DEPARTMENT OF PHYSICS

UG SYLLABUS

B.Sc. Physics

(SHIFT –I)

HOLY CROSS COLLEGE (AUTONOMOUS)

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

PG AND RESEARCH DEPARTMENT OF PHYSICS

Programme: B. Sc. PHYSICS/ PHYSICS WITH SPECIALIZATION IN ELECTRONICS

PO No.	**Programme Outcomes** ***Upon completion of the B.Sc. Degree Programme, the graduate will be able to***
PO-1	Promote Analytical Thinking and research skills in the minds of students
PO-2	Strive for consistent academic excellence and integrated personality development
PO-3	appreciate and apply Basic Physics principles in everyday life
PO-4	Acquire practical skills to gather information, assess, create and execute new ideas to develop entrepreneurial skills
PO-5	Mould the students to face the multi-faceted world of IT, with physics as the base and engulfing electronics
PO-6	Apply knowledge and skill in the design and development of Electronics circuits to cater to the needs of Electronic Industry

PSO No.	**Programme Specific Outcomes** ***Upon completion of these courses the student would***
PSO-1	Acquire academic excellence with an aptitude for higher studies and research
PSO-2	Provide knowledge about material properties and its application for developing technology to ease the problems related to the society
PSO-3	Analyze the applications of mathematics to the problems in physics
PSO-4	Learn to design an experiment (or series of experiments) demonstrating their understanding of the scientific method and processes
PSO-5	Develop communication skills in communicating physics-related topics
PSO-6	Apply appropriate techniques and modern tools to complex scientific activities

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI - 620 002
DEPARTMENT OF PHYSICS - CBCS - UG COURSE PATTERN - B.Sc. Physics
(For the candidates admitted from June 2015 onwards)

Sem	Part	Course	Title of the Course	Code	Hrs/ Wk	Credits	Marks
I	I	Language - 1	Tamil paper I/ Hindi paper I/ French paperI	U19TL1GEN01/ U18HN1HIN01/ U16FR1FRE01	6	3	100
	II	English - 1	English paper -I	U19EL1GEN01	6	3	100
	III	Major Core - 1	General Physics	U15PH1MCT01	7	5	100
	III	Allied Physics - 1 (for Chemistry)	Basic Physics -1	U16PH1ACT01	4	4	100
	III	Allied Physics - 2 (for Chemistry)	Basic Physics Practicals - I	U16PH1ACP02	4	3	100
	IV	Environmental Studies	Environmental Studies	U15RE1EST01	2	1	100
	IV	Value Education	Ethics/Bible studies/Catechism	U15VE2LVE01/ U15VE2LVB01/ U15VE2LVC01	1	--	--
	IV		Service Oriented Course		1	--	--
		Intership/Field work/Field Project – 30 Hours – Extra Credit		U18SP1ECC01		2	100
II	I	Language - 2	Tamil paper II/ Hindi paper II/ French paper II	U19TL2GEN02/ U19HN2HIN02/ U16FR2FRE02	5	3	100
	II	English - 2	English paper -II	U15EL2GEN02	6	3	100
	III	Major Core - 2	Electricity & Electromagnetism	U15PH2MCT02	6	6	100
	III	Major Core - 3	Main Practical I: General Physics	U16PH2MCP03	4	3	100
	III	Allied Physics - 3 (for Chemistry)	Basic Physics - 2	U16PH2ACT03	4	3	100
	IV	Skill Based Elective - 1	Soft skill development	U18SS2SST01	2	2	100
	IV	Skill Based Elective - 2	Rural Enrichment and Sustainability	U18RE2SBT02	1	1	100
	IV	Industrial Relations	Non Destructive Testing Techniques	U19PH2IRT01	1	1	100
	IV	Value Education	Ethics/Bible studies/Catechism	U15VE2LVE01/ U15VE2LVB01/ U15VE2LVC01	1	1	100
	VI		Service Oriented Course		--	--	

	Intership/Field work/Field Project – 30 Hours – Extra Credit			U18SP2ECC02		2	100
III	I	Language – 3	Tamil paper III/ Hindi paper III/ French paper III	U15TL3TAM03/ U18HN3HIN03/ U16FR3FRE03	6	3	100
	II	English – 3	English paper -III	U19EL3GEN03	6	3	100
	III	Major Core – 4	Electronics	U15PH3MCT04	5	5	100
	III	Major Core – 5	Main Practical II: Optics and electricity	U15PH3MCP05	5	5	100
	III	Allied Physics Optional Paper – 1	Properties of matter, Heat and Modern	U15PH3AOT01	4	3	100
	IV	Skill Based Elective - 3 (for Zoology)	Physics for Life sciences	U17PH3SBP03	2	2	100
	IV	Gender Studies	Gender Studies	U15WS3GST01	1	1	100
	IV	Value Education	Ethics/Bible studies/Catechism	U15VE4LVE02/ U15VE4LVB02/ U15VE4LVC02	1	--	-
	VI		Service Oriented Course		--	--	-
		Intership/Field work/Field Project – 30 Hours – Extra Credit		U18SP3ECC03/ U18SP3ECC02		2	100

Sem	Part	Course	Title of the Course	Code	Hrs/ Wk	Credits	Marks
IV	I	Language – 4	Tamil paper IV/ Hindi paper IV/ French paper IV	U15TL4TAM04/ U18HN4HIN04/ U16FR4FRE04	5	3	100
	II	English – 4	English paper -IV	U19EL4GEN04	6	3	100
	III	Major Core 6	Optics & Spectroscopy	U15PH4MCT06	5	5	100
	III	Major Elective – 1	Digital Electronics/ Energy Physics	U15PH4MET01/ U15PH4MET02	5	5	100
	III	Allied Physics Optional Paper – 2	Optics, Electricity and Electronics	U15PH4AOT02	4	4	100
	III	Allied Physics Optional Paper – 3	Basic Physics practicals- II	U15PH4AOP03	4	3	100
	IV		Service Oriented Course		--	1	100
	IV	Value Education	Ethics/Biblestudies/ Catechism	U15VE4LVE02/ U15VE4LVB02/ U15VE4LVC02	1	1	100
	VI		Service Oriented Course		--	1	100
		Intership/Field work/Field Project – 30 Hours – Extra Credit		U18SP4ECC04/ U18SP4ECC02		2	100
	III	Major Core 7	Atomic and Molecular physics	U15PH5MCT07	5	4	100
	III	Major Core 8	Classical and Quantum Mechanics	U15PH5MCT08	5	4	100

V	III	Major Core 9	Electromagnetics and Mathematical physics	U15PH5MCT10	5	4	100
	III	Major Core 10	Main Practical III: Electronics practicals	U15PH5MCP12	5	4	100
	III	Major Elective – 2	Circuit and Network Theory/ Microprocesssor INTEL 8085	U15PH5MET01/ U15PH5MET02	5	5	100
	IV	Non Major Elective – 1	Basics of Computer Electronics	U15PH5NMT01	2	2	100
	IV	Skill Based Elective - 4 (for Botany)	Physics For Life Sciences	U17PH5SBP04	2	2	100
	IV	EXTRA CREDIT	Online Course	U19PH5OCT01	-	2	100
	IV	Value Education	Ethics/Bible studies/Catechism	U15VE6LVE03/ U15VE6LVB03/ U15VE6LVC03	1	--	
		Intership/Field work/Field Project – 30 Hours – Extra Credit		U18SP5ECC05/ U18SP5ECC02		2	100
VI	III	Major Core 11	Solid State Physics	U15PH6MCT13	6	5	100
	III	Major Core 12	Nuclear, Particle and Astrophysics	U15PH6MCT14	6	5	100
	III	Major Core 13	Main Practical IV A: Digital and Microprocessor practicals	U15PH6MCP16	6	5	100
	III	Major Elective – 3	Communication Physics/ Applied Electronics	U15PH6MET04	5	5	100
	IV	Non Major Elective – 2	Basics of Modern Communication Systems	U15PH6NMT02	2	2	100
	IV	Skill Based Elective – 5	Computer Literacy for Physics	U19PH6SBT05	2	2	100
	IV	Skill Based Elective – 6	Research Methodology	U15DS6SBT06	2	2	100
	IV	Value Education	Value Education Ethics/Bible studies/Catechism	U15VE6LVE03/ U15VE6LVB03/ U15VE6LVC03	1	--	
	V	Extension activity	RESCAPES Impact Study of project	U18RE6ETF01	-	1	100
		Intership/Field work/Field Project – 30 Hours – Extra Credit		U18SP6ECC06/ U18SP6ECC02		2	100
Grand Total					**180**	**141 + 14**	**4600+ 600**

HOLYCROSS COLLEGE(Autonomous),Tiruchirappalli-620 002.

TAMIL

DEPARTMENT

For Candidateadmitted from2015onwards

FirstYear-Semester–I

CourseTitle	முதலாமாண்டு – முதற்பருவம்
TotalHours	**90**
Hours/Week	**6 Hrs Wk**
Code	**U19TL1GEN01**
CourseType	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

தமிழ் இலக்கியப் பரப்பையும், பாரம்பரியத்தையும் அறிமுகப்படுத்துதல்.

- To find out the ways to handle the Tamil language effectively and productively.
- To introduce the tradition and the grammar of Tamil language.
- To encourage the creatively development.
- Creating curiosity to make life according to high moral.
- Helping to create healthy thoughts among themselves.

CourseObjectives:

CO No.	CourseObjectives
CO-1	தமிழ் இலக்கியப் பரப்பையும்,விழுமியங்களையும் அறிமுகப்படுத்துதல்.
CO-2	தமிழ் மொழியின் தொன்மை,தாய்மொழிப்பற்று,தன்னம்பிக்கை சூழல்களை எதிர்கொள்ளும் திறன் முதலியவற்றை அறிந்து கொள்வர்.
CO-3	கவிதையின் வாயிலாக அன்பு உணர்வினை வளர்க்கச் செய்தல்.
CO-4	கலைச்சொற்கள்வாயிலாக பிறமொழிச்சொற்களைஆராயும்தன்மைப் பெறுவர்.
CO-5	படைப்பாற்றல் திறனை வளர்த்துக்கொள்வர்.

அலகு:1 செய்யுள் 18**Hrs**

1.பாரதியார் கவிதைகள் - தமிழ்

கண்ணன் என் சேவகன்

2.பாரதிதாசன் கவிதைகள் - உலகம் உன்னுடையது

3.உமர்கய்யாம் - உமர்கய்யாம் பாடல்கள்

4. பட்டுக்கோட்டையார் - செய்யும் தொழிலே தெய்வம்

5.ந.பிச்சமூர்த்தி – ஒளியின் அழைப்பு

6.வைரமுத்து – ஐந்து பெரிது ஆறு சிறிது

7.சிற்பி– ஒரு கிராமத்து

keyWords (Extra Reading)

1.ந.காமராசு கவிதைகள்

2.தமிழன்பன் கவிதைகள்

அலகு:2 செய்யுள்

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

keyWords(ExtraReading)

1.ந.முத்துக்குமார் கவிதைகள்

2.செனட்ரியூ கவிதைகள்

அலகு:3 **18Hrs**

தமிழ் இலக்கிய வரலாறு

தமிழாய்வுத்துறை வெளியீடு 20-ஆம் நூற்றாண்டு (தற்காலம்)

keyWords(ExtraReading)

தமிழ் இலக்கிய வரலாறு -மு.வரதராசன்

அலகு:4

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

அலகு:5

பொதுப்பகுதி - கலைச்சொற்கள் **18Hrs**

Note: Texts givenintheExtra reading /Key wordsmust be testedonly throughAssignment and Seminars.

CourseOutcomes:

CO No.	**CourseOutcomes**	**PSOs Addressed**	**Cognitive Level**
CO-1	Toevaluatethehighnessoftamillanguage,patriotism,standard inall situation, selfdiscipline,unity,growthpathofthe nation.	PSO 1	U
CO-2	to evaluate poems and enrich knowledge on religious faith, preservingnature, social atrocities against women and resistance.	PSO 2	E
CO-3	toenhancecreativespiritamongtheyouththroughthepresent tamil literatures	PSO 2	AN
CO-4	awarenesstowardshumanrightsandhumanismthroughshort stories	PSO 3	AP
CO-5	cultural languageof various departments and similar English wordstohaveknowledgeinboth.	PSO 4	U

PO–Programme Outcomes;CO – Course Outcome;R-Remember;U-Understand;Ap– Apply;

பார்வைநூல்கள்

பாட
நூல்கள்

சய்யுள் - தமிழாய்வுத்துறை வுத்துறை வெளியீடு

தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறைவெளியீடு

சிறுகதைத் தொகுப்பு - தமிழாய்வுத்துறைவெளியீடு

கலைச்சொற்கள் - தமிழாய்வுத்துறைவெளியீடு

(For the candidates admitted from June 2018 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002

DEPARTMENT OF HINDI

SEMESTER – I

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

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

Course Objectives (CO):

The learner will be able to:

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

UNIT – I **(18 Hours)**

1. Aatma Nirbharatha
2. Idgah
3. Sangya

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

UNIT- II **(18 Hours)**

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

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

UNIT- III **(18 Hours)**

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

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

UNIT- IV **(18 Hours)**

1. Bharat Ek Hai
2. Sharandhata
3. Kriya

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

UNIT- V **(18 Hours)**

1. Mitrata
2. Vapasi
3. Ling Aur Vachan

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

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

Course Outcomes:

The learner will be able to:

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

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

Reference Books :

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

(For candidates admitted 2016 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF FRENCH

SEMESTER I

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

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

Course Objectives (CO):

The learner will be able to

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

Unit 1 Parcours d'initiation ; Vous comprenez (15 Hours)

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

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

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

Unit 2 Au travail! (15 Hours)

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

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

Unit 3 On se détend! (15 Hours)

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

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

Unit 4 Racontez-moi ! ; Bon voyage ! (30 Hours)

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

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

Extra Reading (Key Words):La vie despersonnalités célèbres

Unit 5 Bon appétit! (15 Hours)

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

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

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

TEXT BOOKS :

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

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

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

(for candidates admitted from June 2018 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), Tiruchirapalli – 620002

PG AND RESEARCH DEPARTMENT OF ENGLISH

I YEAR UG – SEMESTER I

PART II – ENGLISH 1 - GENERAL ENGLISH I

HOURS : 6 **CODE : U19EL1GEN01**

CREDIT : 3 **MARKS: 100**

OBJECTIVES

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

UNIT I - I, ME, MYSELF

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

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

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

Reading for comprehension of routine work.

Writing -Paragraph guided

Grammar- Articles, Prepositions, Punctuation

Vocabulary-Meanings, Synonyms, Antonyms

Composition –GuidedCreative writing

TEXTS

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

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

UNIT II -MY FAMILY AND FRIENDS

Listening to identify the persons/ places/ things from descriptions

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

Reading to get specific information and to analyze characters

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

Grammar -adjectives and verbs

Vocabulary-synonyms and antonyms in context

Composition - Guided paragraph

TEXTS

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

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

UNIT III -THE WORLD AROUND ME

Listening To identify specific information

Speaking –Discussing and expressing opinions

Reading To infer meaning

Writing Descriptive and Diary writing

Grammar Uses of 'be' Verbs – subject verb concord

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

Composition - Essay writing

TEXTS

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

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

UNIT IV - MY CONCERN AND RESPONSIBILITIES

Listening to short speeches and getting main concern- Global comprehension

Speaking Expressing opinions, concerns and responsibilities

Reading To detect one's perspective

Writing Debate and Dialogue

GrammarSentence patterns (5 basic types)

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

Composition-Imaginative writing

TEXTS

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

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

UNIT V - MY PROFESSIONAL WORLD

Listening to short profile to get details –global comprehension

Speaking Discussion on secrets of success learnt from success stories

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

Writing resume and E-mail writing

Grammar- Four Types of sentences

Vocabulary-Idioms and phrases- meaning

Composition – Formal and imaginative writing

TEXTS

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

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

PRESCRIBED BOOK:

English for Communication –PoGo publication Trichy

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

FIRSTYEAR - SEMESTER I

Course Title	MAJOR CORE 1: GENERAL PHYSICS
Total Hours	105
Hours/Week	7 HrsWk
Code	U15PH1MCT01
Course Type	Theory
Credits	5
Marks	100

General Objective: To study the basic principles of Properties of matter, Mechanics, Theory of Relativity and Heat and Thermodynamics.

Course Objectives:

The Learner will be able to:

CO No.	Course Objectives
CO-1	understand the basic ideas of properties of matter
CO-2	understand harmonic oscillator and apply it to solve problems in mechanics
CO-3	apply the concepts of relativity, understand the idea of space, mass and time
CO-4	remember the laws of thermodynamics
CO-5	understand the concept of transmission of heat and low temperature physics

UNIT I: PROPERTIES OF MATTER21 Hrs

Torsion – couple per unit twist for solid and hollow cylinders – Work done in twisting a wire – Torsion pendulum – static torsion method – bending of beams – bending moment – cantilever – non-uniform bending – Theory – experiment using Microscope - Uniform bending theory – experiment using telescope – I Shape of girders.

Viscosity- coefficient of viscosity—streamline flow of turbulent flow- critical velocity - Poiseuille's formulafor the flow of liquid through a capillary tube- corrections to Poiseuille's formula- Poiseuille's method for determining co-efficient of viscosity of a liquid

Surface tension on kinetic theory – excess pressure inside a curved liquid surface- experimental determination of surface tension-jaegers' method - surface tension -Bernoulli theorem.

Extra reading /Key words: *Elasticity, Flow of liquid*

UNIT II: MECHANICS21 Hrs

HARMONIC OSCILLATORS

Periodic and simple harmonic motions – Energy of a harmonic oscillator – Average values of kinetic and potential energies of a harmonic oscillator – Damped harmonic oscillator – power dissipation – Q factor – Forced harmonic oscillator – power absorption – Q factor – Condition for resonance.

Extra reading / Key words: *Coherent state, Displacement operator*

UNIT III: RELATIVITY21 Hrs

Inertial frames of reference – Galilean transformation – Galilean invariance – Michelson Morley experiment – Einstein's special theory of relativity – Lorentz's transformation equations – relativity of time – relativity of space – relativity of mass – Addition of velocities – Mass energy equivalence and its physical significance – Atomic mass unit.

Extra reading / Key words: *Einstein, Speed of light*

UNIT IV: THERMODYNAMICS21 Hrs

Statement of laws of thermodynamics –Carnot's ideal heat engine – Derivation of its efficiency in terms of temperatures – Internal combustion engine – Otto & Diesel Engines – Kelvin's absolute scale of temperature – Entropy – Changes in Entropy in reversible and irreversible processes – T-S Diagram – Maxwell's thermodynamic relations – T - ds relations – Clausius and Claypeyron latent heat equations using Maxwell's relations.

Extra reading / Key words: *Energy, State coordinates*

UNIT V: TRANSMISSION OF HEAT21 Hrs

Thermal conductivity – Rectilinear flow of heat – experimental methods to determine the coefficient of thermal conductivity – Forbes's method and Lee's disc method – Kirchoff's law, Stefan's law and Newton's law of radiation – Black body radiation – Energy distribution in the black body spectrum.

Low Temperature Physics: Production of low temperature-Joule-Thompson effect-J-T effect for a Vanderwaal's gas- liquification of helium.

Extra reading / Key words: *Conduction, Heat transfer*

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

Course Outcomes:

The Learner will be able to:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Recall and relate Elasticity, Viscosity and Surface tension	PSO 1	R, U
CO-2	Discuss Harmonic oscillator	PSO 5	U
CO-3	Analyze the Einstein's special theory of relativity	PSO 2	U, An
CO-4	Demonstrate Carnot's ideal heat, Internal combustion engine, Otto & Diesel Engines	PSO 3	U, Ap
CO-5	Describe Changes in Entropy in reversible and irreversible processes	PSO 2	U
CO-6	Compare Conduction, Convection and Radiation	PSO 5	U,E
CO-7	Gain Employability-Knowledge on basic principles of Physics	PSO 6	Ap

PO – Programme Outcomes; CO – Course Outcome; R- Remember; U- Understand; Ap – Apply;

An – Analyse; E- Evaluate; C – Create

Text Books:

1. Murugesan R, Kiruthiga Sivaprasath Properties of Matter and Acoustics, S. Chand & Co. (2012)
2. Brijlal & Subramaniam Heat Thermodynamics and Statistical Physics - S. Chand & Co. New Edition (2012)

BOOKS FOR REFERENCE:

1. Mathur D.S., P S Hemne, Mechanics S. Chand & Co., (2014).
2. Rajam J.B., (Revised by Arora. G.I.,) A Text book of Heat & Thermodynamics, S. Chand & Co., (1983).
3. D. Jeyaraman. Dr. K. Ilangovan and S. Visvanathan, Thermal Physics & Statistical Mechanics, (2009).

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

FIRST YEAR - SEMESTER I

Course Title	**ALLIED PHYSICS 1: BASIC PHYSICS – I (for Chemistry students)**
Total Hours	**60**
Hours/Week	**4 HrsWk**
Code	**U16PH1ACT01**
Course Type	**Theory**
Credits	**4**
Marks	**100**

General Objective: To understand the basics of Properties of matter, Mechanics, Sound, Thermal physics and Optics.

Course Objectives:

The Learner will be able to :

CO No.	**Course Objectives**
CO-1	remember the properties of matter, types of stress and amount of strain, viscous nature and surface force
CO-2	understand the nature of S.H.M. and its applications in banking of curves and nature of gravitational field in mechanics
CO-3	understand the features of musical notes and the importance of sound parameters
CO-4	analyze the thermal physics concepts in liquids and gases
CO-5	understand the basic principles of Optics

UNIT I: PROPERTIES OF MATTER12 Hrs

Elasticity - Elastic constants – Theory of Bending of beams - Young's modulus by non - uniform bending - Torsion in a wire - Rigidity modulus - Static torsion.

Viscosity - Coefficient of viscosity - Poisuelle's formula - Comparison of viscosities by burette method - Surface tension - Molecular theory of surface tension - Surface tension by drop weight method.

Extra reading / Key words: *Hooke's law, Angle of twist, Flow of liquid*

UNIT II: MECHANICS12 Hrs

Simple Harmonic Motion - Angular velocity - Angular acceleration - Uniform circular motion - Acceleration of a particle in a circle - centrifugal force - Centrifuge - Banking of curves- Motion of a bicycle around a circle.

Newton's universal law of gravitation - gravitational field - gravitational potential energy - gravitational potential and field due to uniform solid sphere.

Extra reading / Key words: *Tangential angle, Gravitational constant*

UNIT III: SOUND12 Hrs

Characteristics of sound waves - Amplitude, pitch, frequency and loudness - Acoustics of buildings - Reverberation - Reverberation time - Sabine's formula - Condition for good acoustics - Ultrasonics – Introduction – Production- Properties- Applications.

Extra reading / Key words: *Musical note, Echo*

UNIT IV: THERMAL PHYSICS12 Hrs

Postulates of kinetic theory of gases - Critical constants - J-K effect - Porus plug experiment - Theory of porus plug experiment – Regenerative cooling.

Newton's law of cooling - Specific heat of a liquid - specific heats of a gas C_P,C_V - Meyer's Relation.

Extra reading / Key words: *Temperature of inversion, Heat capacity*

UNIT V: OPTICS12 Hrs

Refraction - Refraction through prism- Refractive index – dispersive power of prism- Interference - Condition for Interference – Newton's rings - Air wedge - Diffraction - Theory of grating - normal incidence – comparison between prism spectra and grating spectra.

Extra reading / Key words: *Dispersion, Deviation*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Discuss the properties of matter types of stress and amount of strain, viscous nature and surface force.	PSO 1	U
CO-2	Explain the nature of S.H.M. and its applications in banking of curves and nature of gravitational field in mechanics	PSO 5	U, Ap
CO-3	List the features of musical notes and the importance of sound parameters	PSO 2	R
CO-4	Explain the thermal physics concepts in liquids and gases	PSO 5	R, U
CO-5	Discuss the basic principles of Optics.	PSO 2	R, U
CO-6	Gain Employability-Knowledge on basic principles of Physics	PSO 6	U, Ap

Text Books:

1. Murugesan R Allied Physics, New Delhi, S. Chand & Co. Ltd (2005).
2. Brijlal and Subramaniam, Text Book of Optics, S. Chand & Co, New Delhi (1998).

3. Brijlal and Subramaniam & Jivan Seshan, Mechanics and Electrodynamics, Eurasia publishing house (pvt) Ltd.,Ram nagar, New Delhi(2005).
4. Brijlal, Subramaniam & P.S.Hemne, Heat, Thermodynamics and statistical physics, S. Chand & company Ltd., New Delhi (2007).
5. M. Narayanamurti and N.Nagaratnam, Heat, The National Publishing Co., Madras (1987).

BOOKS FOR REFERENCE:

1. Mathur D.S, Mechanics. S.Chand & Co. Ltd., (2007).
2. P.K. Chakrabharti, Theory and experiment on thermal physics, New central book agency Pvt. Ltd., (2006).
3. P.K. Chakrabharti, Geometrical and Physical optics,New central book agency Pvt. Ltd.,(2005).
4. David Halliday, Robert Resnik, Kenneta S. Krane, The Physics, John Willey and sons, Singapore (2005).
5. Murugeshan R and Kiruthiga Sivaprasath, Properties of matter and Acoustics (2^{nd} ed.), S. Chand & company Ltd. New Delhi (2012).
6. Rajam J.B.and Arora C.L. A Text Book of Heat and Thermodynamics, S.Chand & Co, New Delhi (1983).

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

FIRST YEAR - SEMESTER I

Course Title	**ALLIED PHYSICS 2: BASIC PHYSICS PRACTICALS – I (for Chemistry students)**
Total Hours	**60**
Hours/Week	**4 Hrs Wk**
Code	**U16PH1ACP02**
Course Type	**Practical**
Credits	**3**
Marks	**100**

General Objective: To understand the basics of Properties of matter, Optics, Electricity and Electronics by doing related experiments.

Course Objectives:

The Learner will be able to :

CO No.	**Course Objectives**
CO-1	understand and evaluate the Young's modulus and Rigidity modulus of the given material
CO-2	understand the principles of optics through air wedge and spectrometer experiments
CO-3	create a bridge rectifier using diodes
CO-4	remember the functions of logic gates.
CO-5	understand and analyze the characteristics of various diodes
CO-6	Skill Development-Practical exposure

Any Fourteen experiments only

1. Determination of Young's modulus of the material of a bar using Cantilever (Pin and Microscope).
2. Determination of Young's modulus of the material of a bar by Non-uniform bending using (Pin and Microscope).
3. Determination of Rigidity modulus of the material of a wire using Torsion Pendulum.
4. Determination of Rigidity modulus of the material of a rod - Static Torsion.
5. Comparison of viscosities of two liquids using burette.
6. Determination of Surface Tension by Drop Weight method.
7. Determination of thickness of the wire using Air wedge.
8. Determination of Radius of Curvature of a lens - Newton's Rings.
9. Determination of refractive index of the material of prism using Spectrometer
10. Determination of refractive index of a liquid using hollow prism.
11. Determination of wavelengths of prominent lines of mercury spectrum using grating.
12. Determination of specific heat capacity of a liquid by Newton's law of cooling method.
13. Study of Junction Diode characteristics.

14. Study of Zener Diode characteristics.
15. Construction of Bridge Rectifier.
16. Construction of Regulated Power Supply using Zener Diode
17. Study of AND, OR Logic gates using discrete components.
18. Study of NAND as Universal logic gate.
19. Study of NOR as universal logic gate.
20. Verification of Demorgan's Theorems.

(For candidates admitted from2018 onwards)
HOLY CROSSCOLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B.A/B.Sc./B.Com/B.R.SC/B.C.A/ B.B.A DEGREEEXAMINATION
SEMESTER I / V

CourseTitle	**ENVIRONMENTAL STUDIES**
Total Hours	**15**
Hours/Week	**1**
Code	**U18RE1EST01/ U18RE5EST01**
CourseType	Theory
Credits	**1**
Marks	**100**

General
Objectives:

TheStudent willbeable to understand theconcept ofecosystem, biodiversity, conservation, disastermanagement,analysetheprospectsofnaturalresources,evaluatetheeffectandcontrolof pollution

CourseObjectives:

Thestudent will be able to

1. understand the prospectsofthe various naturalresources.
2. analysethe concept andneed forbiodiversity
3. evaluatetheeffect ofthedifferent types ofpollution.
4. understand the need fordisastermanagement
5. understand the Environment and SocialIssues

Unit I – Awareness andNaturalResources **3hrs**

Awareness of Environmental issues and management strategies– need of thehour

Renewableand non-renewable resources-uses, present status and management of forest, water, land and energyresources.

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

Unit II – EcosystemsandBiodiversity **3hrs**

Ecosystem –concepts,structureand types– concept of food chains andfood web– causes and effects of weakeningfood chains-Biodiversity–concept ofgenetic, species and ecological

biodiversity– ecologicaland economicvalues–India, amegadiversitycountry, hotspots– threats to biodiversityandconservation measures

Extra reading (KeyWords): *Red list(any10 plants and animals)*

Unit III –Environmental Pollution

3hrs Causes, effects andcontrol of water,and air pollution– global warming– ozonedepletion– nuclear hazards. Population growth at national andglobal level

World food production– effects of modernagricultureon land ecosystems– GMOs and related issues .Environmental pollution and diseases– malaria, chikungunya

Extra reading (KeyWords): *Environmentalfactors affecting human behaviour*

Unit IV–DisasterManagement 3hrs

BombThreat–Earthquake–Explosion–Hazardousmaterialspill/release–campusshooting– Terrorist incidence – Financial emergency – a sudden health emergency, unexpected loss of

income,deathinthefamilyorother family emergency.Rentinarrearsandriskofeviction.Natural disasters

Extra reading (KeyWords): *Causativefactors ofany2 disasters*

Unit V – EnvironmentandSocialIssues 3hrs

Rich– poorwide – at national andgloballevels

Urbanization – slums

Changingvalue systems– AIDS Familywelfareprograms

Extra reading (KeyWords): *Scholarshipsand funds benefitting thewelfareof thefamily*

Note: Texts givenintheExtra reading /Key words must be testedonlythroughAssignment and Seminars.

CourseOutcomes:

1.Explain the importanceof thevarious naturalresources.

2.Analyzethe concepts, structureand types ofecosystem. Add note on the biodiversityconcepts

3.Evaluatethe effect of thedifferent types ofpollution

4.Explains thevarious disastermanagement.

5.Discuss theneed ofenvironment and the socialissues

REFERENCES:

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

Chairas, D.D. (1985). Environmental Science. TheBenjaminCummings Publishingcompany.,Inc.

ClarkeGeorge,L. (1954). Elements of Ecology.Hohn Wileyand SONS,Inc.

Hodges,L. (1977). Environmental Pollution, IIEdition. Holt, Rinehart and Winston, New York.Krebs, C.J. (2001).Ecology.VIEdition.BenjaminCummings.

Nebel, B.J. and Wright,R.T.(1996). Environmental Science, PrenticeHall,New Jersey Odum, E.P.(2008) Fundamentals of Ecology.Indian Edition. Brooks / Cole.

Sharma, B.K.and Kaur (1997).Environmental Chemistry. Goel PublishingHouse, Meerut. Sharma, B.K. andKaur,(1997).AnIntroduction to Environmental Pollution. Goel PublishingHouse,

Meerut.

Sinhe, A.K. Boojh, R. and Vishwanathan, P. N. (1989).WaterPollution Conservation and

Management, Gyansdaya Prakashan,Nainital.

HOLYCROSSCOLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2

B.A/B. Sc/B.Com/B.C.A-DEGREE
COURSES LIFE ORIENTEDEDUCATION

ETHICS–I:RELIGIONSANDVALUE SYSTEMS

HRS/WK:1CODE:U15VE2LVE01

CREDITS:1 **MARKS:100**

OBJECTIVES:

xToenablethestudents to understandandappreciateallReligions andCulture

xTohelpthestudentstobecom

xToawareofthenegativeforces ofreligions.

UNIT–I:RELIGION

God–Faith,Religion,Definition,Nature,CharacteristicsandBasicvaluesof different religions. ImpactofGlobalizationonreligion–Importanceofworshipinholyplaces–celebration, Communion(come-union)–Socialization

UNIT–II:DIFFERENT RELIGIONS

Basiccharacteristicsandbasicthoughtsof differentreligions:Buddhism,Christianity, Hinduism,Islam,JainismandSikhism

UNIT–III: UNITYOF RELIGION

Unityof VisionandPurpose-RespectforOther Religions,InterReligiousCo-operation, Religious Pluralismas afactandReligious Pluralismas avalue

UNIT–IV:FUNDAMENTALISM,COMMUNALISMANDSECULARISM

Meaning andimpact of Fundamentalism, Communalism, Violence and Terrorism –

Tolerance–Secularism–Individualism

UNIT–V:VALUE SYSTEMS

ValueandValueSystems-MoralValues-Individualsandtheneedtostandforvaluesin thecontextof Globalization–Consumerism-Willpowertoliveuptoyourvalues-Healthybody for empowerment–Physicalhealthand Mentalhygiene,foodandexercises

REFERENCES:

1. Social Analysis (a course for all first year UG students), 2001. Department ofFoundation Courses,LoyolaCollege,Chennai-34.
2. SpecialtopicsonHinduReligion,2001.Department ofFoundationCourses,LoyolaCollege, Chennai-34.
3. Religion: the livingfaiths of the world, 2001. Department ofFoundation Courses, Loyola College,Chennai-34.
4. SydneyAmMeritt,1997.Guidedmeditationsforyouth.
5. Marie MigonMascarenhas,1986. Family life education- Value Education, Atext book for Collegestudents.

(ForCandidates admittedfromJune2015onwards)

HOLYCROSSCOLLEGE(AUTONOMOUS)T RICHIRAPALLI-2B.A/B.Sc/B.Com/B.C.A-DEGREE COURSES LIFE ORIENTEDEDUCATION

BIBLE STUDIES–I:NEWTESTAMENT

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

CREDIT :1 **MARKS:100**

OBJECTIVE:

- Toenablethestudents todevelopthepassionfortheWordofGod– Jesus andinculcatethe thirstofMissionaries beingadiscipleofChrist.

UNIT–I:BIBLE– THEWORDOF GOD

- BooksoftheBible–DivisionintoOldTestamentandNewTestament–Historyofthe Bible-
- Messianic Prophecies (Isaiah9:6,40:3,53:1-12,61:1-3,Micah5:2)
- TheBirthand MinistryofJohntheBaptist(Luke1:1-80,Mat3:1-17,14:1-12)
- TheBirth,Passion,DeathandResurrectionofJesus (Luke1:26-80,2:1-52,John1:18-21)

UNIT–II: MINISTRYOF JESUS

- Miracles (Mark2:1-12,Luke4:38-41,6:6-11,7:1-17,8:26-56,John2:1-12)
- Parables (Luke6:46-49,8:4-15,10:25-37,15:1-32)
- Preaching
  - ¾ Sermononthemount(Mat5-7)
  - ¾ Lord'sPrayer(Luke11: 1-13)
  - ¾ KingdomofGod(Mat13:24-50)
- PrayerlifeofJesus (Luke5:12-16,John11:41-45,17:1-26,Mark14:32-42)
- RichandPoor(Luke16:19-31,21:1-4) x
- Women Liberation(John4:1-30,8:1-4) x
- WomenintheNew Testament
- Martha& Maria (Luke10:38-42, John11:1-46)

UNIT–III:CHURCH–BIRTHANDGROWTH

- EarlyChurch

xBirth(Acts 2:1-41)

xUnityand sharing(Acts 2:42-47,4:1-37,5:1-11)

xWitnessinglife (Acts 3:1-26,5:12-42,8:26-40,16:20-34)

xComparisonbetweenearlyChurchandpresentChurch.

UNIT–IV:DISCIPLESANDAPOSTLES

xMotherMary(MotherofJesus)(Luke1:27-35, John2:1-12,19:35, Acts 1:13-14)

xSt. Peter(Luke22:1-7,Acts 2:1-41,12:1-17)

xSt.Andrew(Mat4:18-20,John1:35-42,6:1-14)

xSt. Stephen(Acts 6,7)

xSt. Paul(Acts 8,9,14,17,26and28)

xSt. Thomas (John20:24-31)

UNIT–V:ST. PAUL'SLETTERSANDTHEMESSAGE

x I&IICorinthians

x Galatians

xEphesians

xPhilippians

x I&IITimothy

xTitus

REFRENCES:

1. Holy Bible

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

HOLYCROSSCOLLEGE(AUTONOMOUS)TIRUCHIRAPPALLI-2
B.A/B. Sc/B.Com/B.C.A-DEGREE COURSES
LIFE ORIENTEDEDUCATION
CATECHISM–I:GODOF LIFE

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

CREDIT :1 **MARKS:100**

OBJECTIVES:

xToenablethestudents toknowGodandhis SalvificactsthroughHolyBible

xToenablethestudents toknowaboutthe PaschalMystery

UNIT–I:CREATIONANDCOVENANT

Study from petty catechism - Genesis - God revealed himself in creation -God who preserves creationthroughcovenants(Pentateuch)-OurresponsetoGod'scovenant - Reasonforitssuccessandfailure-The relationshipofGodwithIsrael-ImageofGodinOld Testament-Godandme

UNIT–II:GODOF THEPROPHETS

God'scareforthehumanity throughProphets-Major(Isaiah,Jeremiah)Minor(Amos)and Women(Deborah)Prophets-Theirlifeandmission-Theology ofProphets-Concept of sinand collectivesins expressedbyprophets andGod's savinglove.

UNIT–III:GODOFWISDOM

GodexperiencethroughwisdomLiterature, its originandgrowth

UNIT–IV:SYNOPTICGOSPELS

SynopticGospelsandJohn'sGospel –Author–historicalbackground–Chiefmessageof eachGospel andforwhomitwaswritten-Afewpassagesforthestudy ofparallelismin the SynopticGospels.

UNIT–V:LUKE'SGOSPEL

StudyofLuke's Gospelindetail–specialityoftheGospel–mainemphasis ofthemessage –meaningandblessingof sufferingandpaschaljoyinone'slife-Passion–PaschalMystery

REFERENCES:

1. CatechismoftheCatholicChurchpublishedbyTheologicalPublicationsinIndiaforthe CatholicHierarchyofIndia,1994
2. TheHolyBibleRevisedStandardVersionwithOldandNewTestamentsCatholicEdition forIndia.
3. VaazhvinVazhiyil –St.John's Gospel-Fr.Eronimus
4. God'sWordnourishesAcatholicapproachtotheScripturesDr.SilvanoRenuRita,O.C.V. STDandDr. MascarenhasFioS.J.D.mim.CatholicBibleI
5. Documents ofVaticanII–St.Paul's Publications,Bombay1966.

HOLYCROSS COLLEGE(Autonomous),Tiruchirappalli-620 002.

TAMIL DEPARTMENT

For Candidate admitted from2015onwards

First Year-Semester – II

CourseTitle	முதலாமாண்டு – இரண்டாம் பருவம்
TotalHours	**75**
Hours/Week	**5 Hrs Wk**
Code	**U19TL2TAM02**
CourseType	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

இறைச்சிந்தனை வழி மாணவர்களை ஒருமுகப்படுத்துதல்.

- Toharmonize thestudentsinReligiousthoughts.
- ToIntroducethespecialtiesofTamilcaureates
- Toinfuse the friendlynatureintothe students
- Toimprovise the goodhabitsamongstudents

CourseObjectives:

CO No.	CourseObjectives
CO-1	இறைச்சிந்தனை வழி மாணவர்களை ஒருமுகப்படுத்துதல்.
CO-2	மதநல்லிணக்கத்தைஉருவாக்குதல்.
CO-3	ஆளுமைத்திறனை வளர்த்தல்
CO-4	படைப்பாற்றல் திறனை ஊக்கப்படுத்துதல்.
CO-5	பிழையின்றி எழுதவும் படிக்கவும் மாணவர்களை தயார்ப்படுத்துதல்.

அலகு:1செய்யுள் **15ர்சள**

1. தேவாரம் - சுந்தரர் (திருமழப்பாடி)

2.திருவாசகம் - மாணிக்கவாசகர் (குயில் பத்து)

3.திருமந்திரம் - திருமூலர்

4.திருப்பாவை - ஆண்டாள்

5.நாலாயிர திவ்யப்பிரபந்தம் - குலசேகராழ்வார் (பெருமாள் திருமொழி)

keyWords(ExtraReading)

1.அற்புதத்திருவந்தாதி - காரைக்கால் அம்மையார்

2.திருவாய்மொழி - நம்மாழ்வார்

அலகு:2செய்யுள் **15Hrs**

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

keyWords(ExtraReading)

1. நந்திக்கலம்பகம்
2. குற்றாலக்குறவஞ்சி –திரிகூடராசப்பக்கவிராயர்

அலகு:3 **15Hrs**

தமிழ் இலக்கிய வரலாறு –

பல்லவர்காலம்

நாயக்கர்காலம்

அலகு:4 **15Hrs**

படைப்பிலக்கியம் - புதினம்

கல்கி - பார்த்திபன் கனவு

keyWords(ExtraReading)

வில்லோடு வா நிலவே – வைரமுத்து

அலகு:5 15ர்சள

கடிதம் எழுதுதல்

Note: Texts givenintheExtra reading /Key wordsmust be testedonly throughAssignment and Seminars.

CourseOutcomes:

CO No.	CourseOutcomes	PSOs Addressed	Cognitive Level
CO-1	to evaluatethereligious worksandthegrowth ofreligious literature	PSO 1	U
CO-2	tobring-outthesimilaritiesin religiousteachings andto ensure unity	PSO 2	AN
CO-3	the commendable personalityof thekings andagriculture farmers couldbeamodeltodevelopingpersonality	PSO 2	AP
CO-4	to enrich literaturereading, creativityandvocabularystrength	PSO 3	U
CO-5	To volunteertowriteapplicationletterwithoutanysetback	PSO 4	U

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

பார்வைநூல்கள்

செய்யுள் - தமிழாய்வுத்துறை வெளியீடு

தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறை வுத்துறை வெளியீடு

நாவல்

கல்கி - பார்த்திபன் கனவு

கடிதஇலக்கியம் - பயிற்சி ஏடு

(For the candidates admitted from June 2019 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002

DEPARTMENT OF HINDI

SEMESTER – II

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

General Objective : To enable the students to appreciate and critically evaluate the prescribed literary works.

Course Objectives (CO):

The learner will be able to:

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

UNIT – I **(15 Hours)**

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

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

UNIT- II **(15 Hours)**

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

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

UNIT- III **(15 Hours)**

1. Ashad ka ek dhin
2. Nirmala
3. Kriya Visheshan

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

UNIT- IV **(15 Hours)**

1. Ashad ka ek dhin
2. Nirmala
3. Sambandha Bodhak

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

UNIT- V **(15 Hours)**

1. Ashad ka ek dhin
2. Nirmala
3. Yojak(Samuchaya Bhodak) Aur Dhyodak (Vismyadhi Bhodak)

Extra Reading (Key Words):Poos Ki Raat, Shatranj Ke Khiladi

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

Course Outcomes:

The learner will be able to:

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

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

Reference Books :

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

(For candidates admitted 2016 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF FRENCH

SEMESTER II

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

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

Course Objectives (CO):

The learner will be able to

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

Unit 1 Quelle journée ! (15 Hours)

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

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

Unit 2 Qu'on est bien ici ! (12 Hours)

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

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

Unit 3 Souvenez-vous ? (12 Hours)

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

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

Unit 4 On s'appelle ? (12 Hours)

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

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

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

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

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

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

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

TEXT BOOKS :

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

Books for Reference:

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

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

for candidates admitted from June 2018 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), Tiruchirapalli – 620002

PG AND RESEARCH DEPARTMENT OF ENGLISH

I YEAR UG – SEMESTER I

PART II – ENGLISH 2 - GENERAL ENGLISH II

HOURS : 6 **CODE : U19EL2GEN02**

CREDIT : 3 **MARKS: 100**

OBJECTIVES

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

UNIT I – SELF

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

Speaking - Sharing expressions, dreams and expressing opinions.

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

Writing - Story Writing

Grammar - Articles and Sentence Pattern

Vocabulary - Meanings, Synonyms, Antonyms

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

General Essay - Courage is the key to success

TEXTS

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

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

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

UNIT II – STRENGTHS

Listening - Listening to a process

Speaking - Telephone Etiquette

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

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

Grammar- Subject verb agreement, Prepositions

Vocabulary- One word substitute in the context

Composition- Letter Writing - informal letters

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

TEXTS

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

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

UNIT III - POSITIVE SHORTCOMINGS

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

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

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

Writing - Filing Complaints, Travelogues

Grammar - Tenses, Direct and Indirect Speech

Vocabulary - Compound words

Composition - Dialogue Writing

General essay – Adversity is the seed of success.

TEXTS

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

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

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

UNIT IV POTENTIALS

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

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

Reading - Parallel Reading, reading for pleasure

Writing - Letter writing – formal letters

Grammar - Adjectives, Degrees of Comparisons

Vocabulary - Idioms and Phrases

Composition - Debates and Discussions

General essay – My potentials

TEXTS

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

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

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

4. The Flower by Alfred Lord Tennyson (Poem)

UNIT V ACHIEVEMENTS

Listening - Listening to comparisons and arguments

Speaking - Performance

Reading - In-depth reading

Writing - Script writing of story to play

Grammar - Question Tags

Vocabulary - Homophones

Composition - Essay Writing

General essay - The reward of hard work.

TEXTS

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

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

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HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.
DEPARTMENT OF PHYSICS
FIRST YEAR - SEMESTER – II

Course Title	MAJOR CORE 2: ELECTRICITY AND ELECTROMAGNETISM
Total Hours	90
Hours/Week	6 Hrs Wk
Code	U15PH2MCT02
Course Type	Theory
Credits	6
Marks	100

General Objective: To study the basic principles of Electricity, Electrostatics and Electro Magnetism.

Course Objectives:

The Learner will be able to :

CO No.	Course Objectives
CO-1	understand the concepts of electrical measurements and principle of capacitors
CO-2	understand the concepts of electromagnetism
CO-3	remember and analyze the Law's of electromagnetic induction
CO-4	understand, apply and analyze the mechanism of electric generators and motors
CO-5	understand the concepts of alternating currents

UNIT- I: ELECTRICAL MEASUREMENTS & CAPACITORS 18 Hrs

Carey Foster bridge- theory- Determination of the temperature co-efficient of resistance- Potentiometer- measurement of resistance- Ammeter calibration- Calibration of low range voltmeter.

Principle of a capacitor- capacitance of a spherical capacitor with outer and inner sphere earthed. -capacitance of a cylindrical capacitor- energy stored in a charged capacitor- Loss of energy on sharing of charges between two capacitors- Quadrant electrometer- measurement of ionization currents and capacitance using the quadrant electrometer.

Extra reading / Key words: *Dielectrics, Dissipation factor*

UNIT- II: ELECTROMAGNETISM 18 Hrs

Force on a current carrying conductor- Fleming's left hand rule- forces between long conductors carrying current- Definition of Ampere- field along the axis of a circular coil and solenoid- Theory of ballistic galvanometer-correction for damping in ballistic galvanometer- charge sensitivity of a ballistic galvanometer- application of ballistic galvanometer for measurement of absolute capacity of a condenser- Equivalence between a current circuit and magnetic shell (Ampere's theorem).

Extra reading / Key words:*Magneto statics, Electrodynamics*

UNIT- III: ELECTROMAGNETIC INDUCTION 18 Hrs

Laws of Electromagnetic induction- self and mutual induction- self inductance of a solenoid- mutual inductance of a solenoid inductor- coefficient of coupling- experimental determination of self inductance by Rayleigh's method and Anderson's method- mutual inductance by Rayleigh's method - growth and decay of current in circuit containing C & R and L &R – high resistance by leakage- charging and discharging of a condenser through L&R- condition for discharge to be oscillatory- Eddy currents – Applications of Eddy currents: Induction Furnace, Speedometer and Electric Brakes- induction coil.

Extra reading / Key words: *Eddy current, Transformer*

UNIT - IV: ELECTRIC GENERATORS AND MOTORS 18 Hrs

Alternating current generator- distribution of three phase alternating current- three phase four wire system- direct current generator- types of DC dynamos- direct current motor- back e.m.f. of a motor- types of direct current motors- series wound, shunt wound, compound wound motor- efficiency of a motor- rotating magnetic field- induction motor.

Extra reading / Key words:*Electric power grids, Particle accelerators*

UNIT- V: ALTERNATING CURRENTS **18 Hrs**

Peak, average and RMS values of alternating current- analysis of AC circuits by j operator method- alternating EMF applied to a circuit containing resistance, inductance and capacitance in series- alternating EMF applied to a circuit containing resistance, inductance and capacitance in parallel- series and parallel resonant circuits- sharpness of resonance and Q- factor- power in AC circuits- power factor – wattlessc current- choke coil.

Extra reading / Key words: *Sine wave, Modulation*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Recall and explain the concepts of electrical measurements and principle of capacitors	PSO-2	R, U
CO-2	Discuss the concepts of electromagnetism	PSO-1	U
CO-3	Deduce the expression for growth and decay of current and charge in LR, CR & LCR circuit	PSO-4	U, Ap
CO-4	Recognize and analyze the mechanism of electric generators and motors	PSO-4	R, An
CO-5	Explain the concepts of alternating currents	PSO-5	U
CO-6	Describe sharpness of resonance	PSO-3	U
CO-7	Gain employability by applying knowledge of basic principles of electricity and electromagnetism	PSO 6	U, Ap

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

TEXT BOOKS:

1. Murugesan R., Electricity and Magnetism, S. Chand and Co., New Delhi 10th Edition(2017).

2. Ambrose and Vincent Devaraj, Introduction to Electronics, V Edition (1992).(Unit V)

BOOKS FOR REFERENCE:

1. Narayanamoorthy & Nagaratnam, Electricity And Magnetism, NPC, Chennai (1992).
2. N.D Tiwari, Electricity And Electromagnetism, Sultan and Chand Co., New Delhi (1998).
3. Brijlal and Subramanium, Electricity And Electromagnetism, S. Chand and Co, New Delhi (2000).
4. C.L. Arora, Electricity And Magnetism, S. Chand and Co.,New Delhi 16th Edition (1999).
5. Electricity & Magnetism 3rd Edn. 2007 Edition, Kindle Edition by K K Tewari

(for the candidates admitted from June 2015 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

FIRST YEAR - SEMESTER – II

Course Title	**MAJOR CORE 3: MAIN PRACTICAL I - GENERAL PHYSICS PRACTICALS**
Total Hours	**60**
Hours/Week	**4 Hrs Wk**
Code	**U16PH2MCP03**
Course Type	**Practical**
Credits	**3**
Marks	**100**

General Objective: To apply the basic principles of properties of matter, Electricity, Electronics and Optics by doing the relevant experiments.

Course Objectives:

The Learner will be able to :

CO No.	**Course Objectives**
CO-1	understand and evaluate the Young's modulus and Rigidity modulus of the given material
CO-2	analyze the electrical parameters like resistance using potentiometer
CO-3	understand the ways to calibrate an ammeter using potentiometer
CO-4	apply the basic principles of optics to determine the thickness of a wire and refractive index of the material of prism
CO-5	understand and analyze the characteristics of a.c. circuits
CO-6	Skill Development-Practical exposure

Any Fourteen Experiments Only

1. Determination of Young's modulus by non uniform bending - Microscope
2. Determination of Young's modulus by uniform bending - Telescope
3. Determination of Young's modulus by Cantilever method - Microscope
4. Determination of Rigidity modulus of a wire by Torsion Pendulum
5. Determination of Rigidity modulus of a rod by Static Torsion method
6. Ammeter Calibration using Potentiometer
7. Measurement of Resistance using Potentiometer
8. Study of Series Resonant circuits
9. Determination of Refractive Index of material of a prism using Spectrometer
10. Determination of Impedance and Power Factor of a coil
11. Determination of Charge Sensitivity of a galvanometer
12. Study of Parallel Resonant Circuits
13. Study of the characteristics of a Junction Diode
14. Study of Logic gates using discrete components – AND, OR & NOT
15. Determination of thickness of a wire by forming Air Wedge
16. Determination of Refractive Index of the given liquid using Spectrometer
17. Determination of co-efficient of viscosity of liquid by burette method
18. Determination of the surface tension of a liquid by drop weight method
19. Determination of figure of merit of a Ballistic galvanometer
20. Determination of high resistance by leakage using B.G

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

FIRST YEAR - SEMESTER II

Course Title	ALLIED PHYSICS 3: BASIC PHYSICS – II (For Chemistry Students)
Total Hours	60
Hours/Week	4 Hrs Wk
Code	U16PH2ACT03
Course Type	Theory
Credits	3
Marks	100

General Objective: To understand the basics of Electricity, electromagnetism, analog and digital electronics, atomic and nuclear physics.

Course Objectives (CO):

The Learner will be able to :

CO No.	Course Objectives
CO-1	apply the basic principles in electricity and to understand the working of capacitors.
CO-2	understand the concept of electromagnetism
CO-3	understand the working of junction diode, Zener diode and to analyze the working filters and rectifiers and to calculate its rectification efficiency in analog electronics
CO-4	analyze the logical reasoning of gates, application of components and simplify the circuit in digital electronics.
CO-5	understand the application of X-rays in atomic physics, stability of nucleus, nuclear structure in nuclear physics.

UNIT I: ELECTRICITY12 Hrs

Coulomb's law - Electric field - Electric field due to point charge - electric field intensity - Electric potential - Capacitors - Principle of capacitor - Capacity of an isolated sphere - Spherical capacitor- Energy of a charged capacitor - Sharing of charges and loss of energy.

Extra reading / Key words: *Negative gradient, Storage devices*

UNIT II: **ELECTROMAGNETISM12 Hrs**

Force on a current carrying conductor - Flemings left hand rule – Laws of Electromagnetic induction - Self and Mutual induction - experimental determination of self inductance by Anderson's method - experimental determination of mutual inductance by Rayleigh's method.

Extra reading / Key words: *Magnetic flux, Lines of force*

UNIT III: ANALOG ELECTRONICS 12 Hrs

Semiconductors - Types of semiconductors - PN junction diode - V-I characteristics of junction diode - Junction diode as a rectifier (full wave Bridge rectifier) - Zener diode characteristics - Zener diode as a regulator - Transistor- Transistor action- Characteristics of transistor (CE Mode).

Extra reading / Key words: *Majority charge carriers, Minority charge carriers*

UNIT IV: DIGITAL ELECTRONICS12 Hrs

Logic gates-construction of AND, OR & NOT gates using discrete components - Truth tables-NAND and NOR gates - Universal building blocks - Demorgan's theorem - Boolean algebra-Simplification of Boolean expressions(up to 3 variables) - Elementary ideas of IC's - SSI, MSI, LSI and VLSI.

Extra reading / Key words: *Truth table, Pin configuration*

UNIT V: ATOMIC & NUCLEAR PHYSICS12 Hrs

X-ray - Properties - Characteristic and continuous Spectrum - Mosley's law and its importance - Vector Atom Model – Postulates – Quantum numbers

Radioactivity - Law of disintegration - Radioactive equilibrium - Age of earth - Nuclear mass defect - binding energy - packing fraction – Semi empirical mass formula - Liquid drop model - Explanation of fission and fusion(Quantitative study only)

Extra reading / Key words: *Photon, Half life, Mean life*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the basic principles in electricity and the working of capacitors	PSO-2	R, U
CO-2	Discuss the concept of electromagnetism.	PSO-1	U
CO-3	Explain the working of junction diode, Zener diode, working filters and rectifiers and to calculate its rectification efficiency in analog electronics.	PSO-4	U, Ap
CO-4	Construct the logic gates and write their truth tables.	PSO-4	R, An
CO-5	Explain the concepts of alternating currents	PSO-2	U
CO-6	List the application of X-rays in atomic physics, stability of nucleus, nuclear structure in nuclear physics	PSO-3	R, Ap
CO-7	Gain Employability- the knowledge on basics of Electricity, electromagnetism, analog and digital electronics, atomic and nuclear physics.	PSO 6	U

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

Text Books:

1. Murugeshan.R, Allied Physics, S. Chand & Co. Ltd, New Delhi, (2005).
2. Murugeshan R, Allied physics and spectroscopy, S. Chand & Co. Ltd, New Delhi (2007).
3. Mehta V.K., Rohit Mehta, Principles of Electronics, New Delhi: S. Chand & Co. Ltd. 10^{th} edition New Delhi (2006).
4. Murugeshan. R, Electricity and Magnetism, S. Chand & Co., New Delhi (2003).

5. Murugeshan R, Modern Physics, S. Chand & Co. (10^{th} revised edition), (2002).

BOOKS FOR REFERENCE:

1. Narayanamurti, Electricity and Magnetism, The National Publishing Co. Madras (3^{rd} edition) (1994).
2. David Halliday, Robert Resnik, Kenneta S. Krane, The Physics, John Willey and sons, Singapore, (2005).
3. Murugeshan R and Kiruthiga Sivaprasath, Properties of matter and Acoustics S. Chand & company Ltd. (2^{nd} edition) ,New Delhi (2012).
4. Brijlal and Subramaniam, Text Book of Optics, S. Chand & Co., New Delhi (2001).
5. Brijlal and Subramaniam, Text Book of Sound, Vikas Publishing House Pvt. Ltd. (1999).

(Forthecandidates admitted from 2015onwards)

HOLY CROSSCOLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI
B.A/B.Sc./B.Com/B.R.SC/B.C.A/ B.B.A DEGREE EXAMINATION
SEMESTER-II

CourseTitle	**SKILL – BASED ELECTIVE 1: SOFT SKILL DEVELOPMENT**
Total Hours	**30**
Hours/Week	**2**
Code	**U18SS2SST01**
CourseType	Theory
Credits	**2**
Marks	**100**

General Objective:

Thestudent understandsthe need for thedevelopment of self esteem, team spirit and communicative skills to preparethemselves forselfdevelopment.

CourseOutcomes:

Thestudent will beable to

1. Understand the importanceof selfawareness, values andleadership skills in capacitybuilding
2. Understand andanalyzethe factors affectinginterpersonalskills
3. Understand andevaluatethe concepts of vision, mission and goals for corporate skills
4. Understand, applyand analyzethe importanceof bodylanguage, time management and stress management
5. Understand theconceptand need for self developmentplan

UNITI: 6hrs

Individual Capacity Building

Selfawareness-buildingself-esteem-importanceofhaving astrong self–esteem–developing positive attitude-. Anchoring onprinciples: Universal principles and values – forming & inculcatingvalues-Leadership skills.

Extra reading / Key Words:*Biographies of any2 Indian leaders*

UNITII:6hrs

Interpersonal skills

Trust-trustworthiness-interpersonal communication–art oflistening,readingandwriting –art of writing–building relationship-empathy.

Extra reading / Key Words:*Tips for buildingrelationship*

UNITIII:
6hrs

Corporateskills

Vision, mission and goals: Concepts, vision setting,goal setting,Individual and Groupgoals, Concept of synergy, team building, groupskills.

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

UNITIV: 6hrs

Management skills

Developing Body Language– Practicing etiquetteand mannerism–StressManagement–

Time Management Prioritization Importanceandurgent activities-Time management to move towards lifevision.

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

UNITV: 6 hrs

SelfDevelopmentPlan

ConceptandNeedforSelfDevelopmentPlan–PreparingSelfDevelopmentPlan9Formatisused tocompletetheselfdevelopmentPlan),MonitoringandEvaluationofselfDevelopmentplan– Developingindicators for self development introduction to National SkillDevelopment Mission.
Extra reading / Key Words:*Case study*

Note: Extra reading/Key words areonly forinternal testing(Seminar/Assignment)Course

CourseOutcome:

1. explain the importanceof self awareness, valuesand leadership skills in capacitybuilding
2. analyzethe factors affectinginterpersonalskills
3. evaluatetheconcepts ofvision, mission and goals for corporateskills
4. applyand analyzethe importanceof bodylanguage, time management andstressmanagement
5. summarizethe concept and need forself developmentplan

REFERENCES:

AlexK.(2012) SoftSkills–KnowYourself& Knowthe World,S.Chand& CompanyLtd., New DelhiMeenaK.AyothiV.(2013).ABookonDevelopmentofSoftSkills(SoftSkills:ARoad Mapto Success), P.R. Publishers &Distributors,Trichy.

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

Ed., GracePublishers, RathanReddyB.(2005). Team Development andLeadership, Jaico

PublishingHouse, Mumbai.

HOLY CROSSCOLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI– 2

B.A./ B.Sc.,/B.Com./BCA& BBA, DEGREEEXAMINATION
SEMESTER II / III

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

General Objective:

TheStudentwillbeabletounderstandtheconceptofnaturalresourcesandresourcemappingof villagesandstrengthentheirleadershipqualities,keepinginmindtheirresponsibilitiestowards society.

CourseObjectives:

Thestudent will beable to:

1.understand the functioningofNGO'sandSHG's

2.educate themselves aboutthe different farmingmethods.

3.practicealternative agriculturalmethods

4.understand the need forsocial responsibilitythroughNCC.

5.understand theLeadership and ManManagement

Unit–I **6hrs**

Village–Surveyofnaturalresourcesandresourcemapping ofvillages,villagelevelParticipating Approach(VLPA)– Roleof NGO'S and SHG'S–Impact of theGreen Revolution.

Extra reading/Key word:*resourcemapping tools*

Unit–II **6hrs**

Alternativeagriculturemodels– Traditional Farming– OrganicFarming–Zero budget farming – Precision Farming,TerraceFarming and Kitchen garden.

Extra reading / Key word: *Practices in India*

Unit–III **6hrs**

ElementsinAlternativeAgriculturemodels ,Vermicompost,Azolla, Amirthakarasal ,Mulligai Puchiviratti and neemproducts

Extra reading/Key word*:Government policyfor*AlternativeAgriculturefarming.

UnitIV- **6hrs**

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

Extra reading/Keyword*: Benefits ofbeing an NCC cadet.*

Unit-V **6hrs**

Leadership and Man Management– duties of citizen, leadership Training– Types, qualities– Discipline, Duty, Moral– ManManagement, Civil Defense– Aims, Types, Services, Problems

Extra reading/Key word:*Defenserecruitmentmodes.*

Note: Extra Reading/ keywords areonly forInternal Testing (Seminar/ Assignments)

CourseOutcome:

1.Explain the functioningof NGO'sandSHG's

2.Summarizethemselves about thedifferentfarmingmethods.

3.Explain the alternativeagricultural methods

4.Pointout theneed forsocial responsibilitythroughNCC.

5.EvaluatetheLeadership and ManManagement

REFERENCES:

1.Packages of organic practices from Tamil Nadu Center forIndian KnowledgeSystem(CIKS)

2. Tracey, S. andAnne, B. (2008). Sustainabledevelopment linkingeconomy, society, environment. OECDinsights.

3.www.fao.org.in

(for the candidates admitted from June 2015 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

FIRST YEAR - SEMESTER II

Course Title	INDUSTRIAL RELATIONS: NON DESTRUCTIVE TESTING TECHNIQUES
Total Hours	12
Hours/Week	1
Code	U19PH2IRT01
Course Type	
Credits	1
Marks	100

UNIT I: LIQUID PENETRANT TESTING

Brief history of non destructive testing and liquid penetrant testing – Basic principles of liquid penetrant testing – Types of liquid penetrants commercially available-liquid penetrant processing: Preparation of parts-Application of penetrant to parts.

UNIT II: MAGNETIC PARTICLE TESTING

Earth's magnetic field- Magnetic field around magnetized materials – Materials influenced by magnetic fields –Surface cracks- Scratches-Subsurface defects – Methods of inducing current flow in parts – Discontinuities commonly discovered by circular fields.

UNIT III: RADIOGRAPHIC TESTING

Types of radiation instruments – Reading and interpreting meter indications – Requirements for leak testing – Performance of leak testing – Use of time ,distance and shielding to reduce personnel radiation exposure – Applicable regulatory requirements for surveys and posting and control of radiation and high radiation areas- Radiation exposure limits for gamma ray exposure devices- Use collimators to reduce personnel exposure.

UNIT IV: ULTRASONIC TESTING

Definition of ultrasonics –History of ultrasonic testing – Applications of ultrasonic energy-Nature of sounds- Methods of sound wave generation – Basic pulse echo instruments:Calibration – Piezoelectric effect – Types of transducer elements.

UNIT V: VISUAL TESTING

Definition of visual testing – History of visual testing – Overview of visual testing applications – Standard terms and their meanings in the employer's industry – Visual perception-Direct and indirect methods.

TEXT BOOK

Study Material

BOOKS FOR REFERENCE

1. Non-Destructive Testing of Welds, Baldev Raj, C.V. Subramanian, T. Jayakumar - Narosa publication
2. Practical Non-Destructive Testing, B.Raj et al-- Narosa publication
3. 3.Science and Technology of Ultrasonics, B.Raj et al - Narosa publication.
4. Non-Destructive Test and Evaluation and Materials
5. Prof. J. Prasad, Dr. C.G. Krishnadas Nair
6. Halmshaw. R . Non-Destructive Testing, Mettalurgy and Material Science Services, Edward Arnold, London, 1992.

ForCandidates admittedfromJune2015onwards)

HOLYCROSSCOLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2

B.A/B. Sc/B.Com/B.C.A-DEGREE COURSES
LIFE ORIENTEDEDUCATION

ETHICS–I:RELIGIONSANDVALUE SYSTEMS

HRS/WK:1CODE:U15VE2LVE01

CREDITS:1 **MARKS:100**

OBJECTIVES:

xToenablethestudents to understandandappreciateallReligions andCulture

xTohelpthestudentstobecom

xToawareofthenegativeforces ofreligions.

UNIT–I:RELIGION

God–Faith,Religion,Definition,Nature,CharacteristicsandBasicvaluesof different religions. ImpactofGlobalizationonreligion–Importanceofworshipinholyplaces–celebration, Communion(come-union)–Socialization

UNIT–II:DIFFERENT RELIGIONS

Basiccharacteristicsandbasicthoughtsof differentreligions:Buddhism,Christianity, Hinduism,Islam,JainismandSikhism

UNIT–III: UNITYOF RELIGION

Unityof VisionandPurpose-RespectforOther Religions,InterReligiousCo-operation, Religious Pluralismas afactandReligious Pluralismas avalue

UNIT–IV:FUNDAMENTALISM,COMMUNALISMANDSECULARISM

Meaning andimpact of Fundamentalism, Communalism, Violence and Terrorism –

Tolerance–Secularism–Individualism

UNIT–V:VALUE SYSTEMS

ValueandValueSystems-MoralValues-Individualsandtheneedtostandforvaluesin thecontextof Globalization–Consumerism-Willpowertoliveuptoyourvalues-Healthybody for empowerment– Physicalhealthand Mentalhygiene,foodandexercises

REFERENCES:

1. Social Analysis (a course for all first year UG students), 2001. Department ofFoundation Courses,LoyolaCollege,Chennai-34.
2. SpecialtopicsonHinduReligion,2001.Department ofFoundationCourses,LoyolaCollege, Chennai-34.
3. Religion: the livingfaiths of the world, 2001. Department ofFoundation Courses, Loyola College,Chennai-34.
4. SydneyAmMeritt,1997.Guidedmeditationsforyouth.
5. Marie MigonMascarenhas,1986. Family life education- Value Education, Atext book for Collegestudents.

ForCandidates admittedfromJune2015onwards)

HOLYCROSSCOLLEGE(AUTONOMOUS)TRICHIRAPALLI-2.

B.A/B.Sc/B.Com/B.C.A-DEGREE COURSES
LIFE ORIENTEDEDUCATION

BIBLE STUDIES–I:NEWTESTAMENT

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

CREDIT :1 **MARKS:100**

OBJECTIVE:

- Toenablethestudents todevelopthepassionfortheWordofGod– Jesus andinculcatethe thirstofMissionaries beingadiscipleofChrist.

UNIT–I:BIBLE– THEWORDOF GOD

xBooksoftheBible–DivisionintoOldTestamentandNewTestament–Historyofthe Bible-
xMessianic Prophecies (Isaiah9:6,40:3,53:1-12,61:1-3,Micah5:2)
xTheBirthand MinistryofJohntheBaptist(Luke1:1-80,Mat3:1-17,14:1-12)
xTheBirth,Passion,DeathandResurrectionofJesus (Luke1:26-80,2:1-52,John1:18-21)

UNIT–II: MINISTRYOF JESUS

xMiracles (Mark2:1-12,Luke4:38-41,6:6-11,7:1-17,8:26-56,John2:1-12)

xParables (Luke6:46-49,8:4-15,10:25-37,15:1-32)

xPreaching

¾ Sermononthemount(Mat5-7)

¾ Lord'sPrayer(Luke11: 1-13)

¾ KingdomofGod(Mat13:24-50)

xPrayerlifeofJesus (Luke5:12-16,John11:41-45,17:1-26,Mark14:32-42)

xRichandPoor(Luke16:19-31,21:1-4) x

Women Liberation(John4:1-30,8:1-4) x

WomenintheNew Testament

xMartha& Maria (Luke10:38-42, John11:1-

46)

UNIT–III:CHURCH–BIRTHANDGROWTH

xEarlyChurch

xBirth(Acts 2:1-41)
xUnityand sharing(Acts 2:42-47,4:1-37,5:1-11)
xWitnessinglife (Acts 3:1-26,5:12-42,8:26-40,16:20-34)
xComparisonbetweenearlyChurchandpresentChurch

UNIT–IV:DISCIPLESANDAPOSTLES

xMotherMary(MotherofJesus)(Luke1:27-35, John2:1-12,19:35, Acts 1:13-14)

xSt. Peter(Luke22:1-7,Acts 2:1-41,12:1-17)

xSt.Andrew(Mat4:18-20,John1:35-42,6:1-14)

xSt. Stephen(Acts 6,7)

xSt. Paul(Acts 8,9,14,17,26and28)

xSt. Thomas (John20:24-31)

UNIT–V:ST. PAUL'SLETTERSANDTHEMESSAGE

x I&IICorinthians

x Galatians

xEphesians

xPhilippians

x I&IITimothy
xTitus

REFERENCES:

1. HolyBible

2. JohnStott, 1994,**"MenwithaMessage"**,AngusHudson
Ltd. London.

.(**ForCandidates admittedfromJune2015onwards)**

HOLYCROSSCOLLEGE(AUTONOMOUS)TIRUCHIRAPPALLI-2

B.A/B. Sc/B.Com/B.C.A-DEGREE COURSES
LIFE ORIENTEDEDUCATION
CATECHISM–I:GODOF LIFE

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

CREDIT :1 **MARKS:100**

OBJECTIVES:

xToenablethestudents toknowGodandhis SalvificactsthroughHolyBible

xToenablethestudents toknowaboutthe PaschalMystery

UNIT–I:CREATIONANDCOVENANT

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

(Pentateuch)-OurresponsetoGod'scovenant -Reasonforitssuccessandfailure-The relationshipofGodwithIsrael-ImageofGodinOld Testament-Godandme

UNIT–II:GODOF THEPROPHETS

God'scareforthehumanity throughProphets-Major(Isaiah,Jeremiah)Minor(Amos)and Women(Deborah)Prophets-Theirlifeandmission-Theology ofProphets-Concept of sinand collectivesins expressedbyprophets andGod's savinglove.

UNIT–III:GODOFWISDOM

GodexperiencethroughwisdomLiterature, its originandgrowth

UNIT–IV:SYNOPTICGOSPELS

SynopticGospelsandJohn'sGospel –Author–historicalbackground–Chiefmessageof eachGospel andforwhomitwaswritten-Afewpassagesforthestudy ofparallelismin the SynopticGospels.

UNIT–V:LUKE'SGOSPEL

StudyofLuke's Gospelindetail–specialityoftheGospel–mainemphasis ofthemessage –meaningandblessingof sufferingandpaschaljoyinone'slife-Passion–PaschalMystery

REFERENCES:

1. CatechismoftheCatholicChurchpublishedbyTheologicalPublicationsinIndiaforthe CatholicHierarchyofIndia,1994
2. TheHolyBibleRevisedStandardVersionwithOldandNewTestamentsCatholicEdition forIndia.
3. VaazhvinVazhiyil –St.John's Gospel-Fr.Eronimus
4. God'sWordnourishesAcatholicapproachtotheScripturesDr.SilvanoRenuRita,O.C.V. STDandDr. MascarenhasFioS.J.D.mim.CatholicBibleI
5. Documents ofVaticanII–St.Paul's Publications,Bombay1966.

(for the candidates admitted from June 2015onwards)

HOLYCROSS COLLEGE(Autonomous),Tiruchirappalli-620 002.

TAMIL DEPARTMENT

For Candidate admitted from2015onwards

Second Year-Semester – III

CourseTitle	இரண்டாமாண்டு– மூன்றாம் பருவம்
TotalHours	**90**
Hours/Week	**6 Hrs Wk**
Code	**U15TL3TAM03**
CourseType	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

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

- Toexplainthegreatnessof thevaluessuchas dharma,knowingthe meaning of life attainingpleasure andhouseholdlife.
- Tocreate the awarenessaboutsociallife.
- Tostrengthenthe religiousideologies.**CourseObjectives:**

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

அலகு:1 செய்யுள் **18Hrs**

1.சிலப்பதிகாரம் - கடலாடு காதை

2.மணிமேகலை– உலகவறவி புக்க காதை

3.கம்பராமாயணம் - கங்கைப் படலம;

keywords (ExtraReading)

சீவகசிந்தாமணி

அலகு:2 செய்யுள் **18Hrs**

4.இரட்சணிய யாத்திரிகம் - மரணப்படலம்

5. சீறாப்புராணம் - ஒட்டகை பேசியபடலம்

அலகு:3 **18Hrs**

தமிழ் இலக்கிய வரலாறு

சோழர்காலம்

அலகு:4 **18Hrs**

நாடகம்

சத்திய வேள்வி – அய்க்கண்

keyWords(ExtraReading)

யாருக்கும் வெட்கமில்லை- சோ

அலகு:5 **18Hrs**

கோயிற்கலை

Note: Texts givenintheExtra reading /Key wordsmust be testedonly throughAssignment and Seminars.CourseOutcomes:

CO No.	CourseOutcomes	PSOs Addressed	Cognitive Level
CO-1	the lifewiththenatureofthe peoplemaybelearnedthrough epicsandtolearn	PSO 1	U
CO-2	tolearn thevalues taught byreligion	PSO 2	AN
CO-3	toremembertheKingchoola's periodepics,literatureand grammar books	PSO 2	R
CO-4	to enhancetheactinghabit in theepics	PSO 3	U
CO-5	tomakestudentstoevaluate theart,cultureandother aspects ofthetemples in tamil.	PSO 4	U

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

பாட
நூல்கள்

1. செய்யுள் - தமிழாய்வுத்துறை வுத்துறை வெளியீடு

2.தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறை வுத்துறை வெளியீடு

3.நாடகம்

அய்க்கண் - சத்திய வேள்வி

4.கோயிற்கலை- தமிழ்நாட்டிலுள்ள ஆலயங்களைக்

கலைநுணுக்கத்துடன் காணுதல்

(For the candidates admitted from June 2018 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002

DEPARTMENT OF HINDI

SEMESTER – III

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

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

Course Objectives (CO):

The learner will be able to

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

UNIT – I **(18 Hours)**

1. Kabir Das
2. Todathi pathar
3. Veergatha Kal
   (Pravarithiyan, Kavi, Rachanayean)

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

UNIT- II **(18 Hours)**

1. Thulasi Das

2. Anal Kireet
3. BhaktiKal – Gnanashrayi Sakha

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

UNIT- III **(18 Hours)**

1. Rahim Ke Dohe
2. Jhoote Patte
3. BhaktiKal – Prem Margi Sakha

Extra Reading (Key Words): *Rahim*

UNIT- IV **(18 Hours)**

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

Extra Reading (Key Words):

UNIT- V **(18 Hours)**

1. Bihari Ke Dohe
2. Sipahi
3. BhaktiKal – Krishna Bhakthi Sakha

Extra Reading (Key Words):*Bihari satsai*

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

Course Outcomes:

The learner will be able to:

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

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

Prescribed Books

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

Reference Books :

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

(For candidates admitted 2016 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF FRENCH

SEMESTER III

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

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

Course Objectives (CO):

The learner will be able to

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

Unit 1 Vivement demain ! (18 Hours)

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.

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

Unit 2 Tu as du boulot ? (18 Hours)

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

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

Unit 3 Qu'en pensez-vous? (18 Hours)

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

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

Unit 4 C'est tout un programme ! (18 Hours)

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

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

Unit 5 On se retrouve (18 Hours)

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

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

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

TEXT BOOKS :

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

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

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

HOLY CROSS COLLEGE (AUTONOMOUS), Tiruchirapalli – 620002

PG AND RESEARCH DEPARTMENT OF ENGLISH

I YEAR UG – SEMESTER I

PART II – ENGLISH 3 - GENERAL ENGLISH III

HOURS : 6 **CODE : U19EL3GEN03**

CREDIT : 3 **MARKS: 100**

GROWING WITH VALUES

Objectives:

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

UNIT I – Love, Faith and Hope

Listening for comprehension and general significance

Speaking about one's fear and hope

Reading for specific and global comprehension.

Writing – creative writing

Grammar – reporting speeches

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

Composition – Writing Paragraphs

TEXTS

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

1. An extract from the Nobel Lecture by Mother Teresa

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

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

UNIT II – Perseverance

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

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

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

Writing- parallel writing

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

Vocabulary – antonyms, idioms and phrases (10)

Composition – Creative writing

TEXTS

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

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

2. Two Gentlemen of Verona by A.J Cronin

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

UNIT III – Tolerance/Benevolence/Compassion

Listening- for developing / relating (speech)

Speaking- simulate any personality related to humanity

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

Writing- case study / letter writing (personal)

Grammar –writing reports of events and processes (voices)

Vocabulary – Suffixes, idioms and phrases

Composition – imaginative writing

TEXTS:

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

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

UNIT IV – Essential Life Skills/ Resilience

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

Speaking- interviewing (gap activity) / picture description

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

Writing- Situational writing

Grammar – analysis of sentences – simple, compound, complex

Vocabulary – compound words, idioms and phrases

Composition – essay writing (proverb as title)

TEXTS:

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

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

UNIT V – The Art of Living

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

Speaking- reporting from the magazine / newspaper

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

Writing- creative writing

Grammar –'If' clause

Vocabulary – coinage, idioms and phrases

Composition – creative writing/imaginative writing

TEXTS:

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

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

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HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.
DEPARTMENT OF PHYSICS
SECOND YEAR - SEMESTER III

Course Title	MAJOR CORE 4: ELECTRONICS
Total Hours	75
Hours/Week	5 HrsWk
Code	U15PH3MCT04
Course Type	Theory
Credits	5
Marks	100

General Objective: To understand the Fundamentals of Diodes, Transistors, JFET, MOSFET,UJT, Transistor Amplifiers, Feedback Amplifiers, Oscillators and Operational Amplifiers.

Course Objectives:
The Learner will be able to :

CO No.	Course Objectives
CO-1	understand the working and characteristics of semiconductor diodes
CO-2	understand the configuration of transistors (CE & CB), analyze transistor as an amplifier
CO-3	remember the principles of feedback amplifiers and oscillators and compare their different types
CO-4	analyze semiconductor devices such as JFET, MOSFET, UJT
CO-5	Understand the working of operational amplifier and its applications

UNIT I: SEMICONDUCTOR DIODES15 Hrs

PN junction – formation of PN junction – volt ampere characteristics of PN junction – Diode as a rectifier – Half wave rectifier –Efficiency of Half wave rectifier - Full wave rectifier – Efficiency of Full wave rectifier - full wave bridge rectifier – Filter circuits- Capacitor filter – Clipping and Clamping circuits– Zener diode – breakdown mechanisms – Zener diode as voltage stabilizer.

Extra reading / Key words: *types of filters, Construct filter circuit*

UNIT II: TRANSISTORS15 Hrs

Transistor action – characteristics of common base configuration – characteristics of common emitter configuration – comparison of transistor configurations – Transistor biasing – voltage divider bias method – Transistor as an amplifier –load line analysis- Analysis of single stage CE amplifier using h parameters – RC coupled transistor amplifier –frequency response of RC coupled amplifier - classification of power amplifier –class B push pull amplifier.

Extra reading / Key words: *Applications of Transistors*

UNIT III: FEEDBACK AMPLIFIERS AND OSCILLATORS15 Hrs

Principle of negative voltage feedback in amplifiers – gain – advantages of negative voltage feedback – principles of negative current feedback – emitter follower – positive feedback amplifier –

oscillator – barkhausen criterion – LC oscillators – Hartley oscillator – Colpitt's oscillator - RC oscillators – phase shift oscillator - Wein bridge oscillator.

Extra reading / Key words:*Crystal Oscillator, Dynatron Oscillator, applications of oscillators*

UNIT IV: SEMICONDUCTOR DEVICES15 Hrs

Junction field effect transistor – principle and working of JFET – Difference between JFET and bipolar transistor - output characteristics of JFET – parameters of JFET – MOSFET – symbols for MOSFET – circuit operation of D and E MOSFET – transfer characteristics – Uni junction transistor – characteristics of UJT – applications of UJT – UJT relaxation oscillator.

Extra reading / Key words: *BJT, applications of semiconductor*

UNIT V: OPERATIONAL AMPLIFIERS15 Hrs

Operational amplifier – differential amplifier – commom mode and differential mode signals - CMRR – ideal characteristics of OPAMP – applications of OPAMP – inverting amplifier – non inverting amplifier – voltage follower – summing amplifier – difference amplifier – OPAMP integrator – OPAMP differentiator – solving differential equations using OPAMP.

Extra reading / Key words: *Problem solving, tracing wave forms*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the working and characteristics of semiconductor diodes.	PSO 2	U
CO-2	Differentiate configuration of transistors (CE& CB) and analyze transistor as an amplifier.	PSO 2	U
CO-3	Compare the different types of Oscillators.	PSO 6	U, An
CO-4	Discuss the semiconductor devices such as JFET, MOSFET, UJT.	PSO 4	U, Ap
CO-5	Describe the functions of operational amplifier.	PSO 1	U
CO-6	Gain Employability-Knowledge on basic principles of Electronics.	PSO 6	U

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

Text Books:

1. Mehta V.K., Principles of Electronics, S.chand and Company Ltd, New Delhi,11th Edition(2015).
2. Bagde .M.K., Singh S.P. and Kaman Singh - Elements of Electronics, S.Chand and company Ltd. (2002).
3. Bhargava N.N, Kulshreshthra D.C.and Gupta S.G., Basic Electronics and Linear circuits- Tata Mc Graw Hill Publishing Co. Ltd, New Delhi (2013).

BOOKS FOR REFERENCE:

1. D Chattopadhyay Pc Rakshit, B Saha, Foundations Of Electronics, Published by New Age International Ltd, New Delhi (2008).
2. Narayana Rao B.V., Principles of Electronics, Vol III, Wiley Eastern and New Age International Limited, New Delhi, 2nd Edition (1988).
3. Sedha R.S., A text book of applied Electronics, S.Chand & company Ltd, New Delhi (2002).

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

SECOND YEAR - SEMESTER III

Course Title	**MAJOR CORE 5: MAIN PRACTICAL II- OPTICS AND ELECTRICITY PRACTICALS**
Total Hours	**75**
Hours/Week	**5 Hrs/ Wk**
Code	**U15PH3MCT05**
Course Type	**Practical**
Credits	**5**
Marks	**100**

General Objective: To understand the basic laws of optics and electricity through experiments.

Course Objectives (CO):

The Learner will be able to :

CO No.	**Course Objectives**
CO-1	Understand and apply the basic laws of optics by doing simple experiments with prism
CO-2	Understand and apply the basic concepts of electricity by converting Galvanometer into ammeter and voltmeter and doing experiments using B.G.
CO-3	Understand and analyze the characteristics of electronic devices such as diodes and transistors
CO-4	Understand and apply the basic laws of optics by doing experiments with grating
CO-5	Understand and apply the concepts of polarization in measuring specific rotatory power of sugar solution using polarimeter
CO-6	Skill Development-Practical exposure

Any Sixteen Experiments Only

1. Determination of refractive index of glass by forming Newton's rings.
2. Determination of dispersive power of a prism using spectrometer
3. Determination of wavelength of spectral lines using a grating - normal incidence (Spectrometer)
4. Determination of refractive index of the material of a prism – i-d curve (Spectrometer)
5. Determination of dispersive power of a grating (Spectrometer)
6. Determination of Cauchy's constants using Spectrometer
7. Determination of specific rotatory power of sugar solution using polarimeter
8. Conversion of Galvanometer into Ammeter
9. Conversion of Galvanometer into Voltmeter
10. Determination of temperature coefficient of thermistor using P.O Box
11. Construction of Zener regulated power supply
12. Study of Characteristics of a Zener diode
13. Study of transistor characteristics – common base configuration
14 Study of transistor characteristics – common emitter configuration
15. Determination of absolute capacity of a condenser using BG
16. Comparison of EMF-BG
17. Determination of internal resistance of a primary cell-BG
18. Comparison of capacities using De Sauty's bridge
19. Study of Characteristics of JFET
20. Construction of power pack

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

SECOND YEAR - SEMESTER III

Course Title	**ALLIED PHYSICS OPTIONAL PAPER 1: PROPERTIES OF MATTER, HEAT AND MODERN PHYSICS (For Mathematics students)**
Total Hours	**60**
Hours/Week	**4 Hrs Wk**
Code	**U15PH3AOT01**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General objective: To understand the properties of matter and appreciate how the relevant theories find application in various devices, the modes of transfer of heat and the methods of achieving low temperature and the justifications for the vector model of an atom and the liquid drop model for a nucleus.

Course objectives (CO):

The Learner will be able to :

CO No.	**Course Objectives**
CO-1	Understand the basic concepts of stress, strain, internal force and equilibrium in solids.
CO-2	Understand, remember Bernoulli's theorem and Poiseuille's formula.
CO-3	Remember laws of diffusion and understand osmotic pressure.
CO-4	Understand conduction, convection and radiation in thermal physics.
CO-5	Understand and analyze photoelectric effect in different cells in atomic physics.
CO-6	Understand radioactivity, nuclear fission and fusion process in nuclear physics.

UNIT I: ELASTICITY12 Hrs

Stress and Strain- Hooke's law - Moduli of Elasticity – Poisson's Ratio –relation between the elastic moduli-Bending of Beams – Bending Moment – Cantilever(pin and microscope) – Uniform Bending(optic lever method) –Rigidity modulus: static torsion-Torsion pendulum– Couple per unit twist-work done- I shape of Girders.

Extra reading / Key words: *Elastomers, Fracture mechanics*

UNIT II: FLUID MECHANICS12 Hrs

Bernoulli's theorem – venturimeter - filter pump- the atomizer- viscosity- coefficient of viscosity- Streamlined motion and turbulent motion - Poisuelle's formula- experiment to determine viscosity of low viscous liquid by burette method- viscosity of high viscous liquids-Stoke's method.

Extra reading / Key words: *Molasses, Lubricants*

UNIT III: DIFFUSION AND OSMOSIS12 Hrs

Diffusion- Graham's laws of diffusion- Diffusion and kinetic theory- Fick's law-coefficient of diffusion- Analogy between heat conduction and diffusion- determination of coefficient of diffusion- Osmosis- Osmotic pressure- experimental determination of osmotic pressure-Berkeley and Hartley method-Laws of osmotic pressure-difference between osmosis and diffusion.

Extra reading / Key words: *Turgor pressure, Dialysis*

UNIT IV: THERMAL PHYSICS12 Hrs

Transmission of Heat – Co-efficient of Thermal Conductivity – applications of conduction of heat – convection -applications of convection-properties and applications of Radiations – Stefan's law - Solar constant- temperature of the sun.

Production of low temperature - Porous plug experiment - JK effect – Theory – Inversion Temperature – Liquefaction of air-Linde's process.

Extra reading / Key words: *Infrared radiation, Condensation*

UNIT V: ATOMIC AND NUCLEAR PHYSICS12 Hrs

X-rays - Compton Effect – Compton shift- Experimental Verification of Compton effect – Photo electric effect – Laws of photoelectric effect – Einstein's equation - applications of Photo electric effect– Photo electric cells –Applications of photoelectric cells-Vector Atom Model – Pauli's Exclusion Principle.

Radioactivity – properties of radioactive radiations- law of radioactive disintegration – Mean life-law of Successive disintegration –Applications of radio isotopes - Nuclear fission and fusion (Quantitative study only)- Liquid drop model.

Extra reading / Key words: *Dispersion, Hertz effect*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the basic concepts of stress, strain, internal force and equilibrium in solids and characterize materials with elastic constitute relations in elasticity.	PSO 4	U
CO-2	State Poiseuille's formula and determine viscosity of liquids by various method.	PSO 2	U, Ap
CO-3	Distinguish between diffusion and osmosis. Determine osmotic pressure by Berkeley and Hartley method.	PSO 6	U, An

CO-4	Demonstrate conduction, convection and radiation applications in thermal physics.	PSO 5	U, Ap
CO-5	Analyze photoelectric effect in different cells in atomic physics.	PSO 6	U, An
CO - 6	Describe radioactivity, nuclear fission and fusion process and calculate mean life for various elements in nuclear physics.	PSO 4	U,Ap
CO-7	Gain Employability- To understand the properties of matter and find application in various devices, the modes of transfer of heat and nuclear physics	PSO 6	U

Text Books:

1. Murugeshan R and KiruthigaSivaprasath, Properties of matter and Acoustics (2nd ed.) S. Chand & company Ltd , New Delhi (2012).
2. Murughesan , Mechanics S.Chand&Co,New Delhi, (2006).
3. Brijlal and Subramaniam,Heat and Thermodynamics S. Chand & Company Ltd, New Delhi(2002).
4. Murughesan , Modern Physics, S. Chand & Company Ltd,New Delhi, (2006).
5. Brijlal and Subramaniam, Text Book of Heat, Vikas Publishing House PvtLtd.(1993).

BOOKS FOR REFERENCE:

1. J.B Rajam ,Atomic Physics, S.Chand& Co., New Delhi(2010).
2. Halliday, Resnick,Walker, Fundamentals of Physics, 8th Edition , Wiley India Pvt. Ltd., (2008).
3. D.S.Mathur ,Mechanics, Revised edition2012, S.Chand& Co., New Delhi.

HOLYCROSSCOLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2

B.A./B.Sc./B.Com./BBA/B.C.A.DEGREE COURSE
LIFE ORIENTEDEDUCATION

ETHICS–II:EMPOWERMENT OF WOMEN

HRS/WK:1 **CODE:U15VE4LVE02**

CREDIT :1 **MARKS:100**

OBJECTIVES:

- xTomakethelearners awareofvarious genderandsocialissues andCyberCrimes.
- x Tomakethelearners understandandappreciatetheroleofmedia,infacingthechallenges onvariouslifeissues.
- x Toenablethelearners tounderstandtheways ofempoweringwomenandcybercrime againstwomen

UNIT–I:GENDERISSUES

Feminism, Responsibilitiesof men and women towards Egalitarian society, Gender Identity-Factorscontributingtogenderidentity (Familyvalues,culture,tradition,religion,societal values,massmedia)

UNIT–II:SOCIAL ISSUESRELATEDTOWOMEN

Eveteasing,Rape,Dowry,Harassmentinmarriage,DivorceandWidowsRemarriage,HIV &AIDS, Transgender, Female Genocide, sex workers,trafficking, fugitive, Female foeticide, handicappedchildrenandwomenandevils ofdrugabuse.

UNIT–III:WOMENANDMEDIA

Portrayalofwomeninmediaworld-Newspaper,Magazine,Cinema,TV,Videoand Advertisements-MoralityinMediaandRightuseofMedia

UNIT–IV:WAYSOF EMPOWERINGWOMEN

Need for empowerment –Skillsrequired for empowerment and Career Oriented Skills, Women's bill- Propertyrights, ModelsofEmpowered Women- St.TeresaofKolkata, Indira Gandhi,HelenKeller,ChanuSharmilaandMalala.

UNIT–V:CYBERCRIMEAGAINSTWOMEN

HarassmentandSpoofingviae-mail,CyberStalking,CyberPornography,Morphing.Cyber Laws,Socialnetwork:Facebook, Twitter andWhats app.

REFERENCES:

1. Dr.M.Arumairajetal.,1999, "MarchingtowardstheMilleniumahead".
2. ThomasAnjugandam,1999,"GrowFreeLiveFree" SalesianPublicaiton.
3. H.C PrettiNandhiniUpretti,jaipur2000"Womenandproblems ofGender Discrimination".
4. Thomas B.Jayaseelan,2002,"Women: Rights andlaw"IndianSocialInstitute, NewDelhi.
5. ReniJacobvolI&II, April-June2004,"Vikasimi– ThejournalofWomen's Empowerment,Ed,"

B.A/B.Sc/B.Com/B.C.A–DEGREE COURSES
LIFE ORIENTEDEDUCATION

BIBLE STUDIES–II:OLDTESTAMENT

HRS/WK:1CODE:U15VE4LVBO2

CREDIT :1 **MARKS:100**

OBJECTIVE:

- Toenablethestudentstounderstandthedesires ofGodthroughProphetic revelationandto becomesensitivetotheheartbeatofGod.

UNIT–I:PURPOSE OF LIFE

Creationofman –fallofman(Gen1-4)Planofredemptionthroughthelifeof:

- Noah(Gen6-9);Abraham(Gen12-18);
- Joseph(Gen37-40); Moses (Exo 4-5);
- Joshua (Joshua1-8)

UNIT–II:JUDGESANDKINGS

- Judges:Deborah(Judges 4);Samson(Judges 6-8);Gideon(Judges 13-16)
- Kings**:**David(ISam17-31,IISam1-12);Solomon(IKings 1-11)

UNIT–III: MINORPROPHETS

BriefLifeHistoryandteachings of

- Amos
- Jonah
- Micah
- Nahum
- Habakkuk

UNIT–IV: MAJOR PROPHETS

BriefLifeHistoryandteachings of

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

UNIT–V:WOMENINTHEBIBLE

WomenintheOld Testament

- Eve (Gen3)
- Ruth(Ruth1-4)

- Hannah(ISam1:1-28)

xEsther(Esther1-6)

REFERENCES:

1. RussellFueller(1999)TheTextbookoftheTwelveMinorProphets. Wipf&Stock Publishers, UK.
2. Willis JudsonBeecher(2002)The Prophets andThe Promise.Wipf&StockPublishers, UK

HOLYCROSSCOLLEGE (AUTONOMOUS)TIRUCHIRAPPALLI–2

B.A./B.Sc/B.Com/BBA/B.C.A- DEGREE COURSES
LIFE ORIENTEDEDUCATION

CATECHISM–II:CHURCHANDSACRAMENTS

HRS/WK:1 **CODE :U15VE4LVC02**

CREDIT :1 **MARKS:100**

OBJECTIVES:

xToenablethestudents tounderstandtheways ofChristianlivingwiththeChurch

xTounderstandGod's giftoftheHolySpirit.

xTounderstandthemethodsofbuildingrelationshipwithJesus.

xTolearnthelifeofSacraments andPrayer

xToenrichourdevotiontoMotherMaryandSaints.

UNIT–I: MISSIONOF THECHURCH

Whatischurch(attributes)–Interpretation:body ofChrist-BrideofChrist,goal ofall things-Historicalas wellas spiritual-MysteryandSacrament-PilgrimChurch.

UNIT–II:PARTICIPATORYCHURCH

WorkoftheHolySpirit-Saltandleavenintheworld "ChurchofmodernWorld"Church ascommunity –Itsimportantaspect,early Christian Church–Peopleof GodasChurch-Its characteristics andstructure

UNIT–III:THEFUNCTIONARYCHURCHANDI

MinisterialChurch–RelatingChurch–ParishChurch-RoleoflayfaithfulintheChurch–Itschallenges–ChurchandI.

UNIT–IV:SACRAMENTS

Sacraments –Initiation– Healing – Service(alltheseven) –EmphasisonConfession, ConfirmationandHolyCommunion.Sacramental:holy"things"used–Theirsanctity.

UNIT–V:MARYANDSAINTS

Mary asayoungvirgin-Disciple-HerroleintheCatholicChurch-Annualfeasts- Pilgrimages-Devotionto Mary,Dogmas.SaintsintheChurch-Prominent Womenintheold testament

REFERENCES:

1. "Vatican II Revised" Archbishop Angelo Fernandes Published by X.Diax de Rio S.J. GujaratSahitya Prakash,P.O.Box.70, Gujarat, 388001,India.
2. "TheSacramentsTheWordofGodattheMercyoftheBody"ClaretianPublications, Malleswaram,Bangalore560055.
3. Documents ofVaticanII–St. Paul's Publications,Bombay1966.

HOLYCROSS COLLEGE(Autonomous),Tiruchirappalli- 620 002.

TAMIL DEPARTMENT

For Candidate admitted from2015onwards

Second Year-Semester – IV

CourseTitle	இரண்டாமாண்டு–நான்காம்பருவம்
TotalHours	**75**
Hours/Week	**5 Hrs Wk**
Code	**U15TL4TAM04**
CourseType	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

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

- Makethe studenttounderstandthe culturalandtraditionof Tamilians.
- Studentwilllearnunderstandthe religionsknowledge toSustain
- Understandthedepthof TamilLiterature& Culture.
- Knowaboutthe structure ofthe family,mannersisdisciplines.
- Knowaboutthe rightof equality.

CourseObjectives:

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

அலகு:1 செய்யுள் **15Hrs**

1.குறுந்தொகை

1.கொங்கு தேர் வாழ்க்கை அஞ்சிறைத் தும்பி - இறையனார்

2.யாரும் இல்லை தானே கள்வன் - கபிலர்

3.வேம்பின் பைங்காய்என் தோழி தரினே – மிளைக்கந்தன்

4.உள்ளது சிதைப்போர்உளரெனப் படாஅர் - பாலை பாடிய பெருங்கடுங்கோ

5.நோற்றோர் மன்ற தோழி – குறுங்குடி மருதன்

2. நற்றிணை

1.மனையுறை புறவின்செங்கால் 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 **15Hrs**

அகநானூறு

1.வானம் வாய்ப்பக் கவினிக் கானம் -சீத்தலைச் சாத்தனார்

2. எம்வெங் காம மியைவதாயின் - மாமூலனார்

5.புறநானூறு

1.நின் நயந்து உறைநர்க்கும் - பெருஞ்சித்திரனார்

2.காய்நெல் அறுத்துக் கவளம் கொளினே - பிசிராந்தையார்

3.படைப்புப் பலபடைத்து- பாண்டியன் அறிவுடைநம்பி

4.கேட்டல் மாத்திரை – கோப்பெருஞ்சோழன்

5.ஈன்றுபுறந்தருதல் என்தலைக் கடனே- பொன்முடியார்

6. பதிற்றுப்பத்து - ஐந்தாம்பத்து

1.சுடர் வீ வேங்கை

2.தசும்பு துளங்கு இருக்கை

3.ஊன்துவைஅடிசில்

7. திருக்குறள்

1.அறத்துப்பால் - இனியவை கூறல்

2.பொருட்பால் - வினை செயல்வகை

3.காமத்துப்பால் - புலவி நுணுக்கம்

அலகு:3 **15Hrs**

தமிழ் இலக்கிய வரலாறு

சங்ககாலம் - சங்கம் மருவியகாலம்

எட்டுத்தொகை,பத்துப்பாட்டு, பதினெண்கீழ்க்கணக்கு நூல்கள்

அலகு:4 **15Hrs**

வாழ்க்கை வரலாறு

அன்னை தெரசா -பா.தீனதயாளன்

keyWords(ExtraReading)

அக்னி சிறகுகள் -அப்துல் கலாம்

அலகு:5 **15Hrs**

பொது– மொழிப்பெயர்ப்பு

Note: Texts givenintheExtra reading /Key wordsmust be testedonly throughAssignment and Seminars.

CourseOutcomes:

CO No.	CourseOutcomes	PSOs Addressed	Cognitive Level

CO-1	Attitudetoconsiderthelivingbeings of theworldas relations	PSO 1	U
CO-2	the lifestyleof traditionalTamilsmaybeknownwiththe helpof literature	PSO 2	AN
CO-3	tobeinspired bythetraditional cultureandvaluesandbe value oriented	PSO 2	R
CO-4	tofeelthe dedicatedservice ofmotherTheresaandtopractice the same	PSO 3	U
CO-5	to enhanceskillsontranslation	PSO 4	C

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

பாட நூல்கள்

1.செய்யுள் - தமிழாய்வுத்துறைவெளியீடு

2.தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறைவெளியீடு

3. வாழ்க்கை வரலாறு

பா.தீனதயாளன் -அன்னைதெரசா

4.மொழிப்பெயர்ப்பு - தமிழாய்வுத்துறைவெளியீடு

(For the candidates admitted from June 2018 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002

DEPARTMENT OF HINDI

SEMESTER – IV

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

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

Course Objectives (CO):

The learner will be able to

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

UNIT – I **(15 Hours)**

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

Extra Reading (Key Words):*Jal Pradhooshan, Vayu Pradhooshan*

UNIT- II **(15 Hours)**

1. Commercial Letters
2. Technical Terms
3. Translation Ex-4

4. General Essay - Globalisation

Extra Reading (Key Words):*Vyavasayikata*

UNIT- III **(15 Hours)**

1. Office Memorandum
2. Technical Phrases
3. Translation Ex-6
4. General Essay – Self Employment

Extra Reading (Key Words): *Kisan*

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

1. Office Order
2. Technical Phrases
3. Translation Ex-13
4. General Essay – India – Unity in Diversity

Extra Reading (Key Words):*Hamara Bharat*

UNIT- V **(15 Hours)**

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

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

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

Course Outcomes:

The learner will be able to:

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

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

Prescribed Books

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

Reference Books :

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

(For candidates admitted 2016 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF FRENCH

SEMESTER IV

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

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

Course Objectives (CO):

The learner will be able to

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

Unit 1 C'est la fête ! (18 Hours)

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

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

Unit 2 Vous plaisentez ! (18 Hours)

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

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

Unit 3 On s'entend bien ! (18 Hours)

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.

Extra Reading (Key Words): les taboos

Unit 4 À vos risqué et périls ! (18 Hours)

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

Extra Reading (Key Words):les sportifs français

Unit 5 La vie est dure (18 Hours)

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

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

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

TEXT BOOKS :

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

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

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

HOLYCROSS COLLEGE (AUTONOMOUS), Tiruchirapalli – 620002

PG AND RESEARCH DEPARTMENT OF ENGLISH

I YEAR UG – SEMESTER I

PART II – ENGLISH 4 - GENERAL ENGLISH IV

HOURS : 6 **CODE : U19EL4GEN04**

CREDIT : 3 **MARKS: 100**

EMPLOYABILITY SKILLS

OBJECTIVES:

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

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

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

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

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

Writing recommendations.

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

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

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

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

TEXTS

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

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

Listening to differentiate dutyfrom obligation.

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

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

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

Grammar – use of cohesive devices

Vocabulary – figures of speech– simile, metaphor.

Composition –

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

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

TEXTS

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

UNIT III – Team skills

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

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

Reading for comprehension – absorbing the attitude of the people.

Writing – personal essays and report writing

Grammar – use of inverted structures

Vocabulary –New words in current usage.

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

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

TEXTS

1. "The Little Black Boy" by William Blake

2.How to get cooperation by Dale Carnegie.

UNIT IV – Communication skills for interpersonal relationship

Listening to specific information and guessing.
Speaking –Facing interview and situational speeches (Master of ceremony, felicitation and the like).
Reading for comprehension to identify the methods of persuasion.
Writingformal letters and invitations.
Grammar – Transformation of sentences.
Vocabulary – Words related to technical registers.
Composition –1."Communication is an art form that is crafted throughout our lives."

2. Birds of same feather flock together.

TEXTS

1.The Refund by Fritz Karinthy

UNIT V –Presentation skills

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

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

Reading for comprehension.

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

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

Vocabulary – Business terms.

Composition – writing a project.

TEXTS

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

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(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

SECOND YEAR - SEMESTER - IV

Course Title	MAJOR CORE 6: OPTICS AND SPECTROSCOPY
Total Hours	75
Hours/Week	5 HrsWk
Code	U15PH4MCT06
Course Type	Theory
Credits	5
Marks	100

General Objective: To understand the concepts of reflection and refraction, interference of light, diffraction, polarisation and spectroscopy.

Course Objectives (CO):

The Learner will be able to :

CO No.	Course Objectives
CO-1	remember the phenomenon of reflection and refraction, the lens system, aberration, methods of minimizing spherical and chromatic aberrations, Ramsden's and Huygen's eyepieces
CO-2	apply the concept of interference to determine the thickness of the wire and test the planes of a surface wavelength of sodium and monochromatic light
CO-3	understand the term diffraction, normal incidence, dispersive power of grating and compare the spectrum formed by grating and prism
CO-4	understand the concepts of polarization through double refraction, interpret the uses of Nicol prism as producer and analyser and determine the specific rotator power of sugar solution using Laurent's half shade polarimeter
CO-5	analyse different types of spectroscopy and explain the concept of Raman effect on the basis of quantum theory

UNIT I: REFLECTION AND REFRACTION15 Hrs

Lens System - Equivalent focal length of two thin lenses in contact and separated by a distance - Aberration in lenses - Spherical aberration in a lens and methods of minimizing it - Chromatic aberration and achromatic combination of lenses - Huygen's and Ramsden's eyepieces - Comparison of Huygen's and Ramsden's eyepieces.

Extra reading / Key words: *simple experiment using lens, Laser tuning,Optical coherence tomography systems*

UNIT II: INTERFERENCE15 Hrs

Introduction - Theory of Interference fringes - Interference in thin films by reflected light - Interference in thin films by transmitted systems - Wedge shaped films - Air wedge - determination of diameter of a thin wire - Testing the planeness of a surface – Michelson's Interferometer – Determination of wavelength of monochromatic light and difference in wavelength between neighbouring lines - Newton's Rings-Determination of wavelength of sodium light and refractive index of a liquid.

Extra reading / Key words: *Flatness testing, Fabry- Perot Interferometer*

UNIT III: DIFFRACTION15 Hrs

Fresnel diffraction - Fraunhofer diffraction –Plane transmission grating – Normal incidence – Oblique incidence – Overlapping and absent spectra – Dispersive power of a grating - Resolving power of a grating – Comparison of prism spectrum and grating spectrum.

Extra reading / Key words: *DVD*

UNIT IV: POLARISATION15 Hrs

Transverse nature of light –Double refraction – Huygens's explanation of double refraction –Nicol prism – Theory, production and analysis of circularly, elliptically and linearly polarized light – Quarter wave and Half wave plates – Optical activity- Rotatory Polarisation – Fresnel's theory of optical rotation – Specific rotation – Biot's law for Laurent's half shade polarimeter – Determination of specific rotatory power of sugar solution.

Extra reading / Key words: *Liquid crystal display, Polaroid filter*

UNIT V: SPECTROSCOPY15 Hrs

Types of spectra – Emission spectra – Absorption spectra - IR Spectroscopy - Radiation Sources - Detectors – IR photography - uses – UV spectroscopy - Radiation Sources - Detectors - Raman Effect – Explanation of Raman effect using simple Quantum theory – Experiment – Applications - NMR Spectroscopy - Basic Principle -Applications.

Extra reading / Key words: *Metabolomics, Lasers*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Discuss the phenomenon of reflection and refraction, aberration, spherical and chromatic aberrations, Ramsden's and Huygen's eyepieces	PSO 1	U
CO-2	Explain the phenomenon of diffraction and to determine the thickness the wire and test the planes of a surface wavelength of sodium and monochromatic light	PSO 4	U, Ap
CO-3	Describe diffraction, normal incidence, dispersive power of grating and able to compare the spectrum formed by grating and prism	PSO 4	U, Ap
CO-4	Interpret the uses of Nicol prism as producer and analyser and determine the specific rotator power of sugar solution using Laurent's half shade polarimeter	PSO 4	U, Ap
CO-5	Differentiate the types of spectroscopy and list the applications of spectroscopy and Raman effect in various field	PSO 4	U, Ap
CO-6	Gain Employability-Knowledge on basic laws of geometrical optics	PSO 6	U

Text Books:

1. Murugeshan,R and Kiruthiga Sivaprasath, Optics and Spectroscopy, S.Chand and Company, Ltd. (2010)
2. ArulDas G., Molecular Structure and Spectroscopy, PHI Learning Private Editor, New Delhi, Second edition (2007)

BOOKS FOR REFERENCE:

1. Subramaniyam N, Brijlal and Avadhanulu. M.N, A Text Book of Optics ,S.Chand and Company, Ltd (2007).
2. Gupta S.L., Kumar.V. and Sharma.R.C., Elements of Spectroscopy, 16th Revised Edition, Pragati Prakashan, Meerut (2016).
3. Murugeshan, R Optics and Spectroscopy S.Chand and Company, Ltd. (1997).

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

SECOND YEAR - SEMESTER - IV

Course Title	MAJOR ELECTIVE 1: DIGITAL ELECTRONICS
Total Hours	75
Hours/Week	5 HrsWk
Code	U15PH4MET01
Course Type	Theory
Credits	5
Marks	100

General Objective: To understand the number system, Boolean algebra, combinational and sequential circuits, counters, shift registers, A/D & D/A Conversion.

Course Objectives (CO):

The Learner will be able to :

CO No.	Course Objectives
CO-1	understand and apply the various number conversion techniques in number systems, codes and Boolean algebra.
CO-2	understand the function of logic gates and apply min term techniques to simplify the Boolean equations using Karnaugh map.
CO-3	understand, apply and analyze the various arithmetic, combinational and sequential circuits in digital electronics.
CO-4	apply the sequential logic circuits to design the digital devices of shift registers and counter.
CO-5	understand and apply the logics to design the A/D and D/A converters and analyze the A/D and D/A conversions.

UNIT I: NUMBER SYSTEMS, CODES AND BOOLEAN ALGEBRA15 Hrs

Binary numbers – Binary arithmetic – 1's and 2's complements – Decimal to Binary conversion – Binary to decimal conversion – Octal numbers, Hexadecimal numbers – Binary coded decimal – Digital codes – Excess-3, Gray and Alphanumeric (ASCII) codes –Boolean operations – Rules and Laws of Boolean Algebra- Algebraic simplification of Boolean expressions.

Extra reading / Key words: *8421 code, 2421 code, 4221 code, IBM machines*

UNIT II: LOGIC GATES AND SIMPLIFICATION OF BOOLEAN EQUATIONS15 Hrs

AND, OR and NOT gates construction using discrete components- AND, OR, NOT, NAND, NOR, EX-OR gates – operation and truth tables– EX-OR gate applications: Binary to Gray and Gray to Binary conversion, Parity generator and checker - DeMorgan's theorems – NAND and NOR as Universal Building block - Boolean expressions for gate networks — Minterms- Sum of

Products– Karnaugh map forming up to four variables - Simplification using Karnaugh map- AND – OR, NAND-NAND circuit equivalence.

Extra reading / Key words: *EX - NOR gate, Max term, Product of sum*

UNIT III: ARITHMETIC, COMBINATIONAL AND SEQUENTIAL CIRCUITS15 Hrs

Half adder – Full adder – Half subtractor – Full subtractor - Multiplexer: 4-1 Multiplexer, 8-1 Multiplexer – Demultiplexer: 1-4 Demultiplexer, 1-16 Demultiplexer – Decoder: 3-8 decoder, BCD to Seven segment decoder - Encoder – Flip Flops- SR Flip Flop, Clocked SR Flip Flop, D Flip Flop, JK Flip Flop, JK Master slave Flip Flop (Edge Triggering) and T Flip Flop.

Extra reading / Key words: *Full subtractor, Latches, Combinational circuit*

UNIT IV: REGISTERS AND COUNTERS15 Hrs

Registers - Shift registers – Series and Parallel Shift registers – Application of Shift registers: Ring Counter - Asynchronous counters - Modulo –N counter - Asynchronous Decade counter- Synchronous counters – Design of Synchronous counters - Modulo –N counter - Synchronous Decade counter.

Extra reading / Key words: *SISO, SIPO, PIPO, PISO, mod -12 counter, BCD counter*

UNIT V: ANALOG TO DIGITAL AND DIGITAL TO ANALOG CONVERSION15 Hrs

D/A conversion – Resistive divider – Binary ladder –D/A Accuracy and Resolution – A/D conversion - Successive Approximation method - Counter method – A/D Accuracy and Resolution .

Extra reading / Key words: *R-2R resistive ladder, Dual slope A/D counter*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Identify and apply the various number conversion techniques in number systems, codes and Boolean algebra	PSO 1	R,U
CO-2	Explain the function of logic gates.	PSO 4	U
CO-3	Simplify the Boolean equations by using min term technique	PSO 4	U, Ap
CO-4	Design and analyze the various arithmetic, combinational and sequential circuits in digital electronics	PSO 4	U, Ap
CO-5	Apply the sequential logic circuits to design the digital devices of shift registers and counter	PSO 4	U, Ap
CO-6	Design the A/D and D/A converters and analyze the A/D and D/A conversions	PSO 4	U, Ap
CO-7	Gain Employability - Understand the basic principles of digital electronics.	PSO 6	U

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

Text Books:

1. R. P. Jain, Modern Digital Electronics, 4th Edition 2010 , Tata McGraw - Hill Education, New Delhi.
2. Floyd, Digital Fundamentals, 8th Edition2015 , Pearson Education, India.

BOOKS FOR REFERENCE:

1. William H. Gothmann, Digital Electronics- An Introduction to theory & Practice, Second Edition, Prentice Hall of India (2008).
2. Vijayendran V. Introduction to Integrated Electronics Digital And Analog , First Edition, S. Viswanathan (Printers & Publishers) Pvt., Ltd (2009).
3. Malvino. A and Leach, Digital Principles and Applications, 4thEdition, Mc-Graw Hill, New York 2010 .
4. Theraja B.L., Basic Electronics – Solid State- S. Chand and Company Limited, New Delhi,1st Edition (2005).

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2.

DEPARTMENT OF PHYSICS

SECOND YEAR - SEMESTER III

Course Title	MAJOR ELECTIVE 1: ENERGY PHYSICS
Total Hours	75
Hours/Week	5 Hrs Wk
Code	U15PH4MET02
Course Type	Theory
Credits	5
Marks	100

General Objective: To make the students to understand the present day crisis of need for conserving energy and alternatives are provided.

Course Objectives:

The Learner will be able to:

CO No.	Course Objectives
CO-1	understand the various forms of conventional energy resources.
CO-2	understand basic characteristics of solar energy and technologies for their utilization.
CO-3	understand fundamental concepts in biofuels/bioenergy systems
CO-4	understand the principles that underlie the ability of geothermal energy to deliver
	usable energy
CO-5	understand the different non-conventional sources and the power generation
	techniques.

UNIT I: INTRODUCTION TO ENERGY SOURCES **15 Hrs**

An Introduction to Energy Sources and their availability-conventional energy sources-nonconventional energy sources- various forms of energy - coal, oil and natural gas - applications - merits and demerits.

Extra reading / Key words: *Natural Resources*

UNIT II: SOLAR ENERGY **15 Hrs**

Solar energy - nature of solar radiation - components - solar heaters - crop dryers - space cooling - solar cookers - water desalination - photovoltaic generation basics - merits and demerits of solar energy.

Extra reading / Key words: *Solar batteries*

UNIT III: BIOMASS ENERGY **15 Hrs**

Biomass energy - classification - photosynthesis - biomass conversion process - gobar gas plants - wood gasification - ethanol from wood - advantages and disadvantages of biomass as energy source.

Extra reading / Key words: *Biofuels,*

UNIT IV*:* GEOTHERMAL ENERGY **15 Hrs**

Geothermal energy - wind energy - ocean thermal energy conversion (OTEC) - energy from waves and tides (Basic ideas, nature, applications, merits and demerits).

Extra reading / Key words: *Environmental Impact*

UNIT V: ENERGY STORAGE & IMPACTS OF NON-CONVENTIONAL ENERGY 15 Hrs

Conversion of energy - patterns of energy consumption in domestic, industrial, transpotation, agricultural sectors - conservation principles - energy crisis and possible solutions - energy storage and hydrogen as a fuel (basics) - impact due to non-conventional energy sources.

Extra reading / Key words: *Energy storage device applications*

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

Course Outcomes:

The Learner will be able to:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Learn the present energy scenario and the need for energy conservation	PSO 1	U
CO-2	Discriminate between 1) the solar resource, 2) solar energy conversion systems technologies like photovoltaic and 3) solar goods and services like electricity, hot water.	PSO 5	U, An

CO-3	Explain the concept of various forms of renewable energy.	PSO 3	U
CO-4	Outline division aspects and utilization of renewable energy sources for both domestics and industrial application	PSO 3	U, Ap
CO-5	Discuss the positive and negative aspects of geothermal energy in relation to natural and human aspects of the environment	PSO 2	U
CO-6	Employability-Understand the basics of energy storage device applications in physics	PSO 1	U

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

BOOKS FOR REFERENCE:

1. G.D. Raj, Solar Energy, 4th edition, (1997).

2. G.D. Raj, Non conventional energy sources, 4th edition, (1997).

3. S.Rao and Dr. B.B. Parulekar Energy Technology, 2nd Edition, (1997)

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

SECOND YEAR - SEMESTER – IV

Course Title	**ALLIED PHYSICS OPTIONAL PAPER 2: OPTICS, ELECTRICITY AND ELECTRONICS (For Mathematics students)**
Total Hours	**60**
Hours/Week	**4 Hrs Wk**
Code	**U15PH4AOT02**
Course Type	**Theory**
Credits	**4**
Marks	**100**

General Objective: To understand the concepts of optics, Electricity, Electromagnetism, analog and digital electronics.

Course Objectives:

CO No.	**Course Objectives**
CO-1	understand the principle and behavior of Light from optics.
CO-2	apply and analyze the basic concepts and properties of Electricity.
CO-3	remember the electromagnetism principles and their applications.
CO-4	understand the Analog electronics concepts and its applications.
CO-5	apply the structure of various number system and its applications in digital electronics.

UNIT I: OPTICS12 Hrs

Refraction - Refraction through prism- Refractive index – Interference - Condition for Interference – Newton's rings - Air wedge – Diffraction - theory of grating - difference between prism and grating spectrum- Determination of wavelength of light using transmission grating(Normal incidence)- LASER principles- He-Ne Laser.

Extra reading / Key words: *Duality, Polarization*

UNIT II: ELECTRICITY12 Hrs

Electrostatics - Coulomb's inverse square law - electric field- electric field intensity- electric potential- Gauss theorem and its applications (Intensity at a point due to a charged sphere & cylinder) – Principle of a capacitor – Capacity of spherical and cylindrical capacitors – Energy stored in a capacitor – Loss of energy due to sharing of charges.

Extra reading / Key words: *Charge, Discharge, Surface charge density*

UNIT III: ELECTROMAGNETISM 12 Hrs

Laws of electromagnetic induction-Self induction –self inductance of a long solenoid-Mutual induction- coefficient of coupling- determination of coefficient of Self inductance by Anderson's method- determination of coefficient of mutual inductance by Rayleigh's method-growth and decay of current in a circuit having L& R- growth and decay of charge in a circuit having C & R.

Extra reading / Key words: *Potential difference, Torque, Magnetic field*

UNIT IV: ANALOG ELECTRONICS12 Hrs

PN junction diode- characteristics- Zener diode characteristics- Zener as a voltage regulator- junction diode as a rectifier- bridge rectifier- Principle and working of a transistor-Characteristics of a transistor in CE configuration- transistor as an amplifier.

Extra reading / Key words: *Breakdown, Operational amplifier*

UNIT V: DIGITAL ELECTRONICS 12 Hrs

Decimal, binary, octal and hexadecimal Number system – mutual conversion- binary arithmetic- Basic logic gates- Boolean Algebra- De Morgan's theorems-verification using truth tables - NAND and NOR as universal gates- simplification of Boolean equations – Half and full adder.

Extra reading / Key words: *Mutual conversion, Logic operations*

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

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Recall and relate the principles of Light	PSO 1	R, U
CO-2	Describe the working and operation of He-Ne Laser.	PSO 2	R, U
CO-3	Explain the principle of Capacitor.	PSO 1	R, U
CO-4	Describe the working of Anderson's method.	PSO 2	R, U
CO-5	Describe the Characteristics of a transistor in CE configuration.	PSO 4	R, U, Ap
CO-6	State and explain De Morgan's theorems.	PSO 4	R,Ap
CO-7	Gain Employability -understand the concepts of optics, Electricity, Electromagnetism, analog and digital	PSO 6	U, Ap

	electronics.		

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

Text Books:

1. R. Murugeshan, Allied Physics, 1st edition, S.Chand , New Delhi,(2005).
2. R. Murugeshan, Optics and spectroscopy, 1st edition, S.Chand , New Delhi(2003).

BOOKS FOR REFERENCE:

1. Brijlal and Subramaniam, Electricity and Magnetism, Ratan Prakashan Mandir, New Delhi (1987)
2. Gupta and Kumar, Hand Book of Electronics, Pragathi Prakashan, Meerut (1980).
3. Jain, R.P., Modern Digital Electronics, Fourth Edition, Tata McGraw Hill India Ltd., New Delhi (2010).
4. David Halliday, Robert Resnik, Kenneta S. Krane, The Physics, John Willey and sons, Singapore, (2001).
5. V.Vijayendran, Introduction to integrated electronics, S. Viswanathan publishers (2009).

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

SECOND YEAR - SEMESTER IV

Course Title	**ALLIED PHYSICS OPTIONAL PAPER 3: BASIC PHYSICS PRACTICALS II (For Mathematics students)**
Total Hours	**60**
Hours/Week	**4Hrs Wk**
Code	**U15PH4AOP03**
Course Type	**Practical**
Credits	**3**
Marks	**100**

General Objective: To understand and apply the principles of physics by doing related experiments in Properties of Matter, Optics, Electricity and Electronics.

Course Objectives (CO):

The Learner will be able to:

CO No.	**Course Objectives**
CO-1	understand and evaluate the Young's modulus and Rigidity modulus of the given material
CO-2	apply the basic principles of optics to determine the thickness of a wire by using Air wedge Method, radius of curvature of the lens by forming Newton's rings, the refractive index of a Prism and the wavelengths of prominent lines of mercury spectrum using grating
CO-3	understand and apply the concept of properties of matter by doing simple experiment like Poiseuille's flow method
CO-4	understand and analyze the characteristics of electronic devices such as Zener and Junction diodes
CO-5	remember, apply and analyze the functions of logic gates using discrete components
CO- 6	understand, apply and analyze the concept of digital electronics by doing simple experiments using IC chips
CO-7	Skill Development-Practical exposure to Allied Maths Students.

Any Sixteen Experiments Only

1. Determination of Young's modulus of the material of a bar using Cantilever (Pin and Microscope).
2. Determination of Young's modulus of the material of a bar by Non – Uniform bending (pin and Microscope).

3. Determination of Young's modulus of the material of a bar by uniform bending (Scale and telescope)
4. Determination of Rigidity modulus of the material of a wire using Torsion Pendulum.
5. Determination of Rigidity modulus of the material of a rod – Static Torsion.
6. Determination of refractive index of a Prism using Spectrometer.
7. Determination of refractive index of a liquid using Spectrometer and Hollow prism.
8. Determination of the thickness of the wire by using Air wedge method.
9. Determination of the radius of curvature of the lens by forming Newton's rings.
10. Determination of wavelengths of prominent lines of mercury spectrum using grating.
11. Determination of Coefficient of viscosity of liquid by Poiseuille's flow method.
12. Study of Junction Diode characteristics.
13. Study of Zener Diode characteristics.
14. Construction of Bridge Rectifier.
15. Construction of Regulated Power Supply using Zener Diode.
16. Study of IC –Chips.
17. Study of Logic gates AND and OR using discrete components.
18. Verification of De Morgan's theorems.
19. Study of NOR as universal gate.
20. Study of NAND as universal gate.

(For Candidates admitted from June 2015 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2

B.A. /B.Sc. / B.Com. / BBA/ B.C.A. DEGREE COURSE LIFE ORIENTED EDUCATION ETHICS – II: EMPOWERMENT OF WOMEN

HRS/WK:1 **CODE: U15VE4LVE02**

CREDIT : 1 **MARKS : 100**

OBJECTIVES:

1. To make the learners aware of various gender and social issues and Cyber Crimes.
2. To make the learners understand and appreciate the role of media, in facing the challenges on various life issues.
3. To enable the learners to understand the ways of empowering women and cyber crime against women

UNIT – I: GENDER ISSUES

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

UNIT – II: SOCIAL ISSUES RELATED TO WOMEN

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

UNIT – III: WOMEN AND MEDIA

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

UNIT – IV: WAYS OF EMPOWERING WOMEN

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

UNIT – V: CYBER CRIME AGAINST WOMEN

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

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 Pretti Nandhini Upretti, jaipur 2000 "Women and problems of Gender Discrimination".
4. Thomas B.Jayaseelan, 2002, "Women: Rights and law" Indian Social Institute, New Delhi.
5. Reni Jacob vol I & II, April- June 2004, "Vikasimi – The journal of Women's Empowerment, Ed,"

(For Candidates admitted from June 2015 onwards)

HOLY CROSS COLLEGE(AUTONOMOUS) TRICHIRAPALLI-2.

B.A/B.Sc/B.Com /B.C.A – DEGREE COURSES

LIFE ORIENTED EDUCATION

BIBLE STUDIES – II: OLD TESTAMENT

HRS / WK :1 **CODE: U15VE4LVBO2**

CREDIT : 1 **MARKS : 100**

OBJECTIVE:

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

UNIT – I: PURPOSE OF LIFE

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

- Noah (Gen 6-9); Abraham (Gen 12-18);
- Joseph (Gen 37-40); Moses (Exo 4-5);
- Joshua (Joshua 1-8)

UNIT – II: JUDGES AND KINGS

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

UNIT – III: MINOR PROPHETS

Brief Life History and teachings of

1. Amos
2. Jonah
3. Micah
4. Nahum
5. Habakkuk

UNIT – IV: MAJOR PROPHETS

Brief Life History and teachings of

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

UNIT – V: WOMEN IN THE BIBLE

Women in the Old Testament

1. Eve (Gen 3)
2. Ruth (Ruth 1-4)
3. Hannah (I Sam 1:1-28)
4. Esther (Esther 1-6)

REFERENCES:

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

(For Candidates admitted from June 2015 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

B.A./ B.Sc/ B.Com/ BBA/ B.C.A - DEGREE COURSES

LIFE ORIENTED EDUCATION

CATECHISM – II: CHURCH AND SACRAMENTS

HRS/WK:1 **CODE : U15VE4LVC02**

CREDIT : 1 **MARKS : 100**

OBJECTIVES:

1. To enable the students to understand the ways of Christian living with the Church
2. To understand God's gift of the Holy Spirit.
3. To understand the methods of building relationship with Jesus.
4. To learn the life of Sacraments and Prayer
5. To enrich our devotion to Mother Mary and Saints.

UNIT – I: MISSION OF THE CHURCH

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

UNIT – II: PARTICIPATORY CHURCH

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

UNIT – III: THE FUNCTIONARY CHURCH AND I

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

UNIT – IV: SACRAMENTS

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

UNIT – V: MARY AND SAINTS

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

REFERENCES:

1. "Vatican II Revised" Archbishop Angelo Fernandes Published by X.Diax de Rio S.J. Gujarat Sahitya Prakash, P.O.Box. 70, Gujarat, 388001, India.
2. "The Sacraments The Word of God at the Mercy of the Body" Claretian Publications,

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

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

THIRD YEAR - SEMESTER V

Course Title	MAJOR CORE 7: ATOMIC AND MOLECULAR PHYSICS
Total Hours	75
Hours/Week	5 Hrs Wk
Code	U15PH5MCT07
Course Type	Theory
Credits	4
Marks	100

General Objective: To understand the outgrowth of the atomic and molecular structure and the origin of their characteristic spectra.

Course Objectives:

The Learner will be able to:

CO No.	Course Objectives
CO-1	understand the concept of Photoelectric effect and X rays
CO-2	remember the atom model, atomic spectra and importance of Pauli's exclusion principle
CO-3	apply electric and magnetic field, understand the observed dependence of atomic fine structure of spectral lines
CO-4	understand the principles, classify the types and analyze the application of lasers in laser physics
CO-5	understand the selection rules for various optical spectroscopes in terms of the symmetries of molecular vibration in molecular spectra

UNIT I: PHOTOELECTRIC EFFECT AND X-RAYS15 Hrs

Photoelectric effect - Richardson and Compton experiment - Experimental investigation on the photoelectric effect - Laws of photoelectric emission - Einstein's photoelectric equation - Experimental verification - Millikan's experiment - Photoelectric cells - Applications of Photoelectric cells- X-rays - Properties of X-rays-Compton effect-experimental verification-X-ray spectra-continuous spectrum-characteristics spectrum-Moseley's law and its importance.

Extra reading / Key words: *Photoelectrons, Bragg's law*

UNIT II: ATOM MODEL & ATOMOIC SPECTRA15 Hrs

Bohr and atom model –Vector atom model- Quantum numbers associated with vector atom model - coupling schemes- L-S coupling –J-J coupling - Electronic configuration of elements and periodic table - Pauli's exclusion principle- Magnetic dipole moment due to orbital and spin motion of the electron - Stern and Gerlach experiment – Optical spectra- Spectral terms and notations – selection rules- intensity rule and interval rule – Fine structure of sodium D lines.

Extra reading / Key words: *Atom, Quantization*

UNIT III: FINE STRUCTURE OF SPECTRAL LINES15 Hrs

Zeeman effect - Experimental arrangement for the normal Zeeman effect- Classical theory of normal Zeeman effect –expression for the Zeeman shift- Larmor's theorem - Quantum mechanical explanation of the normal Zeeman effect - Anomalous Zeeman effect- Paschen –Back effect-stark effect-experimental study-results.

Extra reading / Key words: *Magnetic field, hyperfine effect*

UNIT IV: LASER PHYSICS15 Hrs

Absorption and Emission - Spontaneous emission - Stimulated emission – Einstein coefficients - principle of laser-population inversion-pumping- pumping schemes - optical resonator - The Ruby laser – Helium –neon laser - Semiconductor laser - Properties of laser beam – Holography- Applications of laser in Medicine and Industry.

Extra reading / Key words: *Photons, Excitation*

UNIT V: MOLECULAR SPECTRA15 Hrs

Origin and nature of molecular spectra - different modes of molecular excitation-factors affecting line width- factors affecting intensity of molecular spectra-Born-Oppenheimer approximation-rotation of linear system- Theory of the pure rotational spectrum of a molecule- Energy of a diatomic molecule – Simple Harmonic oscillator- Anharmonic oscillator- Infra red spectra - Theory of the vibration - rotation spectrum of a molecule – electronic spectra of molecules.

Extra reading / Key words: *Energy state, Path length*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	State Laws of photoelectric emission.	PSO 1	R
CO-2	Explain X rays and its properties.	PSO 1	U
CO-3	Recall and relateBohr atom model –Vector atom model.	PSO 2	R
CO-4	Distinguish Classical and Quantum theory of the normal Zeeman effect.	PSO 6	An
CO-5	Apply laser principle, discuss Holography.	PSO 4	Ap
CO-6	Describe vibration and rotation spectrum of a molecule.	PSO 5	U

CO-7	Gain Employability-Understand the concepts of atomic and nuclear model.	PSO 6	U

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

Text Books:

1. R. Murugesan, Sivaprasath Murugesan, Modern Physics, S. Chand & Co Ltd., New Delhi, 14th Revised edition (2014).
2. J.B. Rajam, Atomic Physics, Revised edition S. Chand & Co Ltd., New Delhi, (2009).
3. G.Arul Dhas, Molecular structure and spectroscopy, 2nd Edition PHI Learning private limited, (2008).
4. Colin N. Banwell& Elaine M. Mc Cash, Fundamentals of Molecular spectroscopy, 4th Edition, Tata McGraw Hill, New Delhi (2016).

BOOKS FOR REFERENCE

1. Sehgal, Chopra and Sehgal, Modern Physics, 9th edition, Sultan Chand & Sons, New Delhi (2004).

2. C.L.Arora, Atomic and Molecular Physics, 1st Edition, S.Chand &Co Ltd., New Delhi, (1999).

3. S.N.Ghosal, Atomic Physics, Revised edition S. Chand & Co Ltd., New Delhi, (2004).

4. Kupta, Kumar, Sharma, Elements of spectroscopy, Pragati prakashan (2015).

5. Mathews, P M & Venkatesan, K, A text book of quantum mechanics, 2nd edition, Tata McGraw-Hillpublishing company Ltd., New Delhi(2010).

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

THIRD YEAR - SEMESTER V

Course Title	**MAJOR CORE 8: CLASSICAL AND QUANTUM MECHANICS**
Total Hours	**75**
Hours/Week	**5 Hrs Wk**
Code	**U15PH5MCT08**
Course Type	**Theory**
Credits	**4**
Marks	**100**

General Objective: To gain knowledge about fundamentals of classical and quantum mechanics and to appreciate the link between them.

Course Objectives:

The Learner will be able to :

CO No.	**Course Objectives**
CO-1	Understand the fundamental concepts in Classical Mechanics and apply the conservation laws and constraints for a system of particles
CO-2	Understand and apply the Lagrangian Formulation for a mechanical system
CO-3	Understand and apply the Hamiltonian Formulation for a mechanical system
CO-4	Remember and understand the importance of Quantum Mechanics over classical Mechanics
CO-5	Understand the postulates of wave mechanics, properties of wave function and operator formulation in Quantum Mechanics II and apply the time dependent and time independent one dimensional Schrodinger equations to solve simple problems

UNIT I: INTRODUCTION TO CLASSICAL MECHANICS15 Hrs

Introduction- Conservation laws-Mechanics of a system of particles- Conservation of linear momentum,angular momentum and energy- Conservation theorem-Co-ordinate systems- Degrees of freedom - Constraints - Types of constrains – Examples of constraints - Difficulties introduced by the constraints and their removal.

Extra reading / Key words:*Coriolis, Spacecraft*

UNIT II: LAGRANGIAN FORMULATION15 Hrs

Generalized coordinates- Principle of virtual work - D'Alembert's principle - Lagrange's equation from D'Alembert's principle - Formation of Lagrange's equations- Applications of Lagrange's equation: simple pendulum - Atwood's machine - compound pendulum- Lagrange's equations in the presence of non-conservative forces.

Extra reading / Key words:*Dissipation function, Gauge function*

UNIT III: HAMILTONIAN FORMULATION15 Hrs

Generalized momentum - Cyclic co-ordinates - Hamiltonian function-Physical significance - Hamilton's equations - Applications of Hamilton's equation: Harmonic oscillator - Motion of a particle in a central force field -Hamilton's principle - Δ-variation - Principle of least action.333

Extra reading / Key words:*Catenary, Geodesic*

UNIT IV: QUANTUM MECHANICS I15 Hrs

Limitations of classical mechanics - Introduction to Quantum mechanics -Wave particle duality - De Broglie waves - Davission and Germer's experiment - G.P.Thomson experiment - Group and phase velocities - Wave packets - Heisenberg's uncertainty principle-Illustration of uncertainty principle –Gamma ray microscope- Electron microscope – Diffraction of a beam of electron through a narrow slit-Application: Radius of the Bohr's first orbit- non- existence of the electron in the nucleus.

Extra reading / Key words:*Otto-Wiener's experiment, Matrix mechanics*

UNIT V: QUANTUM MECHANICS II15 Hrs

Postulates of wave mechanics - Operators - Properties of wave function - Derivation of time dependent and time independent one dimensional Schrodinger equation - Application of Schrodinger equation - Particle in a box - Barrier penetration problem - Linear harmonic oscillator - Hydrogen atom.

Extra reading / Key words:*kets and bras, Rigid rotator*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSO's Addressed	Cognitive Level
CO-1	Summarize the fundamental concepts in Classical Mechanics and apply the conservation laws and constraints for a system of particles	PSO-1	U, Ap
CO-2	Explain and apply the Lagrangian Formulation for a mechanical system	PSO-1	U, Ap
CO-3	Explain and apply the Hamiltonian Formulation for a mechanical system	PSO-1	U, Ap
CO-4	Recall the importance of Quantum Mechanics over classical mechanics	PSO-1	R
CO-5	Differentiate Classical mechanics and Quantum mechanics.	PSO-1	An
CO-6	Summarize the postulates of wave mechanics, properties of wave function and operator formulation in Quantum Mechanics	PSO-1	U
CO-7	Apply the time dependent and time independent one dimensional Schrodinger equations to solve simple problems	PSO-1	Ap
CO-8	Gain Employability – Knowledge on fundamentals of classical and quantum mechanics and to appreciate the link between them.	PSO 6	U, Ap

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

Text Books:

1. J.C. Upadhyaya, Classical Mechanics, Himalaya publishing house, (2005),
2. Chatwal and Anand, Quantum mechanics, Himalaya Publishing House, (2012).

BOOKS FOR REFERENCE

1. Goldstein Herbert, Classical Mechanics- Narosa Publishing House,New Delhi (2001).
2. Gupta, Kumar and Sharma, Classical Mechanics,Pragati prakasan,Meerut (2003)
3. Sathya Prakash, Quantum Mechanics, S.Chand & Company,New Delhi (2001).
4. Aruldhas G., Quantum Mechanics, Prentice Hall of India Pvt., Ltd., New Delhi (2002).
5. Mathews, P M & Venkatesan, K, A text book of quantum mechanics, 2nd edition Tata McGraw Hill Pvt., Ltd., New Delhi, (2017)

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

THIRD YEAR - SEMESTER V

Course Title	**MAJOR CORE 9:ELECTROMAGNETICS AND MATHEMATICAL PHYSICS**
Total Hours	**75**
Hours/Week	**5 Hrs Wk**
Code	**U15PH5MCT10**
Course Type	**Theory**
Credits	**4**
Marks	**100**

General Objective: To understand the basic principles of Electrostatics, Magneto statics and to be familiarized with special functions, vector calculus and matrix theory.

Course Objectives:

The Learner will be able to :

CO No.	**Course Objectives**
CO-1	understand the concept of electrostatics and some applications with the boundary conditions in Electrostatics
CO-2	remember the laws of magnetostatics and apply them to some applications in Magnetostatics
CO-3	understand and analyze the gradient, divergence, curl and their physical interpretation and different integrals in Vector Calculus
CO-4	understand beta and gamma function, their properties, Bessel's differential equation solution and its recurrence relations in Special Functions
CO-5	understand different types of matrices, Cayley Hamilton theorem and its application in Matrix Theory

UNIT I: ELECTROSTATICS15 Hrs

Electric field – Continuous Charge Distribution – Gauss law – Differential Form – Poisson and Laplace equations –Applications: The field outside an isolated charged sphere, the field inside an uniformly charged sphere – Potentials with Dirichlet and Neumann boundary conditions – Electrostatic Boundary Conditions – Electrostatic potential – Method of separation of variables in Cartesian Co-ordinates – Uniqueness theorem – Laplace equation in rectangular co-ordinates – Solution of Laplace's equation in a rectangular box.

Extra reading / Key words: *Laws of electrostatics, Boundary conditions*

UNIT II: MAGNETOSTATICS15 Hrs

Magnetic field – Magnetic forces – Ampere's law of force - Biot-Savart law – Applications: Long straight wire, Circular Coil – Magnetic scalar and vector potential – Magnetostatic Boundary conditions – Multipole expansion of a current distribution –

Magnetization – Magnetic susceptibility and permeability - Comparison between electrostatics and magnetostatics.

Extra reading / Key words: *Laws of magnetostatics, Applications of magnetostatics*

UNIT III: VECTOR CALCULUS15 Hrs

Scalar and Vector fields – Directional derivatives – Level Surfaces – The gradient of a scalar field – The divergence of vector point function – The curl or rotation of a vector point function – physical interpretation - Integration of a vector - The line integral – surface integral – volume integral – Gauss ' divergence theorem – physical interpretation of Gauss ' divergence theorem.

Extra reading / Key words:*Gradient, Divergence, Curl*

UNIT IV: SPECIAL FUNCTIONS15 Hrs

Gamma and Beta functions – Properties of Beta and Gamma functions – Relation between Beta and Gamma function – Bessel's differential equation – Power series solution – Generating function – Recurrence relations.

Extra reading / Key words: *Special function, Differential equation*

UNIT V: MATRIX THEORY15 Hrs

Real, symmetric and Hermitian matrices – Normal matrix – Triangular matrix– trace of a matrix – Orthogonal matrix –Unitary matrix – System of linear equations – Eigenvalue problems – Eigenvectors – Diagonalisation of matrix – Cayley - Hamilton theorem – Power and roots of a matrix.

Extra reading / Key words: *Types of matrices, Eigen value and eigen vector*

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

Course outcomes:

CO No.	Course Outcomes	PSO's Addressed	Cognitive Level
CO-1	Recall the concept of electrostatics and some applications with the boundary conditions in Electrostatics	PSO-1	R, Ap
CO-2	State and explain the laws of magnetostatics and apply them to some applications in Magnetostatics	PSO-2	R, U
CO-3	Explain about gradient, divergence, curl and their physical interpretation and different integrals in Vector Calculus.	PSO-3	R, U
CO-4	Distinguish beta and gamma function, their properties, Bessel's differential equation solution and its recurrence relations in Special Functions.	PSO-3	An
CO-5	Classify different types of matrices, Cayley Hamilton theorem	PSO-4	An

	and its application in Matrix Theory		
CO-6	Gain Employability-understand the basic principles of Electrostatics, Magneto statics and to be familiarized with special functions, vector calculus and matrix theory.	PSO 6	U

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

Text Books:

1. B. D. Gupta, Mathematical Physics, Vikas Publishing House Pvt. Limited (2006) (Unit III and IV).
2. A. W. Joshi, Matrices and Tensors in Physics, 3rd Edition, New Age International Publishers,.(1995) (Unit-V).
3. K. K. Chopra, and G. C. Agarwal and, Electromagnetic Theory, 6th Edition, K. Nath & Co., Meerut (2003).

BOOKS FOR REFERENCE

1. H. K. Dass, Mathematical Physics, S. Chand & Co (2003).
2. B. S. Rajput, Mathematical Physics. Prakati Prakashan & Company, Meerut (2008).
3. Sathyaprakash, Mathematical Physics including Classical Mechanics, 6th Edition, S.Chand & Company, New Delhi (2015).
4. B. B. Laud, Electromagnetics, 3rd edition, New Age International Publishers, New York (2011).
5. Gupta, Kumar and Singh, Electrodynamics -Pragati Prakashan, Meerut (2000).
6. David J.Griffiths, Introduction to Electrodynamics, 3rd Edition Prentice Hall of India., New Delhi (2002).
7. J. D Jackson, Classical Electrodynamics, Third Edition, Wiley – Eastern Ltd, New Delhi (2007).
8. L.C Andrews, Special functions of Mathematics for Engineers, 2ndEdition, SPIE Optical Engineering Press, 1998.

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

THIRD YEAR - SEMESTER V

Course Title	**MAJOR CORE 10: MAIN PRACTICAL III - ELECTRONICS PRACTICALS**
Total Hours	**75**
Hours/Week	**5 Hrs Wk**
Code	**U15PH5MCP12**
Course Type	**Practical**
Credits	**4**
Marks	**100**

General objective: To understand the basic role of various components in electronic circuits,to build the circuits such as amplifiers, oscillators, to study the basic digital circuits and to do simple programs in microprocessor.

Course Objectives:

The Learner will be able to :

CO No.	**Course Objectives**
CO-1	understand and analyze the operations of amplifiers and filters
CO-2	understand the applications of OP-AMP
CO-3	understand simple programs in microprocessor using INTEL 8085
CO-4	remember the working of basic digital circuits using digital kits
CO-5	understand and analyze the operations of various Oscillators
CO-6	Skill Development-Practical exposure

Any Sixteen Experiments Only

1. Construction of a Voltage doubler.
2. Construction and Study of Half wave rectifier with and without filter.
3. Construction of a Single stage amplifier using transistor.
4. Construction of Hartley Oscillator using transistor.
5. Construction of Colpitt's Oscillator using transistor.
6. Study of the characteristics of LDR.
7. OP-AMP – Determination of the parameters – open loop gain, closed loop gain, input impedance and output impedance.
8. Study of the function of OP-AMP as Inverting and Non-inverting amplifier.
9. Study of IC chips and verification of De Morgan's theorems.
10. Study of NAND & NOR as Universal building blocks.
11. Study of Encoders and Decoders.
12. Karnaugh Map – Simplification of Boolean expression.
13. Half adder, Half Subtractor and Full adder circuits.
14. Microprocessor – Programming for addition, Multiplication and Block transfer.
15. Microprocessor – Programming for Subtraction and division.
16. Construction of a FET amplifier.
17. Study of UJT Characteristics.
18. Construction of Relaxation Oscillator using UJT.

19. Study of Mod-n Counters using IC 7473.
20. Parity checker using EXOR gate.

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

THIRD YEAR - SEMESTER – V

Course Title	**MAJOR ELECTIVE 1: CIRCUIT AND NETWORK THEORY**
Total Hours	**75**
Hours/Week	**5 Hrs Wk**
Code	**U15PH5MET01**
Course Type	**Theory**
Credits	**5**
Marks	**100**

General Objective: To understand the basic concepts of circuits and networks, network theorems and apply them to solve the problems.

Course Objectives:

The Learner will be able to:

CO No.	**Course Objectives**
CO-1	remember, understand and apply the concepts of Kirchoff's laws and methods of analyzing circuits
CO-2	understand, apply, analyze and evaluate the theorems in circuit analysis
CO-3	remember, understands and apply the concepts of alternating currents and voltages
CO-4	remember and understands the concepts of power and power factor
CO-5	understand and apply the concepts of transients

UNIT : I KIRCHOFF'S LAWS:

The circuit – resistance parameter – inductance parameter – capacitance parameter – energy sources (Independent sources only) – Kirchoff 's voltage law – voltage division - power in series circuit – Kirchoff's current law – parallel resistance – current division – power in parallel circuits.

UNIT II : METHODS OF ANALYSING RESISTIVE CIRCUITS:

Mesh analysis – Mesh equation by inspection method – super Mesh analysis – nodal analysis – Nodal equation by inspection method – super Node analysis – source transformation technique – Star-Delta transformation**.**

UNIT III: THEOREMS IN RESISTIVE CIRCUIT ANALYSIS:

Superposition theorem – Thevenin's theorem – Norton's theorem – reciprocity theorem –Compensation theorem – maximum power transfer theorem – duals and duality – Millman's theorem – dual Millman's theorem.

UNIT IV: ALTERNATING CURRENTS AND VOLTAGES:

The sine wave – angular relation of a sine wave – the sine wave equation – voltage and current values of A sine wave – phase relation in a pure resistor - phase relation in a pure capacitor – series circuits – parallel circuits – compound circuits.

UNIT V: STEADY STATE AC ANALYSIS:

Mesh analysis - Mesh equation by inspection– nodal analysis – Nodal equation by inspection– Superposition theorems – Thevenin's theorem – Norton's theorem – maximum power transfer theorem

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

Course Outcomes:
The Learner will be able to :

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	State and relate the concepts of Kirchoff's laws and methods of analyzing circuits	PSO-1	R
CO-2	State, explain and examine the theorems in circuit analysis	PSO-2	R, U
CO-3	Recognize and deduce the concepts of alternating currents and voltages	PSO-3	R,U
CO-4	Relate and reproduce the concepts of power and power factor	PSO-5	R, An
CO-5	Recall and discuss the concepts of transients	PSO-2	R, An

CO-6	Gain Entrepreneurship-Understand the basic ideas of circuit & network	PSO 6	U, Ap

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

TEXT BOOKS:

1. SUDHAKAR. A, SHYAM MOHAN S.P., - Circuit And Networks- Analysis And Synthesis, 5th edition, McGraw Hill Education; (2017)

BOOKS FOR REFERENCE:

1. PARANJOTHI S.R., Electrical circuit analysis, 4th edition New age publishers; (2011)

2. Dr. BOLTON A.G., Dr. JAIN L.C., Prof. Mithal A.K. , Networks and systems, Khanna Publishers, New Delhi.

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

THIRD YEAR - SEMESTER V

Course Title	MAJOR ELECTIVE 2: MICROPROCESSOR INTEL 8085
Total Hours	75
Hours/Week	5 Hrs Wk
Code	U15PH5MET02
Course Type	Theory
Credits	5
Marks	100

General Objective: To acquire basic knowledge of INTEL 8085, to write simple programs using the instruction set and to know some applications by interfacing.

Course Objectives:

The Learner will be able to :

CO No.	Course Objectives
CO-1	Understand the various parts of microprocessor in Architecture of INTEL 8085
CO-2	Apply the five instruction set groups in Instruction set of INTEL 8085
CO-3	understand, apply and write simple programs for basic arithmetic and logical operations using the instruction set of INTEL 8085in Programming of Microprocessor
CO-4	Understand interfacing techniques involved in INTEL 8085
CO-5	Understand the applications of INTEL 8085 such as digital display, traffic control, generation of square wave and water level indicator in Microprocessor Applications

UNIT I: ARCHITECTURE OF INTEL 808515 Hrs

General architecture of microcomputer- Architecture of Intel 8085 – functions of individual blocks – registers in 8085 – pin configuration – functions of individual pins – opcode and operand – instruction cycle – fetch operation – execute operation – machine cycle and state – instruction and data flow.

Extra reading / Key words:*Instruction decoder, Machine cycle encoder*

UNIT II: INSTRUCTION SET OF INTEL 808515 Hrs

Instruction word size - instruction and data formats – addressing modes– status flags – Data transfer group – arithmetic group – logical group – branch control group – stack, I/O and machine control group.

Extra reading / Key words: *Control instructions, Limitations*

UNIT III: PROGRAMMING OF MICROPROCESSOR15 Hrs

Assembly language - subroutine - addition, subtraction of 8 bit numbers - sum of a series of eight bit numbers – comparing two 8 bit numbers - finding smallest/largest element of an integer array- sorting integers in ascending and descending order - multiplication and division of 8 bit numbers.

Extra reading / Key words: *Program to subtract two 16-bit numbers,Program to alter the contents of flag register*

UNIT IV: INTERFACING15 Hrs

Address space partitioning – memory and I/O interfacing – data transfer scheme – interrupts of Intel 8085 – programmable peripheral interface –Architecture of Intel 8255 – operating modes – control word.

Extra reading / Key words: *Serial/ parallel interfacing device, memory interfacing*

UNIT V: MICROPROCESSOR APPLICATIONS15 Hrs

Delay subroutine – Delay subroutine using one register, register pair, two registers - 7 segment LED display – display of decimal numbers 0 to 9 - display of alphanumeric characters – formation of codes for alpha numeric characters – multiple digit display- microprocessor - based Traffic Control - to generate square wave using I / O port - to generate square wave using SOD line – water level indicator.

Extra reading / Key words: *Embedded systems, Stepper motor*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSO's Addressed	Cognitive Level
CO-1	List out the various parts of microprocessor in Architecture of INTEL 8085	PSO-2	R, U
CO-2	Apply the five instruction set groups in Instruction set of INTEL 8085.	PSO-4	U, A
CO-3	Apply and write simple programs for basic arithmetic and logical operations using the instruction set of INTEL 8085in Programming of Microprocessor.	PSO-6	U, A
CO-4	Describe the interfacing techniques involved in INTEL 8085.	PSO-2	R,U
CO-5	Recognize the applications of INTEL 8085 such as digital display, traffic control, generation of square wave and water level indicator in Microprocessor Applications.	PSO-6	U,A
CO-6	Gain Entrepreneurship-Basic knowledge on Instruction set of INTEL 8085 and its applications by interfacing	PSO 6	U, Ap

Text Books:

1. Ram B. Fundamentals of microprocessors and microcomputer – Eighth Edition, Dhanapat Rai Publications (P) Ltd, New Delhi (2013).

BOOKS FOR REFERENCE:

1. Ramesh Gaonkar, Microprocessor: Architecture, Programming and Applications with 8085, Sixth Edition, Penram International Publishing (India) Pvt.*Ltd*. Mumbai (2013).

2. Nagoor Kani A., Microprocessors and Microcontrollers, First Edition, RBA Publications, Chennai (2006).

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

THIRD YEAR - SEMESTER V

Course Title	**NON MAJOR ELECTIVE 1: BASICS OF COMPUTER ELECTRONICS**
Total Hours	**30**
Hours/Week	**2 Hrs Wk**
Code	**U15PH5NMT01**
Course Type	**Theory**
Credits	**2**
Marks	**100**

General Objective: To understand the fundamentals and idea of the basic circuits used in computers.

Course Objectives (CO):

The learners will be able to

CO No.	**Course Objectives**
CO-1	Understand about the binary number system and mutual conversion
CO-2	Create the appropriate truth tables from a description of a combinational logic functions.
CO-3	Understand the rules Boolean algebra
CO-4	Apply and analyze the different arithmetic circuits.
CO-5	Remember the concepts of memory devices.

UNIT I: BINARY NUMBER SYSTEM6 Hrs

Binary numbers - Binary-to-Decimal conversion – Decimal – to- Binary conversion –Binary addition – Binary subtraction – 1's complement and 2's complement methods.

Extra reading / Key words:*Octal numbers, Hexadecimal numbers*

UNITII: LOGIC GATES6 Hrs

Introduction-Analog signal and Digital signal-Basic logic gates-Inverter – AND, OR, NAND, NOR, XOR gates – operation and truth tables.

Extra reading / Key words:*Ex- NOR gates, operation and truth table*

UNIT: III BOOLEAN ALGEBRA6 Hrs

Boolean operations- Rules and laws of Boolean algebra – DeMorgan's Theorems – Verification using truth tables-NAND and NOR as Universal gates. - Algebric simplification of Boolean expressions.

Extra reading / Key words:*karnaugh map, sum of products*

UNIT IV: ARITHMETIC CIRCUITS 6 Hrs

Half Adder – Full Adder – Half Subtractor – Implementation of Boolean expressions using gate network.

Extra reading / Key words:*multiplexer, demultiplexer*

UNIT V: MEMORIES6 Hrs

Basic ideas of memory - Main memory and secondary memory – volatile and non volatile memory – program memory and Data memory –Semiconductor memories – RAM-ROM, PROM, EPROM AND EEPROM.

Extra reading / Key words:*Magnetic tape,Hard disk drive*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSO's Addressed	Cognitive Level
CO-1	List out the various number systems	PSO-2	R, U
CO-2	Design the basic logic gates with their truth tables.	PSO-4	U
CO-3	Explain Demorgans theorem using Boolean algebra	PSO-4	U
CO-4	Compare the different types on memories	PSO-2	Ap
CO-5	Gain Employability-Understand the fundamentals of the basic circuits in computers	PSO 6	U

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

Text Books:

1. Ram B. Fundamentals of microprocessors and microcomputer – Eighth Edition, Dhanapat Rai Publications (P) Ltd, New Delhi (2013).
2. Floyd, Digital Fundamentals, 10th Edition, Pearson Education, India (2011).
3. Vijayendran V. Introduction to Integrated Electronics Digital And Analog, First Edition, S. Viswanathan (Printers & Publishers) Pvt., Ltd (2005).

BOOKS FOR REFERENCE:

1.Malvino. A and Leach, Digital Principles and Applications, 4th Edition, Mc-Graw Hill, New YorkPB (2014).
2. Theraja B.L., Basic Electronics – Solid State-1st edition S. Chand and Company Limited, New Delhi, (2005).

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

SECOND YEAR – SEMESTER III

THIRD YEAR – SEMESTER V

Course Title	SKILL BASED ELECTIVE: PHYSICS FOR LIFE SCIENCES
Total Hours	30
Hours/Week	2 Hrs Wk
Code	U17PH3SBP03 (SBE3-II Zoo) / U17PH5SBP04 (SBE4- III Bot)
Course Type	Theory cum Practical
Credits	2
Marks	100

General Objective: To understand the various properties of liquids and to gain knowledge about simple equipments.

Course Objectives (CO):

The Learner will be able to :

CO No.	Course Objectives
CO-1	Understand the basic properties of liquids
CO-2	Understand the concept of simple equipments such as lens and the working of microscope, centrifuge and decibel meter
CO-3	Explain and analyze the principle and working of biomedical instruments such as CRO, Ultra Sonogram, ECG
CO-4	Determine the various properties of liquid, loudness of sound and focal length and power of lens
CO-5	Explain the working of sonogram and mammogram and to detect various eye defects

UNIT I: PROPERTIES OF LIQUIDS6 Hrs

Density – surface tension- definition-Viscosity – Coefficient of Viscosity – Streamlined motion and turbulent motion –Diffusion -Coefficient of diffusion – Osmosis

Extra reading / Key words: *Rate of diffusion, desalination*

UNIT II: SIMPLE EQUIPMENTS6 Hrs

Lens - Convex lens – concave lens – focal length and power of lens – defects in eye.

Microscope – Decibel meter

Extra reading / Key words: *Telescope, Cataract*

UNIT III: BIOMEDICAL INSTRUMENTS6 Hrs

LASER and its properties – medical applications-X-rays in medicine - Cathode ray Oscilloscope (CRO) – Lissajou's figures - Ultra sonogram –ECG.

Extra reading / Key words: *LASIK, ECHO*

UNIT IV: PRACTICALS

1. Surface tension of a liquid by drop weight method
2. Density of a liquid by Hare's apparatus method
3. Decibel meter – Measurement loudness of a sound
4. Diameter of glass tube using Microscope.
5. Focal length and power of convex lens
6. Focal length and power of concave lens
7. Oscilloscope - formation of Lissajous figures

Extra reading / Key words: *Viscometer, Neutralization test*

UNIT V: FIELD VISIT

Field visit to Scan center and Eye hospital

Extra reading / Key words: *Ultra sonogram, Mammogram*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Discuss the basic properties of liquids	PSO 1	U
CO-2	Describe the concept of simple equipments such as lens and the working of microscope, centrifuge and decibel meter	PSO 5	U, Ap
CO-3	Explain and analyze the principle and working of biomedical instruments such as CRO, Ultra Sonogram, ECG	PSO 2	R
CO-4	Determine the various properties of liquid, loudness of sound and focal length and power of lens.	PSO 5	R, U
CO-5	Explain the working of sonogram and mammogram and to detect various eye defects	PSO 2	R, U
CO-6	Skill development - Practical Exposure to Zoology and botany students	PSO 6	U,Ap

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

BOOK FOR REFERENCE

1. R. Murugeshen, Allied physics, I edition, S. Chand & Co, New Delhi (2005).

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

LIFE ORIENTED EDUCATION

ETHICS – III: FAMILY AND CAREER DEVELOPMENT

HRS/WK:1 **CODE: U15VE6LVE03**

CREDIT : 1 **MARKS : 100**

OBJECTIVES:

To help the students acquire skills, knowledge and talents to lead a meaningful life.
To make the students learn skills of nurturing family and children.
To make the students aware of emotional intelligence and choose their career.

UNIT – I: PERSONAL COMPETENCE

Emotional Intelligence for Professional growth, Management Vs Leadership-Management and Leadership Skills - Conflict Management - Tips for Professional growth

UNIT – II: MARRIAGE AND FAMILY

Family Vision - Family Values, Family relationship, Family Management, Sex in Marriage, Emotional Balance and Imbalance, Compaibility between Husband and Wife

UNIT – III: PARENTHOOD

Bringing up Children - Development stages (Eric Ericson model), Spirituality: Spirituality in Family - Prayer, God's Will , Role of Mother

UNIT – IV: PERSONALITY DEVELOPMENT

Self Analysis; interpersonal relation, introspection – Character formation towards positive personality- Values, self and college motto, punctuality, good moral, poverty, honesty, politeness, humanity, gentleness, friendship, fellowship and patriotism

UNIT – V: CAREER CHOICE

Career Choice according to Personality, Preparation for Competitive Exams, Sources of Knowledge, Memory Techniques, Mind Mapping

REFERENCES:

1. Tony B and Barry Buzan(2003), The mind map book, BBC world wide limited, London.
2. Susan Nash(2005), Turning team performance inside out, Jai CO. publishing House, New Delhi.
3. Fr. Ignacimuthu (1999) "Values for Life", Vaigarai Pathipagam.
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.C.A – DEGREE COURSES

LIFE ORIENTED EDUCATION

BIBLE STUDIES – III: ESSENCE OF CHRISTIAN LIVING

HRS/WK:1 **CODE: U15VE6LVBO3**

CREDIT : 1 **MARKS : 100**

OBJECTIVE:

To prepare the students to practice Christian principles in family, church and society as 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: MARRIAGE 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), Eli (I Sam 2: 24-36,3: 11- 18), Mary, Mother of Jesus (Luke 2: 51,52)

Caring for the Aged (I Sam 2: 31,32)

UNIT – IV: CHRISTIAN ETHICS

Holiness – Joseph (Gen 39:9) Levi 11: 45, 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

UNIT – V: MISSIONARIES DOWN THE LANE

William Carrie (Calcutta)

Pandithar Rama Bai (Karnataka)

Amy Carcheal (Dohnavur)

Dr. Ida Scuddar (Vellore)

Devasagayam (Nagercoil)

St. John De Britto (Oriyur)

Graham Staines & Family (Odisha)

St. Mother Teresa (Calcutta)

REFERENCES:

1. Alban Douglass (1982) One Hundred Bible Lessons. Gospel Literature Service, Mumbai.
2. Derek Prince (1993) Foundations for Righteous Living. Derek Prince Ministries-South Pacific, 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.

(For Candidates admitted from June 2015 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

B.A./B.Sc/B.Com/BBA/B.C.A - DEGREE COURSES

LIFE ORIENTED EDUCATION

CATECHISM – III: LITURGY AND CHRISTIAN LIFE

HRS/WK:1 **CODE:U15VE6LVC03**

CREDIT : 1 **MARKS : 100**

OBJECTIVES:

To prepare the students to participate meaningfully in the liturgical celebration and experience GOD in their day today life.

To enable the students to become living witnesses to Jesus Christ in their personal, family and social life.

UNIT – I: LITURGY

Personal prayer (Know oneself) – Vocal prayer – Community prayer – Meditation – Contemplation – Knowing the prayers : Our Father – Hail Mary – Holy Rosary – Mysteries of the Rosary- Litany of Mary – Family prayer-Popular devotion

UNIT – II: HOLY SACRIFICE OF THE MASS

Significance – Meaning and need for spiritual growth – Mass prayers – Part of the mass – Liturgical year, its division and its significance. – The Creed – Act of contrition – Discernment of spirits – Counseling – Spiritual direction.

UNIT – III: CHRISTIAN VOCATION AS DISCIPLE FOR THE KINGDOM OF GOD

Who am I as a Christian? – Christian dignity and others – The values of the Kingdom opposing to the values of the World – Christian social conscience – Christian in the reformation of the world – A call to be salt and light in today's context.

UNIT – IV: CHRISTIAN FAMILY

Holy Family- Characteristic of good family – Bible centered, Prayer centered, Christian centered–Responsibilities of parents and children in the family –Laws of the Church towards marriage-Pro life (Abortion, Euthanasia) – Lay Vocation – Lay Participation – Lay associates.

UNIT – V: CONSECRATED LIFE

"Come and follow me" – special disciples - Religious vocation – "I have called you to be mine"- Role of Nuns and Priest - called to be prophets and agents for God's Kingdom – nucleus of the church – Eschatological signs of the God's Kingdom.

REFERENCES:

1. Compendium – Catechism of the Catholic Church Published by Vaigarai Publishing House for the Catholic Church of India.

2. You are the light of the World, A course on Christian living for II year Religion published by Department of Foundation Courses, St.Joseph's College (Autonomous), Tiruchirappalli–620 002.

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

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

THIRD YEAR - SEMESTER – VI

Course Title	MAJOR CORE 11: SOLID STATE PHYSICS
Total Hours	90
Hours/Week	6 Hrs Wk
Code	U15PH6MCT13
Course Type	Theory
Credits	5
Marks	100

General Objective: To understand the basic ideas of crystallography, nanomaterials, conductors, dielectric materials, magnetic materials and superconductors.

Course Objectives:

The Learner will be able to :

CO No.	Course Objectives
CO-1	understand the concepts of crystallography and nanomaterials
CO-2	remember the ideas about conductors
CO-3	understand the fundamentals of dielectric materials
CO-4	analyze the behavior ofmagnetic materials and to apply the theories to estimate materials properties
CO-5	apply and analyze the fundamental physics on superconductors

UNIT - I: CRYSTALLOGRAPHY AND NANOMATERIALS 18 Hrs

Ionic, covalent, metallic, Van der Waals and hydrogen bonds - properties - Crystal structure – crystal lattice – basis – unit cell – Bravais lattice – Miller indices – Calculation of number of atoms per unit cell – Atomic radius – Coordination number – Packing factor for SC, BCC and FCC structures – Bragg's law – X-ray study of crystal structure: Laue method – Powder crystal method.

Nanomaterials – Properties of nanomaterials – synthesis of nanomaterials: preparation methods – plasma arcing,chemical vapour deposition, electro deposition and ball milling methods (quantitative treatment) – Applications of CNT's.

Extra reading / Key words: *Structure factor, Reciprocal lattice, Brillouin zone*

UNIT - II: CONDUCTORS 18 Hrs

Conductors – Classical free electron theory of metals – Electrical and thermal conductivity – Wiedemann-Franz law – Draw backs of classical theory – Specific heat capacity of solids: Einstein's theory and Debye's theory of specific heat capacity of solids - Quantum theory – Fermi distribution function – Fermi energy- Effect of temperature on Fermi Function – Density of energy states – carrier concentration in metals.

Extra reading / Key words: *Fermi level, thermal conductivity*

UNIT - III: DIELECTRIC MATERIALS **18 Hrs**

Definitions – electric polarization, polarization vector, electric displacement vector – dielectric constant and electric susceptibility – types of polarization – effect of frequency and temperature on polarization – Dielectric loss – local or internal field – Clausius – Mosotti equation – Spontaneous Polarization – Ferroelectricity – electrets (qualitative study only).

Extra reading / Key words: *Polarizability, Piezoelectricity*

UNIT - IV: MAGNETIC MATERIALS **18 Hrs**

Definitions – magnetic dipole – magnetic flux density – magnetic permeability – magnetic field strength – magnetic susceptibility –Types ofmagnetic materials - Classical Langevin Theory of diamagnetic and Paramagnetic Domains - Quantum Mechanical Treatment of Paramagnetism - Curie's law, Weiss's Theory of Ferromagnetism and Ferromagnetic Domains - Discussion of B-H Curve - Hysteresis and Energy Loss.

Extra reading / Key words: *Giant magnetoresistance, Magnetic resonance*

UNIT - V: SUPERCONDUCTORS **18 Hrs**

Superconductors – Properties: Critical Temperature, Critical magnetic field, Persistent current, Meissner effect and Isotope effect - Type I and type II Superconductors (qualitative study only) - BCS theory: Cooper Pair - Coherence length – London's I & II equations – Applications of superconductors.

Extra reading / Key words: *Thermal stability of superconducting wires, Magnetic energy storage*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain theconcepts of crystallography in terms of atom positions and unit cells	PSO-1	U
CO-2	Discuss the fundamentals of nanomaterials and synthesis the process of new nanomaterials	PSO-2	U
CO-3	Describe Einstein's theory and Debye's theory of specific heat capacity of solids	PSO-1	U
CO-4	Compare the types of polarization and investigate the different experimental methods of dielectric materials	PSO-3	An
CO-5	Distinguish the types of magnetic materials and to apply the theories to estimate materials properties	PSO-6	An
CO-6	Explain about BCS theory and Cooper pair in superconductivity	PSO-5	U
CO-7	Gain Employability- Understand the basic of solids and its properties	PSO 6	U

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

TEXT BOOKS:

1. Arumugam M., Materials Science. Anuradha Publishers (2010).

2. S.O.Pillai, Solid State Physics,8th edition New Age International; (2018).

3. Saexena, Gupta Saexena,Fundamentals of Solid State Physics, 29thedition, Pragati Prakashan Meerut, (2017).

4. M. Willson, K.K.M Smith and B.Raguse, Nanotechnology: Basic science and emerging technology, Overseas Press Edition(2005).

BOOKS FOR REFERENCE:

1. Phillips, Introduction to Crystallography, Horney Press (2011).

2. I. Timp, Gregory L Nanotechnology, AIP Press, Springer-Verlag New York (1999).

3. M.A. Wahab, Solid State Physics: Structure and Properties of materials, Narosa Publishing House Pvt. Ltd. - New Delhi 3rd Edition (2015).

4. J.P. Srivastava, Elements of Solid State Physics,Prentice Hall India Learning Private Limited; 4th Revised edition (2014).

5. M. Ali Omar, Elementary Solid State Physics: Principles and Applications, Addison-Wesley; 4th edition (1994).

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

THIRD YEAR - SEMESTER VI

Course Title	**MAJOR CORE 12: NUCLEAR, PARTICLE AND ASTROPHYSICS**
Total Hours	**90**
Hours/Week	**6 Hrs Wk**
Code	**U15PH6MCT14**
Course Type	**Theory**
Credits	**5**
Marks	**100**

General Objective: To understand properties of nucleus, radioactivity, nuclear fission and fusion and basic introduction to elementary particles and astrophysics.

Course Objectives (CO):

The Learner will be able to :

CO No.	**Course Objectives**
CO-1	understand the fundamentals involved in the structure of nucleus in Introduction to the nucleus
CO-2	understand and analyze the laws related to Radioactivity in Radioactivity
CO-3	remember the concept of nuclear fission and fusion
CO-4	understand the properties and significance of elementary particles in Particle Physics
CO-5	analyze the objects in the Sky and the Solar system in Astrophysics

UNIT I: INTRODUCTION TO THE NUCLEUS18 Hrs

Classification of nuclei - isotopes, isobars, isotones - general properties of Nucleus – Determination of nuclear mass – Dempster's mass spectrograph- Binding energy – Nuclear stability – Models of Nuclear structure: The liquid drop model – Semi empirical mass formula – The Shell model.

Extra reading / Key words:*Nucleons, Nuclear forces*

UNIT II: RADIOACTIVITY18 Hrs

Natural radioactivity – properties of α, β and γ rays – range of the α- particle – Geiger – Nuttal Law – Alpha particle spectra – Fundamental laws of radioactivity: Soddy Fajan's displacement Law – Natural radioactive series – Laws of radioactive disintegration – The mean life – unit of radioactivity – Law of successive Disintegration – radioactive dating : The age of the earth.

Extra reading / Key words: *Nuclear transitions, Radiation protection*

UNIT III: NUCLEAR FISSION AND FUSION18 Hrs

Nuclear Fission – energy released in fission – Bohr and Wheeler's theory of nuclear fission – chain reaction – Atom bomb – Nuclear reactors – Nuclear fusion – Source of stellar energy – thermonuclear reactions – Hydrogen bomb – controlled thermonuclear reactions.

Extra reading / Key words: *Nuclear Power plant, Cosmology*

UNIT IV: PARTICLE PHYSICS18 Hrs

Classification of elementary particles – elementary particle quantum numbers – conservation laws and symmetry – The Quark model – Basic ideas of quantum chromo dynamics – Higg's boson, history of the Universe – the future of Universe – Dark matter.

Extra reading / Key words: *Standard model, Gravitational lensing*

UNIT V: ASTROPHYSICS18 Hrs

The objects in the sky: The microwave background radiation – The Stars – Neutron stars and Black holes – Supernovae – galaxies – The structure of Milky Way.

The solar system: Sun and planets – formation of the planets – comets – planets and satellites – Asteroids – Meteorites.

Extra reading / Key words: *Red shift, Observatory*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSO's Addressed	Cognitive Level
CO-1	Recall the fundamentals involved in the structure of nucleus in introduction to the Nucleus.	PSO-2	R, U
CO-2	State and explain the laws related to Radioactivity in Radioactivity	PSO-2	R, U
CO-3	Illustrate nuclear fission and fusion reactions with examples.	PSO-4	R, U
CO-4	Outline the properties of elementary particles in Particle Physics.	PSO-2	R,U
CO-5	List and explain the objects in the Sky and the Solar system in Astrophysics.	PSO-2	R,U
CO-6	Gain Employability by understanding the basic concepts of nuclear, particle and astrophysics.	PSO 6	U

Text Books:

1. Murugesan, Modern Physics, S. Chand and company Ltd., Ram Nagar, New Delhi,(2008).
2. Padmanabhan.T, Theoretical Astrophysics, Vols. 1-3, Cambridge University Press, (2005).
3. Cesare Emiliani, Planet Earth, Cambridge University Press, (1995).

BOOKS FOR REFERENCE:

1. Rao .B.V.N., Modern Physics, Wiley Eastern Ltd., New Delhi (1993).
2. Aruldas.G and Rajagopal, Modern Physics, PHI, New Delhi, 2005.
3. Rajam. J.B., Modern Physics, S.Chand & Co. Pvt. Ltd, New Delhi (1983).
4. Tayal. D.C., Nuclear Physics, Himalaya publishing House, (2015).
5. Beiser.A, Concepts of Modern Physics, Tata McGraw-Hill Ltd., New Delhi,(2002).
6. Abhayankar K.D., Astrophysics, Cambridge University Press, 2001.

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

THIRD YEAR - SEMESTER VI

Course Title	**MAJOR CORE 13: MAIN PRACTICAL IV A - DIGITAL AND MICROPROCESSOR PRACTICALS**
Total Hours	**90**
Hours/Week	**6 Hrs Wk**
Code	**U15PH6MCP16**
Course Type	**Practical**
Credits	**5**
Marks	**100**

General objective: To understand the basic role of various components in electronic circuits, to build the circuits such as amplifiers, oscillators, to study the basic digital circuits and to do simple programs in microprocessor.

Course Objectives:

The Learner will be able to:

CO No.	**Course Objectives**
CO-1	understand and analyze the working of rectifiers, Emitter follower and IC regulated power supply
CO-2	analyze the applications of OP-AMP by tracing different waveforms
CO-3	create simple programs using microprocessor INTEL 8085
CO-4	understand and analyze the working of basic digital circuits using digital kits
CO-5	understand and analyze the working of counters and registers using digital kits
CO-6	Skill Development-Practical exposure

Any Sixteen Experiments Only

1. Construction of Full Wave Rectifier with two diodes- with and without filter.
2. Construction of Bridge Rectifier using diodes.
3. Construction of Emitter Follower using Transistor.
4. Construction of summing and Difference Amplifier using OP-AMP
5. Construction of Differentiator and Integrator using OP-AMP.
6. Study of R-S and J-K Flip Flops.
7. Study the functions of Shift Registers.
8. Construction of Modulus Counters using IC 7490 and Verify its Truth Tables.
9. Microprocessor INTEL 8085 – Programming to find the Sum of Series of 8 – bit numbers.
10. Study of Multiplexer and Demultiplexer using ICs.
11. Study of Up, Down and Ring Counters.

12. Construction of IC Regulated Power Supply.
13. Microprocessor INTEL 8085 – Programming for identifying the biggest and smallest number from a series.
14. Microprocessor INTEL 8085 – Programming for Arranging the numbers in Ascending and descending orders.
15. Microprocessor INTEL 8085 – Programming for Seven Segment Display.
16. Op- Amp Waveform generator – sine waveform.
17. Op- Amp Waveform generator – square waveform.
18. D/A converter, Binary weighted resistor method.
19. Construction of Synchronous counters using excitation table.
20. Binary to Gray and Gray to binary code conversion and parity checker using EXOR gates.

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

THIRD YEAR - SEMESTER – VI

Course Title	MAJOR ELECTIVE 3 : COMMUNICATION PHYSICS
Total Hours	75
Hours/Week	5 Hrs Wk
Code	U15PH6MET04
Course Type	Theory
Credits	5
Marks	100

General Objective: To understand the basic ideas of Radio, Microwave, Satellite, Fiber optic and digital communication systems.

Course Objectives

The Learner will be able to :

CO No.	Course Objectives
CO-1	understand the concepts of modulation, transmission and detection in radio communication systems
CO-2	understand and analyze the microwave communication especially the working of television and RADAR
CO-3	analyze and apply the concepts and principles of satellite communication systems
CO-4	understand optical fiber transmission link, fiber modes configurations and structures in fiber optic communication
CO-5	understand the concept of digital communication system and to analyze digital modulation techniques and digital transmission media

UNIT I: RADIO COMMUNICATION SYSTEM 15 Hrs

Modulation - Types of modulation - Analysis of amplitude modulated wave - carrier suppression -SSB transmission - advantages and disadvantages - generation of SSB signals - Filter method - FM modulation - FM station - Diode detector - receiver - super heterodyne receiver.

Extra reading / Key words: *Radio, Wireless communication*

UNIT II: MICROWAVE COMMUNICATION15 Hrs

Introduction - Generation of microwaves - Klystron oscillator - Television picture tube - image orthicon - scanning - synchronization - T.V. Transmission - T.V. reception - Principle of a colour TV - PAL colour receiver - Television screens - CRT and LCD - fundamentals of RADAR - RADAR equation - Automatic Tracking RADAR - Applications of RADAR.

Extra reading / Key words: *Remote monitoring, Microwave towers*

UNIT III: SATELLITE COMMUNICATION15 Hrs

Introduction - Kepler's I, II, III laws - orbits -satellite launching - station keeping - satellite attitude - power systems - transmission path - path loss - Satellite earth station - satellite station –satellite navigational system- GSM- GPS- DTH- Indian satellites.

Extra reading / Key words: *Mangalyan, Artificial satellite*

UNIT IV: FIBER OPTIC COMMUNICATION15 Hrs

Optical fiber - advantages - Total internal reflection - propagation of light waves in optical fiber - acceptance angle - numerical aperture –Types of fibers - basics of fiber optic system- light sources for fiber optics - LASER diode - light detectors - avalanche photo diode - losses in fiber -Applications in telecommunication.

Extra reading / Key words: *Submarine cables, splicing*

UNIT V: DIGITAL COMMUNICATION SYSTEMS15 Hrs

Introduction- Layered view of digital communication- Pulse Amplitude Modulation - Pulse Width Modulation - Pulse Position Modulation - Time Division Multiplexing - Frequency Division Multiplexing - Wireless communication systems - Cell phone - Internet - GPRS - Bluetooth.

Extra reading / Key words*: Digital interface, Communication sources*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Discuss the concepts of modulation, transmission and detection in radio communication systems	PSO-1	U
CO-2	Discuss in detail the working of television and RADAR	PSO-2	U
CO-3	Explain the concepts and principles of satellite communication systems	PSO-1	U
CO-4	Compare LASER diode and avalanche photo diode	PSO-2	Ap
CO-5	Explain the concept of digital communication system and to analyze digital modulation techniques and digital transmission media	PSO-3	An
CO-6	Gain Employability-Understand the fundamentals of communication systems	PSO 6	Ap

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

Text Books:

1. Ambrose A and Vincent Devaraj. T, Introduction to Electronics, 5th Edition, GaungalMera(1992).
2. Dennis Roddy and John Coolen , Electronic Communication , 3rd Edition, Prentice Hall of India. (1995).
3. Robert J. Schoenbeck, Electronic communications, 2ndEdition, Prentice Hall of India Private Limited, New Delhi (1999).

BOOKS FOR REFERENCE:

1. Deshpande N.D.,Deshpande D. A., and Rangole P.K., Communication Electronics, Fifteenth reprint, Tata McGraw Hill Publishing Company Limited, New Delhi (2001).
2. Kennedy, Electronic Communication systems, 4thEdition, Tata McGraw Hill publishing co., Ltd., New Delhi (2002).
3. Kumar R., Communication systems, Anuradha agencies, Educational publishers, Kumbakonam (2000).

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

THIRD YEAR - SEMESTER VI

Course Title	**MAJOR ELECTIVE 3: APPLIED ELECTRONICS**
Total Hours	**75**
Hours/Week	**5 Hrs/ Wk**
Code	**U15PH6MET05**
Course Type	**Theory**
Credits	**5**
Marks	**100**

General Objective: To understand the basic ideas of fabrication and the functioning of power electronic devices, optoelectronic devices, special diode, MOSFETs and transducers.

Course Objectives (CO):
The Learner will be able to:

CO No.	Course Objectives
CO-1	understand different techniques and measures for IC fabrication.
CO-2	apply and analyze the types and operations of Thyristor.
CO-3	understand the fundamental physical and technical base of optoelectronic devices..
CO-4	understand the working of various special diodes and displays.
CO-5	remember the concepts of measuring system and working of transducers

UNIT I: INTEGRATED CIRCUIT FABRICATION **15 Hrs**

Basic monolithic integrated circuits – epitaxial growth – masking and etching – Diffusion of impurities – Integrated Resistors – Capacitors and Inductors – Large scale and medium scale integration – Fabrication of printed circuit board – Kodak Photo resist method
– developing and etching processes.

Extra reading / Key words: *Active components, Passive components*

UNIT II: THYRISTORS **15 Hrs**

Members of Thyristor Family -Triggering of series connected Thyristors- Simultaneous – Sequential- Optical Triggering- Parallel operation of Thyristors -Silicon controlled rectifier – SCR Half wave rectifier – SCR full wave rectifier-Pulse Control of SCR - 90°&180° Phase Control of SCR - Silicon controlled switch- IGBT –Working and operation – Field controlled transistor- Working and operation -DIAC – TRIAC .

Extra reading / Key words: *Semiconductor devices, Drain current*

UNIT III: OPTO ELECTRONIC DEVICES **15 Hrs**

Introduction – spectral response of human eye – Principle of optical detection- – Light emitting diode (LED) - Different LED structure - LCD plasma display - Photo emissive devices – Photo multiplier tube – Photo transistors – Photo voltaic devices – Bulk type photoconductive cells – Photo detector materials –Noise in Photo detector.

Extra reading / Key words: *Monitors, Switching and communication systems*

UNIT IV: SPECIAL DIODES AND DISPLAYS **15 Hrs**

Tunneling effect – Tunnel diode – Tunnel diode oscillators – Varactor diode – Schottky diode – Step recovery diode – Thermistors – Gunn Effect – Gunn diode – Seven Segment display –Decimal Decoders.

Extra reading / Key words: *Negative resistance, Breakdown mechanism*

UNIT V: TRANSDUCERS 15 Hrs Introduction – Classification of Transducers - Resistive position Transducer -

Resistive pressure Transducer -Linear Variable Differential Transformer (LVDT) – Piezoelectric Transducer- Strain Transducer - Strain Guage- Temperature Transducers- Ultrasonic Temperature Transducers- Photoelectric Transducers- Applications of Transducers.

Extra reading / Key words: *Measuring systems, Energy transformers*

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

Course Outcomes:
The Learner will be able to :

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Recall and relate the procedure of fabrication of IC and PCB.	PSO 2	U
CO-2	Describe the working and operation of IGBT.	PSO 2	R,U
CO-3	Explain the working and operation ofDIAC – TRIAC	PSO 3	R,U
CO-4	Discuss about photo multipier tube and photo detectors	PSO 3	U, An

CO-5	Explain about Tunnel Effect and Tunnel Diode ..	PSO 1	U
CO-6	Describe the working and operation of LVDT.	PSO 1	U
CO-7	Gain Entrepreneurship-Understand the basic ideas of fabrication of IC's, power electronic devices, optoelectronic devices, special diodes and MOSFET	PSO 6	U,Ap

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

Text Books:

1. Jacob Millman, Microelectronics –2nd Edition Tata McGraw Hill (Unit I)(2001)
2. Theraja B.L.,Basic Electronics- Solid state,S.Chand & Co., Ltd.,NewDelhi (2006)
3. M D SINGH ,K B KHANCHANDANI, Power Electronics -– 2nd Edition Tata McGraw Hill
   (unit, II)(2008)

BOOKS FOR REFERENCE:

1. Mehta V.K., Principles of Electronics, 7th Edition, S.Chand and Company Ltd, New Delhi (2001).
2. A.K. Sawhney, Electrical and Electronic Measurement and Instrumentation, Dhanpat Rai and Sons (2007).
3. J. Wilson, J.F.B Hawkes, Optoelectronics an Introduction 2nd edition Prentice Hall of India (P) Ltd, New Delhi (2001).
4. C.K. SarKar, D.C. Sarkar ,Optoelectronics and Fiber Optics Communication New International (P) Ltd, New Delhi (2001).

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

THIRD YEAR - SEMESTER VI

Course Title	**NON MAJOR ELECTIVE 2: BASICS OF MODERN COMMUNICATION SYSTEMS**
Total Hours	**30**
Hours/Week	**2 Hrs Wk**
Code	**U15PH6NMT02**
Course Type	**Theory**
Credits	**2**
Marks	**100**

General Objective: To understand the basic ideas of radio communication, satellite communication, fiber optic, mobile communication and internet.

Course Objectives (CO):

The learner will be able to

CO No.	**Course Objectives**
CO-1	understand radio signal propagation and communication system performance in radio communication
CO-2	understand the basic concept in the field of satellite communication
CO-3	understand the basic elements of optical fiber transmission link
CO-4	understand basic concept of mobile communication and to make familiar with various generations of mobile
CO-5	understand the basics of wireless communication and the usage of internet

UNIT I: RADIO COMMUNICATION6 Hrs

Transmitter – Modulation – Propagation of waves – Surface, space and sky waves - Amplitude modulation – Frequency modulation – Phase modulation – Receivers.

Extra reading / Key words: *Single side band, Carrier suppression*

UNIT II: SATELLITE COMMUNICATION6 Hrs

Introduction – Classification of satellites –Geostationary orbit – Satellite Launching - Application of satellite – Indian satellite in 20^{th} century.

Extra reading / Key words: *Indian satellites, Satellite earth station*

UNIT III: FIBER OPTIC COMMUNICATION SYSTEM6 Hrs

Introduction – Concept of light – EM Spectrum – Critical angle-Total internal reflection in optical fiber - Applications in medicine, defense, telecommunication.

Extra reading / Key words: *Optical cables, Submarine cables*

UNIT IV: MOBILE COMMUNICATION 6 Hrs

Cellular Phone :Basics and signal transmission – GSM - Mobile service – Wifi – 3G & 4G-Bluetooth (Basic idea).

Extra reading / Key words: *GPRS, Mobile services*

UNIT V: INTERNET6 Hrs

INTERNET (Basic ideas)- Search engines - E-MAIL (Basic ideas) – Blogs – Twitter – Whatsapp – Facebook.

Extra reading / Key words: *Hacking, Lollipop*

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

Course Outcomes:

The Learner will be able to :

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the radio signal propagation and communication system performance in radio communication.	PSO 2	U
CO-2	Discuss the basic concept in the field of satellite communication	PSO 3	U, An
CO-3	Explain the basic elements of optical fiber transmission link	PSO 2	U
CO-4	Describe the basic concept of mobile communication.	PSO 5	U
CO-5	Discuss the basics of wireless communication and the usage of internet.	PSO 3	U,Ap
CO-6	Gain Employability-Understand the fundamentals of communication systems	PSO 6	Ap

Text Book:

Course Material prepared by staff.

BOOKS FOR REFERENCE

1. Dennis Roddy & John Coolen-Electronic Communication, 3rdEdition, Reston Publishing Company (1984).
2. Kumar. R Communication systems, Anuradha Agencies, Educational publishers, Kumbakonam (2000).

(for the candidates admitted from June 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.

DEPARTMENT OF PHYSICS

THIRD YEAR - SEMESTER VI

Course Title	**SBE – 5 COMPUTER LITERACY FOR PHYSICS**
Total Hours	**30**
Hours/Week	**2**
Code	**U19PH6SBT05**
Course Type	**Theory**
Credits	**2**
Marks	**100**

General Objective:

To understand, analyse and apply the various applications in smart devices.

Course Objectives:

The student will be able to

CO 1	apply the office packages to gain a better understanding of the computer
CO 2	understand the functions of smart devices and online transactions
CO 3	analyse the purpose of social networking and cyber security in the e-world
CO 4	analyse the graphical data and plot graph using origin
CO 5	understand and apply the LATEX platform for document writing

Unit I: Office Packages (6hrs)

MS- Word : Creation of Documents (letters, Bio- data, etc).Creation of Tables, Formatting Tables (Time table, Calendar, etc).Working with Mail Merge(Circular letters).

MS – Excel: Creation of Worksheet (Mark Sheet, Pay Slip, PF Contribution list, etc). Excel Function (Date, Time, Statistical, Mathematical, Financial Functions). Creating charts (Line, Pie, Bar, etc).

MS- Power Point : Creation of Presentations(Duplicate and New slides, Layouts, View, Slide show, etc.,). Working with objects (Movie, Sound, Word, Excel, etc.,) Working with Transition and Animation effects(Text, Object, Pictures)

Extra Reading/Key words: *Units of Data Storage.*

Unit II: Smart Devices and Online Transactions (6hrs)

Smart phone – Types : Tablet PC , Smart TV, Smart Camera, Smart Watch and Smart Oven.Operating system for Smart phones- Apple iOS, Android, Windows 10, Blackberry, Synbian and Bada. Benefits of Smart Phones.

E-Commerce and M-Commerce: Components of E-Commerce- history, types, and benefits of each (B2B, B2C, C2B, C2C). Business to Government E-Commerce. M-Commerce-History, customers point of view and the provider point of view. Applications of M-Commerce- Mobile ticketing, mobile money transfer, mobile banking, mobile marketing and advertising. Payment methods in M-Commerce- Premium rate telephone numbers, Direct mobile dealing , Macro, Micro payment services and mobile wallets.
Extra Reading/Key words: *Google play for Android Phones.*

Unit III: Social Networking and Cyber Security (6hrs)

Social Networking Sites: Characteristics of Social Networking Website- Examples of Social Networking Services (Facebook, SnapChat, Instagram, Whatsapp, Pinterest, Tumblr, Linkedin, Twitter, Quora and Patreon). Advantages and Disadvantages of Social Network.

Cyber law: Evolution and Historical events in cyber law. Case studies- Article taken from Media. Building blocks of cyber law(Netizens, Cyber space and Technology). Cyber Crime, Electronic and Digital devices, Intellectual Property, Data Protection and Privacy.Merits and Demerits of Cyber crime.
Extra Reading/Key words: *How to stay out of trouble from Social Network.*

Unit IV: Origin (6hrs)

Introduction – Graphing: Graph Types, Multiple Axes and Panels, Grouped Data Plot, Plot Modifiers, Axes, Graph Legends and Color Scales, Annotation, 3D Graphs - Data Exploration - Exploratory Analysis - Curve and Surface Fitting - Peak Analysis – Importing - Exporting and Presentation
Extra Reading/Key words: *analysis the given XRD data*

Unit V: LATEX (6hrs)

Introduction- Document Structure- Essentials, Troubleshooting, Creating a Title, Sections, Labeling, Table of Content- Typesetting Text-Font effects, List, Comments & Spacing, Special Characters- Tables- Figures- Equations-Inserting References.
Extra Reading/Key words: *Practical's, writing a document*

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Apply all the necessary tools in office packages	PSO 2	Ap
CO-2	Operate smart devices for online transactions	PSO 3	Ap
CO-3	Discuss various social networking sites and cyber crime in e-World	PSO 1	U
CO-4	Analyse and interpret graphical data	PSO 2	U, An
CO-5	Recognize the applications of LATEX	PSO 6	Ap

Books for Reference:

1. Mastering Ms-Office by Bittu Kumar
2. https://www.webopedia.com/DidYouKnow/Hardware_Software/mobile-operating-systems-mobile-os-explained.html
3. https://makeawebsitehub.com/social-media-sites/
4. https://www.tutorialspoint.com/information_security_cyber_law/information_security_cyber_law_tutorial.pdf
5. https://www.tutorialspoint.com/information_security_cyber_law/information_security_cyber_law_tutorial.pdf
6. https://www.irjet.net/archives/V4/i6/IRJET-V4I6303.pdf
7. https://www.originlab.com/Origin#Data_Processing

(For candidates admitted from 2015 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2

SEMESTER VI

Course Title	**SKILL BASED ELECTIVE 6 : RESEARCH METHODOLOGY**
Total Hours	**30**
Hours/Week	**2**
Code	**U15DS6SBT06**
Course Type	(Theory cum Project)
Credits	**2**
Marks	**100**

General Objective:

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

Course Objective:

The student will be able to

1. understand the different types of research.
2. analyze the research objectives and frames the hypothesis
3. understand the structure of dissertation.
4. evaluate their research work.

Unit I **6Hrs**

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

Extra reading / Key Words: *Primary data, Secondary data collection*

Unit II **6Hrs**

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

Extra reading / Key Words: *Test of Hypothesis and Levels of significance.*

Unit III **6Hrs**

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

Extra reading / Key Words: *Summarizing any Two research article.*

Unit IV Project work **12Hrs**

Note: 1.Extra reading/Key words are only for internal testing(Seminar/Assignment)

1. 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.

REFERENCES:

1. Blaxter, L., Hughes, C. aned Tight (1999) How to research? Viva Book private Limited
2. Kothari, C.R. (2004) research Methodology- Methods and Technioques, New Age International Publishers, India
3. Lal, B.(2002) Research Methodology, ABD Publishers. India

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2

B.A. /B.Sc. / B.Com. / BBA/ B.C.A. DEGREE COURSE

LIFE ORIENTED EDUCATION

ETHICS – III: FAMILY AND CAREER DEVELOPMENT

HRS/WK:1 **CODE: U15VE6LVE03**

CREDIT : 1 **MARKS : 100**

OBJECTIVES:

To help the students acquire skills, knowledge and talents to lead a meaningful life.
To make the students learn skills of nurturing family and children.
To make the students aware of emotional intelligence and choose their career.

UNIT – I: PERSONAL COMPETENCE

Emotional Intelligence for Professional growth, Management Vs Leadership-Management and Leadership Skills - Conflict Management - Tips for Professional growth

UNIT – II: MARRIAGE AND FAMILY

Family Vision - Family Values, Family relationship, Family Management, Sex in Marriage, Emotional Balance and Imbalance, Compatibility between Husband and Wife

UNIT – III: PARENTHOOD

Bringing up Children - Development stages (Eric Ericson model), Spirituality: Spirituality in Family - Prayer, God's Will , Role of Mother

UNIT – IV: PERSONALITY DEVELOPMENT

Self Analysis; interpersonal relation, introspection – Character formation towards positive personality- Values, self and college motto, punctuality, good moral, poverty, honesty, politeness, humanity, gentleness, friendship, fellowship and patriotism

UNIT – V: CAREER CHOICE

Career Choice according to Personality, Preparation for Competitive Exams, Sources of Knowledge, Memory Techniques, Mind Mapping

REFERENCES:

5. Tony B and Barry Buzan(2003), The mind map book, BBC world wide limited, London.
6. Susan Nash(2005), Turning team performance inside out, Jai CO. publishing House, New Delhi.
7. Fr. Ignacimuthu (1999) “Values for Life”, Vaigarai Pathipagam.
8. 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.C.A – DEGREE COURSES

LIFE ORIENTED EDUCATION

BIBLE STUDIES – III: ESSENCE OF CHRISTIAN LIVING

HRS/WK:1 **CODE: U15VE6LVBO3**

CREDIT : 1 **MARKS : 100**

OBJECTIVE:

To prepare the students to practice Christian principles in family, church and society as 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: MARRIAGE 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), Eli (I Sam 2: 24-36,3: 11- 18), Mary, Mother of Jesus (Luke 2: 51,52)

Caring for the Aged (I Sam 2: 31,32)

UNIT – IV: CHRISTIAN ETHICS

Holiness – Joseph (Gen 39:9) Levi 11: 45, 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

UNIT – V: MISSIONARIES DOWN THE LANE

William Carrie (Calcutta)

Pandithar Rama Bai (Karnataka)

Amy Carcheal (Dohnavur)

Dr. Ida Scuddar (Vellore)

Devasagayam (Nagercoil)

St. John De Britto (Oriyur)

Graham Staines & Family (Odisha)

St. Mother Teresa (Calcutta)

REFERENCES:

1. Alban Douglass (1982) One Hundred Bible Lessons. Gospel Literature Service, Mumbai.
2. Derek Prince (1993) Foundations for Righteous Living. Derek Prince Ministries-South Pacific, 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.

(For Candidates admitted from June 2015 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

B.A./B.Sc/B.Com/BBA/B.C.A - DEGREE COURSES

LIFE ORIENTED EDUCATION

CATECHISM – III: LITURGY AND CHRISTIAN LIFE

HRS/WK:1 **CODE:U15VE6LVC03**

CREDIT : 1 **MARKS : 100**

OBJECTIVES:

To prepare the students to participate meaningfully in the liturgical celebration and experience GOD in their day today life.

To enable the students to become living witnesses to Jesus Christ in their personal, family and social life.

UNIT – I: LITURGY

Personal prayer (Know oneself) – Vocal prayer – Community prayer – Meditation – Contemplation – Knowing the prayers : Our Father – Hail Mary – Holy Rosary – Mysteries of the Rosary- Litany of Mary – Family prayer-Popular devotion

UNIT – II: HOLY SACRIFICE OF THE MASS

Significance – Meaning and need for spiritual growth – Mass prayers – Part of the mass – Liturgical year, its division and its significance. – The Creed – Act of contrition – Discernment of spirits – Counseling – Spiritual direction.

UNIT – III: CHRISTIAN VOCATION AS DISCIPLE FOR THE KINGDOM OF GOD

Who am I as a Christian? – Christian dignity and others – The values of the Kingdom opposing to the values of the World – Christian social conscience – Christian in the reformation of the world – A call to be salt and light in today's context.

UNIT – IV: CHRISTIAN FAMILY

Holy Family- Characteristic of good family – Bible centered, Prayer centered, Christian centered–Responsibilities of parents and children in the family –Laws of the Church towards marriage-Pro life (Abortion, Euthanasia) – Lay Vocation – Lay Participation – Lay associates.

UNIT – V: CONSECRATED LIFE

"Come and follow me" – special disciples - Religious vocation – "I have called you to be mine"- Role of Nuns and Priest - called to be prophets and agents for God's Kingdom – nucleus of the church – Eschatological signs of the God's Kingdom.

REFERENCES:

1. Compendium – Catechism of the Catholic Church Published by Vaigarai Publishing House for the Catholic Church of India.

2. You are the light of the World, A course on Christian living for II year Religion published by Department of Foundation Courses, St.Joseph's College (Autonomous), Tiruchirappalli–
620 002.

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