

**DEPARTMENT  
OF PHYSICS**

**B.Sc. (PHYSICS)**  
**COURSE STRUCTURE AND SYLLABI**  
**(For the academic year 2014-15)**

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**DEPARTMENT OF PHYSICS – CBCS - UG COURSE PATTERN– B.Sc. Physics**  
**(For the candidates admitted from the year 2014- 15 onwards)**

Sem	Part	Course	Title of the Course	Code	Hrs/wk	credits	Marks
I	I	Language -1	Tamil paper I/ Hindi Paper I/ French Paper I	U12TL1TAM01/ U14HN1HIN01/ U13FR1FRE01	6	3	100
	II	English-1	English paper -I	U10EL1GEN01	6	3	100
	III	Major core-1	General Physics	U08PH1MCT01	7	5	100
	III	Allied -1	Allied Physics –I (Basic Physics -I)-for Chemistry	U12PH1ACT01	4	4	100
	III	Allied -2	Allied Physics –II Allied Physics Practicals – General Physics I	U12PH1ACP02	4	3	100
	IV	Environmental studies	Environmental studies	U14RE1EST01	2	2	100
	IV	Value Education	Ethics/Bible studies/Catechism	U11VE2LVE01/ U11VE2LVB01/ U11VE2LVC01	1	--	--
II	I	Language-2	Tamil paper II/ Hindi Paper II/ French PaperII	U12TL2TAM02/ U14HN2HIN02/ U13FR2FRE02	5	3	100
	II	English – 2	English paper -II	U10EL2GEN02	6	3	100
	III	Major core-2	Electricity & Electromagnetism	U08PH2MCT02	6	6	100
	III	Major core -3	Basic Physics practicals	U08PH2MCP03	4	3	100
	III	Allied -3	Allied Physics –III (BasicPhysics–II)-for Chemistry	U12PH2ACT03	4	3	100
	IV	Skill Based Elective -1	Soft skill development	U11RE1SBT01	2	2	100
	IV	Skill Based Elective -2	Rural Enrichment and Sustainability Development	U08RE2SBT02	2	2	100
	IV	Value Education	Ethics/Bible studies/Catechism	U11VE2LVE01/ U11VE2LVB01/ U11VE2LVC01	1	1	100
III	I	Language – 3	Tamil paper III/ Hindi Paper III/ French Paper III	U12TL3TAM03/ U14HN3HIN03/ U13FR3FRE03	6	3	100
	II	English – 3	English paper -III	U10EL3GEN03	6	3	100
	III	Major core -4	Electronics	U08PH3MCT04	5	5	100
	III	Major core -5	Optics and electronics practicals	U08PH3MCP05	5	5	100
	III	Allied– 4	Allied Physics Optional Paper- 1	U13PH3AOT01	4	3	100
	IV	Skill Based Elective-3	Physics for Life sciences- Zoology	U11PH3SBP03	2	2	100
		Gender Studies	Gender Studies	U12WS3GST01	1	1	100
	IV	Value Education	Ethics/Bible studies/Catechism	U11VE4LVE02/ U11VE4LVB02/ U11VE4LVC02	1	--	-

Sem	Part		Subject	Code	Hrs	Credit	Marks
IV	I	Language – 4	Tamil paper IV/ Hindi Paper IV/ French Paper IV	U12TL4TAM04/ U14HN4HIN04/ U14FR4FRE04	5	3	100
	II	English – 4	English paper -IV	U10EL4GEN04	6	3	100
	III	Major core-6	Optics & Spectroscopy	U08PH4MCT06	5	5	100
	III	Major Elective-1	Basics of Digital electronics/Energy Physics	U08PH4MET01/ U08PH4MET02	5	5	100
	III	Allied -5	Allied Physics Optional Paper- II	U13PH4AOP02	4	3	100
	III	Allied -6	Allied Physics Optional Paper-III	U13PH4AOT03	4	4	100
	IV	Value Education	Ethics/Biblestudies/ Catechism	U11VE4LVE02/ U11VE4LVB02/ U11VE4LVC02	1	1	100
V	III	Major core-7	Atomic & Nuclear physics	U08PH5MCT07	5	4	100
	III	Major core – 8	Mathematical physics & Classical Mechanics	U08PH5MCT08	5	4	100
	III	Major core – 9	Lasers, quantum and statistical mechanics	U08PH5MCT10	5	4	100
	III	Major core – 10	Advanced Electronics practicals I	U08PH5MCP12	5	4	100
	III	Major Elective- 2	Circuit and Network Theory/ Microprocessor INTEL 8085	U08PH5MET01/ U08PH5MET02	5	5	100
	IV	Non Major Elective – 1	Basics of Computer Electronics	U08PH5NMT01	2	2	100
	IV	Skill Based Elective -4	Physics For Life Sciences (for Botany) & Trouble Shooting and Maintenance of Electronic Equipments(for Physics)	U11PH5SBP04  & U08PH5SBT04	2	2	100
IV	Value Education	Ethics/Biblestudies/Catechism	U11VE6LVE03/ U11VE6LVB03/ U11VE6LVC03	1	--		
VI	III	Major Core – 11	Condensed MatterPhysics	U08PH6MCT13	6	5	100
	III	Major core -12	Communication Physics	U08PH6MCT14	6	5	100
	III	Major core – 13	Special Electronics practicals - II	U08PH6MCP16	6	5	100
	III	Major Elective- 3	Instrumentation /Applied Electronics	U08PH6MET04/ U08PH6MET05	5	5	100
	IV	Non Major Elective -2	Basics of Modern Communication Systems	U11PH6NMT02	2	2	100
	IV	Skill Based Elective - 5	Printed Circuit Techniques	U08PH6SBT05	2	2	100
	IV	Skill Based Elective – 6	Research Methodology	U13PH6SBT06	2	2	100
	IV	Value Education	Value Education Ethics/Bible studies/Catechism	U11VE6LVE03/ U11VE6LVB03/ U11VE6LVC03	1	--	
V	Extension	RESCAPES	U08RE6ETF01	-	1	100	

	activity	Impact Study of project				
<b>Grand Total</b>				<b>180</b>	<b>141</b>	<b>4300</b>

### List of Allied optional courses

III	III	Allied- 4	Allied Physics Optional Paper - 1 Properties of matter, Heat and Modern Physics)-for Maths	U13PH3AOT01	4	3	100
IV	III	Allied -5	Allied Physics Optional Paper –II General Physics practicals-II	U13PH4AOP02	4	3	100
IV	III	Allied -6	Allied Physics Optional Paper –III Spectroscopy, Electricity and Electronics-for Maths	U13PH4AOT03	4	4	100

### List of Non Major Elective courses

V	IV	Non Major Elective – 1	Basics of Computer Electronics	U08PH5NMT01	2	2	100
VI	IV	Non Major Elective -2	Basics of Modern Communication Systems	U11PH6NMT02	2	2	100

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

**TAMIL DEPARTMENT**

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

Part - I : Language: Tamil Paper - 1

**Total Hours : 90**

**Hrs : 6Hrs /Wk**

**Credit : 3**

**Code : U12TL1TAM01**

**Marks : 100**

**நோக்கங்கள்:**

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

**பயன்கள்:**

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

**பாடத்திட்டம்**

**அலகு:1 செய்யுள்**

மொழி

கல்வி

வீரம்

**அலகு:2 செய்யுள்**

அறம்

வாழ்க்கை

**அலகு:3**

தமிழ் இலக்கிய வரலாறு

20-ஆம் நூற்றாண்டு (தற்காலம்)

தமிழாய்வுத்துறை வெளியீடு

**அலகு:4**

படைப்பிலக்கியம் - சிறுகதைத் தொகுப்பு

**அலகு:5**

பொதுப்பகுதி - கலைச்சொற்கள்

தமிழாய்வுத்துறை வெளியீடு

**பாட நூல்கள்**

செய்யுள் - தமிழாய்வுத்துறை வெளியீடு

தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறை வெளியீடு

சிறுகதைத் தொகுப்பு - தமிழாய்வுத்துறை வெளியீடு

கலைச்சொற்கள் - தமிழாய்வுத்துறை வெளியீடு



**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002**  
**DEPARTMENT OF HINDI**  
**PART – I LANGUAGE HINDI FOR B.A, B.Sc & B.Com**  
**HINDI PAPER-I SHORT STORY, PROSE, GRAMMAR**  
**SEMESTER – I**

**HRS/WEEK : 6**

**CODE: U14HN1HIN01**

**CREDITS : 3**

**MARKS : 100**

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

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

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

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

**UNIT- V** : Anuvad Abhyas – II

Books Prescribed :

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

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

## **DEPARTMENT OF FRENCH**

### **SYLLABUS**

#### **SEMESTER I**

#### **PART I – LANGUAGE - FRENCH PAPER I [GRAMMAR & CIVILISATION (ÉCHO A1 2<sup>e</sup> édition)]**

(For candidates admitted 2013 onwards)

**HRS/WEEK : 6**

**CREDIT : 3**

**CODE : U13FR1FRE01**

**MARKS : 100**

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

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

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

#### **Unit 2 Au travail!**

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

#### **Unit 3 On se détend!**

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

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

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

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

#### **Unit 5 Bon appétit!**

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

#### **TEXT BOOKS :**

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

Authors: J. Girardet and J. Pécheur

Publication: CLÉ INTERNATIONAL, 2012.

(for candidates admitted from 2014 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2.**  
**2014 - 2015**

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

**PART II - ENGLISH 1 - GENERAL ENGLISH PAPER I**

NO.OF HRS/WK : 6

CODE: U10EL1GEN01

NO.OF CREDITS: 3

**OBJECTIVES**

To develop in the students LSRW Skills at the foundation basic level

To focus on Oral Communication Skills through several Spoken English tasks given individually and in groups.

To encourage students to read and appreciate biographies/passages/fables/folk tales

To develop sub skills including comprehension, vocabulary, grammar, spelling, punctuation and reference skills.

**UNIT I: Speak Better I Tasks**

1 - 30

**UNIT II: Speak Better II**

Generation of Alternatives

Viewpoints

Challenging Assumptions

Redesigning

Dominant Ideas and Crucial Factors

**UNIT III : Read and Communicate I : a) Fables and Folk Tales**

The Crow and the Kavun

The Parakeet and the Clay Pot

**UNIT IV: Read and Communicate I: b) Fables and Folk Tales**

How the Ministers Laid Eggs

How Andare Ate Curd at the Palace

**UNIT V: Read and Communicate II : Biographies**

Mahatma Gandhi

Abraham Lincoln

**PRESCRIBED TEXT**

Oranee Jansz : *EXPLORATIONS A Course in reading, thinking and communication skills:*  
Foundation Books. Print.

**LIST OF GENERAL TOPICS:**

1. Knowledge is power
2. The Impact of English Language
3. Science and Technology
4. Where there is a will there is way
5. Honesty is the best policy
6. Birds of the same feather, flock together
7. East or west home is the best
8. Make hay while the sun shines
9. Your favourite leader
10. Description of a significant experience in your life.

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER – I: MAJOR CORE**  
**PAPER – I : GENERAL PHYSICS**

**NO. OF HOURS/WEEK: 7**

**CODE: U08PH1MCT01**

**NO. OF CREDITS: 5**

**Course Objective: To study the basic principles of Elasticity, Mechanics, Theory of Relativity and Heat and Thermodynamics.**

**UNIT : I ELASTICITY**

Types of elastic moduli- Relation between linear strain, shearing strain and bulk strain – Poisson's ratio – relation between elastic constants – 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.

**UNIT: II MECHANICS**  
**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.

**UNIT: III RELATIVITY**

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.

**UNIT: IV THERMODYNAMICS**

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.

## **UNIT: V TRANSMISSION OF HEAT**

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 – Rayleigh Jean’s formula – Wien’s law – Planck’s radiation formula – solar constant – Angstrom’s Pyrheliometer – Temperature of the Sun.

### **BOOKS FOR STUDY**

3. Murugesan R, Properties of matter. S. Chand & Co. (1998) (Units I, II & III)
4. Brijlal & Subramaniam, Heat and Thermodynamics- S. Chand & Co. New Edition (1998) (Units IV & V).

### **BOOKS FOR REFERENCE**

1. Mathur D.S., Mechanics S. Chand & Co., (1997)
2. Rajam J.B., (Revised by Arora. G.I.) A Text book of Heat & Thermodynamics, S. Chand & Co., (1983).

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**ALLIED PHYSICS-I**  
**BASIC PHYSICS-1**

**CODE: U12PH1ACT01**

**HOURS/WEEK: 4**

**NO. OF CREDITS: 4**

**Course Objectives:** To help the students

- 1) To understand the basic laws of Properties of matter and Mechanics
- 2) To know the theories of Relativity
- 3) To study the characteristics of sound waves
- 4) To know the basics of Heat and Optics.

**UNIT I: PROPERTIES OF MATTER**

Elasticity- elastic constants- bending of beams- young's modulus by non-uniform bending-torsion in a wire- rigidity modulus static torsion.

Viscosity- coefficient of viscosity- Poiseuille's formula- comparison of viscosities by burette method- Surface tension- molecular theory of surface tension-Surface tension by drop weight method.

**UNIT II: MECHANICS AND RELATIVITY**

Composition of two Simple Harmonic waves along a straight line and at right angles- Lissajou's figures- applications

Newton's laws and their limitations- Michelson-Morley experiment- negative results- Lorentz transformation equations- variation of mass with velocity- addition of velocities - mass-energy equivalence

**UNIT III: SOUND**

Characteristics of sound waves- amplitude, pitch and frequency and loudness- Acoustics of buildings- reverberation- reverberation time- Sabine's formula- Condition for good acoustics-Ultrasonics-Production and properties of ultrasonic waves-Applications ultrasonics-SONAR

**UNIT IV: THERMAL PHYSICS**

Low temperature physics:

Postulates of kinetic theory of gases- critical constants-low temperature- J-K effect-theory- liquefaction of gases- Linde's process

Transmission of Heat:

Modes of transmission of heat- conduction-coefficient of thermal conductivity- determination of thermal conductivity of a bad conductor by Lee's disc method - Radiation- Stefan's law of radiation.

**UNIT V: OPTICS**

Refraction through lenses - lens formula- defects of images- spherical and chromatic aberration in lenses- dispersion of light- refraction through prism- refracting index, conditions for Interference Newton's rings, Air wedge.

**BOOKS FOR STUDY:**

1. Murugesan R and Kiruthiga Sivaprasath. Properties of matter and Acoustics ( 2<sup>nd</sup> ed.). New Delhi: S. Chand & company Ltd. (2012)
2. Brijlal and Subramaniam. Text Book of Optics. New Delhi: S. Chand & Co. 1998

**BOOKS FOR REFERENCE**

1. Rajam J.B., and Arora C.L. A Text Book of Heat and Thermodynamics. New Delhi: S.Chand & Co. (1983)
2. Mathur,D.S. Mechanics. S.Chand & Co. Ltd (2007).
3. Chakrabharti Theory and experiment on thermal physics. New central book agency Pvt Ltd. (2006).
4. Chakrabharti P.K Geometrical and Physical optics. , New central book agency Pvt Ltd. (2005).
5. David Halliday, Robert Resnik, Kenneth S. Krane, The Physics, John Willey and sons, Singapore, (2005).

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**ALLIED PHYSICS-II**  
**ALLIED PHYSICS PRACTICAL**

**CODE: U12PH1ACP02**

**NO OF HOURS/WEEK: 4**

**NO.OF CREDITS: 3**

**Course Objective: To make the students to understand the concepts of Properties of matter, Optics, Electricity and Electronics by doing related experiments.**

1. Determination of Young's modulus of the material of a bar using Cantilever (Microscope)
2. Determination of Young's modulus of the material of a bar by Non-uniform bending using Microscope.
3. Comparison of viscosities of two liquids using burette.
4. Determination of Rigidity modulus of the material of a rod - Static Torsion
5. Determination of focal length of a convex lens
6. Determination of thickness of the wire using Air wedge
7. Determination of Radius of Curvature of a lens- Newton's Rings
8. Determination of refractive index of Solid Prism using Spectrometer
9. Determination of refractive index of hollow prism using Spectrometer
10. Determination of dispersive power of Solid Prism using Spectrometer
11. Determination of wavelengths of prominent lines of mercury spectrum using grating
12. Study of AND, OR Logic gates using discrete components
13. Construction of Bridge Rectifier
14. Study of Junction Diode characteristics
15. Study of Zener Diode characteristics
16. Construction of Regulated Power Supply using Zener Diode
17. Study of NAND as Universal logic gate
18. Study of NOR as Universal logic gate



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

**CODE: U14RE1EST01**  
**CREDITS : 2**

**Hrs – 2/Week**

**Unit I–Awareness and Natural Resources**

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

**Unit II–Ecosystems and Biodiversity**

Ecosystem–concepts, structure and types–concept of food chain and food web–causes and effects of weakening food chains

Biodiversity–concept of genetic, species and ecological biodiversity–ecological and economic values–India, a mega diversity country, hotspots–threats to biodiversity and conservation measures.

**Unit III–Environmental Pollution**

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

**Unit IV–Human population and Environment**

Population growth at national and global level.

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

Environmental pollutions and diseases-malaria- chikungunya

**Unit V–Environment and Social Issues**

Rich poor wide–at national and global levels. Urbanization –slums

Changing value systems –AIDS

Family welfare programs

**HOLY CROSS COLLEGE ( AUTONOMOUS), TIRUCHIRAPPALLI-2**  
**B.A. /B.Sc. / B.Com. / B.R.Sc. / B.C.A. DEGREE COURSE LIFE ORIENTED**  
**EDUCATION**

**ETHICS – I: RELIGION AND VALUE SYSTEMS**

**HRS / Wk :1**

**CODE: U12VE2LVE01**

**CREDITS : 1**

**MARKS : 100**

**OBJECTIVES:**

- To Understand My and Other Religions and Culture
- To Appreciate My and Other Religions and Culture
- To Learn from other Religions and Culture
- To Interact with My and Other Religions and Culture to enhance My faith in My religion.
- To Help the students to become aware of the negative forces of religions.

**UNIT – I: RELIGION**

Concept of God- Faith, Meaning, Definition, Nature, Characteristics. Basic values of different religions-Globalization.

**UNIT – II: DIFFERENT RELIGIONS**

Basic characteristics and basic thoughts- Buddhism, Christianity, Hinduism, Islam, Jainism and Sikhism

**UNIT – III: UNITY OF RELIGION**

Unity of Vision and Purpose- Respect for Other's Faith, Inter Religious Co-operation, Religious Pluralism as a fact and Religious Pluralism as a value.

**UNIT – IV: FUNDAMENTALISM, COMMUNALISM AND SECULARISM**

Meaning and impact of Fundamentalism-Communalism-Violence and terrorism – Tolerance – Secularism - Individualism.

**UNIT – V: VALUE SYSTEMS**

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

**REFERENCES:**

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

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

**HRS / WK : 1**

**CODE: U12VE2LVBO1**

**CREDIT : 1**

**MARKS : 100**

**OBJECTIVE:**

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

**UNIT - I: BIBLE – THE WORD OF GOD**

- Books of the Bible – Division into Old Testament and New Testament – history of the Bible-
- Messianic Prophecies (Isaiah 9:6,40:3,53:1-12,61:1-3,Micah 5:2)
- The Birth and Ministry of John the Baptist (Luke 1:1-80,Mat 3:1-17,14:1-12)
- The Birth, Passion and Resurrection of Jesus (Luke 1:26-80,2:1-52,John 1 :18-21)

**UNIT – II: MINISTRY OF JESUS**

- Miracles (Mark 2:1-12,Luke 4:38-41,6:6-11,7:1-17,8:26-56,John 2:1-12)
- Parables (Luke 6:46-49,8:4-15,10:25-37,15:1-32)
- Preaching
  - Sermon on the mount (Mat 5-7)
  - Lord's Prayer (Luke 11: 1-13)
  - Kingdom of God (Mat 13: 24-50)
- Prayer life of Jesus (Luke 5:12-16,John 11:41-45,17:1-26,Mark 14:32-42)
- Rich and Poor (Luke 16: 19-31,21:1-4)
- Women Liberation (John 4:1-30,8:1-4)
- Women in the New Testament
- Mary(Mother of Jesus)-(Luke 1:27-35, John 2:1-12, 19:35, Acts 1:13-14)
- Martha & Maria (Luke 10: 38- 42, John 11: 1-46)

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

- Early Church
- Birth (Acts 2:1-41)
- Unity and sharing (Acts 2:42-47,4:1-37,5:1-11)
- Witnessing life (Acts 3:1-26,5:12-42,8:26-40, 16:20-34)
- Comparison between early Church and present Church.

#### **UNIT – IV: DISCIPLES AND APOSTLES**

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

#### **UNIT – V: MISSIONARIES**

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

#### **REFERENCES:**

1. John Stott, 1994, “**Men with a Message**”, Angus Hudson Ltd. London.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI -2**  
**B.A/B.Sc./B.Com/B.R.Sc/B.C.A-DEGREE COURSES**  
**LIFE ORIENTED EDUCATION**  
**CATECHISM – I: GOD OF LIFE**

**HRS / WK :1**  
**MARKS : 100**

**CODE :U12VE2LVC01**  
**CREDIT : 1**

**OBJECTIVES:**

- To enable the students to know God and his Salvific acts through Holy Bible
- To enable the students to know about the Paschal Mystery

**UNIT - I: CREATION AND COVENANT**

Genesis - God revealed himself in creation -God who preserves creation through covenants (Pentateuch) -Our response to God's covenant -Reason for its success and failure -The relationship of God with Israel -Image of God in Old Testament-God and me

**UNIT - II: GOD OF THE PROPHETS**

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

**UNIT - III: GOD OF WISDOM**

God experience through wisdom Literature, its origin and growth

**UNIT - IV: SYNOPTIC GOSPELS**

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

**UNIT - V: LUKE'S GOSPEL**

Study of Luke's Gospel in detail – specialty of the gospel – main emphasis of the message – meaning and blessing of suffering and paschal joy in one's life.

**Passion – Paschal mystery**

**REFERENCES:**

1. Catechism of the Catholic Church published by Theological Publications in India for the Catholic Hierarchy of India, 1994
2. The Holy Bible Revised Standard Version with Old and New Testaments Catholic Edition for India.
3. Vaalvin Valizha – St. John's Gospel – Fr. Eronimus

புனித சிலுவை தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி – 620 002.

தமிழாய்வுத்துறை

இளங்கலை / இளமறிவியல் / இளம் வணிகவியல் பட்ட வகுப்பு

முதலாமாண்டு – இரண்டாம் பருவம் - 2014

தாள் - II

**Total Hours : 75**

**Code : U12TL2TAM02**

**Hrs : 5Hrs /Wk**

**Marks : 100**

**Credit : 3**

நோக்கங்கள்:

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

பயன்கள்:

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

அலகு:1 செய்யுள்

இறைமை

அன்பு

நேர்மை

அலகு:2 செய்யுள்

தன்னம்பிக்கை

முயற்சி

அலகு:3

தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறை வெளியீடு

பல்லவர்காலம்

நாயக்கர்காலம்

அலகு:4

படைப்பிலக்கியம் - புதினம்

சு.தமிழ்ச்செல்வி - கீதாரி

அலகு:5

கடிதம் எழுதுதல்

பாட நூல்கள்

செய்யுள்

- தமிழாய்வுத்துறை வெளியீடு

தமிழ் இலக்கிய வரலாறு

- தமிழாய்வுத்துறை வெளியீடு

கீதாரி

- சு.தமிழ்ச்செல்வி

கடித இலக்கியம்

- பயிற்சி ஏடு.

(for the candidates admitted from June 2014 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002**  
**DEPARTMENT OF HINDI**  
**PART – I LANGUAGE HINDI FOR B.A, B.Sc & B.Com**  
**HINDI PAPER-II PROSE, DRAMA, GRAMMAR-II, COMPREHENSION**  
**SEMESTER –II**

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

**CODE: U14HN2HIN02**  
**MARKS : 100**

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

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

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

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

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

Books Prescribed :

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



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

## **DEPARTMENT OF FRENCH**

### **SYLLABUS**

#### **SEMESTER II**

#### **PART I - LANGUAGE - FRENCH PAPER II [GRAMMAR, CIVILISATION & TRANSLATION (ÉCHO A1 2<sup>e</sup> édition)]**

(For candidates admitted 2013 onwards)

**HRS/WEEK : 5**

**CREDIT : 3**

**CODE : U13FR2FRE02**

**MARKS : 100**

#### **Unit 1 Quelle journée !**

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

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

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

#### **Unit 3 Souvenez-vous ?**

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

#### **Unit 4 On s'appelle ?**

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

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

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

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

#### **TEXT BOOKS :**

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

(for candidates admitted from 2013 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2.**  
**2014 - 2015**

**II B.A., B.Sc., B.Com., B.R.Sc., B.C.A., B.B.A., SEMESTER I**  
**PART II - ENGLISH III - GENERAL ENGLISH PAPER III**

**PART II - ENGLISH 1I - GENERAL ENGLISH PAPER II**

NO.OF HRS/WK : 6

CODE: U10EL2GEN02

NO.OF CREDITS: 3

**OBJECTIVES**

Integrated skills of English with focus on reading, writing, speaking and listening.  
Integrated sub skills that include comprehension, vocabulary, grammar, spelling, punctuation and reference skills.  
Literary appreciation (incidental)

**UNIT I**

The Suitor and Papa: *Anton Chekov*

**UNIT II**

The Sniper : *Liam O'Flaherty*

**UNIT III**

A Handful of Dates : *Tayeb Salih*

**UNIT IV**

Two Gentlemen of Verona: *A.J. Cronin*

**UNIT V**

GRAMMAR - 1. Transformation of sentences – a) Direct – Indirect speech b) Voices  
2. Question Tag 3. Tenses

COMPREHENSION – Prescribed texts

COMPOSITION - 1. Personal letter  
2. Creative Writing  
3. Narrative Writing  
4. Article Writing

GENERAL ESSAY: 5 TOPICS

1. My relationship with my mother
2. My favourite hobby
3. Look before you leap
4. All that glitters is not gold
5. Me, after ten years...

**BOOKS FOR REFERENCE**

Renu, Anand and Geetha, Rajeevan, *Images Of Life An Anthology of Prose*, New Delhi:  
Cambridge University Press, 2006. Print.

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**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER – II: MAJOR CORE**  
**PAPER – II: ELECTRICITY AND ELECTROMAGNETISM**

**NO. OF HOURS/WEEK: 6**

**CODE: U08PH2MCT02**

**NO. OF CREDITS: 6**

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

**UNIT I: ELECTROSTATICS**

Electrical capacity- capacity of a spherical conductor- energy of a condenser- loss of energy due to sharing of charges- capacity of a spherical condenser with outer sphere earthed and inner sphere earthed- capacity of a cylindrical condenser- Kelvin's attracted disc electrometer- dielectric constant of a parallel sided slab of a dielectric- quadrant electrometer- measurement of ionization currents using the quadrant electrometer.

**UNIT II: ELECTROMAGNETISM**

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).

**UNIT III: ELECTROMAGNETIC INDUCTION**

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- induction coil.

**UNIT IV: ELECTRIC GENERATORS AND MOTORS**

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.

## **UNIT V: ALTERNATING CURRENTS**

Alternating EMF- analysis of AC circuits by j operator method- alternating EMF applied to a circuit containing resistance and inductance- alternating EMF applied to a circuit containing resistance and capacitance- alternating EMF applied to a circuit containing resistance, inductance and capacitance - series resonant circuit and parallel resonant circuit- sharpness of resonance and Q- factor- power in AC circuits- power factor – wattless current.

### **BOOKS FOR STUDY**

1. Murugesan R., Electricity And Magnetism S. Chand and Co., New Delhi (2003) (for Units I, II, III & IV).
2. Ambrose and Vincent Devaraj, Introduction To Electronics, Gaungai mere Vth Edition (1992) (for Unit V).

### **BOOK FOR REFERENCE**

1. Narayanamoorthy & Nagaratnam, Electricity And Magnetism, NPC, Chennai (1992).

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER –II: MAJOR CORE**  
**PAPER – III : MAIN PRACTICAL – I**

**NO. OF HOURS/WEEK: 4**

**CODE: U08PH2MCP03**  
**NO. OF CREDITS: 3**

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

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 - using 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.
15. Determination of thickness of a wire by forming Air Wedge
16. Determination of Refractive Index of material of a hollow prism using Spectrometer

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**ALLIED PHYSICS-III**  
**BASIC PHYSICS-II**

**CODE : U12PH2ACT03**  
**NO.OF CREDITS: 3**

**NO.OF HOURS/WEEK: 4**

**COURSE OBJECTIVES:** To make the students

- 1) To understand the basic laws of Electricity, electromagnetism,
- 2) To know the functions of diode and its applications
- 3) To apply the vector atom model in explaining the fine structure
- 4) To understand the basics of nuclear physics and spectroscopy

**UNIT I: ELECTRICITY & ELECTROMAGNETISM**

Coloumb's law- Electric field- 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- Self induction-Mutual induction-coefficient of coupling- Growth and decay of current in a circuit having L& R- Growth and decay of charge in a circuit having C & R.

**UNIT II: ANALOG & DIGITAL ELECTRONICS**

PN junction diode- characteristics- Zener diode characteristics- Zener as a regulator- junction diode as a rectifier- bridge rectifier- Principle and working of a transistor- logic gates, Demorgan's theorem – NAND , NOR as universal gates.

**UNIT III: ATOMIC PHYSICS**

X-ray- Characteristic and continuous Spectrum- Mosley's law and its importance – Vector Atom Model- Pauli's exclusion principle- fine structure of Na lines-Einstein's photo electric equation – Millikan's experiment.

**UNIT IV: NUCLEAR PHYSICS**

Radioactivity- laws of disintegration- Radioactive equilibrium- Age of earth- Properties of Nucleus- Charge, Spin, Mass, Shape – Nuclear mass defect- Binding Energy – Packing fraction- Liquid drop model- Explanation of fission- Binding energy formula –Shell model

**UNIT V: SPECTROSCOPY**

Electromagnetic spectrum – theory of grating- difference between prism and grating spectrum- Rayleigh and Raman scattering- Theory of Raman Effect- Experimental arrangement- uses- LASER principles.

**BOOKS FOR STUDY**

1. Murugesan.R. Allied Physics. New Delhi: S. Chand & Co. Ltd. (2005).
2. Murugesan R. Allied physics and spectroscopy , New Delhi: S. Chand & Co. Ltd. ( 2007 )

## **BOOKS FOR REFERENCE**

1. Murugesan R. Modern Physics (10<sup>th</sup> revised revision). S. Chand & Co. . (2002).
2. Narayanamurti Electricity and Magnetism (3<sup>rd</sup> edition revised by N. Nagaratinam & Lakshmi Narayan). Madras: The National Publishing Co. (1994).
3. David Halliday, Robert Resnik, Kenneth S. Krane, The Physics, John Willey and sons, Singapore, (2005)
4. Murugesan R and Kiruthiga Sivaprasath Properties of matter and Acoustics (2<sup>nd</sup> ed.). S. Chand & company Ltd. New Delhi (2012).
5. Brijlal and Subramaniam Text Book of Optics. New Delhi: S. Chand & Co. (1998).
6. Brijlal and Subramaniam Text Book of Sound. Vikas Publishing House Pvt Ltd. (1993).

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

**Hrs – 2/Week**

**CODE:U14RE2SBT01**

**CREDITS : 2**

**General Objective:**

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

**UNIT I: Capacity Building**

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

**UNIT II : Interpersonal skills**

Trust-trustworthiness-interpersonal communication-art of listening, reading and writing-art of writing-Emails etiquettes-building relationship-networking

**UNIT III: Corporate skills**

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

**UNIT IV: Management skills**

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

**UNIT V: Employability skills**

Writing Resume/CV- interview skills-Group Discussion-mock Interview-mock GD-Career planning

**TEXT BOOKS:**

Meena K.Ayothi V.(2013) A Book on development of soft skills(soft skills: A Road Map to Success) P.R . Publishers and distributors, Trichy.

Alex K.(2012) Soft Skills Know Yourself & Know the World, S.Chand&Company Ltd., NewDelhi

**Book Recommended:**

1.Francis Thamburaj S.J.(2009).Communication soft skills for Professional Excellence,1<sup>st</sup> Ed., Grace Publishers,

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



**HOLY CROSS COLLEGE (AUTONOMOUS),TIRUCHIRAPPALLI–  
B.A./B.Sc./B.Com./BCA&BBA, DEGREE EXAMINATION  
SEMESTER II  
SKILL BASED ELECTIVE II: RURAL ENRICHMENT AND SUSTAINABLE  
DEVELOPMENT**

**Hrs – 2/Week**

**CODE: U08RE2SBT02  
CREDIT: 2**

**UNIT I:**

Green Revolution and industrialization

Cost climate changes and mismanagement of natural resources: Effects of over exploitation of land and water, mono culture practices use of hybrid and genetically modified (GM) seeds dumping of chemical fertilizers and pesticides-reduced economic returns from agriculture-resultant social issues-poverty-farmers suicide.

**UNIT II:**

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

**UNIT III:**

Elements in sustainable development I: Water shed management-rain water Harvesting, de-silting, bunds construction ,check dams, managing rain water drainage canals Alternative agricultural models –agro-forestry.

**UNIT IV:**

Elements in sustainable development II: addressing agricultural issues-biofertilizers-azolla culture, vermicomposting, biopesticides-panchakavya, mulikai puchiviratti ,amirthakarasal ,addressing health and sanitation issues-health, nutrition, vaccination.

**UNIT V:**

Survey of natural resources and resource mapping in villages, village level participatory approach(VLPA)-role of SHGs and NGOs.  
Introduction to disaster Management (fire and flood)

**HOLY CROSS COLLEGE ( AUTONOMOUS), TIRUCHIRAPPALLI-2**  
**B.A. /B.Sc. / B.Com. / B.R.Sc. / B.C.A. DEGREE COURSE LIFE ORIENTED**  
**EDUCATION**

**ETHICS – I: RELIGION AND VALUE SYSTEMS**

**HRS / Wk :1**

**CODE: U12VE2LVE01**

**CREDITS : 1**

**MARKS : 100**

**OBJECTIVES:**

- To Understand My and Other Religions and Culture
- To Appreciate My and Other Religions and Culture
- To Learn from other Religions and Culture
- To Interact with My and Other Religions and Culture to enhance My faith in My religion.
- To Help the students to become aware of the negative forces of religions.

**UNIT – I: RELIGION**

Concept of God- Faith, Meaning, Definition, Nature, Characteristics. Basic values of different religions-Globalization.

**UNIT – II: DIFFERENT RELIGIONS**

Basic characteristics and basic thoughts- Buddhism, Christianity, Hinduism, Islam, Jainism and Sikhism

**UNIT – III: UNITY OF RELIGION**

Unity of Vision and Purpose- Respect for Other's Faith, Inter Religious Co-operation, Religious Pluralism as a fact and Religious Pluralism as a value.

**UNIT – IV: FUNDAMENTALISM, COMMUNALISM AND SECULARISM**

Meaning and impact of Fundamentalism-Communalism-Violence and terrorism – Tolerance – Secularism - Individualism.

**UNIT – V: VALUE SYSTEMS**

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

**REFERENCES:**

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

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

**HRS / WK : 1**

**CODE: U12VE2LVBO1**

**CREDIT : 1**

**MARKS : 100**

**OBJECTIVE:**

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

**UNIT - I: BIBLE – THE WORD OF GOD**

- Books of the Bible – Division into Old Testament and New Testament – history of the Bible-
- Messianic Prophecies (Isaiah 9:6,40:3,53:1-12,61:1-3,Micah 5:2)
- The Birth and Ministry of John the Baptist (Luke 1:1-80,Mat 3:1-17,14:1-12)
- The Birth, Passion and Resurrection of Jesus (Luke 1:26-80,2:1-52,John 1 :18-21)

**UNIT – II: MINISTRY OF JESUS**

- Miracles (Mark 2:1-12,Luke 4:38-41,6:6-11,7:1-17,8:26-56,John 2:1-12)
- Parables (Luke 6:46-49,8:4-15,10:25-37,15:1-32)
- Preaching
  - Sermon on the mount (Mat 5-7)
  - Lord's Prayer (Luke 11: 1-13)
  - Kingdom of God (Mat 13: 24-50)
- Prayer life of Jesus (Luke 5:12-16,John 11:41-45,17:1-26,Mark 14:32-42)
- Rich and Poor (Luke 16: 19-31,21:1-4)
- Women Liberation (John 4:1-30,8:1-4)
- Women in the New Testament
- Mary(Mother of Jesus)-(Luke 1:27-35, John 2:1-12, 19:35, Acts 1:13-14)
- Martha & Maria (Luke 10: 38- 42, John 11: 1-46)

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

- Early Church
- Birth (Acts 2:1-41)
- Unity and sharing (Acts 2:42-47,4:1-37,5:1-11)
- Witnessing life (Acts 3:1-26,5:12-42,8:26-40, 16:20-34)
- Comparison between early Church and present Church.

#### **UNIT – IV: DISCIPLES AND APOSTLES**

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

#### **UNIT – V: MISSIONARIES**

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

#### **REFERENCES:**

1. John Stott, 1994, “**Men with a Message**”, Angus Hudson Ltd. London.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI -2**  
**B.A/B.Sc./B.Com/B.R.Sc/B.C.A-DEGREE COURSES**  
**LIFE ORIENTED EDUCATION**  
**CATECHISM – I: GOD OF LIFE**

**HRS / WK :1**  
**MARKS : 100**

**CODE :U12VE2LVC01**  
**CREDIT : 1**

**OBJECTIVES:**

- To enable the students to know God and his Salvific acts through Holy Bible
- To enable the students to know about the Paschal Mystery

**UNIT - I: CREATION AND COVENANT**

Genesis - God revealed himself in creation -God who preserves creation through covenants (Pentateuch) -Our response to God's covenant -Reason for its success and failure -The relationship of God with Israel -Image of God in Old Testament-God and me

**UNIT - II: GOD OF THE PROPHETS**

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

**UNIT - III: GOD OF WISDOM**

God experience through wisdom Literature, its origin and growth

**UNIT - IV: SYNOPTIC GOSPELS**

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

**UNIT - V: LUKE'S GOSPEL**

Study of Luke's Gospel in detail – specialty of the gospel – main emphasis of the message – meaning and blessing of suffering and paschal joy in one's life.

**Passion – Paschal mystery**

**REFERENCES:**

1. Catechism of the Catholic Church published by Theological Publications in India for the Catholic Hierarchy of India, 1994
2. The Holy Bible Revised Standard Version with Old and New Testaments Catholic Edition for India.
3. Vaalvin Valizha – St. John's Gospel – Fr. Eronimus

புனித சிலுவை தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி – 620 002.  
தமிழாய்வுத்துறை  
இளம் வணிகவியல் / இளங்கலை / இளம் அறிவியல் பட்ட வகுப்பு  
இரண்டாம் ஆண்டு - மூன்றாம் பருவம் - 2014  
தாள் - III

**Total Hours : 90**

**Code : U12TL3TAM03**

**Hrs : 6Hrs /Wk**

**Marks : 100**

**Credit : 3**

நோக்கங்கள்:

1. வாழ்வின் கூறுகளாகிய அறம், பொருள், இன்பம், வீடுபேறு ஆகியவற்றின் வழிமுறைகளை எடுத்துரைத்தல்.
2. ஊடகங்களின் ஆழமான நுண்ணறிவை வெளிப்படுத்துதல்.

பயன்கள்:

1. காப்பியங்களை பயில்வதன் மூலமாக மாணவர்கள் அறக்கருத்துக்களை உணர்ந்து கொள்ளுதல்.
2. தமிழ் மொழியை செம்மொழியாக அறிவித்துள்ள இக்காலக்கட்டத்தில் தமிழ் இலக்கியத்தின் பயனை மாணவர்கள் முழுமையாக அறிந்துக் கொள்ளுதல்.
3. ஊடகங்கள் வெளிப்படுத்தும் நன்மை, தீமை ஆகியவற்றைப் பகுத்தறியக் கூடிய பக்குவத்தை அடைதல்.

அலகு:1 செய்யுள்

இயற்கை

நாட்டுப்பற்று

உழைப்பு

அலகு:2 செய்யுள்

மானம்

பெண்ணுரிமை

அலகு:3

தமிழ் இலக்கிய வரலாறு

சோழர் காலம்

அலகு:4

நாடகம்

தண்ணீர் தண்ணீர் - கோமல் சுவாமிநாதன்

அலகு:5

கோயிற்கலை - திட்டக்கட்டுரை, வினாடி வினா

பாட நூல்கள்

- |                             |                        |
|-----------------------------|------------------------|
| 1. செய்யுள் நூல்            | - தமிழ்த்துறை வெளியீடு |
| 2. தமிழ் இலக்கிய வரலாறு     | - தமிழ்த்துறை வெளியீடு |
| 3. நாடகம் - தண்ணீர் தண்ணீர் | - கோமல் சுவாமிநாதன்    |
| 4. கோயிற்கலை                | - தமிழ்த்துறை வெளியீடு |

(for the candidates admitted from June 2014 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002**  
**DEPARTMENT OF HINDI**  
**PART – I LANGUAGE HINDI FOR B.A, B.Sc & B.Com**  
**HINDI PAPER-III POETRY, PREDICS, HISTORY OF HINDI LITERATURE**  
**SEMESTER – III**

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

**CODE: U14HN3HIN03**  
**MARKS : 100**

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

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

**UNIT- III** : Bakthi Kaal

**UNIT- IV** : Poetics

3. Ras : Shringar, karun, Hasya, Veer
4. Alankar : Anupras, Yamak, Upama, Roopak
5. Chand : Choupayee, Baravai

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

Books Prescribed :

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



**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2**  
**DEPARTMENT OF FRENCH**  
**SYLLABUS**  
**SEMESTER III**

**PART I - LANGUAGE - FRENCH PAPER III**

[LANGUAGE & CIVILISATION

(ÉCHO A2 2<sup>e</sup> édition)]

(For candidates admitted 2013 onwards)

**HRS/WEEK : 6**

**CREDIT : 3**

**CODE : U14FR3FRE03**

**MARKS : 100**

**Unit 1 Vivement demain !**

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

**Unit 2 Tu as du boulot ?**

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

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

L'emploi du subjonctif , l'expression de la quantité – revue de presse – entrée en politique – la naissance des départements - la vie politique – l'organisation administrative et politique de la France.

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

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

**Unit 5 On se retrouve**

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

**TEXT BOOKS :**

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

Authors: J. Girardet and J. Pécheur

Publication: CLÉ INTERNATIONAL, 2010.

(for candidates admitted from 2013 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2.**  
**2014 - 2015**

**II B.A., B.Sc., B.Com., B.R.Sc., B.C.A., B.B.A., SEMESTER I**  
**PART II - ENGLISH III - GENERAL ENGLISH PAPER III**

NO.OF HRS/WK : 6

CODE: U10EL3GEN03

NO.OF CREDITS: 3

**OBJECTIVES**

To reinforce the LSRW skills of students.

To enhance their study skills and literary skills through a selection of prose extracts.

To develop soft skills such as presentation and group discussion skills.

To strengthen sub skills including vocabulary, grammar, comprehension, argumentative and imaginative writing

**UNIT I**

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

**UNIT II**

The Avenger : *Anton Chekov*

**UNIT III**

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

**UNIT IV**

The Second Crucifixion: *Larry Collins and Dominique Lapierre*

**UNIT V**

General Essay – 5 topics given

Idioms and Phrases - 20 Idioms and phrases given

**BOOKS FOR REFERENCE**

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

**List of Idioms and Phrases:**

1. To tuck in
2. In tune with
3. To frown upon
4. In favour of
5. In vogue
6. To gloat at
7. On the contrary
8. Prompted by
9. To pale to nothing
10. To wax enthusiastic
11. To figure one out
12. Crystal clear
13. Grey area
14. To have second thoughts
15. On red alert
16. On a fool's errand

17. To be taken aback
18. To storm
19. Trouble spots
20. Flood of humanity

### **GENERAL ESSAY TOPICS**

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

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**HOLY CROSS COLLEGE (AUTOMOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER III: MAJOR CORE**  
**PAPER- IV: ELECTRONICS**

**NO. OF HOURS/WEEK: 5**

**CODE: U08PH3MCT04**  
**NO. OF CREDITS: 5**

**Course Objectives :** To know the Fundamentals of Diodes, Transistors, FET, Rectifiers, Power supplies, Transistor Amplifiers, Feedback Amplifiers, Oscillators and Operational Amplifiers.

**UNIT I: SEMICONDUCTOR THEORY AND SEMICONDUCTOR DIODES**

Semiconductors – PN Junction diode – Biasing of PN junction – Volt-Ampere characteristics of a diode – PN junction diode as a Rectifier – Half wave Rectifier, Full wave Rectifier, Bridge Rectifier- Breakdown mechanisms- Zener diode- characteristics of zener diode- zener diode as a voltage regulator.

**UNIT II: TRANSISTORS**

Bipolar junction transistor – Basic configurations – Relation between  $\alpha$  and  $\beta$  – Study of the characteristics of a transistor- CB,CE mode – DC load line – DC bias and stabilization – fixed bias – voltage divider bias- JFET- Characteristics of JFET.

**UNIT III: TRANSISTOR AMPLIFIER**

Transistor as an amplifier – Transistor as a two port network –h parameters- Analysis of single stage CE amplifiers using h parameters – power amplifiers – efficiency of Class B power amplifier – push pull amplifier.

**UNIT IV: FEEDBACK AMPLIFIER AND OSCILLATORS**

General theory of feedback - properties of negative feedback- Emitter follower-current series feedback – Oscillators- criterion for sustained oscillations – LC oscillator circuit- Hartley oscillator - Colpitt's oscillator.

## **UNIT V: OPERATIONAL AMPLIFIERS**

Differential amplifier – common mode rejection ratio – Characteristics of an ideal OP-AMP – Pin diagram – virtual ground – Inverting amplifier – Non Inverting amplifier – Applications: Adder- Subtractor-Integrator-Differentiator-Unity gain buffer.

### **BOOKS FOR STUDY**

1. Bagde M.K., Singh S.P. and Kaman Singh - Elements of Electronics, S.Chand and company Ltd. (2002) (UNITS I, II, III, IV).
2. Narayana Rao B.V., Principles of Electronics, Vol III, Wiley Eastern And New Age International Limited, New Delhi, 2<sup>nd</sup> Edition (1988) (UNIT V).
3. Mehta V.K., Principles of Electronics, S.chand and Company Ltd,New Delhi,7 th Edition (2001) (UNIT IV).

### **BOOKS FOR REFERENCE**

1. Chattpadhyay D.C.,Rakshit P.C, Saha B. and Purkait N.N.,Foundation of electronics,Wiley Eastern Limited, New Delhi, 2<sup>nd</sup> Edition (1988)
2. Bhargava N.N, Kulshreshthra D.C.and Gupta S.G., Basic Electronics and Linear circuits- Tata Mc Graw Hill Publishing Co. Ltd, New Delhi (1984)
3. Sedha R.S., A text book of applied Electronics, S.Chand & company Ltd, New Delhi (2002).
4. Jose Robin and Ubald Raj, Electronics – II, Indira Publication, Marthandam (1998)
5. Theraja B.L., Basic electronics solid state,S. Chand and Company Ltd., New Delhi (2005).

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER III: MAJOR CORE**  
**PAPER V: MAIN PRACTICAL - II**

**NO. OF HOURS/WEEK: 6**

**CODE: U08PH3MCP05**  
**NO. OF CREDITS: 5**

**Course objective:** To understand the basic laws of optics and electricity by doing related experiments in optics , electricity and electronics

1. Conversion of Galvanometer into Ammeter
2. Conversion of Galvanometer into Voltmeter
3. Determination of temperature coefficient of thermistor using P.O Box
4. Determination of specific rotatory power of sugar solution using polarimeter
5. Study of Characteristics of a Zener diode
6. Construction of Zener regulator
7. Construction of Power pack
8. Study of transistor characteristics – common base configuration
9. Study of transistor characteristics – common emitter configuration
10. Study of the characteristics of JFET
11. Determination of refractive index of glass by forming Newton's rings
12. Determination of dispersive power of a prism using spectrometer
13. Determination of Cauchy's constant using Spectrometer
14. Determination of wavelength of spectral lines using a grating - normal incidence (spectrometer)
15. Determination of refractive index of the material of a prism – i-d curve (Spectrometer)
16. Determination of dispersive power of a grating (Spectrometer)

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**ALLIED PHYSICS (OPTIONAL PAPER – I)**  
**PROPERTIES OF MATTER, HEAT AND MODERN PHYSICS**

**CODE: U13PH3AOT01**

**NO. OF HOURS/WEEK : 4**

**NO. OF CREDITS: 3**

**COURSE OBJECTIVES:**

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 & the justifications for the vector model of an atom and the liquid drop model for a nucleus.

**UNIT – I: ELASTICITY**

Stress and Strain- Hooke's law - Elastic Moduli – Poisson's Ratio –relation between the elastic moduli-Bending of Beams – Bending Moment – Cantilever – Uniform and Non-uniform Bending – I shape of Girders - Torsion – Couple per unit twist – Torsion Pendulum.

**UNIT – II: FLUID MECHANICS**

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

**UNIT III: DIFFUSION AND OSMOSIS**

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- vapour pressure of a solution-elevation in boiling point and depression in freezing point of a solution.

**UNIT – III: THERMAL PHYSICS**

Transfer of Heat – Co-efficient of Thermal Conductivity – Experimental Determination of thermal conductivity of bad conductor – Lee's Disc --Radiation – Stefan's law of radiation- Solar constant- Angstrom's pyroheliometer- temperature of the sun.

Production of low temperature - Porous plug experiment - JK effect – Theory – Inversion Temperature – Liquefaction of Helium.

**UNIT – IV: ATOMIC AND NUCLEAR PHYSICS**

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 emissive cell -Vector Atom Model – Pauli's Exclusion Principle. Radioactivity – properties of radioactive radiations-law of Successive disintegration – Applications of radio isotopes - Age of earth – Properties of Nucleus – Charge, Spin, Mass –

Nuclear mass defect – Binding Energy – Packing fraction – Nuclear fission- Liquid drop model.

**BOOKS FOR STUDY:**

1. Murugesan R and Kiruthiga Sivaprasath Properties of matter and Acoustics (2nd ed.). New Delhi: S. Chand & company Ltd. (2012).
- 2 Murughesan R Mechanics S. Chand ,New Delhi , ( 2006)

**BOOKS FOR REFERENCE:**

1. Rajam J.B,Atomic Physics, S.Chand & Co.,
2. **Halliday, Resnick,Walker : Fundamentals of Physics**, 8th Edition , Wiley India Pvt. Ltd., (2008)
3. Mathur D.S, Mechanics, Thirteen edition, S.Chand & Co.,( 1998)
4. Murughesan , Modern Physics , S. Chand ,New Delhi ( 2006)
- 5 Brijlal and Subramaniam Text Book of Heat . Vikas Publishing House Pvt Ltd (1993).



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

**II YEAR: SEMESTER - III**  
**(From 2012 onwards)**

**GENDER STUDIES**

**Hours: 1Hr/wk**

**CODE: U12WS3GST01**

**CREDITS: 1**

**Objectives**

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

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

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

**Unit I Concepts of Gender :**

Sex-Gender-Biological Determination-Patriarchy-Feminism-Gender Discrimination-Gender Division of Labour - Gender stereotyping – Gender Sensitivity-Gender Equity – Equality – Gender Main streaming – Empowerment.

**Unit II Women's Studies Vs Gender Studies:**

UGC's Guidelines – VII to XI Plans –

Gender Studies : Beijing Conference and CEDAW-Exclusiveness and Inclusiveness.

**Unit –III Areas of Gender Discrimination :**

Family – Sex Ratio – Literacy – Health – Governance – Religion Work Vs Employment –

Market – Media – Politics – Law – Domestic Violence – Sexual Harassment – State Politics and Planning.

**Unit – IV Women Development and Gender Empowerment :**

Initiatives – International Women's Decade – International Women's Year – National Policy for Empowerment of Women – Women Empowerment Year 2001 – Mainstreaming Global Policies.

**Unit – V Women's Movements and Safeguarding Mechanism:**

In India National / State Commission for Women (NCW) – All Women Police Station – Family Court – Domestic Violence Act – Prevention of Sexual Harassment at Work Place Supreme Court Guidelines – Maternity Benefit Act – PNMT Act – Hindu Succession Act 2005 – Eve Teasing Prevention Act – Self Help Groups – 73<sup>rd</sup> Amendment for PRIs.

**BOOK FOR STUDY**

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

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

**HRS / Wk : 1**

**CODE: U12VE4LVE02**

**CREDIT : 1**

**MARKS : 100**

**OBJECTIVES:**

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

**UNIT – I: GENDER ISSUES**

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

**UNIT – II: WOMEN AND MEDIA**

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

**UNIT – III: SOCIAL ISSUES RELATED TO WOMEN**

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

**UNIT – IV: WAYS OF EMPOWERING WOMEN**

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

**UNIT – V: CYBER CRIME AGAINST WOMEN**

Harassment and Spoofing via e-mail, Cyber Stalking, Cyber Pornography, Morphing - Cyber Laws, social network, face book, and twitter

**REFERENCES:**

1. Dr.M.Arumairaj et al., 1999, "Marching towards the Millenium ahead".
2. Thomas Anjugandam, 1999, "Grow Free Live Free" Salesian Publicaiton.
3. H.C Pretti Nandhini Upreti, 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,"

**HOLY CROSS COLLEGE(AUTONOMOUS) TRICHIRAPALLI-2.**  
**B.A/B.Sc./B.Com/B.R.Sc/B.C.A – DEGREE COURSES**  
**LIFE ORIENTED EDUCATION**  
**BIBLE STUDIES – II: OLD TESTAMENT**

**HRS / WK :1**

**CODE: U12VE4LVBO2**

**CREDIT : 1**

**MARKS : 100**

**OBJECTIVE:**

- Understanding the desires of God through Prophetic revelation and becoming sensitive to the heart beat of God.

**UNIT – I: PURPOSE OF LIFE**

Creation of man – fall of man (Gen 1-4)

Plan of redemption through the life of :

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

**UNIT – II: JUDGES AND KINGS**

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

**UNIT – III: WOMEN IN THE BIBLE**

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

**UNIT – IV: MINOR PROPHETS**

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

## **UNIT – V: MAJOR PROPHETS**

- Brief Life History and teachings of
- Elijah(I Kings 17-19)
- Elisha(II Kings 4-6)
- Isaiah (Is 1,6,11,36-38,40-42,44,50,53,61)
- Jeremiah (Jer 1-3,7-12,18-19,23)
- Daniel (Daniel 1-6)

## **REFERENCES:**

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

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

**HRS / Wk : 1**

**CODE : U12VE4LVC02**

**CREDIT : 1**

**MARKS : 100**

**OBJECTIVES:**

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

**UNIT - I: MISSION OF THE CHURCH**

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

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

Work of the holy Spirit- Salt and leaven in the world “Church of modern World” Church as community – Its important aspect, early Christian Church – People of God as Church- Its characteristic and structure

**UNIT – III: THE FUNCTIONARY CHURCH AND I**

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

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

**UNIT – IV: SACRAMENTS AND SACRAMENTAL**

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

**UNIT – V: MARY AND SAINTS**

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

**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.

புனித சிலுவை தன்னாட்சிக் கல்லூரி, திருச்சிராப்பள்ளி – 620 002.

தமிழாய்வுத்துறை

இளம் வணிகவியல் / இளங்கலை / இளம் அறிவியல் பட்ட வகுப்பு

இரண்டாம் ஆண்டு – நான்காம் பருவம் - 2014

தாள் - IV

**Total Hours : 75**

**Hrs : 5Hrs /Wk**

**Credit : 3**

**Code : U12TL4TAM04**

**Marks : 100**

நோக்கங்கள்:

1. மாணவர்களுக்குத் தமிழர்தம் வாழ்வியல் விழுமியங்களை உணர்த்துதல்.
2. அறநெறிகள் வாழ்க்கைக்கு வழிகாட்டும் விதத்தினை எடுத்துரைத்தல்
3. சிகரம் தொட்ட படைப்பாளிகளின் சிந்தனைகளை வெளிப்படுத்துதல்
4. மொழித்திறன் வளர்த்தல்.

பயன்கள்:

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

அலகு:1 செய்யுள் கடமை

காலந்தவறாமை

ஒற்றுமை உணர்வு

அலகு:2 செய்யுள்  
நட்பு  
குடும்பமும் விருந்தோம்பலும்

அலகு:3  
தமிழ் இலக்கிய வரலாறு  
சங்ககாலம் - சங்கம் மருவியகாலம்  
எட்டுத்தொகை, பத்துப்பாட்டு, பதினெண்கீழ்க்கணக்கு நூல்கள்

அலகு:4  
உரைநடை  
சங்க இலக்கியம் (பெண்பாற் புலவர்கள்)  
கட்டுரைத் தொகுப்பு

அலகு:5  
பொது - மொழிபெயர்ப்பு

#### பாட நூல்கள்

1. செய்யுள் நூல் - தமிழாய்வுத்துறை வெளியீடு
2. தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறை வெளியீடு
3. சங்க இலக்கியம் கட்டுரைத் தொகுப்பு - தமிழாய்வுத்துறை வெளியீடு
4. மொழிபெயர்ப்பு - தமிழாய்வுத்துறை வெளியீடு

(for the candidates admitted from June 2014 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002**  
**DEPARTMENT OF HINDI**  
**PART – I LANGUAGE HINDI FOR B.A, B.Sc & B.Com**  
**HINDI PAPER-IV FUNCTIONAL HINDI & TRANSLATION**  
**SEMESTER – IV**

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

**CODE: U14HN4HIN04**  
**MARKS : 100**

**UNIT – I** Functional Hindi

**UNIT- II** Adhunic Kaal

**UNIT- III** General Essays

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

**UNIT- IV** Letter Writing

**UNIT- V** Anuvad Abhyas - III

Books Prescribed :

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



# HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2

## DEPARTMENT OF FRENCH

### SYLLABUS

#### SEMESTER IV

#### **PART I - LANGUAGE - FRENCH PAPER IV [LANGUAGE & CULTURE**

(ÉCHO A2 2<sup>e</sup> édition)]

(For candidates admitted 2013 onwards)

**HRS/WEEK : 5**

**CODE : U14FR4FRE04**

**CREDIT : 3**

**MARKS : 100**

#### **Unit 1 C'est la fête !**

Les pronoms objets directs et indirects – parler d'une fête – exprimer des goûts et des préférences – fêtes sans frontières – plats des fêtes – les jours fériés – les saisons – le calendrier – les fêtes traditionnelles, importées, francophones.

#### **Unit 2 Vous plaisantez !**

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

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

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

#### **Unit 4 À vos risqué et périls !**

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

#### **Unit 5 La vie est dure**

Les pronoms possessifs, les adjectifs, les pronoms indéfinis – parler de ses activités quotidiennes, exprimer la confiance ou la méfiance – les tâches ménagères – la France insatisfaite - sans travail – la chanteuse Diam's – le film 'Le Couperet de Costa-Gavras'.

#### **TEXT BOOKS :**

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

Authors: J. Girardet and J. Pécheur

Publication: CLÉ INTERNATIONAL, 2010.

(for candidates admitted from 2013 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2.**  
**2014 - 2015**

**II B.A., B.Sc., B.Com., B.R.Sc., B.C.A., B.B.A.,**  
**SEMESTER I PART II - ENGLISH IV -**  
**GENERAL ENGLISH PAPER IV**

NO.OF HRS/WK : 6  
NO.OF CREDITS: 3

CODE: U13EL4GEN04

**OBJECTIVES**

To strengthen the LSRW skills of students through inter-active approaches, participatory methods and activity oriented exercises.  
To develop skills required for referential and independent learning.  
To focus on writing skills like creative and comparative writing and book reviews.  
To reinforce sub skills including vocabulary, grammar, dialogue, report writing and note making.

**UNIT I: READ AND COMMUNICATE: HISTORICAL SKETCHES**

The Renaissance  
India under the British Raj

**UNIT II: READ AND COMMUNICATE : MODERN FABLES**

Nonchi Nona and Kotiya the Cat The Competition

**UNIT III: READ AND COMMUNICATE : MODERN FABLES**

The Nightingale and the Rose The Butterfly that Stamped

**UNIT IV -READ AND COMMUNICATE : BIOGRAPHIES AND MODERN FABLES**

Napoleon Bonaparte The Hiding Place

**UNIT V**

GRAMMAR

- Tenses COMPREHENSION - General

COMPOSITION

- 1. Note making

2.

Dialogue

3.

Creative Writing

4.

Narrative Writing

5.

Imaginative Writing GENERAL ESSAY – 5

TOPICS

1.

Should capital punishment be abolished?

2.

Is a corruption- free India a dream?

3.

The nuclear family and its consequent changes in society.

4.

The threat of terrorism.

5.

If man becomes immortal...

**THINK BETTER - READ AND COMMUNICATE : MODERN FABLES**

1 – 10 for Internal Testing

**BOOKS FOR REFERENCE**

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

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

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

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER IV: MAJOR CORE**  
**PAPER VI: OPTICS AND SPECTROSCOPY**

**NO. OF HOURS/WEEK: 5**

**CODE: U08PH4MCT06**

**NO. OF CREDITS: 5**

**Course objective:** To understand the basic laws of geometrical optics, interference of light, diffraction, polarisation and spectroscopy

**UNIT : I GEOMETRICAL OPTICS**

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.

**UNIT : II INTERFERENCE**

Interference in thin films-Wedge shaped films- Air wedge- Testing the planeness of a surface –determination of diameter of a thin wire –Michelson's Interferometer – Determination of wavelength of monochromatic light and difference in wavelength between neighbouring lines.

**UNIT : III 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.

**UNIT : IV POLARISATION**

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 – Rotatory Polarisation – Fresnel's theory of optical rotation – Specific rotation – Laurent's half shade polarimeter – Determination of specific rotatory power of sugar solution.

**UNIT : V SPECTROSCOPY**

IR Spectroscopy- Radiation Sources - Detectors – Dispersing systems – Wordsworth Prism – Mirror spectrograph - IR photography - uses – UV spectroscopy - Raman Effect – Explanation of Raman effect using simple Quantum theory – Experiment – Applications.

### **BOOK FOR STUDY**

1. Murugesan, R and Kiruthiga Sivaprasath, Optics and Spectroscopy, S.Chand and Company, Ltd.(2010)

### **BOOKS FOR REFERENCE**

1. Subramaniam 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, 16<sup>th</sup> Edition, Pragati Prakashan, Meerut (2001).

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER IV: MAJOR ELECTIVE- I**  
**BASICS OF DIGITAL ELECTRONICS**

**NO. OF HOURS/WEEK: 5**

**CODE: U08PH4MET01**  
**NO. OF CREDITS: 5**

**Course objective:** To understand the basic ideas of number system, Boolean algebra, combinational and sequential circuits, counters and shift registers.

**UNIT: I NUMBER SYSTEMS, CODES AND LOGIC GATES**

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 – Logic gates – Inverter, AND, OR, NAND, NOR gates – operation and truth tables.

**UNIT:II BOOLEAN ALGEBRA AND SIMPLIFICATION OF BOOLEAN EQUATIONS**

Boolean operations – Rules and Laws of Boolean Algebra – DeMorgan's theorems – NAND and NOR as Universal Building blocks — Boolean expressions for gate networks – Algebraic simplification of Boolean expressions – Minterms- Sum of Products– Karnaugh map forming up to four variables-Simplification using Karnaugh map- AND – OR, NAND- NAND circuit equivalence.

**UNIT: III ARITHMETIC, COMBINATIONAL AND SEQUENTIAL CIRCUITS**

Half adder – Full adder – Half subtractor – Encoder – Decoder – Multiplexer – Demultiplexer – Flip Flops- SR, D, JK and T Flip Flops – Clocked SR Flip Flop – Edge Triggering – Master slave JK Flip Flop.

**UNIT: IV COUNTERS AND SHIFT REGISTERS**

Modulus of a counter – Modulo –N counter (asynchronous counters) - asynchronous Decade counter- Synchronous counters using JK Flip Flop – Synchronous Decade counter – Up/Down Synchronous counters – Shift registers – Series and Parallel Shift registers – serial in/out, parallel in/out (SISO, SIPO, PIPO, PISO) registers.

**UNIT: V ANALOG TO DIGITAL AND DIGITAL TO ANALOG CONVERSION**

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

## **BOOKS FOR STUDY**

1. Malvino. A and Leach, Digital Principles and Applications, 4<sup>th</sup> Edition, Mc-Graw Hill, New York (1986).
2. Theraja B.L., Basic Electronics – Solid State- S. Chand and Company Limited, New Delhi, 1<sup>st</sup> Edition (2005).

## **BOOKS FOR REFERENCE**

1. William H. Gothmann, Digital Electronics- An Introduction to theory & Practice, Second Edition, Prentice Hall of India (1999).
2. Vijayendran V. Introduction to Integrated Electronics Digital And Analog , First Edition, S. Viswanathan (Printers & Publishers) Pvt., Ltd (2005).

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER IV: MAJOR ELECTIVE- I**  
**ENERGY PHYSICS**

**NO. OF HOURS/WEEK: 5**

**CODE: U08PH4MET02**  
**NO. OF CREDITS: 5**

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

**UNIT I: INTRODUCTION TO ENERGY SOURCES**

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.

**UNIT II: SOLAR ENERGY**

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.

**UNIT III: BIOMASS ENERGY**

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

**UNIT IV: GEOTHERMAL ENERGY**

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

**UNIT V: ENERGY STORAGE & IMPACTS OF NON-CONVENTIONAL ENERGY**

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

**BOOKS FOR STUDY:**

1. G.D. Raj, Solar Energy, 4<sup>th</sup> edition, (1997).
2. G.D. Raj, Non conventional energy sources, 4<sup>th</sup> edition, (1997).

**BOOK FOR REFERENCE:**

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



**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2**  
**DEPARTMENT OF PHYSICS**  
**ALLIED PHYSICS OPTIONAL PAPER –II**  
**ALLIED PHYSICS PRACTICAL**

**CODE : U13PH4AOP02**  
**NO OF CREDITS: 3**

**NO OF HOURS/WEEK: 4**

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

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 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 refractive index of a Prism using Spectrometer.
6. Determination of refractive index of a liquid using Spectrometer and Hollow prism.
7. Determination of dispersive power of a Prism using Spectrometer
8. Determination of wavelengths of prominent lines of mercury spectrum using grating
9. Study of Logic gates AND and OR using discrete components.
10. Construction of Bridge Rectifier.
11. Study of Junction Diode characteristics
12. Study of Zener Diode characteristics
13. Construction of Regulated Power Supply using Zener Diode
14. Verification of De Morgan's theorems
15. Study of NAND as universal gate.
16. Study of NOR as universal gate.

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2**  
**DEPARTMENT OF PHYSICS**  
**ALLIED PHYSICS OPTIONAL PAPER III**  
**SPECTROSCOPY, ELECTRICITY AND ELECTRONICS**

**NO.OF HOURS/WEEK: 4**

**CODE: U13PH4AOT03**  
**NO.OF CREDITS: 4**

**COURSE OBJECTIVES:**

To understand the concepts in spectroscopy, Electricity and Electromagnetism:

To acquire knowledge about the working of semiconductor devices and their applications and to appreciate the digital principles & their applications.

**UNIT I: SPECTROSCOPY**

Electromagnetic spectrum – theory of grating - difference between prism and grating spectrum- Rayleigh and Raman scattering- Quantum Theory of Raman Effect- Experimental arrangement- Applications of Raman Effect- LASER principles- Production of He-Ne Laser- Introduction to Optical fibre - Numerical aperture.

**UNIT II: ELECTRICITY**

Capacitors- principle of capacitor- Capacity of an isolated sphere- spherical capacitor- energy of a charged capacitor- sharing of charges and loss of energy-determination of absolute capacity using B.G.-comparison of capacities- De Sauty's bridge method.

**UNIT III : ELECTROMAGNETISM**

Laws of electromagnetic induction-Self induction of a coil-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.

**UNIT IV: ELECTRONICS**

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.

## **UNIT V: DIGITAL ELECTRONICS**

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.

### **BOOK FOR STUDY**

1. R.Murugeshan ,Allied Physics, Third edition, S.Chand , New Delhi ,2012
2. R.Murugeshan, Optics and spectroscopy, First edition, S.Chand , New Delhi ,2005

### **BOOKS FOR REFERENCE**

1. Brijlal and Subramaniam, Electricity and Magnetism, Palaniappa Bros., Chennai (1974)
2. Gupta and Kumar, Hand Book of Electronics, Pragathi Prakashan, Meerut (1970)
3. Jain, R.P., Modern Digital Electronics, Tata McGraw Hill India Ltd., New Delhi(1984)
4. Murugeshan R, Allied Physics , First edition, S.Chand , New Delhi 2005
5. David Halliday, Robert Resnik, Kenneth S. Krane, The Physics, John Willey and sons, Singapore, 2005

**HOLY CROSS COLLEGE ( AUTONOMOUS), TIRUCHIRAPPALLI-2**  
**B.A. /B.Sc. / B.Com. / B.R.Sc./ B.C.A. DEGREE COURSE**  
**LIFE ORIENTED EDUCATION**

**ETHICS – II: EMPOWERMENT OF WOMEN**

**HRS / Wk : 1**

**CODE: U12VE4LVE02**

**CREDIT : 1**

**ARKS : 100**

**OBJECTIVES:**

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

**UNIT – I: GENDER ISSUES**

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

**UNIT – II: WOMEN AND MEDIA**

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

**UNIT – III: SOCIAL ISSUES RELATED TO WOMEN**

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

**UNIT – IV: WAYS OF EMPOWERING WOMEN**

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

**UNIT – V: CYBER CRIME AGAINST WOMEN**

Harassment and Spoofing via e-mail, Cyber Stalking, Cyber Pornography, Morphing - Cyber Laws, social network, face book, and twitter

**REFERENCES:**

1. Dr.M.Arumairaj et al., 1999, "Marching towards the Millenium ahead".
2. Thomas Anjugandam, 1999, "Grow Free Live Free" Salesian Publicaiton.
3. H.C Prettì Nandhini Upreti, 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,"
6. Thomas B.Jayaseelan, 2002, "Women: Rights and law" Indian Social Institute, New Delhi.
7. Reni Jacob vol I & II, April- June 2004, "Vikasimi – The journal of Women's Empowerment, Ed,"

**HOLY CROSS COLLEGE(AUTONOMOUS) TRICHIRAPALLI-2.**  
**B.A/B.Sc./B.Com/B.R.Sc/B.C.A – DEGREE COURSES**  
**LIFE ORIENTED EDUCATION**  
**BIBLE STUDIES – II: OLD TESTAMENT**

**HRS / WK :1**

**CODE: U12VE4LVBO2**

**CREDIT : 1**

**MARKS : 100**

**OBJECTIVE:**

- Understanding the desires of God through Prophetic revelation and becoming sensitive to the heart beat of God.

**UNIT – I: PURPOSE OF LIFE**

Creation of man – fall of man (Gen 1-4)

Plan of redemption through the life of :

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

**UNIT – II: JUDGES AND KINGS**

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

**UNIT – III: WOMEN IN THE BIBLE**

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

**UNIT – IV: MINOR PROPHETS**

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

## **UNIT – V: MAJOR PROPHETS**

- Brief Life History and teachings of
- Elijah(I Kings 17-19)
- Elisha(II Kings 4-6)
- Isaiah (Is 1,6,11,36-38,40-42,44,50,53,61)
- Jeremiah (Jer 1-3,7-12,18-19,23)
- Daniel (Daniel 1-6)

## **REFERENCES:**

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

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

**HRS / Wk : 1**

**CODE : U12VE4LVC02**

**CREDIT : 1**

**MARKS : 100**

**OBJECTIVES:**

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

**UNIT - I: MISSION OF THE CHURCH**

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

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

Work of the holy Spirit- Salt and leaven in the world “Church of modern World” Church as community – Its important aspect, early Christian Church – People of God as Church- Its characteristic and structure

**UNIT – III: THE FUNCTIONARY CHURCH AND I**

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

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

**UNIT – IV: SACRAMENTS AND SACRAMENTAL**

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

**UNIT – V: MARY AND SAINTS**

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

**REFERENCES :**

1. “Vatican II Revised” Archbishop Angelo Fernandes Published by X.DiAx de Rio S.J.  
Gujarat Sahitya Prakash, P.O.Box. 70, Gujarat, 388001, India.
2. “The Sacraments The Word of God at the Mercy of the Body”  
Claretian Publications, Malleswaram, Bangalore 560055.

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER V: MAJOR CORE**  
**PAPER VII: ATOMIC AND NUCLEAR PHYSICS**

**CODE: U08PH5MCT07**

**NO. OF HOURS/WEEK: 5**

**NO. OF CREDITS: 4**

**Course objective:** To understand the basic principles and theories of atomic & nuclear physics

**UNIT: I PHOTO ELECTRIC EFFECT AND X – RAYS**

Photo electric effect - laws of photo electric emission- Einstein's photo electric equation – Millikan's experiment- photo electric cell- X- rays- characteristic and continuous spectrum- Compton effect- theory- experimental verification.

**UNIT: II ATOMIC MODEL**

Vector atom model- Pauli's exclusion principle- double fine structure of Sodium-Stern - Gerlach experiment- optical spectra- magnetic dipole moment due to orbital motion of the electron- magnetic dipole moment due to spin motion of the electron- Zeeman effect- experimental set up- explanation of normal Zeeman effect using classical theory.

**UNIT: III NATURAL RADIO ACTIVITY**

Radio activity- Successive disintegration - Radio active equilibrium- age of earth- Geiger Nuttall law- Alpha particle disintegration energy- alpha particle spectra- Beta ray spectra- origin of line and continuous spectrum- neutrino theory of beta decay.

**UNIT: IV ARTIFICIAL RADIO ACTIVITY AND ELEMENTARY PARTICLES**

Nuclear reactions- induced Radio activity- uses of radio isotopes- mass energy balance and Q- value- nuclear models- liquid drop and shell model - Elementary particles- ( introductory idea ) – classification of Elementary particles- Leptons- mesons- baryons- antiparticles- fundamental interactions- conservation laws.

**UNIT: V PARTICLE DETECTORS AND ACCELERATORS**

Detectors of radioactivity- GM counter-scintillation counter- - particle accelerators- linear accelerators- cyclotron- betatron.

**BOOK FOR STUDY:**

1. Murugesan, Modern Physics , S. Chand and company Ltd., Ram Nagar, New Delhi

**BOOKS FOR REFERENCE:**

- Rao .B.V.N., Modern Physics, (For Elementary Particles - Unit IV), Wiley Eastern Ltd., New Delhi (1993).
- Rajam. J.B., Modern Physics, S.Chand & Co. Pvt. Ltd, New Delhi (1972).



**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS) - SEMESTER V: MAJOR CORE**  
**PAPER – VIII: MATHEMATICAL PHYSICS AND CLASSICAL MECHANICS**

**NO.OF HRS. /WEEK: 5**

**CODE: U08PH5MCT08**

**NO.OF CREDITS: 4**

**Course Objectives :** To make the students familiar with special functions and their use in Solving problems- to understand about curve fitting- to evaluate the Correlation and regression coefficients- to know about the concepts in Classical mechanics, Lagrange and Hamiltonian functions, their physical significance and apply them in solving problems in Physics.

**UNIT I: SPECIAL FUNCTIONS**

Gamma & Beta functions – Properties of Beta and Gamma functions – relation between Beta and Gamma functions – Bessel’s differential equation - power series solution – Generating function – recurrence relations.

**UNIT II: CURVE FITTING**

Principle of least squares – Curve fitting by the method of least squares – small samples - Chi square test – definition - Additive property - Pearson’s statistics – uses of Chi square test – Test of goodness of fit.

**UNIT III: CORRELATION AND REGRESSION**

Correlation – Coefficient of correlation – Rank correlation – regression and lines of regression – Theory of errors.

**UNIT IV: CLASSICAL MECHANICS – I**

Degrees Of Freedom - Constraints – holonomic and non holonomic constraints – generalized coordinates – principle of virtual work – D’Alembert’s principle – Lagrange’s formulation – Derivation of Lagrange’s equations from D’Alembert’s principle – Applications of Lagrange’s equation to simple pendulum & Atwood’s machine.

**UNIT V: CLASSICAL MECHANICS – II**

Phase Space- Generalised momentum – Cyclic coordinates – conservation theorem for generalized momentum – conservation theorem for energy – Hamiltonian formulation – Hamilton’s equations from Lagrangian – Physical significance of Hamiltonian function – Applications of Hamilton’s equation to simple pendulum and motion of a particle in a central force field.

### **BOOKS FOR STUDY**

1. Gupta, Kumar and Sharma, Classical Mechanics, Pragati Prakasan, Meerut (2003) (Units IV & V).
2. Dass H.K., Mathematical Physics, S. Chand & Co (1999) ( Unit – I)
3. Gupta B.D., Mathematical Physics ,Vikas Publishing House Pvt Limited(2006) (Units II & III).

### **BOOKS FOR REFERENCE**

1. Rajput B.S., Mathematical Physics. Prakati Prakashan & Company, Meerut (2008).
2. Sathya Prakash, Mathematical Physics including classical mechanics, S.Chand & Company, New Delhi (1985).
3. Goldstein Herbert, Classical Mechanics – Narosa Publishing House, New Delhi (2001).

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER V: MAJOR CORE**  
**PAPER – IX: LASERS, QUANTUM AND STATISTICAL MECHANICS**

**NO. OF HRS. / WEEK: 5**

**CODE: U08PH5MCT10**  
**NO.OF CREDITS: 4**

**Course objective:** To understand the fundamentals of LASER & its applications and to be familiar with the laws of quantum and statistical mechanics.

**UNIT: 1: FUNDAMENTALS OF LASERS**

Basic theory of lasers – Spontaneous and stimulated emission – Population inversion – Pumping – Meta Stable State – Laser action – Einstein’s Co-efficients for spontaneous and stimulated emission – Threshold condition for laser action – Critical population inversion – Laser rate equation for two and three level lasers.

**UNIT II: LASERS AND APPLICATIONS**

Properties of Lasers- Types of lasers– Ruby laser – He-Ne laser – semiconductor laser – Applications of laser in holography, medicine and industry.

**UNIT III: QUANTUM MECHANICS**

Particle properties of waves– wave properties of particles – de Broglie waves – wave function- Phase velocity and group velocity – de Broglie wavelength – Davisson and Germer experiment – G.P.Thomson’s experiment – electron diffraction- Electron microscope – Heisenberg’s uncertainty principle – illustration of uncertainty principle.

**UNIT IV: SCHRÖEDINGER’S WAVE EQUATION**

Wave function for a free particle – Schrödinger’s wave equation – Physical significance of wave function – operators and Eigen values- Postulates of quantum mechanics – applications of Schrödinger’s equation – particle in a box – linear harmonic oscillator- hydrogen atom.

**UNIT V: STATISTICAL MECHANICS**

Macroscopic and Microscopic description – Statistical equilibrium – Postulates of statistical Mechanics – Boltzmann’s theorem on entropy and thermodynamic probability- Phase space – Three kinds of statistics – Maxwell – Boltzmann statistics - Application of M.B statistics to molecular energies in an ideal gas – Bose Einstein’s statistics – Application of B.E. statistics to photon gas- Fermi Dirac statistics – Application of F.D. statistics to electron gas – comparison of three statistics.

## **BOOKS FOR STUDY**

1. Avadhanulu. M.N – An introduction to lasers (Theory and application), 1<sup>st</sup> edition, S. Chand & Co. (2001) (Units I & II).
2. Murugesan R., Modern Physics, 10<sup>th</sup> revised revision, S.Chand & Co. (2002) (Units III, IV, V).
3. BrijLal & Subramaniyam M., Heat and Thermodynamics, S.Chand & Co. (2003).

## **BOOKS FOR REFERENCE**

1. Nambiar. K.R., Lasers, Principles types and Application, New Age international Publishers (P) Ltd (2005).
2. Bagde & Singh, Quantum Mechanics, S.Chand & Co., New Delhi.
3. Laud B.B., Lasers and Non-Linear Optics, 2<sup>nd</sup> Edition, New Age International (P) Limited, Publishers (2004).
4. Gupta and Kumar, Elementary Statistical Mechanics, Pragati Prakashan, 18<sup>th</sup> Edition (2002).

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER V: MAJOR CORE**  
**PAPER – X: MAIN PRACTICAL - III**

**NO.OF HOURS/WEEK: 5**

**CODE: U08PH5MCP12**  
**NO.OF CREDITS: 4**

**Course objective:** (i) To understand the basic role of various components in electronic circuits (ii) to build the circuits such as amplifiers, oscillators (iii) to study the basic digital circuits and (iv) to do simple programs in microprocessor.

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. Hartley Oscillator using transistor
5. 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. Verification of Truth Tables of Logic gates- Study of IC chips
10. Verification of De Morgan's theorems
11. Study of NAND & NOR as Universal logic builders.
12. Study of Encoders and Decoders
13. Karnaugh Map – Simplification of Boolean expression
14. Half adder, Half Subtractor and Full adder circuits
15. Microprocessor – Programming for addition, Multiplication and Block transfer
16. Microprocessor – Programming for Subtraction and division

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2.**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER V: MAJOR ELECTIVE II**  
**CIRCUIT AND NETWORK THEORY**

**NO.OF HRS. /WEEK :5**

**CODE: U08PH5MET01**  
**NO.OF CREDITS : 5**

**Course objective:** To understand the basic ideas of circuits and networks and to prove the network theorem and apply them to solve the problems.

**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

**BOOK FOR STUDY:**

1. SUDHAKAR. A, SHYAM MOHAN S.P., - CIRCUIT AND NETWORKS-ANALYSIS AND SYNTHESIS, Tata McGraw Hill Publishing Company Limited, New Delhi.

**BOOKS FOR REFERENCE:**

1. PARANJOTHI S.R., Electrical circuit analysis , NEW AGE PUBLISHERS.
2. Dr. BOLTON A.G., Dr. JAIN L.C. , Prof. Mithal A.K. , Networks and systems, Khanna Publishers, New Delhi.

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER V: MAJOR ELECTIVE II**  
**MICROPROCESSOR- INTEL 8085**

**NO. OF HOURS/ WEEK: 5**

**CODE: U08PH5MET02**  
**NO. OF CREDITS: 5**

**Course Objectives:** To know the operation of Intel 8085 & Instruction set, to write Simple Programs using the Instruction set of Microprocessor.

**UNIT: I INTRODUCTION TO MICROCOMPUTERS AND MEMORY ELEMENTS**

Digital computers – single chip microcomputers – General architecture of Microcomputer and microprocessor – CPU – Input/output devices – ALU – memory – types of memories – Semiconductor memories – RAM – static RAM – Dynamic RAM – ROM – Basics of PROM, EPROM and EEPROM – Program memory – real and virtual memory .

**UNIT: II ORGANIZATION OF INTEL 8085**

Architecture of Intel 8085 – functions of Individual blocks – registers in 8085 – Data Bus – address bus – control bus – pin configuration – Functions of individual pins – Opcode and operand – instruction word size – Instruction cycle – Fetch operation – Execute operation – Machine cycle and state – Instruction and data Flow.

**UNIT: III INSTRUCTION SET OF INTEL 8085**

Instruction and data formats – addressing modes – direct addressing – register addressing – register indirect addressing – immediate addressing – implicit addressing – status flags – Data transfer group – arithmetic group – logical group – branch control group – stack, I/O and machine control group.

**UNIT: IV PROGRAMMING OF MICROPROCESSOR**

Assembly language -stacks - subroutines - simple programs - addition, subtraction of 8 bit numbers - sum of a series of eight bit numbers - finding smaller/larger of two numbers - Finding smallest/largest element of an integer array- arranging an integer array in ascending and descending order - Multiplication and division of 8 bit numbers - finding square root.

**UNIT: V INTERFACING**

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- Applications Of 8255- Generation of square wave using 8255



## **BOOK FOR STUDY**

1. Ram B. Fundamentals of microprocessors and microcomputer – Fifth Edition, Dhanapat. Rai Publications (P) Ltd, New Delhi (2003).

## **BOOKS FOR REFERENCE**

1. Ramesh Gaonkar, Microprocessor: Architecture, Programming and Applications, 5<sup>th</sup> Edition, Wiley Eastern Limited, New Delhi.
2. Nagoor Kani A., Microprocessor and its applications, First Edition, RBA Publications, Chennai (1999).

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**SEMESTER V- NON MAJOR ELECTIVE - I**  
**BASICS OF COMPUTER ELECTRONICS**

**NO. OF HOURS / WEEK: 2**

**CODE: U08PH5NMT01**  
**NO. OF CREDITS: 2**

**UNIT I: NUMBER SYSTEM**

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

**UNIT II: LOGIC GATES**

Inverter – AND, OR, NAND, NOR, XOR gates – operation and truth tables- DeMorgan's Theorems – NAND, NOR Universal gates

**UNIT III: BOOLEAN ALGEBRA**

Boolean operations – Rules and laws of Boolean Algebra – Algebraic simplification of Boolean expressions

**UNIT IV: ARITHMETIC CIRCUITS & SIMPLIFICATION OF LOGIC CIRCUITS**

Half Adder – Full Adder – Half Subtractor – Implementation of Boolean expressions using networks

**UNIT V: MEMORIES**

Basic ideas of memory – Main memory And secondary memory – volatile and non volatile memory – program memory and Data memory – Semiconductor memories – ROM, PROM, EPROM AND EEPROM – Read-Write memory (RAM)

**BOOKS FOR STUDY:**

1. Albert Paul Malvino and Leach, Digital principles and applications , sixth edition, ( 1990 ) McGraw Hill
2. B.L.Theraja ,Basic Electronics , Thirteenth edition (2001) S. Chand & company. New Delhi

**BOOKS FOR REFERENCE:**

1. Floyd F., Basics of Digital Electronics, Fourth Edition, McMillan Publishing (1990).

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

**HRS / WK: 1**

**CODE:U12VE6LVC03**

**CREDIT: 1**

**MARKS: 100**

**OBJECTIVES:**

- To prepare the students to participate meaningfully in the liturgical celebration and experience GOD in their day today life.
- To become a living witness to Jesus Christ in their personal, family and social life.

**UNIT - I: LITURGY**

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

**UNIT – II: HOLY SACRIFICE OF THE MASS**

Significance – meaning and need for spiritual growth – mass prayers – part of the mass – liturgical year, its division and its significance. –Creed – Act of contrition – Discernment of spirits – Counseling – Spiritual direction.

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

Who am I as a Christian? – Christian dignity and others – The values of the Kingdom opposing to the values of the World – Christian social conscience – Christian in the reformation of the world – a call to be salt and light in today’s context-Come follow me-I have chosen you-Servant hood-Baptism-Common priesthood-Discipleship-Lay vocation-Lay participation-Lay associates.

**UNIT – IV: CHRISTIAN FAMILY**

Holy family- characteristic of good family – role of families in the church and society- Responsibilities of parents, and children in the family – church – laws towards marriage-Prolife (Abortion, Euthanasia).

**UNIT – V: CONSECRATED LIFE**

“Come and follow me” – special disciples - “I have called you to be mine”- - called to be prophets and agents for God’s Kingdom – nucleus of the church – Eschatological signs of the God’s Kingdom.

**REFERENCES:**

1. Compendium – Catechism for the Catholic Church Published by Vaigarai Publishing House for the Catholic Church of India.
2. You are the light of the World, A course on Christian living for II year Religion published by Department of Foundation Courses, St.Joseph’s College (Autonomous), Tiruchirappalli–620 002.

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

**B.A. /B.Sc. / B.Com. / B.R.Sc./ B.C.A. DEGREE COURSE**

**LIFE ORIENTED EDUCATION**

**ETHICS – III: FAMILY AND CAREER DEVELOPMENT**

**HRS / Wk : 1**

**CODE: U13VE6LVE03**

**CREDIT : 1**

**MARKS : 100**

**OBJECTIVES:**

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

**UNIT – I: PERSONAL COMPETENCE**

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

**UNIT - II: MARRIAGE AND FAMILY**

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

**UNIT – III: MOTHERHOOD**

Bringing up Children - Development stages (Eric Ericson model), Spirituality: Spirituality in Family - Prayer, God's Will, and 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.R.Sc./B.C.A – DEGREE COURSES**

**LIFE ORIENTED EDUCATION**

**BIBLE STUDIES – III: ESSENCE OF CHRISTIAN FAITH**

**HRS/WK:1**

**CODE: U12VE6LVBO3**

**CREDIT : 1**

**MARKS : 100**

**OBJECTIVE:**

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

**UNIT - I: ESSENTIALS OF CHRISTIAN FAITH**

- Salvation – Deliverance from sin (Is 53), Assurance of salvation and New life (II Cor 5:17)
- Sacraments – Baptism (Luke 3: 6-14), Lord's Supper (I Cor 10: 16,17; 11: 23-29)
- Trinity– One in three and three in one. Illustrations from the Bible. (John 14: 16,17)
- Heaven and Eternal life (John 14: 13, 3: 13-21)

**UNIT – II: MARIAGE AND FAMILY LIFE**

- Finding the God's Will - Issac (Gen 24)
- Man and woman as Partners – Abraham and Sarah (Gen 16-18,22) Aquila and Priscilla (Acts 18: 1-3,26)
- Evils to be avoided – Premarital Sex, Extramarital Sex, Homosexuality, Abortion(Heb 13: 4, Psalm 127 : 4)
- Ideal Wife – Sarah (I Peter 3: 1-6), Ruth, Eph 5

**UNIT – III: CHRISTIAN HOME**

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

**UNIT – IV: CHRISTIAN ETHICS**

- Holiness – Joseph (Gen 39:9) Levi 11: 45, Ecc 12
- Obedience to God - Abraham (Gen 12) ; St.Paul (Acts 9)
- Freedom and Accountability
- Justice and Love
- Choices in Life – Making Decisions(Studies, job, life Partner)
- Model to follow – Who is your model? (John 15: 1-17)
- Social Evils – Dowry, Caste discrimination, Accumulation of wealth
- Freedom of Options, Time Management, Work Ethics (I Peter 2: 11-25)

## **UNIT – V: ROLE IN CHURCH AND SOCIETY**

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

## **REFERENCES:**

1. Alban Douglass (1982) One Hundred Bible Lessons. Gospel Literature Service, Mumbai.
2. Derek Prince (1993) Foundations for Righteous Living. Derek Prince Ministries-South Pacific, New Zealand.
3. Derek Prince and Ruth Prince (1986) God is a Match maker. Derek Ministries, India.
4. Ron Rhodes(2005) Hand book on Cults. Amazon.com
5. Stanley.R. (1997) With God Again. Blessing Youth Mission, India.
6. Taylor.H. (1993) Tend My Sheep. SPCK, London.

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER VI: MAJOR CORE**  
**PAPER – XI: CONDENSED MATTER PHYSICS**

**NO.OF HOURS/ WEEK: 6**

**CODE: U08PH6MCT13**

**NO.OF CREDITS: 5**

**Course objective:** To understand the basic ideas of crystallography, magnetic materials, dielectrics and NDT

**UNIT: I BONDS IN SOLIDS AND ELEMENTARY CRYSTALLOGRAPHY**

Ionic, covalent, metallic, vander Walls and hydrogen bonds – properties- Crystal structure – crystal lattice – basis- unit cell – atomic radius in simple cubic, BCC, FCC – Bragg’s law – Bragg’s spectrometer – Miller indices – X-ray study of crystal structure – Laue method - powder crystal method – structure of simple crystals NaCl , KCl.

**UNIT: II MAGNETIC MATERIALS**

Intensity of Magnetization – Susceptibility – types of magnetic materials – Langevin’s theory of dia and para magnetic materials – Weiss theory of ferromagnetism – Elementary ideas of antiferromagnetism – properties of para, dia and ferromagnetic materials.

**UNIT: III CONDUCTOR, SEMICONDUCTOR AND SUPERCONDUCTOR**

Specific heat capacity of solids – Debye’s theory – Electrical conductivity – free electron theory – Wiedemann – Franz law – super conductivity – properties and applications – the Meissner effect – the BCS theory (simple idea)- Formation of bands in solids – classification of solids on the basis of band theory.

**UNIT: IV DIELECTRICS**

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).

**UNIT: V NON-DESTRUCTIVE TESTING TECHNIQUES**

Principles of NDT- methods of NDT- Types of detection- Analysis- Instrumentation- Advantages and disadvantages - Simple ideas of X– ray and gamma ray radiography- magnetic and ultrasonic methods of non – destructive testing- Applications of Non – Destructive testing in Industry.

## **BOOKS FOR STUDY**

1. Arumugam.S. Material Science, Anuradha Agencies, Kumbakonam (2003).
2. Study material prepared by the Faculty of Physics, Holy Cross College, Tiruchirappalli.

## **BOOKS FOR REFERENCE**

1. Saxena B.S., Gupta R.C. and Saxena P.N., Fundamentals of Solid State physics Pragati Prakashan, Meerut (2003).
2. Kakani S. L. and Hemarajani C, Solid State Physics, Sultan Chand & Sons (2005).



**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER: VI: MAJOR CORE**  
**PAPER – XII: COMMUNICATION PHYSICS**

**NO. OF HOURS/ WEEK: 6**

**CODE: U08PH6MCT14**  
**NO. OF CREDITS: 5**

**Course objective:** To understand the basic ideas of Radio, microwave, satellite and fiber optic communication systems and also study transmission lines and facsimile transmission.

**UNIT: I RADIO COMMUNICATION SYSTEM**

Modulation –Types of modulation- Analysis of amplitude modulated wave- carrier suppression- generation of SSB signals – Diode detector – receiver- super heterodyne receiver - Wave propagation – Ionosphere and propagation of sky waves-direct waves and ground waves.

**UNIT: II MICROWAVE COMMUNICATION**

Introduction - Generation of microwaves– Klystron oscillator– Reflex Klystron – Television picture tube– iconoscope – image orthicon – scanning – synchronization – T.V. Transmission – T.V. reception– Fundamentals of Colour T.V. – fundamentals of RADAR – RADAR equation – Type A and PPI displays – Automatic Tracking RADAR – Applications of RADAR.

**UNIT: III SATELLITE COMMUNICATION**

Introduction – Kepler’s 1st, 2nd and 3<sup>rd</sup> laws – orbits – station keeping – satellite attitude – power systems – transmission path – path loss – the Satellite earth station – Satellite station–Survey of Indian satellites and the purpose.

**UNIT: IV FIBER OPTIC COMMUNICATION**

Introduction – Principles of light transmission in a fiber – propagation within a fiber – listing of losses in fiber – light sources for fiber optics – LED , LASER diode – detectors – photo diodes – avalanche photo diode.

**UNIT: V LINE AND FASCIMILE TRANSMISSION**

Introduction – Transmission lines \_ Hertz Experiment – Fundamentals of Aerials – Radiation field, Radiation Resistance, Power radiated for a Dipole Antenna - Facsimile transmitter – cylindrical scanning - facsimile receiver – photographic reception – direct recording reception.

## **BOOKS FOR STUDY**

1. Ambrose A and Vincent Devaraj.T – Introduction to Electronics, Gaungal Mera,5<sup>th</sup> Edition (1992).
2. Dennis Roddy and John Coolen – Electronic Communication – 3<sup>rd</sup> Edition, Prentice Hall of India.

## **BOOKS FOR REFERENCE**

1. Deshpande N.D., Deshpande D. A., and Rangole P.K., Communication Electronics, Fifteenth reprint, Tata Mc Graw – Hill Publishing Company Limited, New Delhi (2001).
2. Kennedy, Electronic Communication systems, 4th Edition Tata Mc Graw – Hill publishing co.,Ltd.,New Delhi (2002).
3. Kumar R., Communication systems, Anuradha agencies, Educational publishers, Kumbakonam (2000).

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER VI: MAJOR CORE**  
**PAPER XIII -MAIN PRACTICAL IV-A**

**NO.OF HOURS/WEEK: 6**

**CODE: U08PH6MCP16**  
**NO.OF CREDITS: 5**

**Course 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.

1. Full Wave Rectifier with two diodes- with and without filter
2. Bridge Rectifier
3. Emitter Follower
4. OP-AMP - Adder and Subtractor
5. OP-AMP - Differentiator and Integrator
6. Flip Flops: R-S and J-K
7. Shift Registers
8. Modulus Counters using 7490
9. Microprocessor – Sum of Series of 8 – bit numbers
10. Multiplexer and Demultiplexer using ICs
11. Up, Down and Ring Counters
12. Study of Fiber Optic Characteristics
13. Construction of IC Regulated Power Supply
14. Microprocessor – Identifying the biggest and smallest number from a series
15. Microprocessor – Arranging the numbers in Ascending and descending orders
16. Microprocessor – Addition and multiplication of two 8-bit numbers

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER VI: MAJOR ELECTIVE-III**  
**INSTRUMENTATION**

**NO. OF HOURS/ WEEK: 5**

**CODE: U08PH6MET04**  
**NO. OF CREDITS: 5**

**Course objective:** To study the measurement and performance characteristics of electrical and electronic transducers.

**Unit I: MEASUREMENT AND PERFORMANCE CHARACTERISTICS**

Basic concepts of measurements- introduction- system configuration- basic characteristics of measuring devices- accuracy - precision- error- systematic and instrumental error- zero drift- installation error- operational error- linearity- Hysteresis-resolution- scale readability- threshold- reliability- calibration - performance characteristics of an instrumentation system- zero order system- step and ramp response of 1<sup>st</sup> order system.

**Unit II: TRANSDUCERS**

Basic Requirements Of a Transducer – Classification- Modulating Transducer- Generating Transducer- Strain Gauges- Bonded Strain Gauges and Unbonded Strain Gauge- Uses of Strain Gauges- Measurement of Temperature- Characteristics Of a Thermistor- - Measurement Of Temperature With Thermistor- Variable Inductance Transducer- Principle- LVDT.

**Unit III: ELECTRICAL INSTRUMENTATION**

Resistors- materials used for resistors- resistance standards- methods of reducing residual inductance and capacitance in resistors- DC potentiometer- basic potentiometer circuit- constructional details of potentiometers- applications of DC potentiometers- calibration of voltmeter and ammeter- measurement of resistance.

**Unit IV: ELECTRONIC INSTRUMENTATION**

Multimeter - Electronic voltmeters and their advantages- CRO- measurement of voltage, current, phase and frequency- recorders- necessity of recorders- analog- graphic strip chart recorders- principle of tape recorders- methods of recording- direct recording-frequency modulated recording.

**Unit V: TELEMETRY**

Methods of data transmission- telemetry- general telemetry system- electrical telemetry system- voltage, current and position telemetry system- Basic ideas of pulse modulation- pulse amplitude, pulse duration, pulse frequency and pulse code modulation- transmission channels and media- wireline, radio, microwave powerline, carrier channels.

## **BOOK FOR STUDY**

1. Sawhney A. K., Electrical and Electronic Measurements and Instrumentations – Dhanpat Rai & Sons, New Delhi (1989).

## **BOOKS FOR REFERENCE**

1. Umesh Sinha- Electrical and Electronic Measurements and Instrumentations – Satyaprakash Co., Delhi (1990).
2. William Cooper And Albert Helfrich, Electronic Instrumentation and measurement Techniques– Prentice Hall Of India, New Delhi (1987).
3. Rangan C.S., Instrumentation- Devices And Systems-McGraw Hill, New Delhi (1998).

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002**  
**DEPARTMENT OF PHYSICS**  
**B.Sc., (PHYSICS)**  
**SEMESTER VI: MAJOR ELECTIVE- III**  
**APPLIED ELECTRONICS**

**NO.OF HRS/WEEK. : 5**

**CODE: U08PH6MET05**

**NO.OF CREDITS: 5**

**Course objective:** To understand the basic ideas of fabrication, power electronic devices, optoelectronic devices, special diodes and MOSFETs.

**UNIT: I INTEGRATED CIRCUIT FABRICATION:**

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.

**UNIT: II : POWER ELETRONICS:**

Unijunction transistor – UJT relaxation oscillators – Silicon controlled rectifier – SCR Half wave rectifier – SCR full wave rectifier – Phase control of SCR – 90 Phase control of SCR – 180 phase control of SCR controlled circuit – DIAC – TRIAC – Silicon controlled switch.

**UNIT: III : OPTO ELECTRONIC DEVICES :**

Introduction – spectral response of human eye – Light emitting diode (LED) Photo emissive devices – Photo multiplier tube – Photo transistors – Photo voltaic devices – Bulk type photoconductive cells – Photo diodes – PN junction photo diode – PIN photodiode – Avalanche photo diode.

**UNIT: IV : SPECIAL DIODES AND DISPLAYS :**

Tunneling effect – Tunnel diode – Tunnel diode oscillators – Varactor diode – Schottky diode – Step recovery diode – Thermistors – Gunn effect – Gunn diode – Seven Segment display – Nixie tube – Decimal Decoders – Diode matrix.- Dot matrix

**UNIT: V : MOSFET :**

Introduction – Depletion type MOSFET – working of a depletion type MOSFET – Drain characteristic of Depletion type MOSFET – Transfer characteristic of depletion type MOSFET – Circuit symbol for depletion type MOSFET – Enhancement type MOSFET – Drain characteristics for Enhancement type MOSFET – Transfer characteristic for Enhancement type MOSFET – Circuit symbol for Enhancement type MOSFET – The MOSFET as a resistor – Advantages of N channel MOSFET over P Channel.

**BOOKS FOR STUDY:**

1. Microelectronics by Jacob Millman – Tata McGraw Hill Edition (Unit I)
2. Basic Electronics By B.L. Thereja (Units II, III & IV)
3. Applied Electronics by Sedha (Unit V)

**BOOKS FOR REFERENCE:**

1. Principles of Electronics by V.K. Mehta.
2. Electrical and Electronic Measurement and Instrumentation by A.K. Sawhney, Dhanpat Rai and Sons.

**HOLY CROSS COLLEGE (AUTONOMOUS) ,TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**SEMESTER: VI- NON MAJOR ELECTIVE - II**  
**BASICS OF MODERN COMMUNICATION SYSTEMS**

**NO. OF HOURS/WEEK: 2**

**CODE: U11PH6NMT02**  
**NO. OF CREDITS: 2**

**UNIT I: RADIO COMMUNICATION SYSTEM**

Electromagnetic Spectrum- Transmitter – receiver –need for modulation- types of modulation- Demodulation- super heterodyne receiver.

**UNIT II : TELEVISION**

Television – Transmission and reception- scanning synchronization– Basic ideas of colour T.V

**UNIT III: FIBER OPTIC COMMUNICATION SYSTEM**

Fiber optic communication system- Structure of optical fibers – principle of propagation of light waves in optical fiber –Advantages of optic fibers

**UNIT IV: SATELLITE COMMUNICATION**

Introduction – Geostationary orbit- Satellite Launching- Satellite earth station – Equipments on Satellite - Introduction to Indian satellites.

**UNIT V: CELLPHONE AND INTERNET**

Introductory ideas on cell phone - INTERNET (Basic ideas)- E-MAIL (Basic ideas).

**BOOKS FOR STUDY**

1. Mehta V.K., Principles of Electronics, S.Chand and Company Ltd, New Delhi, 7<sup>th</sup> Edition (2001).
2. Theraja B.L., Basic Electronics (solid state), S. Chand and Co., Ltd., New Delhi (2005).

**BOOKS FOR REFERENCE**

1. Dennis Roddy & John Coolen-Electronic Communication, 3<sup>rd</sup> Edn, Prentice Hall Of India.
2. Kumar. R Communication systems, Anuradha Agencies, Educational publishers, Kumbakonam (2000).



**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**SKILL BASED ELECTIVE– PHYSICS FOR LIFE SCIENCES**

**CODE: U11PH3SBP03 (SBE3-II B.Sc., Zoology) /**  
**U11PH5SBP04 (SBE4- III B.Sc., Botany)**

**HRS/ WEEK: 2                      NO. OF CREDITS: 2 PRACTICAL SYLLABUS**

**ANY TEN OF THE FOLLOWING:**

**UNIT I :**

1. Defects in eye (Field visit)
2. Focal length of convex lens and power of lens
3. Focal length of concave lens and power of lens
4. Study of progressive lens

**UNIT II:**

5. Numerical Aperture measurement using LASER beam
6. Thickness of a wire using Laser
7. Thickness of thin fibers- air wedge method
8. Concentration of sugar in sugar solution – Saccharimeter

**UNIT III:**

9. Surface tension – Capillary rise method
10. Viscosity measurement - Burette method (low viscous liquids)
11. Viscosity measurement - Redwood viscometer (high viscous liquids)
12. Density of a liquid by Hare's apparatus.

**UNIT IV:**

13. Oscilloscope – Study of wave forms
14. Oscilloscope - Lissajou's figures
15. Decibel meter – Measurement loudness of a voice
16. Ultra sonogram

**UNIT V:**

17. Crystal Growth – preparation of stock solution
18. Crystal Growth – sol-gel method
19. Crystal Growth – slow evaporation method
20. Crystal Properties (Calculi) – Field visit.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**SEMESTER V- SKILL BASED ELECTIVE (SBE-4 for Physics students)**

**TROUBLE SHOOTING AND MAINTENANCE OF ELECTRONIC EQUIPMENTS**

**CODE: U08PH5SBT04**

**NO. OF HRS /WEEK: 2**

**NO. OF CREDITS: 2**

**UNIT I – FUNCTIONAL ASPECTS OF ELECTRONIC EQUIPMENT**

Reliability Aspects – Equipment Failures – Causes Of Failures – Reliability Predictions – Maintenance Policy – Process Of Trouble Shooting – Manual And Its Importance.

**UNIT II – TROUBLE SHOOTING PROCEDURES**

Testing Instruments– Multimeter – Oscilloscope - Systematic Trouble Shooting Checks – Corrective Action – Preventive Maintenance.

**UNIT III – PASSIVE COMPONENTS**

Resistors – Types – Identification Marking In Resistors - Failures in Fixed Resistors – Capacitor – Types– Identification Marking In Capacitors - Failures in Fixed Capacitors.

**UNIT IV – SEMICONDUCTOR DEVICES**

Types Of Semi Conductors Devices – Causes Of Failures In Semi Conductors Devices – PN Junction Diodes – Zener Diodes – LED.

Bipolar Transistor – Symbols and Terminals – Field Effect Transistor

**UNIT V – TESTING OF PASSIVE AND ACTIVE COMPONENTS**

Testing Of Resistors – Capacitors – Inductors – Diodes – Transistors – FET

**BOOK FOR STUDY**

1. R.S. Khandpur, Modern electronic Equipment, Tata McGraw Hill Publishing Company Ltd.

**BOOKS FOR REFERENCE**

1. Millmann J. Halkias, Electronic Circuits and Devices, Printice Hall India, New Delhi.

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI**  
**DEPARTMENT OF PHYSICS**  
**SEMESTER VI- SKILL BASED ELECTIVE (SBE-5)**  
**PRINTED CIRCUIT TECHNIQUES**

**CODE: U08PH6SBT05**

**NO. OF HRS /WEEK: 2**

**NO. OF CREDITS: 2**

**UNIT I PRINTED CIRCUIT FUNDAMENTALS**

Introduction- Reading Electronic symbols- Drawing symbols into schematic diagrams- Printed Layout Tracing- Pattern Layout Pads- ( for the components: Resistors, Capacitors and Diodes only)

**UNIT II PRINTED CIRCUIT BOARD LAYOUT DESIGN**

Single Sided Printed Circuit Board - Layout Design Requirements – Preliminary Layout Techniques – Designs Specifications And Procedures – Taping The Master Layout- PCB Design software.

**UNIT III FILM PROCESSING FOR SINGLE SIDED PCB**

Taped Layout – Making A Negative From A Taped Layout - Photo Processing – Negative Film Processing – Constructing A Printed Circuit Board Holder

**UNIT IV FABRICATION OF THE PRINTED CIRCUIT BOARD**

Cutting And Cleaning Process – Photoresists – Procedure For Applying Negative Photoresists – Kodak Photoresist Method - KPR – 3 Process – Developing And Etching Process.

**UNIT V ASSEMBLING THE PRINTED CIRCUIT BOARD**

Selection Of Tools for Assembling – Safety Rules For Handling The Tools – Resistor, Capacitor, Diode PCB Mounting Techniques Cleaning After Soldering.

**BOOK FOR STUDY**

1. George Geragosian, Printed Circuit Fundamentals, Reston Publishing Company – A Printice Hall Company, Reston, Virginia (1985).

**BOOKS FOR REFERENCE**

1. Millmann J. Halkias, Electronic Circuits and Devices, Printice Hall India, New Delhi.
2. Khandpur, R.S., “Modern Electronic Equipment” - Trouble Shooting, Repair and Maintenance, Tata Mc Graw Hill Company Ltd, New Delhi (1992).

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

**UG – SEMESTER: VI**

**SKILL BASED ELECTIVE: 6**

**RESEARCH METHODOLOGY**

**CODE: U13DS6SBT06**

**NO. OF HRS /WEEK: 2**

**NO. OF CREDITS: 2**

**COURSE OBJECTIVE:** To be familiar with literature survey, execution and presentation of project.t

**UNIT: 1- SELECTION OF A PROBLEM**

Identification of the Problem - Awareness of current state of art – Determining the mode of attack.

**UNIT: 2 - LITERATURE SURVEY**

Possible way of getting oneself abreast of current Journal – Journal Survey – Survey through Internet.

**UNIT: 3- EXECUTION OF THE RESEARCH WORK**

Guidance from the Supervisor – Actual Investigation – Results and Conclusions - documentation

**UNIT: 4- PRESENTATION OF RESULTS**

Art of writing the thesis – Structure of a research report – Writing and presenting in a Seminar/ conference – Oral & poster presentation.

**UNIT: 5- PROJECT**

Project

**BOOKS FOR REFERENCE**

1. Kothari C.R. Research Methodology, New Delhi: New Age International (P) Ltd Publishers, 2009. Reprint
2. Rahim F.A. Thesis Writing: A Manual for researchers, New Delhi: New Age International Publishers, 1988. Print.
3. Gopalana. Thesis Writing. Chennai: Vijay Nicole, 2005. Print.
4. Oliver, Paul, Writing Your Thesis. New Delhi: Sage Publication, 2008. Print

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

**HRS / WK: 1**

**CODE:U12VE6LVC03**

**CREDIT: 1**

**MARKS: 100**

**OBJECTIVES:**

- To prepare the students to participate meaningfully in the liturgical celebration and experience GOD in their day today life.
- To become a living witness to Jesus Christ in their personal, family and social life.

**UNIT - I: LITURGY**

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

**UNIT – II: HOLY SACRIFICE OF THE MASS**

Significance – meaning and need for spiritual growth – mass prayers – part of the mass – liturgical year, its division and its significance. –Creed – Act of contrition – Discernment of spirits – Counseling – Spiritual direction.

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

Who am I as a Christian? – Christian dignity and others – The values of the Kingdom opposing to the values of the World – Christian social conscience – Christian in the reformation of the world – a call to be salt and light in today’s context-Come follow me-I have chosen you-Servant hood-Baptism-Common priesthood-Discipleship-Lay vocation-Lay participation-Lay associates.

**UNIT – IV: CHRISTIAN FAMILY**

Holy family- characteristic of good family – role of families in the church and society- Responsibilities of parents, and children in the family – church – laws towards marriage-Prolife (Abortion, Euthanasia).

**UNIT – V: CONSECRATED LIFE**

“Come and follow me” – special disciples - “I have called you to be mine”- - called to be prophets and agents for God’s Kingdom – nucleus of the church – Eschatological signs of the God’s Kingdom.

**REFERENCES:**

3. Compendium – Catechism for the Catholic Church Published by Vaigarai Publishing House for the Catholic Church of India.
4. 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.

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

**B.A. /B.Sc. / B.Com. / B.R.Sc./ B.C.A. DEGREE COURSE**

**LIFE ORIENTED EDUCATION**

**ETHICS – III: FAMILY AND CAREER DEVELOPMENT**

**HRS / Wk : 1**

**CODE: U13VE6LVE03**

**CREDIT : 1**

**MARKS : 100**

**OBJECTIVES:**

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

**UNIT – I: PERSONAL COMPETENCE**

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

**UNIT - II: MARRIAGE AND FAMILY**

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

**UNIT – III: MOTHERHOOD**

Bringing up Children - Development stages (Eric Ericson model), Spirituality: Spirituality in Family - Prayer, God's Will, and 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.R.Sc./B.C.A – DEGREE COURSES**

**LIFE ORIENTED EDUCATION**

**BIBLE STUDIES – III: ESSENCE OF CHRISTIAN FAITH**

**HRS/WK:1**

**CODE: U12VE6LVBO3**

**CREDIT : 1**

**MARKS : 100**

**OBJECTIVE:**

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

**UNIT - I: ESSENTIALS OF CHRISTIAN FAITH**

- Salvation – Deliverance from sin (Is 53), Assurance of salvation and New life (II Cor 5:17)
- Sacraments – Baptism (Luke 3: 6-14), Lord's Supper (I Cor 10: 16,17; 11: 23-29)
- Trinity– One in three and three in one. Illustrations from the Bible. (John 14: 16,17)
- Heaven and Eternal life (John 14: 13, 3: 13-21)

**UNIT – II: MARIAGE AND FAMILY LIFE**

- Finding the God's Will - Issac (Gen 24)
- Man and woman as Partners – Abraham and Sarah (Gen 16-18,22) Aquila and Priscilla (Acts 18: 1-3,26)
- Evils to be avoided – Premarital Sex, Extramarital Sex, Homosexuality, Abortion(Heb 13: 4, Psalm 127 : 4)
- Ideal Wife – Sarah (I Peter 3: 1-6), Ruth, Eph 5

**UNIT – III: CHRISTIAN HOME**

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

**UNIT – IV: CHRISTIAN ETHICS**

- Holiness – Joseph (Gen 39:9) Levi 11: 45, Ecc 12
- Obedience to God - Abraham (Gen 12) ; St.Paul (Acts 9)
- Freedom and Accountability
- Justice and Love
- Choices in Life – Making Decisions(Studies, job, life Partner)
- Model to follow – Who is your model? (John 15: 1-17)
- Social Evils – Dowry, Caste discrimination, Accumulation of wealth
- Freedom of Options, Time Management, Work Ethics (I Peter 2: 11-25)

## **UNIT – V: ROLE IN CHURCH AND SOCIETY**

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

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