eye stalk ablation. Economic returns – starting investments. Bank Facility, Marketing, byproducts.

TEXT BOOK:

Santhanam,R. Sukumaran,N. and Natarajan, P. (1990) A manual of fresh water aquaculture. Oxford and IBH Publishing Co. Pvt. Ltd. New Delhi.

REFERENCE BOOKS:

Bardach, J.E.et al., (1972) Aquaculture John Wiley and sons. New York.
Jhingaran,V.G. (1983) “Fish and fisheries of India”. Hindustan Publishing Corporation, New Delhi.
Shukla,G.S. and Upadhyay, V.B. (1997): Economic Zoology, Rakesh Rastogi, Meerut.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2

(For the candidates admitted from 2015 onwards)

SEMESTER IV

ALLIED ZOOLOGY 5 – ZOOLOGY AND HUMAN WELFARE

(Compulsory for Botany students)

Hours/Week:4 **Code:U15ZO4ACT05**

Credits:4 **Marks:100**

OBJECTIVE

Students learn about the culture of commercially important animals. Agricultural importance of some animals and methods of control are also learnt. They also study the bacterial, viral, protozoan and helminth diseases of man. They understand the basic structure and functions of immune system.

UNIT I

Culture methods of commercially important animals

Apiculture, Prawn culture and Fish culture.

UNIT II

Causes - modes of transmission, symptoms and preventive measures of the following.

Viral diseases - Polio, rabies, mumps, influenza, measles, Japanese encephalitis, hepatitis group of virus - water borne (A and E) , Blood borne- (B,C and D), AIDS.

Bacterial diseases –Dysentery, cholera, tuberculosis, tetanus, diphtheria, typhoid, STD – gonorrhea and syphilis andLeptospirosis

UNIT III

Protozoan diseases – Amoebiasis and malaria.

Helminthiasis - Taeniasis, ascariasis, ancylostomiasis and elephantiasis

Immune system – Organs, cells, antigens, antibodies, immuneresponse;

Vaccination schedule for children inIndia.

UNIT IV

Insects of agricultural importance:

Any two pests of paddy (Leptocorisa varicornis & Spodoptera mauritia), sugarcane (Tryporiza novella & Pyrilla perpusilla), coconut (Oryctes rhinoceros & Rhynchophorous ferrugineus), vegetables (Epilachna vigintioctopunctata & Leucinodes orbonalis) and stored products (Tribolium casteneum & Sitophilus oryzae)– their life cycle and control.

UNIT V

GENETICS

Blood group inheritance A, B, AB, O & Rh.

Sex-determination and sex linked inheritance in man - haemophilia and colour blindness.

Inborn errors of metabolism – phenylketonuria,

Chromosomal abnormalities –Syndromes in man- Down‟s, Klinefelter, Turner‟s & Cri-du-chat.

Genetic counseling – amniocentesis.

REFERENCE BOOKS:

Chandler, A.(1972). Introduction to Parasitology. John Wiley & Sons Publications, 10th Edition

Ekambaranatha Ayyar. M. and Ananthakrishnan. T. N. (1988) Outlines of Zoology (for B.Sc. Ancillary).

Gardener and Peter Snubtard.D. (1984) Principles of Genetics, John Wiley & Sons.

Jawaid, A. and Subhas ,P. S. (2000). A hand book on Economic Zoology. S.Chand Publications. 5th edition.

Jhingaran,V.G.(1983) Fish and Fisheries of India .Hindustan Publishing Corporation, New Delhi.

John.B.Walter (1982) An introduction to the Principles of diseases. W.B.Saunders Company.

Kuby, J. (2007) Immunology. (Sixth edition) W.H.Freeman and company, New York.

Manju Yada, 2003. Economic Zoology, Discovery Publishing House, New Delhi

Paul.A.Ketchuns (1984) Microbiology. John Wiley and Sons, New York.

Rajesh,,K. and Ajit, D.(2005). Medical Parasitology. Books & Allied (P) Ltd. Kolkata

Ramakrishnan Ayyar (1940) Handbook of Economic Entomology for South India, Government Press. Madras.

Shukla & .Upadhyaya, S. (2000). Economic Zoology, Rastogi Publications.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2

(For the candidates admitted from 2015 onwards)

SEMESTER IV

ALLIED ZOOLOGY 6 - PRACTICAL

(Compulsory for Botany students)

Hours/Week: 4 **Code:U15ZO4ACP06**

Credits:3 **Marks:100**

OBJECTIVE

Student learns the skills of performing experiments, analyzing the results and discussing the observations pertaining to courses studied.

1. Anatomy of cockroach/ Earthworm- Digestive system and Nervous system-Virtual class study.
2. Prawn - Appendages
3. Temporary mounting ofPediculus/mosquito.
4. Buccal Smear – Barrbody
5. Bacteria - Gram Staining, AntibioticSensitivity
6. Frog– Digestive system and reproductive system – Virtualclass
7. Measurement of bloodpressure.
8. Blood groupidentification.
9. Qualitative tests for free sugar and albumin inurine.
10. Study of Mendeliantraits
11. Pedigree analysis (Autosomal dominant, recessive and Sexlinked)
12. Syndromes – Down, Turner &Klinefelter

Spotters – Animals of Biological/Economic interest

Protozoa	-Entamoeba
Coelenterata	- Aurelia,Corals
Platyhelminthes	-Taenia
Annelida	-Leech
Arthropoda	- Prawn and any two insect pests ofcrops
Mollusca	-Pila
Echinodermata	-Starfish
Prochordata	-Amphioxus
Chordata	- Naja naja, Pigeon,Mammal

Animal products of economic importance – honey and silk thread.

Ornamental fishes (any 3) Edible fishes (any 3)

Slides of Endoparasites (any 5) Meiosis in Grasshopper Testis.

A record of the work done is to be submitted at the time of examination.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B.A. /B.Sc. / B.Com. / B.R.Sc./ B.C.A. DEGREE COURSE
LIFE ORIENTED EDUCATION
ETHICS – II: EMPOWERMENT OF WOMEN

HRS / WK :1 **CODE: U12VE4LVE02**
CREDIT :1 **MARKS : 100**

OBJECTIVES:

- To make the learners aware of various Social, Gender issues and Cyber Crimes.
- To make them aware of the property rights.
- To make them understand and appreciate the role of media, in facing the challenges on various life issues.

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: WOMEN AND MEDIA

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

UNIT – III: SOCIAL ISSUES RELATED TO WOMEN

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

UNIT – 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-Mother Teresa, Indira Gandhi, and 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, and twitter

REFERENCES:

1. Dr.M.Arumairaj et al., 1999, "Marching towards the Millenium ahead".
2. Thomas Anjugandam, 1999, "Grow Free Live Free" Salesian Publicaiton.
3. H.C PrettiNandhiniUpretti, jaipur 2000 "Women and problems of Gender Discrimination".
4. Thomas B.Jayaseelan, 2002, "Women: Rights and law" Indian Social Institute, New Delhi.

Reni Jacob vol I & II, April- June 2004, "Vikasimi – The journal of Women's Empowerment, Ed,"

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 – II: OLD TESTAMENT

HRS / Wk :1 **CODE: U12VE4LVB02**
CREDIT :1 **MARKS : 100**

OBJECTIVE:

- Understanding the desires of God through Prophetic revelation and becoming 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 (Gen 12-18);
- Joseph (Gen 37-40); Moses (Exo 4-5);
- Joshua (Joshua 1-8)

UNIT – II: JUDGES AND KINGS

- **JUDGES:** Deborah (Judges 4); Samson (Judges 6-8); Gideon (Judges 13-16)
- **KINGS:** David (I Sam 17-31, II Sam 1-12); Solomon (I Kings 1-11, Proverbs 1-5,31)

UNIT – III: WOMEN IN THE BIBLE

- Women in the Old Testament
- Eve (Gen 3)
- Ruth (Ruth 1-4)
- Hannah (I Sam 1:1-28)
- Esther (Esther 1-6)

UNIT – IV: MINOR PROPHETS

- Brief Life History and teachings of
- Amos
- Jonah
- Micah
- Nahum
- Habakkuk

UNIT – V: MAJOR PROPHETS:

- Brief Life History and teachings of
- Isaiah (Is 1,6,11,36-38,40-42,44,50,53,61)
- Jeremiah (Jer 1-3,7-12,18-19,23)
- Ezechial (chapters 1,2,3,5,8,12 visions)
- Daniel (Daniel 1-6)

REFERENCES:

1. Missionaries Biographies. 1995, Amazon.com
2. Russell Fueller (1999) The Text book of the Twelve Minor Prophets. Wipf&Stock Publishers, UK.
3. Willis Judson Beecher (2002) The Prophets and The Promise. Wipf& Stock Publishers, UK

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
B.A./B.Sc./ B.Com/ B,R.SC/ B.C.A - DEGREE COURSES
LIFE ORIENTED EDUCATION
CATECHISM – II: CHURCH AND SACRAMENTS

HRS/WK:1 **CODE : U12VE4LVC02**
CREDIT : 1 **MARKS : 100**

OBJECTIVES:

- To instruct the students to live in relationship with God.
- To offer God's gift of the Holy Spirit.
- To build relationship with Jesus.
- To learn Sacraments and Prayer life through which a Christian is able to live in relationship with Christ.
- To enrich our devotion to Mother Mary and Saints.

UNIT – I: MISSION OF THE CHURCH

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

UNIT – II: PARTICIPATORY CHURCH (AS LAY FAITHFUL) AS A COMMUNITY

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 characteristic 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.

Sacraments – Initiation- Social – Healing (all the seven) - stress on Confession, Confirmation and Holy Communion - Sacramental: holy "things" used –their sanctity

UNIT – IV: SACRAMENTS AND SACRAMENTAL Sacraments-Initiation-Social-Healing (all the seven)-stress on Confession, Confirmation and Holy Communion. Sacramental: holy "things"used-their sancity.

UNIT – V: MARY AND WOMEN IN THE BIBLE- RUTH, ESTHER, JUDITH

Mary as a young virgin- Disciple- Her role in the Catholic Church-Annual feasts-Pilgrimages- Devotion to Mary, Theologies. Saints in the Church- 10 women saints. Ex. Mother Teresa, St.Alphonse.

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.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPALLI-2
B.Sc. ZOOLOGY (With Specialization in Biotechnology)
(For the candidates admitted from 2015 onwards)
SEMESTER V

MAJOR CORE 7 - DEVELOPMENTAL BIOLOGY AND EVOLUTION

Hours/Week: 5 **Code:U15ZO5MCT07**
Credits:5 **Marks:100**

OBJECTIVE
This course is designed to study the concepts of fertilization, parthenogenesis, cleavage, gastrulation, organogenesis, extra embryonic membranes, nuclear transplantation and organizers.

UNIT I
Fertilization: Physico-chemical aspects of fertilization and its significance.
Parthenogenesis: Natural and artificial – significance.
C**leavage:** Types (Holoblastic & meroblastic) and patterns of cleavage (radial, spiral, bilateral, rotational, determinate and indeterminate cleavage).
Gastrulation: Fate map, morphogenetic movements – Gastrulation in frog, chick and mammals.

UNIT II
Organogenesis - Ectodermal derivatives – Development of brain and eye of frog.
Mesodermal derivatives – Heart and Kidney of mammals.
Extra embryonic membranes in chick.
Placentation in mammals – Types and functions
Nuclear transplantation in Amphibia.

UNIT III
Organiser – Spemann‟s embryonic induction and chain of induction
Post embryonic developments -insects and amphibians.
Regeneration - invertebrates and vertebrates. Development of immune system in vertebrates.
Aging – concepts and Models.

UNIT IV
Emergence of Evolutionary thoughts: Lamarckism & Neo-Lamarckism.Darwinism & Neo – Darwinism. Mutation theory – Mutation and their role inevolution.
Animal colouration and Mimicry. Isolating mechanisms.
Modes of speciation. Adaptive radiation in reptiles, Golden ages of reptiles and mammals.
Origin of prokaryotic and eukaryotic cells.

UNIT V
Molecular Evolution: Stages of primate evolution, Human evolution, Future of human.
Concepts of neutral evolution, molecular divergence and molecular clocks.
Fossils – fossil formation, types of fossils- Dating of fossils.
Indian fossils. Living Fossils. Extinction – extinct animals, types of extinction, rates, causes and significance of extinction.

Developmental Biology

TEXT BOOK :

Arumugam, N. (1988) A Text Book of Embryology. Saras Publication, Nagercoil.

REFERENCE BOOKS:

Balinsky, B.I. (1970) An Introduction to Embryology. Saunders Press, Phil. 3rd Edn.

Berril, N.C. (1971) Developmental Biology, McGraw Hill, New York.

Berril, R. (1979) Developmental Processes in Higher Vertebrates. Logos Press.

Bodmer, (1978) Modern Embryology. HR & W. New York.

Nelson.O.E.(1953) Comparative Embryology of the Vertebrates.McGraw Hill,New York.

Scott, F & Gilbert F.S (1988) Developmental Biology. Sinauer associates Inc. Publishers.

Sunderland Massachusetts.

Subramoniam, T. (2002) Developmental Biology, Narosa Publishing House, New Delhi

EVOLUTION

REFERENCE BOOKS:

Darwin,C(1990).The origin of species. 6e.oup. Desmond MorrisCrown Pub.Co., London.

Earnst Mayr (1966). Animal species and Evolution. The Belknap Press of Harvard University Press, Cambridge, Massachusetts.

Theodore H. Eaton Jr. (1970). Evolution. Thomas Nelson and Sons Ltd, Trinidad

Theodosius Dobzhansky (1967). Evolutionary Biology. Appleton- Century – Crofts, Division of Meredith Publishing Company, New York.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPALLI-2
B.Sc. ZOOLOGY (With Specialization in Biotechnology)
(For the candidates admitted from 2015 onwards)
SEMESTER V
MAJOR CORE: 8 -FUNDAMENTALS OF BIOTECHNOLOGY

Hours/Week: 5 **Code:U15ZO5MCT08**
Credits:4 **Marks:100**

OBJECTIVE

Students understand the methods in genetic engineering such as isolation of genes, gene transfer, selection and screening, plant, animal and stem cell culture. Students learn the principles of blotting techniques and DNA sequencing.

UNIT I

Definition and scope of biotechnology
Introduction and techniques in genetic engineering**.** Isolation of DNA – shot gun technique, cDNA, artificial gene.PCR amplification – types and their application.c-DNA and genomic DNA libraries
Molecular tools-Restriction enzymes - discovery, nomenclature, types and uses DNA ligase, DNA polymerases, Reverse transcriptase, terminal transferases, T_4 polynucleotide kinases, methylases, DNases, Ribonucleases, alkaline phosphatases, S1 nucleases.
Linking of recombinant DNA with vector - linkers, adapters and homopolymer tails, terminal dinucleotides.

UNIT II
Vectors: plasmid- Col E1, pBR322; bacteriophage- M13 and λ phage, cosmid, phagmid, YAC, BAC, animal and plant viruses as vectors, shuttle vector, cloning and expression vectors.
Host: *E. coli, Bacillus***,** yeast and mammalian cells
Gene transfer techniques: Bacterial transformation, calcium phosphate co-transformation, transduction, protoplast fusion, electroporation andmicroinjection.
Selection and screening; Insertional inactivation, Immunological screening, DNA hybridization, reporter gene. Concept of fusion protein.

UNIT III
Principles of blotting techniques: Immuno blot, Southern, Northern and Western, dot blot; PCR – Principle and applications
DNA sequencing: DNA sequencing methods-Maxim Gilbert andSanger‟s method and next generationsequencing.
Humangenomeproject- Salient features of humangenome.
DNA microarray: Principle and applications.

UNIT IV
Gene knockout technique and its significance.
DNA Finger printing: principle and applications
Safety in Biotechnology.
Intellectual property rights and patenting.

UNIT V

Plant tissue culture and preservation: Culture media. Methods-cell culture, suspension culture, organ culture, callus culture, embryo culture. Organogenesis - Somatic embryogenesis. Somatic Hybridization – Protoplast isolation, fusion, regeneration of hybrids. Cybridization, Somaclonal Variation. Haploid production – anther culture – pollen culture. Application of plant tissueculture.
Animal cell culture: Primary and secondary culture, continuous cell lines, culture media and applications.
Stem cell culture and its applications.

TEXT BOOK:

Dubey, P.C. (1994) Text Book of Biotechnology, Chand and Co., New Delhi.

REFERENCE BOOKS:

Gupta, P.K. (2004) Elements of Biotechnology, Rastogi Publication, Meerut
Irfan Ali Khan and AthiyaKhanum (2004) Fundamentals of Molecular biology, Genetic engineering and Biotechnology, Ukaaz Publication, Hyderabad
Old R.W. and Primrose. S.B. (1989) Principles of Gene Manipulation, Blackwell
Scientific Publications.
Primrose. S.B. and R.M. Twyman (2006) Principles of Gene Manipulation and Genomics Blackwell Publishing, UK.
Satyanarayana (2006) Biotechnology, Books and Allied (P) Ltd., Lolkata.
Smith John.E. (1988) Biotechnology, Edward Arnold, London.
Walker, J.M. and Gingold, E.D. (Eds) (1992) Molecular Biology and Biotechnology,
Panima Educational Book Agency. New Delhi.
Watson, J.D., Michael G., Tam Witkowski and Mark Zollew (1999) Recombinant DNA, Scientific American Books, New Delhi

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B. Sc. ZOOLOGY (With Specialization inBiotechnology)
(For the candidates admitted from 2015onwards)
SEMESTER V

MAJOR CORE 9 - BIOLOGICAL TECHNIQUES

Hours/Week:5 **Code:U15ZO5MCT09**
Credits:4 **Marks:100**

OBJECTIVE
The student learns the principles of Light –theories-interaction with matter, Electromagnetic spectrum-properties, principle and applications of microscopes, spectrophotometers, centrifugation , chromatography and electrophoresis. Radioactivity-radioactive elements, decay, half life, measurement and effects and Nanobiology.

UNIT I
Units of measurement and Preparation of solutions: Percentage, Normality, Molarity, ppm, buffers, stock and working solution.
Microtechnique – Fixatives and principles of fixation; Tissue preparation, block making and sectioning. Stains and principles of staining; Haematoxylin and Eosin staining method for histologyand mounting.

UNIT II
Microscopy - Principle and applications of Light microscope, Phase contrast, Confocal scanning light microscopy, Fluorescence and Electron (TEM, SEM and STEM) microscopy, X-ray crystallography,
pH meter- principle and application.

UNIT III
Spectrophotometry
Electromagnetic spectrum and its properties.
Principle and applications of Colorimeter; Spectrophotometer; Flow cytometer and
Nuclear magnetic resonance
Radioactivity- Detection and measurement of radioactivity: autoradiography; Geiger Muller and Scintillation counter.

UNIT IV
Centrifugation –concepts of relative centrifugal force and sedimentation coefficient.
Principle and applications of Preparative Centrifuge –Differential and Gradient centrifugation;
Analytical centrifuges- Ultra centrifuge.
Chromatography - Principle and applications of Paper, Thin layer, Column, HPLC, Gas-liquid, Ion-exchange, Affinity and Gel permeation, GC-MS, MALDI TOF, LC-MS.

UNIT V
Electrophoresis – Principle and applications of Paper, Polyacrylamide gel electrophoresis - PAGE and SDS – PAGE, Agarose gel electrophoresis (AGE) Immunoelectrophoresis and Isoelectric focussing.
Introduction to Nanobiology.

TEXT BOOK:

Upadhyay, A., Upadhayay, K. and Nirmalendu, N. (2002) Biophysical Chemistry. Himalayan Publishing House, Mumbai.

REFERENCE BOOKS:

Casey, E. J., (1962). Biophysics - Concepts and Mechanisms. East West Press Pvt., Ltd., New Delhi.

Daniel, M., (2005). Basic Biophysics for Biologist. Agro Botanical Publishers, Bihaner, India.

Narayanan, P., (2007). Essentials of Biophysics. New Age International (P) Ltd. Publishers.

PlummerT. D., (1978). An introduction toPracticalBiochemistry. Tata McGraw Hill Publishing Company Limited, NewDelhi.

Skoog, A. D. and James, J. L. (1992). Principles of Instrumental Analysis. Saunders Golden Sunberst Series

Vasanthan, P. and Gautham, N. (2002). Biophysics. Narosa Publishing House, New Delhi.

Veeralakumari , l., (2006). Bioinstrumentation. MJP Publishers, Chennai.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPALLI-2
B.Sc. ZOOLOGY (With Specialization in Biotechnology)
(For the candidates admitted from 2015 onwards)
SEMESTER V
MAJOR CORE 10 - PRACTICAL – III
(DEVLOPMENTAL BIOLOGY, EVOLUTION, MICROBIOLOGY, BIOTECHNOLOGY & BIOINFORMATICS)

Hours/Week:5 **Code:U15ZO5MCP10**
Credits: 4 **Marks:100**

OBJECTIVE

Student learns the skills of performing experiments, analyzing the results and discussing the observations pertaining to courses studied.

Developmental biology

Preparation and observation Sperm suspension
Observation of slides pertaining to development of frog and chick.
Artficial parthenogenesis
Regeneration in amphibians.
Placenta in mammals.

Evolution

Variation – Homologous and Analogus organs.
Mimicry.
Adaptive Radiation.

Microbiology

Microscopic observations of bacterial types and Gram staining
Culturing – agar slant and stab and observation of bacterial colonies
Observation of Antibiotic sensitivity test.
Serial dilution technique.
Observation of fermentation in grapes
Milk quality test-methylene blue reductase test, phosphatase test.
LPCB mount- fungal staining
Water potability test-MPN test

Biotechnology

Isolation of Genomic DNA (IndividualWork)
Agarose gel electrophoresis to show DNA (Individualwork)
Blotting techniques –Southern, and Western (Group Work)
Immobilization of enzymes (IndividualWork)

Bioinformatics

Retrieving the sequence using Fasta
Protein sequence analysis – SwissProt
Pairwise sequence alignment – BLAST
Nucleotide sequence analysis – GenBank
Multiple sequence alignment –CLUSTALW and Phylogenetic analysis, ORF prediction

A record of the laboratory work should be maintained and submitted at the time of external practical examination

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPALLI-2
B.Sc. ZOOLOGY (With Specialization in Biotechnology)
(For the candidates admitted from 2015 onwards)
SEMESTER V

MAJOR ELECTIVE 2: MICROBIOLOGY AND BIOINFORMATICS

Hours/Week:5 **Code:U15ZO5MET03**
Credits: 4 **Marks:100**

Objectives:
Microbiology: Student classifies microorganisms and learns the structure of bacteria, actinomycetes sand virus, also learns the bacterial culture methods, soil, water, dairy, industrial and pathogenic microbes**.**
Bioinformatics: The student learns the structure and function relationship of genes and proteins. Uses computers to retrieve, sort, store and analyze the sequence information about genes and genomesfrom the databases and trace the phylogenetic relationship between theorganisms.

MICROBIOLOGY

UNIT I

Microbes and Bacterial culture methods
Whittaker‟s classification of microorganisms and scope of microbiology.
Structure of Bacteria, Actinomycetes and Viruses – T4 phage and HIV.
Nutritional requirements, types of culture media; culture and growth characteristics.
Methods in microbial culture – sterilization, inoculation and incubation; preparation of pure culture and maintenance.

UNIT II

Environmental and Industrial microbiology
Common air and soil microbes
Food microbiology: Microbial food spoilage, food poisoning, physic-chemical methods in food preservation.
Water microbiology: Common pathogenic microbes in water.
Basic design of fermenter, industrial fermentation of ethanol, penicillin and enzymes.
Dairy microbiology: Pasteurization, fermented milk products (Curd and Cheese).

UNIT III

Medical microbiology
Study of common bacterial and viral diseases in man: causative organisms, mode of transmission, pathogenicity, symptoms and preventive measures.
Diseases of
Gastro-enteric system: Cholera, Typhoid and Viral hepatitis.
Respiratory system: Influenza, Pneumonia and Tuberculosis.
Nervous system: Meningitis, Leprosy, Tetanus, Polio, Rabies and Herpes.
Genital system: Gonorrhea, Syphilis and Candidiasis.
Rheumatic fever and AIDS.

UNIT IV

Proteomics and Genomics

History, Scope and application of Bioinformatics. Accessing bioinformatics resources from databases: Sequence databases –. Nucleotide sequence databases – NCBI, PubMed, EMBL, Genbank, DDBJ. Protein sequence databases – SWISS-PROT, TrEMBL and PIR.

Structure of DNA, RNA. ORF, Genetic code. Structure and organization of genomes- Prokaryotes (E.coli), Eukaryotes (Yeast and Human).

UNIT V

Protein structure, sequence analysis and phylogenetic analysis

Proteinstructurepredictionandhomologymodeling.Pairwisealignmentand itssignificance.Multiple sequence alignment and its application. Phylogenetic tree: clustering and cladistic methods. Computer assisted drug design- outline of methods and toolsemployed.

TEXT BOOK:

Microbiology

Mani, A., Narayanan, L.M., Selvaraj, A.M., amd Arumugam, N (1996). Microbiology, Saras Publication, Kanyakumari.

REFERENCE BOOKS:

Anathanarayanan, R and Jeyaram Panikar, C.K (1990). Text book of Microbiology, Orient Longman.

Deb, W.C (1982). Microbes and Diseases of Man. Text book of Microbiology (including parasitology) CBS publishers and Distributors, New Delhi.

Kalaichelven, P.T (2005). Microbiology and Biotechnology – A Laboratory Manual, MJP Publishers, Chennai.

Ketchuns, P.A (1984). Microbiology, John Wiky and Sons, New York.

Pelzer, M.J AND Reid, R.D (1965). Microbiology, McGraw Hill Book Company, New Delhi.

Sharma, P (1995). Microbiology, Rastogi and Company, MEERUT, India.

Sullila, S.B and Shantharm, S (1998). General Microbiology, Oxford and IBH Publishing Co. Pvt. Ltd, New Delhi.

TEXTBOOK:

Bioinformatics

Arthur M. Lesk (2003). Introduction to Bioinformatics, Oxford Univerity Press.

REFERENCE BOOKS:

Irfan A, Khan and Atiya A Khanum (2003). Recent Advances in Bioinformatics, Ukaaz publishers, Hyderabad.

Mani K and Vijayaraj N(2003). Bioinformatics for Beginners, Kalaikathir Achagam, Tamilnadu.

Murthy C.S.V (2003). Bioinformatics, Himalaya Publishing House, Mumbai.

Subramanian C (2004). A Textbook of Bioinformatics. Dominant Publishers and Distributors – New Delhi.

Westhead, D.R., Parish, J.H., and Twyman, R.M (2003)- Instant notes- Bioinformatics, Viva Books Private Limited, New Delhi.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B. Sc. ZOOLOGY (Specialization in Biotechnology)
(For the candidates admitted from 2015 onwards)
SEMESTER V
MAJOR ELECTIVE 2: APPLIED ENTOMOLOGY

Hours/Week:5 **Code :U15ZO5MET04**
Credits:4 **Marks:100**

Objectives: The student learns the structure and physiological aspect of insects. Also learns theinsects as service to man, enemies of man, productive insects and necessary steps to control theinsects.

Unit I
Introduction to Entomology
Mention Agricultural entomology, Forest entomology, Veterinary entomology, Medical entomology, Forensic entomology, Industrial entomology, Nutritional entomology, Cultural entomology. Classificaiton of Class Insecta down to orders, General organization of an insect.

Unit II
Insects as Service to Man
Useful products, Useful body, Galls, Pollinators, Destroyers of insect pests,
Serve as food for animals and even man, Destroyers of weeds, Improve soil fertility, Act as scavengers, Aid in scientific research, Aesthetic and entertainment value, Use in medicine, Pollution indicators, Arrow poisons, Cold light, Insects in forensic science, Utility of insect pheromones and hormones

Unit III
Insects as enemies of Man
Morphology, damages caused and control measures of the following:
Pests of coconut: *Oryctes rhinoceros*, *Rhyncophorus ferrugineus*, *Nephantis serinopa*, eriophid mite (*Aceria guerreronis*),
Pestofpaddy: *Leptocorisa acuta*, *Spodoptera mauritia*, Rice stem borer (*Scirpophaga incertulas, Nilaparvatalugens)*
Pest of stored food products: *Trogoderma granarium, Tribolium castaneum, Sitophilus oryzae*

Unit IV

Productive Insects
Honey bee: Apiculture and its scope; Different species, Social organization, structure of worker bee, life history and communication; Bee products: Honey and Bee wax, Composition and Uses, Bee diseases.
Silk moth: Different types of silkworms, life cycle; Sericulture, moriculture, Processing and extraction of silk, Diseases of silk worms, composition and uses of silk.
Lac insect: Different strainsof Lac insects; cultivation, inoculation and harvesting, propagation of lac ; composition and uses of lac, enemies of lac insects.

Unit V

Control Measures: a) Natural control (b) Applied control or Artificial control: Prophylactic and Curative methods [cultural, mechanical, legal methods (brief account), biological and chemical methods].

Biological control: History; Ecological, biological and economic dimensions of biological pest control methods , Mention any 3 important biological control project undertaken in India. Merits and demerits.

Chemical control: Classification, Insecticides of plant origin; Insecticides, Mention insecticide residue, resistance and resurgence of insect pests; Pesticide appliances (Hand compression sprayer, Knapsack sprayer and Rocker sprayer); Precautions in handling insecticides.

Modern methods of Pest control: Autocidal and Pheromonal control

Integrated Pest Management (IPM): Features, advantages.

References

Atwal, A.S and Dhaliwa, G.S.(2008) Agricultural Pests of south Asia and their Management. Kalyani Publishers.

Bhaskaran, K.K and Francy, C. F (2010) Elements of Applied Entomology, Manjusha Publications.

Dhaliwal, G.S. *et al*., (2008) Essentials of Agricultural Entomology, Kalyani Publishers

Metcalf, C.L. & Flint, W.P. (1973) Destructive and Useful Insects, USTMH

Nair, M.R.G.K. (1989) A Monograph on Crop pests of Kerala and their control. KAU Publ., Vellanikkara.

Ramakrishna Ayyar, T.V. Maras, 1963. Handbook of Economic Entomology for South India,

Srivastava,K. P. A (1988) Text book of Applied Entomology , Vol. I & Vol. II, Kalyani Publishers, Ludhiana, New Delhi, Noida.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
DEPARTMENT OF ZOOLOGY
(For candidates admitted from 2015 onwards)
FOR B.A/ B.Sc/ B.Com/ B.C.A/B.R.Sc/BBA Degree Course
SEMESTER V
NON-MAJOR ELECTIVE: 1 - ORNAMENTAL FISH CULTURE

Hours/Week: 2 **Code:U15ZO5NMT01**
Credits: 2 **Marks:100**

OBJECTIVE

Student learns the importance of ornamental fish culture, maintaining an aquarium, knowing the common ornamental fishes and to explore the self employment opportunities.

UNIT I

Importance of ornamental fish culture – World Aquarium trade and present status.
Design and setting up of fish tank - Construction and maintenance of home aquarium, requirements and design for the commercial production units of ornamental fishes and transportation methods. Aquarium plants and theiruses.

UNIT II

Major marine ornamental fish resources of India.
Popular tropical fresh water ornamental fishes and their characteristics- Live bearers- guppy, molly, platy and swordtail - any two. Egg layers- fighter, gourami, angelfish, red tailed shark and gold fish. – any two. A compatible group of fishes for home aquarium.

UNIT III

Different kinds of feeds- culture of fish food organisms, preparation of artificial feeds, feeding methods and vacationalfeed.

UNIT IV

Diseases and treatment methods in brief- ectoparasite- anchor worm and argulus,
white spot, fin rot, mouth fungus, dropsy and velvet disease.
Breeding of aquarium fishes for commercial purpose

UNIT V

Maintenance of Aquarium in the lab (Lab work)
Note: The students maintain an aquarium in the lab and document the observations.

TEXT BOOK:

Ahilan. B, Felix. N and Santhanam.R., 2008. Text book of Aquariculture. Daya Publishing House, New Delhi. p.157.
Ramanathan et al., (2000), Tropical freshwater ornamental fish culture, Department of fisheries farm management, Veterinary and animal sciences university, Tamil Nadu.

REFERENCE BOOKS:

Dey,V.K., (1995), Hand book of aqua forming. MPEDA India.
Jameson, J.D., Srinivasan.AandVenkataramanujam. (1995) Ornamental fish culture technology, TANUVAS publicationChennai.
Jameson, J.D.and Santhanam,R., (1996), Manual of ornamental fishes and farming technologies. Peejay,Thoothukkudi.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
DEPARTMENT OF ZOOLOGY
(for candidates admitted 2015 onwards)
SEMESTER V
SBE – 4 BIOLOGICAL SKILLS FOR CHEMICAL SCIENCES
(LAB FOR CHEMISTRY STUDENTS)

Hours: 2 **Code:U15BZ5SBP04**
Credits:2 **Marks:100**

Objective: Students learns the skills of performing experiments, analyzing the results and discussing the observations

Unit I: Biological Systems
Observation of different types of animal cells.
Observation of different types of animal tissues.
Anatomy of plant stem.

Unit II: Physiology
Determination / Estimation of Heamoglobin 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 Karotypes.
Analysing their Blood Groups.

Unit IV: Plant tissue Culture & Molecular Biology
Tissue culture techniques.
Isolation of DNA.

Unit V: Food & Nutrition
Kitchen gardening-concept, nutritional value of vegetables.
Mass production of Spirulina.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
DEPARTMENT OF ZOOLOGY
(For candidates admitted from 2015 onwards)
SEMESTER V
SBE- 4: BIOLOGICAL SKILLS FOR CHEMICAL SCIENCES-ADVANCED
(Theory cum Lab. - For Chemistry Students)

Hours/Week:2 **Code:U15ZO5SBT04**
Credits:2 **Marks:100**

Objectives: The student understands the principles of a biological system, molecular biology, and computational tools including computer aided drug design.

UNIT I
Molecular Biology: Organization of gene exon- intron- functional genes- organization of operon: promoter, operator, regulator, enhancer, repressor

Unit II
Recombinant-DNA technology – DNA as universal molecule- construction of r DNA- vector-cloning methods- examples for transgenic plants and animals.

UNIT III
Role of computers in chemical research; Structure representation; Chemical Databases – Design, Storage & Retrieval methods, 2D and 3D structures, reaction databases, similarity searches; Modelling of small molecules; Chemoinformatics tools for drug discovery

UNIT IV
Bioinformatics: Introduction to data bases and retrieval of information.
Introduction to Genomics- sequence alignment, gene finding.
Introduction to Proteomics- protein prediction, and visualization using various tools.
Applications of Bioinformatics

UNIT V
Structure representation: Chemsketch, ISIS Draw; Chemical database: Pubchem, chem bank, Drug Bank, Chem finder, Organic Syntheses, Chem mine; Reaction database: Chemogenesis, Web reactions database, Organic Synthesis(ORGSYN) database, and synthetic Pages database. Tools for chemo informatics: Chem spotlight, Molinspiration

REFERENCE BOOKS

Arthur M. Lesk (2003) Introduction to Bioinformatics, Oxford University Press.

Attwood, T.K. and D.J. Parry-Smith, (2001). Introduction to Bioinformatics, Pearson Education (Singapore Pvt. Ltd., Delhi, India.)

De Robertis, E.D.P. and De Robertis, E.M.F. (1995) Cell and Molecular Biology. Saunders College, PA.

Mani K. and Vijayaraj N.(2003) Bioinformatics for Beginners, Kalaikathir Achchagam, Tamil Nadu

Murray, R. K., Granner, D. K., Mayes, P. A., Rodwell, V. W. (2000). Harper‟s Biochemistry, Prentice Hall International Inc..

Palanichamy, S. & Manoharan,M. (1991) Statistical methods for biologists. Palani, Paramount Publications, Palani, Tamil Nadu.

Power,C.B. Cell Biology. (1991). Himalaya Publishing House, Mumbai, India.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPALLI-2
B.Sc. ZOOLOGY (With Specialization in Biotechnology)
(For the candidates admitted from 2015 onwards)
SEMESTER VI
MAJOR CORE 11 – ANIMAL PHYSIOLOGY

Hours/Week: 6 **Code:U15ZO6MCT11**
Credits:5 **Marks:100**

OBJECTIVE
The student learn the principle of homeostasis in animals. They also learn the process of digestion and absorption of food, circulation, respiration and excretion. They understand the mechanism of muscle contraction, neural conduction and functioning of receptors. They also learn the structure and functioning of reproductive organs and endocrine glands.

UNIT I
Introduction to Animal Physiology, scope of physiology
Principles of Homeostasis:
Osmo- ionic regulation in crustaceans and fishes.
Thermoregulations in poikilotherms and homeotherms.
Digestion: Digestion of food and absorption (in mouth, stomach, duodenum and intestine).

UNIT II
Circulation: Composition of blood, blood-clotting mechanisms, heartbeat – origin, conduction; cardiac cycle, bloodpressure.
Respiration: Respiratory pigments; structure of haemoglobin; transport of respiratory gases-O_2 dissociation curve, CO_2 transport; Haemoglobin as a buffer.
Excretion: Biosynthesis of nitrogenous waste products – ammonia, urea, uric acid; physiology of urine formation, acid -base balance.

UNIT III

Muscle Contraction: Structure and molecular organization of skeletal muscle; mechanism and chemistry of muscle contraction ; Cori cycle, energetics of musclecontraction.
Neural conduction: Resting potential, conduction of nerve impulse, synaptic transmission, neuromuscular junction,reflexes.
Receptor Mechanisms: Photoreception – structure of retina – visual pigments, photochemistry;
Chemoreception – gustatory, olfactory;
Mechanoreception – Pacinian corpuscle, **Phonoreception.**

UNIT IV

Endocrine glands I: Hypothalamus, Pituitary, pineal, thyroid, parathyroid, pancreas and thymus.
Endocrine glands II: Adrenal cortex and medulla, ovary and testis- structure, hormones and their functions.
Animal Behaviour: Kinesis, taxis, instinctive behaviour, learned behaviour. Biological clock-circadian, lunar and circannualrhythms.

UNIT V

Reproduction: Anatomy of reproductive organs in Human; Menstrual cycle and contraception.

Hormonal Control of implantation, gestation, parturition; Infertility.

Assisted Reproductive technologies (ART) – Artificial insemination, surrogate motherhood, IVF, GIFT, ZIFT and ICSI ; Oocyte banking and donation.

TEXT BOOK:

Mariakuttikan, A. and Arumugam, N. (2007). Animal Physiology, Saras Publication, Tamil nadu.

REFERENCE BOOKS:

Hoar, S.W. (1987). General and Comparative Physiology. Prentice Hall.

Knut Schmidt Nielson, (1985). Animal Physiology. Adaptation and Environment, Cambridge, University Press.

Murray,R.K.,Mayes,P.A.Granner,D.K.andRodwell,V.W.(1990).Harpers‟ Biochemistry, Tweny Second edition, Prentice Hall InternationInc.

Parameswaran, R., Ananthakrishnan, T.N., Anantha Subramanian, K.S (1998) Outlines of Animal Physiology, S. Visuwanathan Pvt. Ltd, Chennai.

Philips, P. and Murray Mooyoung (1989). Animal Biotechnology, Pergamm Press, Oxford.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B. Sc. ZOOLOGY (With Specialization inBiotechnology)
(For the candidates admitted from 2015onwards)
SEMESTER VI
MAJOR CORE12- APPLIED BIOTECHNOLOGY

Hours/Week: 6 **Code:U15ZO6MCT12**
Credits:5 **Marks:100**

OBJECTIVE
This paper deals with the applications of biotechnological principles for the improvement of industrial production, medical products for treatment and prevention of diseases, for waste disposal, environmental clean up, agricultural technologies and fish and livestock farming.

UNIT I
Plant Biotechnology
Applications of plant tissue culture; Transgenic plants – Agro bacterium-mediated transformation, Principles in the production of golden rice, flavr savr tomato, insect-resistant and disease-resistant plants.Concept of biofuel-types and applications.

UNIT II
Animal Biotechnology
Sericulture- Definition, Silk production. Seri- Biotechnology. Potential, strengths and challenges of sericulture industry in India.
Ploidy induction in fish; Transgenic fishes- principles and applications and transgenic live stock-production and application.
GMO- regulations - risk assessment; Bioethics- ELSI.

UNIT III
Microbial Biotechnology
Microbial enzymes- types and applications. Immobilization of enzymes.Industrial scale production of enzyme-protease.
Concept of bio-pesticides and bio-fertilizers.
Single cell protein- production and applications.

UNIT IV
Medical Biotechnology
Production of humulin. Recombinant growth hormone. Recombinant vaccines: r-subunit vaccine, r-live vaccines, Anti-idiotypic, edible vaccines, HIV, Malarial vaccine.
Monoclonal antibodies- applications
Gene therapy – types, , Ex Vivo and in Vivo methods, treatment of genetic disorders. Principle and protocol for ADA deficiency- future prospects

UNIT V
Environmental Biotechnology
Biotechnology of sewage treatment and effluent treatment for tannery, textile and paper;
Concept of bio-monitoring, biofilters, biosensors, bioscrubbers.
Bioremediation of heavy metal and oil - super bug;
Concept of biopolymers.

TEXT BOOK

Dubey and Maheswari (2006) Text Book of Biotechnology, Chand and Company, New Delhi

REFERENCE BOOKS

Annual Report of Central Sericultural Research and Training Institute (2014). Central Silk Board, Mysore.

Babiuk, L.A., J.P.Philips and M.M.Young (1989) Animal Biotechnology, Pergamaness, Oxford.

Balasubramanianet al.(1996) Concepts in Biotechnology. Universities Press, Hyderabad.

Chrispeels. M.J. and Sadava, D.E (1994) Plants, Genes and Agriculture . Jones and Bartelett Publishers, Boston.

Ganga, G. and Sulochana Chetty, J. (1997).An Introduction to Sericulture. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi

Gupta, P.K. (2004) Elements of Biotechnology, Rastogi Publication, Meerut.

Old R.W. and Primrose. S.B.(1989) Principles of Gene Manipulation, Blackwell Scientific Publications.

Primrose, S.B. and R.M. Twyman (2006) Principles of Gene Manipulation and Genomics, Blackwell Publishing, UK.

Sathyanarayana, U. (2006) Biotechnology, Books and Allied (P) Ltd Kolkota, India

Watson, J.D., M.Gilman, J.Witkowski and M. Zoller (1999).Recombinant DNA.Scientific American Books. W.H. Freeman and Company, New York.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B. Sc. ZOOLOGY (With Specialization inBiotechnology)
(For the candidates admitted from 2015onwards)
SEMESTER VI
MAJOR CORE 13 – PRACTICAL IV - ANIMAL PHYSIOLOGY, ENVIRONMENTAL BIOLOGY AND IMMUNOLOGY

Hours/Week:6 **Code:U15ZO6MCP13**
Credits: 5 **Marks:100**
OBJECTIVE:
Students learns the skills of performing experiments, analyzing the results and discussing the observations

ANIMAL PHYSIOLOGY

1. Oxygen consumption in an aquatic animal –fish
2. Determination of Q_{10}infish
3. Analysis of excretory products in animals of different habitats (ammonia,urea and uric acid)
4. Analysis of ECGrecording
5. Differential count of WBC
6. Total count ofRBC
7. Total count of WBC andPlatelets
8. Measurement of human bloodpressure
9. Estimation of Haemoglobin content – Sahlismethod.

ENVIRONMENTAL BIOLOGY

1. Construction of ecological pyramid to study the structural and functionalrelationship of different tropiclevels
2. Analysis of the fauna and their adaptations to the respective habitat - rocky shore,sandy shore, muddy shore and deepsea
3. Analysis of marineplankton
4. Analysis of water samples for pH, O_2, salinity, carbonates andbicarbonates
5. Estimation of primary productivity of apond
6. Animal associations (symbiosis, mutualism, commensalism andparasitism)

IMMUNOLOGY

1. Organs of immunesystem
2. Histology of spleen, lymph node andthymus
3. Haemagglutination test (Individualwork)
4. Immunodiffusion (Individualwork)

A record of the laboratory work should be maintained and submitted at the time of external practical examination.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B. Sc. ZOOLOGY (With Specialization inBiotechnology)
(For the candidates admitted from 2015onwards)
SEMESTER VI
MAJOR ELECTIVE: 3 –IMMUNOLOGY

Hours/Week:5 **Code: U15ZO6MET05**
Credits:5 **Marks:100**

OBJECTIVE
Student learns about the types of immunity, organization of immune system, antigens, vaccines, immunoglobulins, humoral and cell mediated immune responses, Complement activation, Major histocompatible complexes, Organ transplantation, altered state of immunity and selected immunological techniques.

UNITI .
Scope of Immunology - Types of Immunity
Lymphoid system - Organs – Structure and Functions.
Lymphoid Cells – Types – Haematopoietic stem cells – Significance -Origin and differentiation of lymphocytes.

UNIT II
Antigens : Structure – Properties, Factors affecting antigenecity.
Vaccine – Types , Vaccination Schedule.
Immunoglobulins: Structure, types, distribution and biological functions.

UNIT III
Immune response: Humoral response-antigen processing and presentation, clonal proliferation, cell-cell interaction, antibody secretion; Primary and secondary immune response.
Cell mediated immune response- Mechanism and target cell lysis
Complements – Classical and Alternative pathways, role in immunity.

UNIT IV
Introduction to HLA – HLA complex-Structure and Function of molecules.
Organ transplantation- types of graft, mechanism of allograft rejection.
Immunosuppression (Basic concepts).
Autoimmune Diseases –Concept and types (Graves‟s disease and Rheumatoid arthritis)

UNIT V
Hypersensitivity –Types with example.
Immunological Techniques in Clinical Diagnosis:Antigen – antibody reactions – agglutination, precipitation and immunodiffusion. Widal test – Pregnancy test – ELISA
Introduction to Immunotherapy.

TEXT BOOK:

Nandhini, S. (1994). Immunology- Introductory Text Book. New Age Int. (P) Ltd. Publication, New Delhi

Kuby, J. (2007) Immunology. (Sixth edition) W.H.Freeman and company, New York.

REFERENCE BOOKS:

Fathimunisa Begum 2014.Immunology. PHI Learning Pvt. Ltd., Delhi

Roitt, I. (1987) Essential Immunology. P.G. Publishing PVT. Ltd., New Delhi.

Sell,S.(1987) Basic Immunology. Elsevier Science Publishing Company.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B. Sc. ZOOLOGY (With Specialization in Biotechnology)
(For the candidates admitted from 2015 onwards)
SEMESTER VI

MAJOR ELECTIVE: 3 – ENVIRONMENTAL SCIENCE

Hours/Week:5 **Code :U15ZO6MET06**
Credits: 5 **Marks:100**

UNIT-I

Physical Environment and Habitat

Definition and Scope of Environmental Science – **Environment:** Physical environment – Light, temperature, soil and water. Basic concepts of limiting factors - Leibig‟s law of minimum and Shelford's law of tolerance. **Habitat: Fresh water habitat** - lentic and lotic habitat. **Marine habitat**- Pelagic, benthic and deep sea. **Estuarine habitat** - characteristics and adaptations. **Terrestrial habitat**- characteristics. **Biomes** - Forest and desert biomes. Grass land ecosystem.

UNIT-II

Population and Community

Population - Characteristics of population, regulation of population- density dependent and density independent factors, age structure of populations. **Biotic community -** Community structure and characteristics, Ecotone and edge effect, ecological niche. **Biotic environment -** Inter specific interactions - symbiosis, commensalisms and antagonism.

UNIT-III

Environmental Pollution

Water pollution – Eutrophication, Minamata episode, Post gulf war (1990) effect, Bombay high oil slick (1993), WHO standard for drinking water. **Air pollution –** Global warming, stone leprosy and Tajmahal, Bhopal tragedy, Emission standard and control measures. **Radiation pollution episodes** - Hiroshima and Nagasaki, Chernobyl, Fukushima. **Pesticide pollution -** Biomagnification, biological control, biopesticides, integrated pest management.

UNIT- IV

Environmental Disaster and Fragile Ecosystems

Environmental Disaster: Definition, **Earth Quake -** Kashmir Earth quake 2005, **Tsunami-**Case study India - 2004, **Cyclones and Anticyclones, Floods, Drought. Natural disaster management. Fragile Ecosystem:** Coral reef ecosystem, Mangroves, Wetlands, Mountain environment.

UNIT-V

Environmental Institutions, International Co-operation and Law

International Union for Conservation of Nature and Natural Resources (IUCN), World Wildlife Fund (WWF), US Environmental Protection Agency (EPA), **Indian Environmental Institutions –** Ministry of Environment, Forest and Wildlife (Government of India). Central Pollution Control Board (CPCB). **Environmental Laws/Acts –** Indian Forest Act, Forest Conservation Act, Wildlife Act, Air Act, Water Act. **Environmental Movement in India –** Chipko Movement, Silent Valley Movement

Text book:

Veer Bala Rastogy and Jayaraj, M. S.(1980). Animal Ecology and Distribution of Animals, Kendar Nath Ram Nath, Meerut, Delhi

REFERENCES:

Odum, E.P. and Barrett, G.W. (2005).Fundamental of Ecology. 5th Ed., Cengage Learning India. New Delhi.

Peter, J.R., Stephan, L.W., Paule, H., Ceche, S. and Bevlerly, (2008).M. Ecology. Cengage learning India. New Delhi.

Rana, S.V. S. (2007).Essentials of Ecology and Environmental Science, Third Ed. Prentice –Hall of India Pvt. Ltd. New Delhi.

Smith, T.M. and Smith, R.L.(2008). Elements of Ecology. 6th Ed., Pearson Education. New Delhi.

Wright, R.T. (2008).Environmental Science. 10th Ed., Pearson Education. New Delhi.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
DEPARTMENT OF ZOOLOGY

B.A/ B.Sc./ B.Com/ B.C.A/B.R.Sc./BBA Degree Course

(For the candidates admitted from 2016 onwards)

SEMESTER VI

NON- MAJOR ELECTIVE: 2 - FIRST AID AND HOME NURSING

Hours/Week:2 **Code: U15ZO6NMT02**
Credits:2 **Marks:100**

OBJECTIVE

This course is designed to give insight into Principles of First –aid, essential First –aid. Home Nursing, Trauma First –aid and Advanced First –aid. The student gets aware and learns to act at the time of emergency. They also learn basic home nursing and how to act practically during illness, trauma and Adult first –aid.

UNIT I

Introduction to First – Aid

Principles of First- Aid - An out line of human Anatomy, Carrying Posture at emergency - First - aid Kit; Emergencycenters.

UNIT II

Trauma First – Aid.

Bleeding (External and Internal); Electric shock – Facial injuries (Ear injuries, Eye injuries, Tooth injuries); Head injuries ; Spinal injuries; Chest injuries; Abdominal injuries; Epilepsy/Convulsions – Cuts, Incisions and Abrasions .

UNIT III

Advanced First - Aid.

Sprains and fractures-Bandages and slings

Expired Air Resuscitation (EAR) – Cardiopulmonary Resuscitation (CPR) - Oxygen administration – Analgesic administration; road traffic accidents; fire accidents; Burns and scales, Common minor sports injuries; backinjuries.

UNIT IV

Introduction to Home Nursing.

Principles of Home Nursing –Room maintenance, temperature taking, Care of the hair and skin, administration of medicines, bed making, bed pan, hot water bottle, ice cap and inhalation.

Home Remedies for general ailment

UNIT V

Childhood and adult illnesses care. Vomitting, diarrhoea and dehydration; anaphylaxis - asthma – common cold, cough and fever; hyperventilation; fainting, stroke (Paralysis); diabetes; Blood pressure; Heart attack; Choking; Poisoning: Food, Drug Overdose; Drowning ; Snake and Insect stings.

REFERENCE BOOKS:

Bhave,V.N., Deodhar, N.S., Bhave,S.V.and Sathe R. V. (1983) You and Your Health, Vol.I, National Book Trust ,India.

First Aid to the injured. (2009) St.John Ambulance,5th edition

Harold, S and Hubert, O.S. Your health and You, 1970.Vol I & II . The Stanborough Press Ltd, Alma Park, Grantham, Lincolnshire England.

Muthu, Era. Su. (2004) First - Aid, Sura Books (Pvt) Ltd, Chennai, Bangalore & Kolkata.

Subramanian, R. (2005). First – aid and Home – Nursing, Sindmayam Publishing,Tirunelveli.

HOLY CROSS COLLEGE (AUTONOMOUS), TRICHIRAPPALLI-2
DEPARTMENT OF ZOOLOGY
(For the candidates admitted from 2015 onwards)
SEMESTER VI
SKILL BASED ELECTIVE: 5- ANIMAL CELL CULTURETECHNIQUES
(THEORY CUMLAB)
(For ZoologyStudents)

Hours/Week:2 **Code:U15ZO6SBT05**
Credits:2 **Marks:100**

OBJECTIVE: The student learns the basic requirements for cell culture, maintenance of Primary and Secondary cell culture and their applications.

UNIT I
Requirements for Animal Cell culture – Laboratory media, glass ware
1. Exercise: Preparation of media- Balanced salt solution andsterilization

UNIT II
Preparation of Primary cell culture
2. Exercise: Cell viability and cyto-toxicityassays.

UNIT III
Maintenance of Secondary Culture, Application of Cell culture
3. Exercise: Subculturing

UNIT IV
Stem cell – types and its applications. Stem cell bank. Ethical legal social issues.
4. Exercise: Identification of stem cell types(Spotters)

UNIT V
Signal transduction pathways: receptor- types & cellular responses in normal and diseased condition.
5. Exercise:Identificationofabnormalcellularresponseanddifferentiatingthemfromnormal.

REFERENCES BOOKS:

Babiuk , L .A ., John . P.Phillips and Murray Moo-young (1989), Animal Biotechnology Pergamm press , Oxford.
Freshney. R.I. (2000), Culture of Animal cells : Manual of Basic technique, 4th edition. John Wiley Publications.
Gor Dard and Lucessen, E. (1993) In-vitro Culture of Animal Cells. Butterworth – HeinemannPublications.
Stewart Sell 2003(Ed) Stem Cells Handbook, Humana Press, NY.

HOLY CROSS COLLEGE (AUTONOMOUS), TRICHIRAPPALLI-2
DEPARTMENT OF ZOOLOGY
(For candidates admitted from 2015 onwards)
SEMESTER VI
SKILL BASED ELECTIVE: 6 –RESEARCH METHODOLOGY
(Theory cum Project)

Hours/Week: 2 **Code:U15DS6SBT06**
Credits:2 **Marks:100**

OBJECTIVE
Students get introduced to concept of research and to carry out research projects.

Unit I
Introduction to research: Concept of research – types of research – introduction to research literature base – collection of research information from different sources; maintenance of information.

Unit II
Research focusing: identifying research area – drawing objectives\ hypothesis – designing the work – data collection – analysis.

Unit III
Preparation of dissertation: Structure of dissertation – editing – bibliography.

Unit IV
Project work

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

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

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

Note:
The students will be evaluated internally by a test for 50 marks. The Project will be evaluated by an external evaluator and a viva- voce will be conducted for 50 marks.

The students can carry out their projects individually or in groups.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B.A. /B.Sc. / B.Com. / B.R.Sc./ B.C.A. DEGREE COURSE
LIFE ORIENTED EDUCATION
ETHICS – III: FAMILY AND CAREER DEVELOPMENT

HRS / Wk :1 **CODE: U13VE6LVE03**
CREDIT :1 **MARKS : 100**

OBJECTIVES:

- To help the students learn skills, knowledge, talent to lead a meaningful life.
- To help the students understand marriage life.
- To make the students learn skills of nurturing family and children.
- To make them aware of emotional intelligence and choose their carrier.

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: MOTHERHOOD

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", Dominant Publishers.

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 – III: ESSENCE OF CHRISTIAN FAITH

HRS / Wk : 1 **CODE: U12VE6LVB03**
CREDIT :1 **MARKS : 100**

Objective:

- Prepare to practice Christian principles in family, church and society as a young women.

UNIT – I: ESSENTIALS OF CHRISTIAN FAITH

- Salvation – Deliverance from sin (Is 53),Assurance of salvation and New life (II Cor 5:17)
- 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: MAARIAGE AND FAMILY LIFE

- Finding the God's Will - Issac (Gen 24)
- 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, Eph 5

UNIT – III: CHRISTIAN HOME

- Parental Responsibilities and bringing up children – Abraham (Gen 22),
- Caring for the Aged (I Sam 2: 31,32)
- Entertainments (I Cor 10: 23)

UNIT – IV: CHRISTIAN ETHICS

- Holiness – Joseph (Gen 39:9)Levi 11: 45, Ecc 12
- Obedience to God - Abraham (Gen 12) ; St. Paul (Acts 9)
- Freedom and Accountability
- Justice and Love

- Choices in Life – Making Decisions(Studies, job, life Partner)
- Model to follow – Who is your model? (John 15: 1-17)
- Social Evils – Dowry, Caste discrimination, Accumulation of wealth
- Freedom of Options, Time Management, Work Ethics (I Peter 2: 11-25)

UNIT – V: ROLE IN CHURCH AND SOCIETY

- Man is the temple of God (I Cor 3: 11-17, 6: 19-20) Individual responsibility in Gospel work
- Church –Body of Christ (I Cor 12: 14-27)
- Unity (John 17: 20-23, Mat 10: 37-39, 16:24-26, Mark 13: 11-13)
- Discipleship (I & II Timothy, Titus)
- Social Responsibilities (Phil 2; 1-11, James 1: 27, 2: 14-17, 4: 17, 5: 14-15)

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, New Zealand.
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.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
B.A./B.Sc/B.Com/B,R.SC/B.C.A DEGREE COURSES
LIFE ORIENTED EDUCATION
CATECHISM – III: LITURGY AND CHRISTIAN LIFE

HRS / WK :1 **CODE:U12VE6LVC03**
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 become a living witness 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. –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 – church – laws 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 for 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– 620 002.