(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
B.Sc. CHEMISTRY- COURSE PATTERN
(2014-2015)

Semester	Part	Course	Title of the Course	Code	Hrs./wk.	Credits	Marks
I	I	Language	Tamil Paper I/ Hindi Paper I/ French Paper I	U12TL1TAM01/ U14HN1HIN01/ U13FR1FRE01	6	3	100
	II	English	English Paper I	U10EL1GEN01	6	3	100
	III	Major Core - 1	General Chemistry I	U14CH1MCT01	7	6	100
		Allied – 1 (Compulsory)	Allied - Allied Chemistry Paper I	U10CH1AOT01	4	4	100
		Allied – 2 (Compulsory)	Allied Chemistry- II Practicals (for Botany and Zoology)	U11CH1AOP02	4	3	100
	IV	Environmental Studies	Environmental Studies	U14RE1EST01	2	2	100
		Value Education	Ethics-I/ Bible Studies-I/ Catechism-I	U12VE2LVE01/ U12VE2LVB01/ U12VE2LVC01	1	-	-
TOTAL					30	21	600
II	I	Language	Tamil Paper II/ Hindi Paper II/ French Paper II	U12TL2TAM02/ U14HN2HIN02/ U13FR2FRE02	5	3	100
	II	English	English Paper II	U10EL2GEN02	6	3	100
	III	Major Core –2	General Chemistry II	U14CH2MCT02	7	6	100
		Major Core –3	Practical – 1 : Semimicro analysis	U08CH2MCP03	3	2	100
		Allied – 3 (Compulsory)	Allied - Allied Chemistry Paper III	U10CH2AOT03	4	3	100
	IV	Skill-based Elective -1	Soft Skill Development	U14RE2SBT01	2	2	100
		Skill-based Elective – 2	Rural Enrichment and Sustainable Development	U08RE2SBT02	2	2	100

		Value Education	Ethics I/ Bible Studies I/ Catechism I	U12VE2LVE01 / U12VE2LVB01/ U12VE2LVC01	1	1	100
	Total				30	22	800

Semester	Part	Course	Title of the Course	Code	Hrs./wk.	Credits	Marks
III	I	Language	Tamil Paper III/ Hindi Paper III/ French Paper III	U13TL3TAM03/ U14HN3HIN03/ U14FR3FRE03	6	3	100
	II	English	English Paper III	U10EL3GEN03	6	3	100
	III	Major Core – 4	General Chemistry – III	U13CH3MCT04	6	6	100
		Major Core – 5	Volumetric Analysis - Theory Cum Lab - I	U12CH3MCP05	4	4	100
		Allied – 4 (Optional)	Allied Chemistry-I(For Physics)	U08CH3AOT01	4	3	100
		Skill-based Elective–3	Beauty Care	U08CH3SBT03	2	2	100
			Experimental Chemistry For Life Science [For Botany]	U14CH3SBP04	2	2	100
	IV	Value Education	Ethics -II/ Bible Studies-II/ Catechism -II	U12VE4LVE02/ U12VE4LVB02/ U12VE4LVC02	1	-	-
		Gender studies	Gender studies	U12WS3GST01	1	1	100
Total					30	22	700
IV	I	Language	Tamil Paper IV/ Hindi Paper IV/ French Paper IV	U13TL4TAM04 U14HN4HIN04 U14FR4FRE04	5	3	100
	II	English	English Paper IV	U13EL4GEN04	6	3	100
	III	Major Core –6	General Chemistry – IV	U13CH4MCT06	5	5	100
		Major Elective - 1	Physical Chemistry - Theory Cum Lab – II (Separation Techniques and Virtual Lab Experiments)/ Physical Chemistry Theory Cum Lab –	U14CH4MEP01/	5	5	100

			III(Verification of Colligative properties)	U14CH4MEP02			
		Allied – 5 (Optional)	Allied Chemistry-I(For Physics)	U08CH4AOT02	4	4	100
		Allied – 6 (Optional)	Allied Chemistry –II (For Physics)	U08CH4AOP03	4	3	100
	IV	Value Education	Ethics II/ Bible Studies II/ Catechism II	U12VE4LVE02 U12VE4LVB02 U12VE4LVC02	1	1	100
	Total				30	24	700

Semester	Part	Course	Title of the Course	Code	Hrs./wk.	Credits	Marks
V	III	Major Core – 7	Inorganic Chemistry	U08CH5MCT07	4	3	100
		Major Core – 8	Organic Chemistry - I	U08CH5MCT08	4	4	100
		Major Core – 9	Physical Chemistry - I	U08CH5MCT09	4	4	100
		Major Core – 10	Practical II – Gravimetric, Organic analysis and Organic Preparation / III – Physical Chemistry	U08CH5MCP10/ U08CH5MCP11	8	5	100
		Major Elective – 2	Dairy chemistry/ Polymer Chemistry/ Chemistry of Biomolecules	U08CH5MET01/ U08CH5MET02/ U08CH5MET03	5	5	100
	IV	NME – 1	Home Care/ Cosmetology	U08CH5NMT01/ U08CH5NMT02	2	2	100
		SBE – 4	Experimental Chemistry for Life Science [For Zoology]	U14CH5SBP04	2	2	100
	IV	Value Education	Ethics -III / Bible Studies-III / Catechism-III	U12VE6LVE03 U12VE6LVB03 U12VE6LVC03	1	-	-
Total					30	25	700
VI	III	Major Core – 11	Organic Chemistry -II	U14CH6MCT12	5	5	100
		Major Core – 12	Physical Chemistry- II	U08CH6MCT13	5	5	100
		Major Core –	Practical III - Physical	U08CH6MCP11/	8	5	100

		13	Chemistry / II-Gravimetric, Organic analysis and Organic Preparation	U08CH6MCP10			
		Major Elective – 3	Environmental Pollution / Dye Chemistry/ Food Chemistry/ Analytical Chemistry	U08CH6MET01 U08CH6MET02 U08CH6MET03 U08CH6MET04	5	5	100
	IV	NME – 2	Home Care/ Cosmetology	U08CH6NMT01/ U08CH6NMT02	2	2	100
		SBE – 5	Forensic Science	U12CH6SBT05	2	2	100
		SBE – 6	Research Methodology	U13DS6SBT06	2	2	100
		Value Education	Ethics -III / Bible Studies-III / Catechism-III	U112VE6LVE03 U12VE6LVB03 U12VE6LVC03	1	-	-
	V	Extension Activity	RESCAPES-Impact Study of Project	U08RE6ETF01	-	1	100
	Total				30	27	800
Grand Total					180	140+1	4300

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

TAMIL DEPARTMENT

BA/ B.SC/ B.COM DEGREE

Part - I : Language: Tamil Paper - 1

Total Hours : 90 **Code : U12TL1TAM01**
Hrs : 6Hrs /Wk **Marks : 100**
Credit : 3

நோக்கங்கள்:

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

பயன்கள்:

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

பாடத்திட்டம்

அலகு:1 செய்யுள்

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 – 2

DEPARTMENT OF HINDI
SEMESTER I
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 :

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

HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
DEPARTMENT OF FRENCH

SYLLABUS

SEMESTER I
PART I – LANGUAGE - FRENCH PAPER I [GRAMMAR & CIVILISATION
(ÉCHO A1 2e édition)]
(For candidates admitted 2013 onwards)

HRS/WEEK : 6 CODE : U13FR1FRE01
CREDIT : 3 **MARKS : 100**

Unit 1 Parcours d'initiation ; Vous comprenez

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

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

Unit 2 Au travail!
La conjugaison des verbes du 1er groupe, des accords, les articles – l'état civil, des personnes et des objets caractéristiques d'un pays – exprimer ses gouts – première approche de la société française.

Unit 3 On se détend!

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

Unit 4 Racontez-moi ! ; Bon voyage !

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

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

Unit 5 Bon appétit!

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

TEXT BOOKS :

ECHO A1 – METHODE DE FRANÇAIS & CAHIER PERSONNEL D'APPRENTISSAGE
Authors: J. Girardet and J. Pécheur Publication: CLÉ INTERNATIONAL, 2012.

HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
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.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER I
MAJOR CORE – 1: GENERAL CHEMISTRY I

Hours: (Theory 5 + Practical 2)
Credits : 6 **Code: U14CH1MCT01**

Course objectives: To know first law of thermodynamics, its terms, energy work, heat, Cp, Cv relation, Joule-Thomson effect, Heat reactions, thermochemical laws and bond energy. To study qualitative analysis of acid and basic radicals. To understand the various effects and to study important reactions in alkenes, alkynes and dienes.

UNIT I

Qualitative Analysis

1.1 Basic principles of chemical analysis, solubility product, definition, limitations, applications of solubility product, complexation, oxidation and reduction.

1.2 Wet tests – Reactions of dil. and con. H_2SO_4, preparation of soda extract – tests for the acid radicals – halides, phosphate, oxalate, fluoride, sulphate, borate, arsenite, arsenate and chromate. Tests to distinguish bromide from nitrate, oxalate from carbonate.

1.3 Interfering acid radicals and their removal – Oxalate, borate, fluoride, phosphate and arsenate. Separation of cations into groups.

1.4 Semi Micro Analysis of Simple Salts.

UNIT II

Various Effects and Isomerism

2.1 Various effects operating in organic compounds – Inductive effect, Electromeric effect, Resonance, Hyperconjugation, Steric effect and Mesomeric effect.

2.2 Isomerism – Types, definition and examples. Tautomerism: Keto-enol, amido – imido, nitro – acinitro tautomerim.

2.3 Geometrical Isomerism – Cis-trans (maleic and fumaric acids), Syn-anti Nomenclature (aldoxime-ketoximes).

UNIT III

Unsaturated Hydrocarbons

3.1 Alkenes : Nomenclature, preparation and Properties: addition – Markownikoff's and anti Markownikoff's rule, reactions showing stereo specificity and non stereo specificity, hydroboration, allylic substitution by NBS – mechanism, Polymerisation – Free radical, cationic and anionic polymerization.

3.2 Alkynes - Acidity of acetylene, Properties – oxidation, ozonolysis, hydroboration, polymerization.

3.3 Dienes - Conjugated, isolated and cumulated dienes. Diels Alder reaction – endo rule, 1,2 & 1,4 addition, kinetic and thermodynamic control, stabilities of isolated and conjugated dienes.

UNIT IV

Thermodynamics – I

4.1 Importance and Limitations of Thermodynamics, terms and definitions – system, macroscopic properties, state variables, thermodynamic equilibrium, extensive and intensive properties, processes and their types, exact and inexact differentials, concept of heat and work.

4.2 First Law of Thermodynamics:- Statement, the energy content, work, heat and energy changes, heat and work - not properties of a system, thermodynamic reversibility, work of expansion against constant external pressure, isothermal reversible work of expansion.

4.3 Heat changes at constant volume and constant pressure, heat content, definitions of Cp and Cv, relationship between Cp and Cv, reversible adiabatic expansion and compression, adiabatic relationships.

UNIT V

Gases and Thermochemistry:

5.1 Gases – Boyel's law, Charles law, Avogadro's law, Ideal gas equation, deviations from ideal behavior.

5.2 Joule-Thomson experiment, Joule-Thomson coefficient – derivation, sign and magnitude of Joule-Thomson coefficient, inversion temperature, derivation of inversion temperature in terms of Vanderwaal's constants.

5.3 Heat of reaction, Heat changes at constant pressure and constant volume, types of heat of reactions – heat of formation, combustion, neutralization and solution. Effect of temperature on heat of reaction – Kirchoff's equation.

5.4 Thermochemical laws – the Lavoisier and Laplace law, Hess's law of constant heat summation and its applications. Bond energies.

Books For Study

1. Jain M.K. (2003). *Organic chemistry* (12th edn). New Delhi: Shoban Lal Nagin Chand and Co.
2. Puri B.R., Sharma L.R. and Madan S. Pathania, (2008).*Principles of Physical Chemistry (*35th edn).New Delhi: Shoban Lal Nagin chand and Co.

Books For Reference

1. Samuel Glasstone,(1974). *Thermodynamics for Chemists (* 3rd printing). East-West Edn.
2. Gopalan R., Subramanian P.S. and Rengarajan K, (1993).*Elements of Analytical Chemistry.* New Delhi: Sultan Chand and sons.
3. Puri B.R. and Sharma, L.R. (1989).*Principles of Inorganic Chemistry.* New Delhi: Sultan Chand.
4. Soni P.L. and Chawla H.M.(2004).*Text Book of Organic Chemistry(* 26th edn). New Delhi: Sultan Chand and sons.
5. Tewari K.S., Mehrotra S.N. and Vishnoi N.K. (1994).*A Text Book of Organic Chemistry.* New Delhi: Vikas publishing House Pvt., Ltd.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER I
ALLIED – 1: ALLIED CHEMISTRY PAPER I
[For Botany and Zoology]

HOURS: 4Hrs./Wk.
Credit: 4 **CODE: U10CH1AOT01**

Objectives: To make the students to understand the basic concepts in organic chemistry, carbohydrates and heterocyclic compounds, periodic properties, quantum numbers, chemical equilibrium and kinetics, chromatography and osmosis.

UNIT I:

Fundamental Concepts of Organic Chemistry:

1.1 Types of organic reactions - substitution, addition, elimination, rearrangement and polymerization reactions and reagents – common elelctrophiles, nucleophiles and free radicals.
1.2 Inductive, resonance, hyper conjugation and steric effects – an elementary idea. States of hybridization of carbon.
1.3 Isomerism –structural isomerism, types definition and example.

UNIT II:

Carbohydrates and Heterocyclic compounds:

2.1 Carbohydrates – classification, glucose, fructose and sucrose – preparation, properties and uses.
2.2 Heterocyclic compounds: Furan, Pyrrole, Thiophene, Pyridine – Preparation, properties and uses.

UNIT III:

3.1 Quantum numbers:- Principal, Azimuthal, Magnetic and spin quantum numbers. Electronic configuration of elements – Aufbau principle, Hund's rule and Pauli's exclusion principle.
3.2 Long form of periodic table, division of elements into s, p, d and f blocks, cause of periodicity.
3.3 Periodic properties – atomic radius, ionic radius – Ionization energy – Electron affinity and Electronegativity – definition and variation along a group and a period.

UNIT IV:
Chemical Equilibrium and Chemical Kinetics:

4.1 Chemical equilibrium – Criteria of homogeneous and heterogeneous equilibria, Decomposition of HI, N_2O_4 and $CaCO_3$, Le-chatlier's principle and its application to manufacture of NH_3 by Haber's process.
4.2 Kinetic equations for I and II order, order of reactions and their determination.

UNIT V:

Chromatography and Osmosis:

5.1 Chromatography – Column, Paper and Thin layer, Electrophoresis.

5.2 Osmosis – Osmotic pressure and its determination, reverse osmosis.

BOOKS RECOMMENDED:

REFERENCE BOOKS:

1. Gopalaratnam M.V., Parthasarathi T.K., Kandaswami A., (1975), 'B.Sc., Ancillary Chemistry', Part I Physical Chemistry, Jothi Publications, 3rd edn.
2. Soni P.L., Chawla H.M., (2004), 'Text Book of Organic Chemistry', Sultan Chand & Sons, 26th edn.
3. Vasudevan K.S., Jeyasubramanian R., Ramasami V., (1985), "Chemistry B.Sc., Ancillary", Part-I & II, Einstein Publishers, 2nd edn.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER I
ALLIED : 2 - ALLIED CHEMISTRY PRACTICAL PAPER II
[FOR BOTANY ANDZOOLOGY]

Hours : 4Hrs./wk.
Credits : 3 **Code: U11CH1AOP02**

OBJECTIVES:

To expose the students to the theory of volumetric analysis and also to develop practical skills by giving them certain experiments in volumetric analysis.

VOLUMETRIC ANALYSIS: (10 hrs.)

1.1 Definitions:- Titration, Back Titration, End point, Equivalence point, Indicator, Normality, Molality, Molarity, Mole Fraction, Equivalent weights of acid, base, salt, oxidizing and reducing agents.

1.2 Standard solution, requirements of a primary standard, preparation of standard solution, secondary standard, principle of volumetric analysis.

1.3 Acid-Base titrations – HCl with NaOH, CH_3COOH against NaOH, Na_2CO_3 with HCl. Acid-Base indicators – Ostwald's theory and quinonoid theory.

1.4 Redox titrations – Mohr salt against $KMnO_4$, Oxalic acid with $KMnO_4$, $FeSO_4$ against $K_2Cr_2O_7$. Redox indicator – Diphenyl amine, Iodometry - Estimation of copper sulphate

VOLUMETRIC ANALYSIS (DOUBLE TITRATION WITH WEIGHING):
(3 hrs. External)

I Acidimetry and Alkalimetry:

1. Estimation of sodium hydroxide.
2. Estimation of hydrochloric acid.

II Permanganometry:

3. Estimation of Mohr's Salt.
4. Estimation of Oxalic acid.

III Iodometry:

5. Estimation of copper sulphate

IV Dichrometry:

6. Estimation of iron (internal indicator)

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

Hrs – 2/Week **CREDITS : 2**

Unit I–Awareness and Natural Resources

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

Unit II–Ecosystems and Biodiversity

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

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

Unit III–Environmental Pollution

Causes, effects and control of water, and air pollution–global warming–ozone

depletion– Nuclear hazards.

Unit IV–Human population and Environment

Population growth at national and global level.

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

Environmental pollutions and diseases-malaria- chikungunya

Unit V–Environment and Social Issues

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

Changing value systems –AIDS

Family welfare programs

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) TIRUCHIRAPPALLI -2
B.A/B.Sc./B.Com/B.R.Sc/B.C.A-DEGEE COURSES
LIFE ORIENTED EDUCATION
CATECHISM – I: GOD OF LIFE

HRS / WK :1 **CODE :U12VE2LVC01**
MARKS : 100 **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

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-
- Messianie Prophecier (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 Scuddar & St. Britto (Oriyur)
- Amy Carcheal
- Mother Teresa (Calcutta)
- Devasagayam (Nagercoil)
- Staines & Family

REFERENCES:

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

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.

HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2

DEPARTMENT OF HINDI
HINDI PAPER-II PROSE, DRAMA, GRAMMAR-II, COMPREHENSION
SEMESTER –II

HRS/WEEK : 5 **CODE: U14HN2HIN02**
CREDITS : 3 **MARKS : 100**

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

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

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

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

UNIT- V : Comprehension – Prose passages

Books Prescribed :

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

(For candidates admitted 2013 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2

DEPARTMENT OF FRENCH

SEMESTER II

PART I - LANGUAGE - FRENCH PAPER II

[GRAMMAR, CIVILISATION & TRANSLATION (ÉCHO A1 2e édition)]

HRS/WEEK : 5 CODE : U13FR2FRE02

CREDIT : 3 **MARKS : 100**

Unit 1 Quelle journée !

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

Unit 2 Qu'on est bien ici !
Les prépositions et les adverbes, les verbes exprimant un déplacement – le logement, la localisation, l'orientation, l'état physique, le temps qu'il fait – demander de l'aide, exprimer une interdiction – le climat en France, les cadres de vie (ville et campagne)

Unit 3 Souvenez-vous ?
Emplois du passé composé et de l'imparfait – les moments de la vie, la famille, les relations amicales, amoureuses, familiales – demander/donner des informations sur la biographie d'une personne – le couple et la famille.

Unit 4 On s'appelle ?

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

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

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

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

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

for candidates admitted from 2013 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2.

II B.A., B.Sc., B.Com., B.R.Sc., B.C.A., B.B.A

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

1. Creative Writing
2. Narrative Writing
3. 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.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER II
MAIN CORE PAPER – 2: GENERAL CHEMISTRY – II

Theory: 7 hrs./wk
Credits: 6 **Code: U14CH2MCT02**

Course objectives: To make the students to learn about s & p block elements.
To study the nomenclature, structure, reactions of aromatic hydrocarbons.To learn the second and third law of thermodynamics.

UNIT I

S-Block Elements

1.1 General characteristics of S-block elements with respect to atomic and ionic radii, ionization energy, reducing properties, the electro positive character, hydration of ions, oxidation potentials, flame colouration, lattice energy and chemical properties.

1.2 Trends in physical and chemical properties of compound. Comparison of Li with other elements of group I, comparison of Be with other elements of group II, Diagonal relationship between Li and Mg; Al and Be. Biological functions of Na,K, Ca and Mg ions.

1.3 Compounds of S-block elements: $NaNH_2$, NaCN, $NaNO_2$ – preparation, properties and uses. Structure of $BeCl_2$ based on VSEPR theory. Portland cement – composition, manufacture and setting of cement.

UNIT II

P-Block Elements

2.1 Characteristics of P-block elements – comparative study of P-block elements, group trends in electronic configuration, atomic and ionic radii, ionization potential, electron affinity, electronegativity, oxidation states, inert pair effect, oxidizing and reducing property, flame colouration, catenation and important class of compounds such us hydrides, oxides and halides.

2.2 MOT of O_2 and F_2 Application of VSEPR theory to BF_3, PCl_3, CCl_4. IF_3, IF_5 and IF_7.

2.3 Compound of Boron: Diborane, Borazole, Borax – preparation, properties, structure and uses. Compounds of carbon: Unique character of carbon, intercalation compounds of graphite, fullerenes. Formation of carbon nano tubes.

Self Study:

2.4 **Compounds of Nitrogen group elements**: Ammonium nitrate, urea, Graham salt and super phosphate of lime, preparation, properties and uses.
Compounds of oxygen group elements: Preparation, properties and structure of ozone, oxidizing properties of H_2SO_4, important applicatons of selenium.
Compounds of halogen group elements: Interhalogen compounds, pseudo halogens, positive nature of iodine, chlorofluoro carbons – applications and hazard. Biological functions and Toxicity of iodine.

UNIT III

Aromatic Hydrocarbons:

3.1 Nomenclature, Structure of benzene, stability of benzene ring, molecular orbital picture of benzene, aromaticity, Huckel's rule and its applications.

3.2 Electrophilic substitution reaction in aromatic compounds – general mechanism, Mechanism for nitration, sulphonation, halogenation, Friedel Craft's reaction, Reactions of benzene ring.

3.3 Effect of substituent groups – activating and deactivating groups, directive influence, orientation.

3.4 Aromatic polynuclear hydrocarbons – Naphthalene, Anthracene and Phenanthrene – synthesis, properties and uses.

UNIT IV

Second Law of Thermodynamics

4.1 The second law of thermodynamics:- Need for the second law of thermodynamics, spontaneous or irreversible processes, statements of the II law, conversion of heat into work – the carnot's theorem, the carnot cycle, maximum efficiency of heat engine, refrigeration engine, the thermodynamic scale of temperature.

4.2 Entropy – definition, entropy changes in reversible and irreversible processes, entropy change and phase change, entropy changes of ideal gases, entropy of mixing, entropy and disorder.

4.3 Variation of entropy with temperature – Maxwell's relations, the thermodynamic equations of state.

4.4 Free energy and work function, definition, work function and free energy relationships, the Gibbs-Helmholtz equations, conditions of equilibrium.

UNIT V

Chemical Potential And third Law of Thermodynamics

5.1 Chemical potential – partial molar properties, physical significance of partial molar property, partial molar free energy – Gibb's-Duhem equation, Variation of chemical potential with temperature and pressure.

5.2 Chemical potential in a mixture of ideal gases, Clausius-Clapeyron equation.

5.3 The third law of thermodynamics – Nernst heat theorem, the third law, determination of absolute entropies of solids, liquids and gases, exceptions to III law, applications of III law of thermodynamics.

5.4 Free energy and chemical reactions – Vant-Hoff reaction isotherm. Standard free energy of reaction, Variation of equilibrium constant with temperature – The Vant-Hoff's equation.

Books For Study

1. Puri B.R. and Sharma L.R. (1989) 'Principles of Inorganic Chemistry' Sultan Chand.
2. Puri B.R., Sharma L.R. and Madan S. Pathania, (1994), 'Principles of Physical Chemistry, 35th edn. Shoban Lal Nagin chand and Co., Delhi.

Books For Reference

1. Jain M.K., 'Organic Chemistry', 12th edn. Shoban Lal Nagin Chand and Co.
2. Tewari K.S., Mehrotra S.N. and Vishnoi N.K., (1994) 'A Text Book of Organic Chemistry', Vikas publishing House Pvt., Ltd.
3. Soni P.L. and Mohankatyal (1992) 'Text book of Inorganic Chemistry' 20th revised edition, sultan chand.
4. Soni P.L. and Chawla H.M., (2004), 'Text Book of Organic Chemistry', 26th edn. Sultan Chand and sons, Delhi.
5. Samuel Glasstone D.Sc., Ph.D., (1974) Text Book of physical Chemistry, 2nd edition.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER II
MAIN CORE – 3: PRACTICAL –I : SEMIMICRO ANALYSIS

Hours:3hrs./wk.
Credits: 2 **Code: U08CH2MCP03**

Objectives: To impart in students the skill in the analysis of Inorganic salts.

1. Reactions of the following Radicals:

   Lead, Copper, Bismuth, Cadmium, Iron, Aluminium, Zinc, Manganese, Cobalt, Nickel, Calcium, Strontium, Barium, Magnesium and Ammonium.

   Sulphate, Carbonate, nitrate, Fluoride, Chloride, Bromide, Oxalate, Phosphate, Borate and Arsenite.

2. Analysis of Mixtures containing two cations and two anions of which one will be an interfering ion.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER – II
ALLIED - 3 (Optional): ALLIED CHEMISTRY PAPER III
[For Botany and Zoology]

Hours: 4Hrs./Wk. **Total Hours: 50**
Credits: 3 **Code:U10CH2AOT03**

Objectives: To make the students to learn about coordination chemistry, Amino acids and proteins, thermodynamics, electrochemistry and photochemistry.

UNIT: I

Co-ordination Chemistry:

1.1 Nomenclature of mono nuclear complexes, Theories of coordination compounds – Werner, Sidgwick and Pauling theories.
1.2 Chelation and its industrial importance with particular reference to EDTA. Biological role of haemoglobin and chlorophyll.

UNIT: II

Amino acids and Proteins:

2.1 Amino acids: Classifications, preparation and properties. Peptides – peptide linkage.
2.2 Proteins – definition, classification based on physical properties and biological function, primary and secondary structures (elementary treatment).

UNIT: III

Thermodynamics:

3.1 First law of thermodynamics – internal energy, work done in reversible isothermal and adiabatic processes, Enthalpy of a system.
3.2 Second law of thermodynamics – Carnot cycle, Carnot theorem – statement, entropy, free energy and work function (Basic concepts alone).

UNIT: IV

Electrochemistry:

4.1 Electrical conductance –Conductance, specific conductance, equivalent conductance and molar conductance, determination of conductance, variation of specific and equivalent conductances with dilution.
4.2 Kohlrausch's law and its application to determine Λo of a weak electrolyte, Conductometric titrations – HCl Vs NaOH, KCl Vs $agNO_3$, CH_3COOH Vs NaOH.
4.3 Determination of pH by conductivity method, buffer solution.

UNIT: V

Photochemistry

5.1 Photochemistry – Photochemical reactions – Lambert's law, Beer's law, Stark Einstein's law of photochemical equivalence.
5.2 Photochemical processes – fluorescence, phosphorescence and Chemiluminescence, Photosensitized reactions.

BOOKS RECOMMENDED:

TEXT BOOKS:

1. Vasudevan K.S., Jeyasubramanian R., Ramasami V., (1985), 'Chemistry B.Sc., Ancillary", Part-I & II, Einstein .

REFERENCE BOOKS:

1. Puri B.R., Sharma L.R., Kalia K.C., 'Principles of Inorganic Chemistry', Vallabh Publications.
2. Puri B.R., Sharma L.R. and Madan S. Pathania., (1994), 'Principles of Physical Chemistry', Shoban Lal Nagin Chand and Co., 35^{th} edn.

HOLY CROSS COLLEGE(AUTONOMOUS),TIRUCHIRAPPALLI

B.A/B.Sc./B.Com/B.R.SC/B.C.A/B.B.A DEGREEEXAMINATION

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,1st Ed., Grace Publishers,

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

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI–2
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 igions- Globalization.

UNIT – II: DIFFERENT RELIGIONS

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

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) TIRUCHIRAPPALLI -2
B.A/B.Sc./B.Com/B.R.Sc/B.C.A-DEGEE COURSES
LIFE ORIENTED EDUCATION
CATECHISM – I: GOD OF LIFE

HRS / WK :1 **CODE :U12VE2LVC01**
MARKS : 100 **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:

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

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-
- Messianie Prophecier (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 Scuddar & St. Britto (Oriyur)
- Amy Carcheal
- Mother Teresa (Calcutta)
- Devasagayam (Nagercoil)
- Staines & Family

REFERENCES:

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

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 : U13TL3TAM03**
Hrs : 6Hrs /Wk **Marks : 100**
Credit : 3

நோக்கங்கள்:

1. வாழ்வின் கூறுகளாகியஅறம், 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 **CODE: U14HN3HIN03**

CREDITS : 3 **MARKS : 100**

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

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

UNIT- III : Bakthi Kaal

UNIT- IV : Poetics

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

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

Books Prescribed :

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

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

SYLLABUS

SEMESTER III
PART I - LANGUAGE - FRENCH PAPER III [LANGUAGE & CIVILISATION
(ÉCHO A2 2e édition)]
(For candidates admitted 2013 onwards)

HRS/WEEK : 6 CODE : U14FR3FRE03
CREDIT : 3 **MARKS : 100**

Unit 1 Vivement demain !

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

Unit 2 Tu as du boulot ?
Le pronom « en » et « y » - exprimer une condition : si + présent, si + passé composé, exprimer des préférences – les emplois de demain - des idées pour créer une entreprise – le travail en France.

Unit 3 Qu'en pensez-vous?

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

Unit 4 C'est tout un programme !
Les propositions relatives, la formation des adverbes, la forme « en + participe présent » - parler de la télévision et de la radio - comment les Français s'informent (la télévision et la presse en France)

Unit 5 On se retrouve

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

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

(for candidates admitted from 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 III 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 errandTo be taken aback
17. To storm
18. Trouble spots
19. 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?

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER III
MAJOR CORE – 4 : GENERAL CHEMISTRY – III

Hours: 6 Hrs./Week
Credits: 6 **Code: U13CH3MCT04**

OBJECTIVES:

To make the students to learn about the general characteristics of d-block elements and their compounds, derivatives of hydrocarbons, alkyl halides, nucleophilic substitution and elimination reaction and kinetics.

UNIT: I

1.1 General characteristics of d-block elements – electronic configuration, comparative study of elements of first transition series with reference to atomic and ionic radii, ionization potential, oxidation states, magnetic properties, complex formation, catalytic activities and colour.
1.2 Biological function and toxicity of elements – Cr, Mn, Co, Ni, Cu, Mo, Cd, Hg, Pb, Fe and Zn.
1.3 Prussian blue – preparation, uses and structure. Verdigris – preparation and uses. Stainless steel, alloys of Au, Cu and Ag - Composition and uses. Oxidizing properties of $K_2Cr_2O_7$ and $KMnO_4$. TiO_2, V_2O_5, sodium nitroprusside – preparation, properties and uses.
1.4 Ammonium molybdate, amalgams, philosopher's wool (ZnO), colloidal Au, Tungsten carbides, silver chloride – properties and uses.

UNIT: II

2.1 Alcohols - distinction of primary, secondary and tertiary alcohols. Thioalcohol (Ethyl Mercaptan), Poly-hydric alcohols (Glycol and Glycerol). Unsaturated alcohol (Allyl alcohol) – preparation and properties.
2.2 Ethers - (Diethyl ether and anisole). Epoxide (Ethylene oxide). Thioether (Ethyl Sulphide) - Mustard gas – preparation and properties.
2.3 Phenols – Acidic character of phenols – explanation on the basis of resonance stabilization. Ring substitution in phenols – Orientation of phenolic group towards electrophiles, esterification, nitration, sulphonation, halogenation, coupling, Kolbes reaction (mechanism), Reimer-Tiemann reaction (mechanism). Gattermann, Lederer-Manasse, Liebermann's and Hoesh reactions.
2.4 Cresols, substituted phenols, Di and Trihydric phenols and naphthols – Preparation and reactions.

UNIT: III

3.1 Aromatic and aliphatic Alkyl halides and haloalkenes - preparation and properties, Grignard reagents and their synthetic uses.
3.2 Aliphatic nucleophilc substitution – Mechanisms of SN1, SN2 and SNi reaction, Effect of solvents, leaving groups, nucleophiles and structure of substrates.
3.3 Elimination reactions – Hoffman, Saytzeff eliminations, mechanism of E1 and E2, elimination Vs substitution.

UNIT: IV

Chemical Kinetics I:

4.1 Empirical laws and experimental aspects – Rate laws, stoichiometry, order and molecularity of reactions, setting up and solving simple differential equation and derivation of half-life period for first order reaction.
4.2 Setting up and solving simple differential equations and derivation of half-life periods for second order, third order and zero order reactions, determination of order of reactions.
4.3 Experimental techniques involved in the following kinetics of reactions – volumetry, manometry, dilatometry, polarimetry and colorimetry – typical examples for each of the techniques.
4.4 Postulates of the kinetic theory of gases, Maxwell's distribution of molecular velocities and energies, collision diameter, collusion frequency, mean free path.

UNIT: V

Chemical Kinetics II:

5.1 Theoretical aspects: Effect of temperature on the rate constant – Arrhenius equation – activation energy.
5.2 The collision theory of reaction rates and its limitations. The theory of absolute reaction rates – comparison of collision theory with the absolute reaction rate theory, significance of free energy of activation and entropy of activation.
5.3 Lindemann's theory of unimolecular reactions, thermal chain reactions – hydrogen-bromine reaction.
5.4 Catalysis – Types of Catalysis- Homogeneous catalysis – the intermediate compound formation theory – Enzyme catalysis – the mechanism of enzyme catalysed reaction.
5.5 Heterogeneous catalysis – the adsorption theory – active centers – poisoning of catalyst – Langmuir's adsorption isotherm.

BOOKS RECOMMENDED:

TEXT BOOKS:

1. Puri B.R., Sharma L.R. and Madan S. pathania, (1994), "Principles of Physical Chemistry', Shoban Lal Nagin Chand and Co, 35th edn.
2. Puri B.R. and Sharma L.R., (2002), 'Principles of Inorganic Chemistry', Shoban Lal Nagin Chand and Co.
3. Soni P.L., Mohan Katyal, (1992), "Text Book of Inorganic Chemistry', Sultan Chand, 2oth revised edn.

REFERENCE BOOKS:

1. Cotton and Wilkinson, 'Advanced Inorganic Chemistry', 6th edn., 2002, John Wiley & Sons, INC.
2. Esmarch S. Gilreath, (1958), 'Fundamental concepts of Inorganic Chemistry', International student edn., Mcgraw-Hill Kogakusha, ltd.
3. Gurtu J.N. and Amit Gurtu, (1979), 'Chemical Kinetics', 5th edn., Mittal K.K.
4. Glasstone S., (1967), 'Source Book on Atomic Energy', Affiliated East West Press, 3rd edn.
5. Gurdeep Chatwal and Yadav M.S., (1992) 'Co-ordination Chemistry', Himalaya Publishing House, Ist edn.
6. Madan R.D., (1987), 'Modern Inorganic chemistry', S. Chand and Company (PVT) limited. Ist edn.
7. Samuel Glasstone D.Sc. Ph.D., 'Text Book of Physical Chemistry', 2nd edn. (1974).

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER III
MAINCORE – 5: VOLUMETRIC ANALYSIS – Theory Cum Lab -I

Hours: 4 Hrs./Week.
Credits: 4 **Code: U12CH3MCP05**

OBJECTIVES:

To expose the students the various concepts in volumetric analysis and to gain skill in the preparation of standard solution and to find out the strength of unknown solutions in different types of volumetric analysis.

UNIT: I
VOLUMETRIC ANALYSIS:

1.1 Terminology, Basic requirement of a titration, standard solution – primary standard, preservation of standard solution, expressing concentration of standard solution, simple correlation for quick and convenient volumetric calculation, p-functions.
1.2 Volumetric Titrations: Acid base titration – acid base titration and use of indicators, titration of a strong acid against a strong base, titration of a weak acid with a strong base, titration of a weak base with strong acid, titration of Na_2CO_3 with HCl, the theory of acid base indicators, action of phenolphthalein and methyl orange.
1.3 Redox titration – theory – titration of Mohr salt against $KMnO_4$, oxalic acid against $KMnO_4$, $FeSO_4$ against $K_2Cr_2O_7$, internal indicator, external indicator, starch, iodimetry and iodometry. Precipitation titrations – conditions for precipitation titration and indicators.
1.4 Complexometric titration:-EDTA titrations, indicators of EDTA titrations, complexometric titration curves, EDTA – titration methods – masking of ions, precautions to avoid errors in titrimetric analysis, corrections for unavoidable errors.

VOLUMETRIC ANALYSIS:

1. Acidimetry
   Estimation of Oxalic acid.
2. Permanganometry:
   i. Estimation of $FeSO_4$.
   ii. Estimation of Calcium. (Direct Method).
3. Iodimetry & Iodometry:
   i. Estimation of copper.
   ii. Estimation of Arsenious oxide.
4. Dichrometry:
   Estimation of Ferrous ion.
5. EDTA Titrations:
   i. Estimation of Magnesium.
   ii. Estimation of Zinc.

BOOKS FOR STUDY:

1. Puri B.R. and Sharma L.R., (2002), 'Principles of Inorganic Chemistry', Shoban Lal Nagin Chand and Co.
2. Venkateswaran V., Veeraswamy R., Kulandaivelu A.R., (1997), 'Basic Principles of Practical Chemistry', Second edition, Sultan Chand & Sons.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER III
ALLIED – 4 : ALLIED CHEMISTRY PAPER – I (FOR PHYSICS MAIN)

Hours: 4 Hrs/wk
Credit : 3 **Code: U08CH3AOT01**

OBJECTIVES:

To make the students to understand the basic concept in organic reactions, quantum numbers, chemical bonding, electrical and magnetic properties, solutions, colligative properties and phase equilibria.

UNIT: I
Fundamental Concepts

1.1 Types of organic reactions and reagents, common electrophiles, nucleophiles and free radicals.
1.2 Inductive, resonance, hyperconjugation and steric effects – an elementary idea.
1.3 Aromatic compounds - Benzene, phenol, benzaldehyde and acetophenone –preparation, properties and uses.

UNIT: II

2.1 Quantum numbers:- Principal, Azimuthal, Magnetic and spin quantum numbers. Electronic configuration of elements – Aufbau principle, Hund's rule and Pauli's exclusion principle.
2.2 Long form of periodic table, division of elements into s, p, d and f blocks, cause of periodicity.
2.3 Periodic properties – atomic radius, ionic radius – Ionization energy - Electron affinity – Electronegativity - definitions and variation along a group and period.

UNIT : III

Chemical Bonding:
3.1 Ionic bond – definition, Factors influencing formation of ionic bonding, variable electrovalency, properties of ionic compounds. Covalent bond - orbital overlap concept of molecules like H_2, F_2, O_2 and HF, Variable covalency, properties of covalent compounds.
3.2 Polarity in covalent bonds, Fajan's rules. Polarisation of molecules, Effects of polarization, percent ionic character.

UNIT :IV

Electrical and Magnetic Properties of Molecules:

4.1 Dipolemoment – Polar and nonpolar molecules, Induced dipolemoment – polarizability, polarization of molecule in an electric field. Mosotti – Clausius equation and Debye equation (derivation not required).
4.2 Dipolemoment and molecular structure - CO_2, BCl_3, NH_3, CCl_4, and H_2O.
4.3 Magnetic properties – Magnetic permeability, magnetic susceptibility and magnetic moment. Diamagnetism, paramagnetism and ferro magnetism.

UNIT: V

Solutions and Phase equilibria:

5.1 Solutions of liquids in liquids – ideal and non-ideal solutions – Raoult's law – criteria for ideal solutions, non-ideal solutions – Type I, Type II and Type III.

5.2 Colligative properties – Lowering of vapour pressure by a non-volatile solute, Measurement of vapour pressure lowering by Ostwald-Walker method, Osmosis and osmotic pressure – Measurement of osmotic pressure by Berkeley – Hartley method, Isotonic solutions, Reverse osmosis.

5.3 Phase Equilibria:- Phase, component, degree of freedom, Phase rule (derivation not required). One component system – water system. Two component system – simple eutectic system (Pb-Ag system).

BOOKS RECOMMENDED
Text Books:

1. Vasudevan A.N.S. (1981), Ancillary Chemistry, Part I and Part II.
2. Veeraiyan .V (1997), Text Book of Allied Chemistry, Volume I and Volume II.

Reference Books:

1. Puri B.R. and Sharma L.R. and Kalia K.C. (1997), Principles of Inorganic Chemistry and Shoban lal Nagin chand and Co.
2. Puri B.R. Sharma L.R and Madan S. Pathania, (1994) Principles of Physical Chemistry, 35th edition, shoban Lal Nagin Chand and Co.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER III
SKILLED BASED ELECTIVE PAPER – 3: BEAUTY CARE

Hours: 2hrs/wk.
Credits : 2 **Code: U08CH3SBT03**

OBJECTIVES:

To make the students to learn about skin, skin imperfections, hair, hygiene and cosmetics.

UNIT: I

Skin – Types of skin, Nerves of the skin, functions of the skin, Lesions of skin, Terms applied to skin diseases, Protection of skin from sun, water, cold and heat, diet for a healthy skin. Skin care for changes with age and skin care for different age groups. Conditions affecting the skin.

UNIT: II

Skin imperfections - Black heads and white heads, pigmentation of skin, Hyper sensitive skin, cracked skin, muddy skin, prickly heat, sunburn, birthmarks, discourlation of skin, red nose. Skin afflictions, pimple and acne, moles warts, leucoderma, dermatitis, scabies and skin allergies.

UNIT: III

Know your hair – The scalp – composition of hair-types. Diet for healthy hair. Face, figure and hair style, important tips on hair style. Problems of hair. Hair techniques – bleaching, perming, shampooing and conditioning the hair, hair dye shampoo, how to use shampoo hair dye, how to dye your hair, ill effects of chemical dye – hair fashion colouring, applying henna, scalp massage. Make-up techniques, mehandi, hair do's, make up, bleaching, waxing, hair dye, pedicure, manicure & nail art.

UNIT: IV

Hygiene and good grooming, correct standing posture, correct walking posture, correct sitting posture, ideal weight, food you eat, foods you may eat, food you should avoid. Figure and frame of the body, ethics for self-grooming.

UNIT:V

Your own cosmetics laboratory: Preparations for skin and hair:
Cleansing creams, moisturizing creams, noursing creams and skin tonics. Astringent lotions – hair shampoos, hair setting lotions, hair tonics and conditioners, antidandruff lotions, herbal remedy for baldness.

REFERENCE BOOKS:

1. A complete book on Beauty, Body, Make-up and Hair styles – Parvesh, Handa Goodwill Publishing House.
2. Complete Beautician Course specially useful for running parlours at Home by Dr. Renu Gupta.
3. Speaking of skin care by Parvesh Handa.

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

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

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

OBJECTIVES:

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

UNIT - I: MISSION OF THE CHURCH

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

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

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

UNIT – III: THE FUNCTIONARY CHURCH AND I

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

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

UNIT – IV: SACRAMENTS AND SACRAMENTAL

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

UNIT – V: MARY AND 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) 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./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 – PNDT Act – Hindu Succession Act 2005 – Eve Teasing Prevention Act – Self Help Groups – 73rd Amendment for PRIs.

BOOK FOR STUDY

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

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

Total Hours : 75 **Code : U13TL4TAM04**
Hrs : 5Hrs /Wk **Marks : 100**
Credit : 3

நோக்கங்கள்:

1. மாணவர்களுக்குத் தமிழர்தம் வாழ்வியல் விழுமியங்களை உணர்த்துதல்.
2. அறநெறிகள் வாழ்க்கைக்கு வழிகாட்டும் விதத்தினை எடுத்துரைத்தல்
3. சிகரம் தொட்ட படைப்பாளிகளின் சிந்தனைகளை வெளிப்படுத்துல்
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 **CODE: U14HN4HIN04**

CREDITS : 3 **MARKS : 100**

UNIT – I Functional Hindi

UNIT- II Adhunic Kaal **UNIT-**

III General Essays

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

UNIT- IV Letter Writing

UNIT- V Anuvad Abhyas - III Books

Prescribed :

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

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2
DEPARTMENT OF FRENCH
SYLLABUS
SEMESTER IV
PART I - LANGUAGE - FRENCH PAPER IV [LANGUAGE & CULTURE (ÉCHO A2 2e édition)]

(For candidates admitted 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 20e siècle – le plaisir de jeux de mots.

Unit 3 On s'entend bien !
Les constructions « faire + verbe » et « laisser + verbe », le discours rapporté – décrire le caractère ou le comportement, exprimer l'accord et le désaccord – le langage des couleurs – sujets de conversation – sujets d'étonnement.

Unit 4 À vos risqué et périls !

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

Unit 5 La vie est dure
Les pronoms possessifs, les adjectifs, les pronoms indéfinis – parler de ses activités quotidiennes, exprimer la confiance ou la méfiance – les taches ménagères – la France insatisfaite - sans travail – la chanteuse Diam's – le film 'Le Couperet de Costa-Gavras'.

TEXT BOOKS :

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

(for candidates admitted from 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 V

PART II - ENGLISH IV - GENERAL ENGLISH PAPER IV

NO.OF HRS/WK : 6 CODE: U13EL4GEN04

NO.OF CREDITS: 3

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. Ima

ginative Writing GENERAL

ESSAY – 5 TOPICS

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

THINK BETTER - READ AND COMMUNICATE : MODERN FABLES

1 – 10 for Internal Testing

BOOKS FOR REFERENCE

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

*****

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

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

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER IV
MAIN CORE – 6 : GENERAL CHEMISTRY – IV

Hours: 5 Hrs./Week.
Credits:5 **Code: U13CH4MCT06**

OBJECTIVES:

To enable the students to learn about structure of solids, dipolemoment and magnetic properties, solutions, carbonyl compounds and the applications of reagents of synthetic importances.

UNIT: I

1.1 Structure of solids – Classification, isotropy and anisotropy, Interfacial angle, symmetry in crystals – cubic and hexagonal systems, space lattice and unit cell, Bravais lattices, designation of planes in crystals – Miller indices, diffraction of X-rays by crystals – Bragg's equation – derivation - rotating crystal technique.
1.2 Types of crystals, close packing of identical solid spheres, interstitial sites, limiting radius ratios (derivation not needed), radius ratio rule and shapes of ionic crystals, Structures of NaCl, CsCl, ZnS ,CaF_2, CaC_2, CdI_2 and Rutile.
1.3 Defects in stoichiometric crystals – Schottky and Frenkel defects – defects in Non-stoichiometric crystals – metal excess and metal deficiency defects – impurity defects – semi conductors – n-type and p-type semi conductors.

UNIT: II

2.1 Dipole moment and magnetic properties – Dipole moment – polar and non polar molecules – polarization of molecules – atomic, induced and orientation polarizations – Mosotti-Clausius equation and Debye equation.
2.2 Measurements of dipole moment and its applications to structural studies of simple inorganic and organic molecules including substituted benzenes - estimation of percent ionic character.
2.3 Magnetic properties of matter – diamagnetism – paramagnetism – ferro magnetism – antiferromagnetism – magnetic flux – magnetic permeability. Magnetic susceptibility – its determination using Guoy balance – Application to structural problems.

UNIT: III

Solution I:

3.1 Raoult's law, ideal solutions – criteria for ideal solution. Non ideal solutions – Type I, II and III solutions vapour pressure – composition curves and boiling point – composition curves of completely miscible binary solutions.
3.2 Fractional distillation of binary liquid solutions – Type I, II and III solutions. Distillation of immiscible liquids-steam distillation.
3.3 Solutions of gases in liquids – Henry's law and Raoult's law.

UNIT: IV

4.1 Carbonyl compounds – general properties of aliphatic and aromatic aldehydes and ketones.
4.2 Mechanisms of Aldol, Claisen, Perkin, Knoevenagel, Benzoin condensations, Reformatsky, Wittig, Claisen-Schmidt, Cannizaro and haloform reactions. Mechanisms of reduction (sodium

borohydride, Wolff-Kishner and MPV reductions)

4.3 Alpha, Beta – Unsaturated carbonyl compounds – preparation and properties, Mechanism of Michael addition.

UNIT: V

Applications of reagents of synthetic importance:

5.1 $LiAlH_4$, Sodamide, Aluminium isoproposide.
5.2 Lead tetra acetate, Osmium tetroxide, Ozone, Periodic acid, SeO_2.
5.3 Cyclo dextrin, NBS, DCC, crown ethers.

BOOKS RECOMMENDED:

TEXT BOOKS:

1. Jain M.K, Sharma S.C. 'Modern Organic Chemistry', (2007), Vishal Publishing Co.
2. Puri B.R., Sharma L.R. and Madan S. Pathania, "Principles of Physical Chemistry', (2003), Shobanlal Nagin Chand and Co., Delhi, 35th edn.
3. Soni P.L. and Chawla H.M., 'Text book of Organic Chemistry', (1994), Sultan Chand 26th edn.
4. Samuel Glasstone M.Sc. Ph.D., 'Text Book of Physical Chemistry', (1974), 2nd Edn.
5. Samuel Glasstone and David Lewis, 'Elements of Physical Chemistry', (1960)The Macmillan Press Ltd. 2nd edition.

REFERENCE BOOK:

1. Finar I.L., 'Organic Chemistry', Volume I, 6th edn., Longman group Ltd.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER IV
MAJOR ELECTIVE – 1 : PHYSICAL CHEMISTRY - THEORY CUM LAB – II
(SEPARATION TECHNIQUES AND VIRTUAL LAB EXPERIMENTS)

Hours: 5Hrs./wk
Credits : 5 **Code: U14CH4MEP01**

OBJECTIVES:

To expose the students to the knowledge of solutions and distribution law and also to develop practical skills in the same topics by giving them certain experiments.

UNIT: I

Solution I:

1.1 Raoult's law, ideal solutions – criteria for ideal solution, Non ideal solutions – Type I, II and III solutions, vapour pressure – composition curves and boiling point – composition curves of completely miscible binary solutions.
1.2 Fractional distillation of binary liquid solutions – Type I, II and III solutions. Distillation of immiscible liquids-steam distillation.
1.3 Solutions of gases in liquids – Henry's law and Raoult's law.
1.4 Nernst distribution law & its applications.

UNIT:II
Solutions II and Distribution law

2.1 Lowering of vapour pressure by non-volatile solute, relationship between relative lowering of vapour pressure and mole fraction, experimental determination of molecular weight of non-volatile solute.
2.2 Osmosis and osmotic pressure, relationship between osmotic pressure and lowering of vapour pressure of an ideal solution, isotonic solutions, measurement of osmotic pressure, reverse osmosis.
2.3 Elevation in boiling point and depression in freezing point by a non volatile solute – thermodynamic derivation and experimental determination.
2.4 Abnormal molecular weights – Van't Hoff factor, association and dissociation.

PRACTICALS:

I. Separation of the given mixture into its constituents, Purification and determination of

m.pt/B.pt of any one constituent

1. Solid Mixtures

a. Benzoic acid + m-dintrobenzene (Bicarbonate separation)

b. Benzoic acid + Biphenyl (Bicarbonate separation)

c. Benzoic acid + p- Toludine (HCl separation)

d. Phenol + m-dinitrobenzene (NaOH separation)

e. Cinnamic acid + m-dinitrobenzene (NaOH separation)

2. Liquid mixtures

a. Water + Ethyl acetate

b. Water + Toluene

c. Water + Ethyl methyl ketone

II. Chromatographic separation

a. Separation of amino acids by paper chromatrography

b. TLC separation of analgesics / dyes / quinones

III. Fractional distillation – Soxhlet apparatus (Demo)

IV. Virtual lab Experiments.

a. Freundlich and Langmuir`s Adsorption isotherms.

b. Determination of elevation in boiling point

c. Determination of depression in freezing point.

d. Calorimetry - Heat of Neutralization

e. Determination of viscosity of organic solvents.

BOOKS RECOMMENDED:

Test Books:

1. Puri B.R., Sharma L.R. and Madan S. Pathania, "Principles of Physical Chemistry', (2003), Shobanlal Nagin Chand and Co., Delhi, 35th edn.

Reference Books:

1. A.S. Negi & S.C. Anand, " A Text book of Physical Chemistry", (1994) 3rd Edition, Wiley Eastern Ltd.
2. Arun Bahl, B.S. Bahl & G.D. Tuli, "Essentials of Physical Chemistry", (2014) S.Chand & company Pvt. Ltd.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER IV
MAJOR ELECTIVE – 1 : PHYSICAL CHEMISTRY - THEORY CUM LAB – II
(VERIFICATION OF COLLIGATIVE PROPERTIES)

Hours: 5Hrs./wk
Credits : 5 **Code: U14CH4MEP02**

OBJECTIVES:

To expose the students to the knowledge of solutions and phase equilibria and also to develop practical skills in the same topics by giving them certain experiments.

UNIT: I

Solutions II and Distribution law

1.1 Lowering of vapour pressure by non-volatile solute, relationship between relative lowering of vapour pressure and mole fraction, experimental determination of molecular weight of non-volatile solute.
1.2 Osmosis and osmotic pressure, relationship between osmotic pressure and lowering of vapour pressure of an ideal solution, isotonic solutions, measurement of osmotic pressure, reverse osmosis.
1.3 Elevation in boiling point and depression in freezing point by a non -volatile solute - thermodynamic derivation and experimental determination.
1.4 Abnormal molecular weights – Van't Hoff factor, association and dissociation.
1.5 Nernst distribution law & its applications.

PHYSICAL CHEMISTRY PRACTICAL – HEATING EXPERIMENTS

1. Determination of Molal depression constant of a solvent by Rast Macro method.
2. Determination of Molecular weight of a solute by Rast Macro method.
3. Determination of Transition Temperature of a given salt-hydrate.
4. Critical solution temperature of phenol-water system.
5. Effect of impurity on the critical solution temperature.

BOOKS RECOMMENDED:

Test Books:

1. Puri B.R., Sharma L.R. and Madan S. Pathania, "Principles of Physical Chemistry', (2003), Shobanlal Nagin Chand and Co., Delhi, 35th edn.

Reference Books:

1. Samuel Glasstone M.Sc. Ph.D., 'Text Book of Physical Chemistry', (1974), 2nd Edn.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER IV
ALLIED – 5 : ALLIED CHEMISTRY PAPER II (FOR PHYSICS MAIN)

Hours : 4Hrs./Wk
Credit : 4 **Code: U08CH4A0T02**

OBJECTIVES:

To make the students learn about fundamentals in solid state, photochemistry, electrochemistry and chemical kinetics.

UNIT: I

The Solid State

1.1 Structure of solids – classification, isotropy and anisotropy, interfacial angle.
1.2 Symmetry in crystals – cubic system, space lattice and unit cell, law of rational indices, Miller indices.
1.3 Packing arrangements in crystals – hcp and ccp, simple, body centered and face centered cubes.
1.4 Structure of NaCl - rotating crystal technique.

UNIT: II

Photochemistry:

2.1 Photochemical reactions – Differences between thermal and photochemical reactions. Stark-Einstein law of photochemical equivalence, Lambert – Beer's law.
2.2 Quantum yield – definition, classification of photochemical reactions based on quantum yield, reasons for high and low quantum yield with one example for each.
2.3 Photosensitized reactions, photo processes – fluorescence, phosphorescence, chemiluminescence.

UNIT: III

Electrochemistry – I

3.1 Electrical conductance, Ohm's law, specific conductance, equivalent conductance, molar conductance, Determination of conductance, variation of equivalent conductance with dilution.
3.2 Kohlrausch's law and its application – Calculation of molar conductance at infinite dilution for weak electrolyte. Conductometric titrations - HCl with NaOH, CH_3COOH with NaOH, CH_3COOH with NH_4OH and KCl with $AgNO_3$.

UNIT :IV

Electrochemistry – II:

4.1 Galvanic cell – Daniel cell, single electrode potential, standard electrode potential, determination of electrode potential.
4.2 Reference electrodes – hydrogen and calomel electrodes. Electrochemical series and its applications.

4.3 Corrosion – definition, electrochemical theory of corrosion, prevention. Over-voltage – definition and application of over-voltage.

UNIT: V

Chemical kinetics:

5.1 Order and molecularity of reactions, setting up and solving simple differential equation and half-life period for first order reaction.
5.2 Setting up and solving simple differential equations and half-life periods for second order and zero order reactions.
5.3 Determination of order of reactions, effect of temperature on reaction rate – Arrhenius equation, the activation energy.

BOOKS RECOMMENDED

Text Books:

1. Vasudevan A.N.S. (1981), Ancillary Chemistry, Part I and Part II.
2. Dr. V Veeraiyan (1997), Text Book of Allied Chemistry, Volume I and Volume II.

Reference Books:

1. Puri B.R. Sharma L.R and Madan S. Pathania, (1994) Principles of Physical Chemistry, 35th edition, shoban Lal Nagin Chand and Co.
2. Soni P.L. and Chawla H.M., (1997) 'Text Book of Organic Chemistry", 27th Edition, Sultan Chand and sons.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER IV
ALLIED 6: ALLIED CHEMISTRY PRACTICAL PAPER III
[FOR PHYSICS MAIN]

Hours: 4Hrs./wk.
Credits: 3 **Code: U08CH4AOP03**

Objectives:
To expose the students to the theory of volumetric analysis and also to develop practical skills by giving them certain experiments in volumetric analysis.

VOLUMETRIC ANALYSIS: (10 hrs.)

1.1 Definitions:- Titration, Back Titration, End point, Equivalence point, Indicator, Normality, Molality, Molarity, Mole Fraction, Equivalent weights of acid, base, salt, oxidizing and reducing agents.
1.2 Standard solution, requirements of a primary standard, preparation of standard solution, secondary standard, principle of volumetric analysis.
1.3 Acid-Base titrations – HCl with NaOH, CH_3COOH against NaOH, Na_2CO_3 with HCl. Acid-Base indicators – Ostwald's theory and quinonoid theory.
1.4 Redox titrations – Mohr salt against $KMnO_4$, Oxalic acid with $KMnO_4$, $FeSO_4$ against $K_2Cr_2O_7$. Redox indicator – Diphenyl amine, Iodometry - Estimation of copper sulphate

VOLUMETRIC ANALYSIS (DOUBLE TITRATION WITH WEIGHING): (3 hrs. External)

I Acidimetry and Alkalimetry:

1. Estimation of sodium hydroxide.
2. Estimation of hydrochloric acid.

II Permanganometry:

3. Estimation of Mohr's Salt.
4. Estimation of Oxalic acid.

III Iodometry:

5. Estimation of copper sulphate

IV Dichrometry:

6. Estimation of iron (internal indicator)

BOOKS FOR STUDY:

1. Puri B.R. and Sharma L.R., (2002), 'Principles of Inorganic Chemistry', Shoban Lal Nagin Chand and Co.
2. Venkateswaran V., Veeraswamy R., Kulandaivelu A.R., (1997), 'Basic Principles of Practical Chemistry', Second edition, Sultan Chand & Sons.

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:

6. Dr.M.Arumairaj et al., 1999, "Marching towards the Millenium ahead".
7. Thomas Anjugandam, 1999, "Grow Free Live Free" Salesian Publicaiton.
8. H.C Pretti Nandhini Upretti, jaipur 2000 "Women and problems of Gender Discrimination".
9. Thomas B.Jayaseelan, 2002, "Women: Rights and law" Indian Social Institute, New Delhi.
10. Reni Jacob vol I & II, April- June 2004, "Vikasimi – The journal of Women's Empowerment, Ed,"

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

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

OBJECTIVES:

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

UNIT - I: MISSION OF THE CHURCH

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

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

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

UNIT – III: THE FUNCTIONARY CHURCH AND I

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

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

UNIT – IV: SACRAMENTS AND SACRAMENTAL

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

UNIT – V: MARY AND 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 :

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

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:

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

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER V
MAIN CORE – 7: INORGANIC CHEMISTRY

Hours: 4hrs./wk.
Credits : 3 **Code: U08CH5MCT07**

OBJECTIVES:

Student understands and learns about co-ordination chemistry, nuclear chemistry, carbonyls, nitrosyls, bio-inorganic chemistry and f-block elements.

UNIT I:

Co-ordination Chemistry:

1.1 Double salts, co-ordination compounds, co-ordination complexes and complex ions, co-ordination number, classification of ligands, chelates, physical methods in the study of complexes.
1.2 Nomenclature of co-ordination compounds, Werner's theory and Effective atomic number (EAN).
1.3 Structural isomerism – hydrate isomerism, co-ordination isomerism, linkage isomerism, co-ordination position isomerism, ionization isomerism and polymerization isomerism.
1.4 Stereoisomerism – Geometrical isomerism and optical isomerism in 4 and 6 co-ordinate complexes.

UNIT II:

Co-ordination chemistry II:

2.1 Valence bond theory – Postulates, formation of inner and outer sphere complexes, application of VBT (Magnetic property and geometry of complexes), defects of VBT.
2.2 Crystal field theory – crystal field splitting of energy levels of d-orbitals in octahedral, tetrahedral and square planar complexes, crystal field stabilization energy, factors affecting the magnitude of Δ_o. Application of CFT – colour, magnetic properties and spin states of the complexes, distortion of octahedral complexes and John-Teller theorem, cause and types of distortion, defects of CFT.
2.3 Stability of complexes – stepwise formation and overall formation constant, labile and inert complexes, factors affecting the stability of complexes, experimental determination of stability constant (Job's method, Bjerrum method).

UNIT III:

Substitution reactions, carbonyls & nitrosyls:

3.1 Substitution reactions in octahedral complexes – Mechanism of acid hydrolysis (S_N^1), mechanism of base hydrolysis [S_N^2, S_N^1 (CB)], substitution in square planar complexes – Trans effect, uses of trans effect in the formation of cis and trans isomers, theories of trans effect Electron transfer reactions - definition, types (Mechanisms are not included)
3.2 Carbonyls – Mono, binuclear and polynuclear carbonyls of Ni, Cr, Fe and Co. Bonding and structures only. Examples of heteronuclear carbonyls.

UNIT IV:

Nuclear Chemistry

4.1 Subatomic particles, Nuclear size, Nuclear forces – Meson theory of nuclear forces.
4.2 Magic number, Nuclear shell structure, Liquid drop model.
4.3 Mass defects in atomic nucleus – Nuclear binding energies. Nuclear stability – n/p ratio. The whole number rule and packing fraction. Isotopes, Isobars, Isotones and isomers - definition and examples.
4.4 Definition of nuclear transformation – Bohr's theory of nuclear reactions, classifications of nuclear reactions – Q value of nuclear reactions, nuclear fission, nuclear fusion, stellar energy, controlled nuclear fission.
4.5 Artificial transmutation of elements, induced radioactivity, applications of radioisotopes in medicine, agriculture and industry, carbon dating.

UNIT V:

Bio-inorganic chemistry and f block elements.

5.1 The porphyrin ring system – myoglobin and cytochrome – C-structure and function. Blue copper proteins. Ferridoxin, vitamin B_{12} function only.
5.2 Lanthanide series: Properties of lanthanides – electronic configuration, oxidation states, ionic radii, lanthanide contraction, colour, magnetic properties, basic character, solubility of compounds, chemical reactivity, separation of lanthanides.
5.3 Actinide series: Transuranic elements – electronic configuration – oxidation states, Ionic radii, colour, formation of complexes. Comparison between actinides and lanthanides.

BOOKS RECOMMENDED:

Text Books:

1. R. Gopalan, P.S. Subramanian & K. Rengarajan, Elements of Analytical Chemistry Second revised edition sultan chand 1993.
2. Venkateswaran V., Veeraswamy R., Kulandaivelu A.R., (1993) 'Basic Principles of Practical Chemistry', First edition, sultan chand 1993.
3. Gurdeep R. Chatwal, Sham K. Anand (2005) Instrumental methods of chemical analysis, Himalaya publishing house.
4. Kapil p.N., Gakar K.L., Katyal R.P. (1986) 'Advanced College Practical Chemistry', Volume 1, Pradeep Pulications.
5. Vogel A.I., Text Book of Quantitative Inorganic Analysis, 'The English Language Book Society, Fourth Edition – 1978.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER V
MAIN CORE – 8: ORGANIC CHEMISTRY

Hours: 4hrs./wk.
Credits: 4 **Code: U08CH5MCT08**

OBJECTIVES:

To expose the students to the preparation, properties and uses of organic acids, nitro compounds, amines, amino acids and proteins and to learn about the structure of carbohydrates.

UNIT I:

Organic acids and Derivatives:

1.1 General methods of preparation of aliphatic and aromatic mono carboxylic acids, Ionization of carboxylic acids, acidity constant, comparison of acids, strengths of halo substituted acids, acid strengths of substituted benzoic acid – Hammett equation.
1.2 Aromatic sulphonic acid – preparation and properties, Aliphatic dicarboxylic acid – Blanc's rule. Aliphatic Hydroxy acids – Action of heat on α, β, γ hydroxy acids, acyl substitution.
1.3 Malonic and aceto acetic ester – characteristics of reactive methylene groups, synthetic uses.

UNIT II:

Nitro Compounds and Amines:

2.1 Aliphatic nitro compounds, conversion of nitrobenzene to o, m and p dinitro benzene. TNT, Reduction of nitrobenzene in neutral, acidic and alkaline media.
2.2 Relative basic characters of aliphatic and aromatic amines. Separation of aliphatic amines. Phenylene diamines – preparation and properties.
2.3 Diazotisation and its mechanism. Synthetic applications of diazonium salts.
2.4 Diazo methane and diazo acetic ester – preparation, structure and their synthetic uses.

UNIT III:

Amino acids, Proteins and Nucleic acids:

3.1 Amino acids – introduction, classification, preparation, properties and reactions of amino acids, zwitter ions, iso electric point.
3.2 Polypeptides – peptide synthesis, structural determination of polypeptides – end group analysis.
3.3 Proteins – classification based on physical and chemical properties and physiological functions, primary and secondary structures of proteins.
3.4 Nucleic acids – RNA and DNA, Biological functions.

UNIT IV:

4.1 Molecular Rearrangements: Classification.
4.2 Mechanism of Pinacol – Pinacolone, Beckmann, Benzidine rearrangements.
4.3 Curtius, Schmidt, Cope rearrangement.
4.4 Claisen, Fries, Benzil – Benzilic acid rearrangements.

UNIT V:

Carbohydrates:

5.1 Introduction, classification, preparation and reactions of glucose and fructose.
5.2 Ascending and descending of sugar series, interconversions. Mutarotation and its mechanism. Epimerization. Constitution of glucose and fructose.
5.3 Disaccharides – preparation, reactions and structures of maltose, lactose and sucrose (structural elucidation not expected).
5.4 Polysaccharides – starch and cellulose – properties and uses.

BOOKS RECOMMENDED:

Text Books:

1. Parmer V.S. & Chawla B.M., (1973), "Principles of reaction mechanism in Organic Chemistry", 2nd edn. Sultan Chand.
2. Soni P.L. and Chawla H.m., (1997) "Text Book of organic Chemistry", 27th Edition, Sultan Chand and Sons.
3. Subash cahndra Rastogi, Satiskumar, Agarwala, Ashok Kumar Sharma. " Natural Products" –Vol. I.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER V
MAIN CORE – 9: PHYSICAL CHEMISTRY – I [ELECTRO CHEMISTRY AND PHOTOCHEMISTRY]

Hours : 4 Hrs./Wk.
Credits : 4 **Code:U08CH5MCT09**

OBJECTIVES:

To expose the students to various concepts of electrochemistry and photochemistry.

UNIT I:

Electrolytic Conduction

1.1 Specific conductance, equivalent conductance, relation between specific conductance and equivalent conductance, molar conductance, variation of molar conductance with dilution.
1.2 Determination of conductance and Cell constant. Ionic mobility and its determination, discharge of ions on electrolysis – Hittorf's, theoretical device.
1.3 Transport number, determination of transport number – Hittorf's method and moving boundary method, effect of concentration on transport number.

UNIT II:

2.1 Kohlrausch's law – statement, applications of Kohlrausch's law – calculation of molar conductance at infinite dilution for weak electrolytes and determination of transport number.
2.2 Applications of conductance measurements – determination of α of weak electrolyte, ionic product of water, solubility of sparingly soluble salt and conductometric titrations.
2.3 An elementary treatment of Debye Huckel theory of strong electrolytes, significance of Debye Huckel Onsagar equation. Conductance at high field and high frequencies - Wein & Debye – Falkenhagen effects.

UNIT III:

Electrochemical Cells

3.1 Galvani cells, reversible electrodes and their types – metal/metal ion, gas/ion, metal/insoluble salt/anion, oxidation – reduction electrodes.
3.2 Single electrode potential, sign of electrode potential, reference electrodes – hydrogen, calomel and silver/silver chloride electrodes.
3.3 Thermodynamics of reversible cells and reversible electrodes – electrical energy in a galvanic cell, electrical energy and free energy change of the cell reaction, relation between electrical energy and enthalpy of a cell reaction. Effect of concentration of electrolyte on cell potential and electrode potential – Nernst equation.
3.4 E.M.F. of a cell and its measurement, Weston standard cell, the electrochemical series and its applications.

UNIT IV:

4.1 Electrolyte concentration cells with and without transference, liquid junction potential.

4.2 Applications of E.M.F. measurements – determination of valency of ions, solubility product and pH – hydrogen electrode, quinhydrone electrode and glass electrode, potentiometric titrations.

4.3 Over – Voltage – definition, determination and applications. Corrosion of metals – definition, types, electrochemical theory of corrosion and prevention.

UNIT V:

Photochemistry

5.1 Photochemical reactions, absorption of light – Grothuss Draper's law, Beer – Lambert's law, Stark Einstein's law of photochemical equivalence.

5.2 Quantum yield – definition, classification of photochemical reactions based on quantum yield and determination. Principles of photochemical kinetics – hydrogen – bromine reaction.

5.2 Photosensitized reactions, photochemical processes – fluorescence, phosphorescence, chemiluminescence.

BOOKS RECOMMENDED:

Text Books:

1. Gurdeep Chatwal R, Photochemistry, Good Publishing House.

2. Puri B.R., Sharma L.R. and Madan Pathania S. (1994), Principles of Physical Chemistry, 35th edition Shobanlal nagin Chand and Co.

3. Samuel Glasstone D.Sc., Ph.D., (1974) Text Book of physical Chemistry, 2nd edition.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER V & VI
MAIN CORE – 10 : PRACTICAL PAPER II & III
GRAVIMETRIC, ORGANIC ANALYSIS AND ORGANIC PREPARATION

Hours: 8hrs. /wk. **Code: U08CH5MCP10/**
Credits: 5 **U08CH6MCP11**

OBJECTIVES:

Student acquires the skill in gravimetric analysis, preparation of organic compounds and analyses various organic compounds.

Gravimetric analysis:

1. Nickel as nickel dimethyl glyoxime.
2. Lead as lead chromate.
3. Barium as barium sulphate.
4. Calcium as calcium oxalate.
5. Calcium as calcium carbonate.

Organic Preparation:

1. Preparation involving oxidation, hydrolysis, nitration and halogenation (Internal valuation only).

2. Characterization of organic compounds by their functional groups and confirmation by preparation of derivative.

Substances for organic analysis:

Urea, Nitrobenzene, Glucose, Phthalic acid, m-dinitro benzene, aniline, benzoic acid, cinnamaldehyde, resorcinol, acetanilide, benzamide, succinic acid, sucrose, ethyl benzoate, acetophenone, benzaldhyde, phenol, cinnamic acid.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER V & VI
MAIN CORE – 13: MAIN PRACTICAL III & II: PHYSICAL CHEMISTRY

Hours: 8hrs./wk. **Code: U08CH5MCP11/**
Credits : 5 **U08CH6MCP10**

OBJECTIVES:

To expose the students to develop practical skills in few physical chemistry experiments.

Conductivity:
1. Determination of cell constant.
2. Determination of equivalent conductance of a strong electrolyte.
3. Determination of dissociation constant of a weak electrolyte.

Conductometric titrations:
4. Strong acid versus strong base. (HCl Vs NaOH)
5. Weak acid versus strong base. (CH_3COOH Vs NaOH)

Potentiometric Titrations:
6. To find the strength of HCl potentiometrically using quinhydrone electrode.
7. To determine the strength of Ferrous ammonium Sulphate potentiometrically.

Colorimetry:
8. To verify Beer's law for $K_2Cr_2O_7$ solution using photoelectric colorimeter and determine the unknown concentration.
9. Estimation of Fe (III) as ferric thiocyanate complex.

PH Meter:

10. To determine the strength of the given CH_3COOH by titrating with given NaOH.

Polarimetry:
11. To determine the concentration of the given sugar solution using a polarimeter.

Chemical Kinetics:

12. I order - Acid catalysed hydrolysis of ester.
13. II order - Saponification of ester.

Nernst Distribution law:

14. Determination of partition coefficient of iodine between CCl_4 and H_2O.
15. Determination of equilibrium constant for the reaction $KI + I_2 \leftrightarrow KI_3$ and concentration of unknown KI solution.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER V
MAJOR ELECTIVE – 2 : DAIRY CHEMISTRY

Hours : 5hrs/week **CODE: U08CH5MET01**

UNIT I:

Milk: Definition – General composition of milk – Physical properties of milk – colour, odour, acidity – natural and developed, specific gravity – Recknagel effect, viscosity and conductivity, factors affecting the gross composition of milk, Physico – chemical change taking place in milk due to processing parameters – boiling pasteurization, sterilization and homogenization. Adulterants, preservatives and neutralizers – examples and their detection. Estimation of fat, specific gravity, acidity and total solids in milk.

UNIT II: 10 hrs.

Milk lipids – terminology and definitions classification – saponifiable (triglycerides) and unsaponifiable matters (sterols and cholesterol) phospholipids – structure and properties (Lecithin and Cephalin) Milk fat constants – refractive index – saponification number, Iodine number, R.M. number and Polenske number.

Milk proteins – chemistry of proteins in general structure –N-terminal and C-terminal, hydrogen bond, disulphide bond and salt linkages, outlines of primary, secondary and tertiary structure of proteins. Physical properties of milk proteins – electrical properties and hydration, solubility, reaction of milk proteins with formaldehyde and ninhydrin. Non-protein nitrogen constituents of milk, effect of heat on milk protein, milk enzyme and functions.
Milk carbohydrate – Lactose – its structure, solubility, hydrolysis, oxidation and reduction, estimation of lactose in milk.
Milk vitamins – water and fat soluble vitamins, effect of heat and light on vitamins.
Ash and mineral matters in milk.

UNIT III:
Creams: Definition – composition – chemistry of creaming process – gravitational and centrifugal methods of separation of cream – factors influencing cream separation (Mention the factors only) – cream neutralization. Estimation of fat in cream.

Butter: Definition - % composition – manufacture – Estimation of fat, acidity, salt and moisture content – Desi butter.

Ghee: Major constituents – common adulterants added to ghee and their detection – rancidity – definition – types (hydrolytic, oxidative and ketonic) prevention and anti oxidants and synergist (natural and synthetic) – Measurements.

UNIT IV:
Fermented Milk products: Fermentation of milk – definition, conditions, cultured milk – definition of culture – examples, conditions, types – cultured cream – cultured butter milk – Bulgaricus milk - acidophilus milk – yogurt. Recteriophage – definition and its function.

Indigenous Products: Definition – percentage composition – preparation – physico- chemical changes take place during khoa making – khoa sweet – Gulabjamun, Chana sweet – Rossogolla – ingredients and preparation.

Ice Cream: Definition – Percentage composition – types – ingredients needed – manufacture of ice-cream stabilizers – emulsifiers and their role.

UNIT V:

Milk Powder: Definition – need for making powder – drying process – spray drying, drum drying, jet drying and foam drying – principles involved in each. Manufacture of whole milk powder by spray drying process – keeping quality of milk powder.

Dairy Detergents: Definition – characteristics – classification – washing procedure (modern method) sterilization – Chloramines – T and hypochlorite solution.

REFERENCE:

1. Outlines of Diary Technology – Sukumar De.
2. Principles of Dairy Chemistry – Robert Jenness & S. Patorn.
3. Indian Diary products – K.S. Rangappa and K.T. Achaya.
4. Modern Diary products – L.M. Lampert.
5. Principles of Dairy processing – Warner.

PRACTICAL:

1. Estimation of fat, acidity and T.S. in various samples of milk.
2. Estimation of protein in milk.
3. Detection of adulterants, preservatives and neutralizers in milk.
4. Detection of rancidity I ghee.
5. Estimation of rancidity, salt content, fat in butter.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER V
MAJOR ELECTIVE – 2 : POLYMER CHEMISTRY

Hours : 5hrs/week
Credits: 5 **Code: U08CH5MET02**

OBJECTIVES:

To expose the students to important concepts about polymers.

UNIT I:

1.1 Introduction, classification of polymers.
1.2 Polymerization - step polymerization, chain polymerization and co-ordination polymerization.
1.3 Catalysts in polymerization, degree of polymerization, kinetic chain length.

UNIT II:

2.1 General methods of polymerization bulk, solution, suspension and emulsion polymerization.
2.2 Study of commercial polymers – polyacrylonitrile, polymethyl methacrylate, polyurethanes, polyvinyl chloride, polytetra fluoroethylene, polyamides.
2.3 Silicones, rubber, elastomers, vulcanization.

UNIT III:

3.1 Characterisation of polymers – chemical structure and polymer properties – Degree of crystallinity, Tm, Tg, mechanical, electrical, thermal, optical and chemical properties.
3.2 Molecular weights and averages – number average, weight average, molecular weight distribution.
3.3 Determination of molecular weight – Viscosity method, osmometry and end group analysis, spectral analysis and thermogravimetric analysis.

UNIT IV:

4.1 Polymer degradation – definition, types.
4.2 Thermal degradation, mechanical degradation.
4.3 Photo degradation, oxidative degradation – rubber oxidation, ozone oxidation.

UNIT V:

5.1 Compounding – compounding materials and their significances.
5.2 Fabrication – Techniques – Compression, injection, lamination mouldings.
5.3 Applications of polymers and plastics.

BOOKS RECOMMENDED:

Text Book:

1. Gowarikor V.R., Viswanathan N.V., Jayadev Sreedhar, Polymer Science , Revised edition 2005, New Age International PVT. LTD.

Reference Book:

1. Fred W. Billmeyer JR, 3rd edition John Wiley & Sons (P) Ltd.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER V
MAJOR ELECTIVE – 2 : CHEMISTRY OF BIOMOLECULES

Hours: 5 Hrs,/Wk.
Credits : 5 **Code: U08CH5MET03**

OBJECTIVES:

To make the students understand the Chemistry of biomolecules.

UNIT I:

Carbohydrates:

1.1 Digestion and absorption of CH_2O, Fate of glucose after absorption (Preliminary idea).
1.2 Intermediary metabolism of carbohydrates – glycogenesis, glycogenolysis, glycolysis, gluconeogenesis.
1.3 Regulation of blood sugar – Regulation by liver and regulation by kidney, glucose tolerance tests – Diabetic Mellitus, glycosuria.

UNIT II:

Lipids:

2.1 Introduction, Blood lipids.
2.2 Oxidation of fatty acids –β-oxidation cycle of saturated fatty acids.
2.3 Ketogenesis, Ketosis, Ketolysis, role of liver in fat metabolism.
2.4 Cholesterol – absorption, factors influencing absorption, Cholesterol content of serum, fatty liver.

UNIT III:

Proteins:

3.1 Absorption, metabolic pool, general pathway of protein metabolism, nitrogen metabolism.
3.2 Anabolism of protein – protein turnover and Biosynthesis of protein.
3.3 Catabolism of proteins – Removal of amino group, Fate of amino group and fate of carbon Skelton.
3.4 Inborn errors of phenylalanine metabolism, metabolism in starvation.

UNIT IV:

4.1 Enzymes – properties, classification, mechanism of enzyme action, Factors influencing enzyme action, enzyme inhibitors. (Coenzymes not needed).
4.2 Digestive enzymes and their action – salivary digestion, gastric digestion, pancreatic and intestinal digestion.
4.3 Intestinal fermentation and putrefaction – Action of Bacteria on CH_2O, fat, protein, Bilirubin.
4.4 Thyroxine – Circulating thyroid hormone, metabolic effects of thyroxine, Agents interfering with the synthesis of thyroid hormone, Diseases associated with abnormal metabolism of thyroxin.

UNIT V:

5.1 Blood – functions of plasma proteins blood groups and Rh factor, coagulation of blood mechanism.
5.2 Haemoglobin – structure, properties of Hb, metabolism.
5.3 Bile pigments – examples, properties, Types of Jaundice (preliminary idea).

BOOKS RECOMMENDED:

Text Books:

1. Ambika Shanmugam, 'Fundamentals of Biochemistry for medical students', July 1982, 4th edn., 1983 Navabharat offset works.
2. Dulsy Fatima, L.M.Narayanan and Co-workers – BioChemistry 1993, Saras publication.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER V/VI
NON MAJOR ELECTIVE – 1: HOME CARE

Hours: 2hrs./wk.
Credits : 2 **Code: U08CH5NMT01/ U08CH6NMT01**

OBJECTIVES:

To learn about dietetics and food nutrition, marriage and family, fire prevention and protection, care of household metals and safe use of pesticides.

UNIT I:
Dietetics and Food nutrition:
Balanced diet , Specific functions of nutrients, Effects of cooking on various nutrients.

UNIT II:
Marriage and Family:
Family life cycle, Different types of marriage, Parenting styles, Single parenthood, Types of family.

UNIT III:
Major causes of fire in Homes, Fire prevention and fire fighting in homes, Methods of extinguishing fires – starvation, cooling and smothering. Simple extinguishing agents. Chemical fire extinguisher – CO_2 extinguisher .

UNIT IV:
Care of house hold metals:

Metal polishes – functions, composition, mode of action, general rules for cleaning and polishing, cleaning and polishing of aluminium utensils, silverwares, copper and brassware, gold and teflon.

UNIT V:
Safe use of Pesticides:
Need of pesticides at home, Types of insects and their control at home - mosquitoes, flies, ants, cock roaches, termites and head louse. Precautions in the applications of pesticides.

REFERENCE:

1. Bharathi V.V. & M. Jacinth 'Family resource management' Discovery publishing house, 1994.
2. Matin Khan 'Consumer Behavior' New age international (p) Ltd.,
3. Raheena Begum "A Text Book of applied Chemistry' Sterling publishers private Ltd, 1991.
4. Swaminathan M., 'Essentials of food and nutrition' the Bangalore printing & publishing Co., Ltd. 1985.
5. Shankar Rao C.N., 'Sociology' S.Chand & Company Ltd., 1997.
6. Sumati Mudambi R. Rajagopal M.V., Fundamentals of food and nutrition, third edition.
7. Thankamma Jacob 'A Text Book of Applied Chemistry' Macmillan India Ltd. 1987.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER V & VI
NON MAJOR ELECTIVE – 1 : COSMETOLOGY

Hours: 2Hrs./Week
Credit : 2 **Code: U08CH5NMT02/ U08CH6NMT02**

OBJECTIVES:
To expose the students to the study of skin, hair, facial, cosmetics and hazards of cosmetics.

UNIT: I

SKIN:
Study of Skin: Types, functions, diet and skin, threats to skin, effects of summer, winter, wind and rain on skin. Common skin disease – acne and warts.

UNIT: II

HAIR:
Types of hair, problems of hair – Hair falling, baldness, graying of hair, problems with lice, dandruff, hair care conditioning.

UNIT: III

FACIAL:
Manual massage – advantages, disadvantages. Mask treatment – setting and non-setting masks and uses.

UNIT: IV

COSMETICS:
Face creams, toilet powders – ingredients, preparations. Preparation of facial packs for different types of skin, Dentifrices.

UNIT: V

Hazards due to cosmetics, skin – cleansing, toning, moisturizing, exfoliation – types, preparation, applications and uses.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER III / V
SBE-4 : EXPERIMENTAL CHEMISTRY FOR LIFE SCIENCE[BOTANY AND ZOOLOGY]

Hours: 2 hrs.
Credits : 5 **Code: U14CH3SBP04/ U14CH5SBP04**

1. Determination of melting point of the given organic compound.
2. Determination of boiling point of the given organic compound.
3. Preparation of buffer solutions and the determination of pH of the given buffer solution.
4. Determination of conductance of solutions.
5. Determination of Water parameters using water analyzer.
6. Demonstration:
   - Extraction of phytoconstituents from a dried plant powder using Soxhlet apparatus
   - Separation of amino acids using column chromatography

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) 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), 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),
  Eli (I Sam 2: 24-36,3: 11- 18), Mary Mother of Jesus (Luke 2: 51,52
- Caring for the Aged (I Sam 2: 31,32)
- 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.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER VI
MAJOR CORE – 11: ORGANIC CHEMISTRY

Hours: 5hrs. /wk.
Credits: 5 **Code: U14CH6MCT12**

OBJECTIVES:

To make the students to learn about stereochemistry, reaction intermediates, dyes, heterocyclics and natural products.

UNIT I:

Stereochemistry I

1.1 Optical isomerism - Asymmetric centre, chirality, achiral molecule, prochiral. Elements of symmetry.
1.2 Racemisation, Resolution, Asymmetric synthesis. Walden Inversion. Vant Hoff's rule of superposition. Freudenberg's rule of shift.
1.3 Notations of optical isomers – Cahn, Ingold, Prelog rules – R.S. notations for optical isomers with one asymmetric carbon.
1.4 Optical activity in compounds containing no asymmetric carbon – Biphenyls, allenes and spiranes – Elementary treatment only.

UNIT II:

Stereochemistry II:

2.1 Cycloalkanes: Introduction – preparation and reactions – Baeyer's strain theory and theory of strain less rings.
2.2 Conformational analysis – Introduction of terms – conformers – configuration – dihedral angle – torsional strain – conformational analyses of ethane and n butane.
2.3 Conformers of cyclohexane – axial and equatorial bonds – ring flipping showing axial and equatorial bonds and their inter-conversions. Conformations of mono substituted cyclohexanes – 1,3-diaxial interaction.

UNIT III:

Reaction intermediates and Dyes

3.1 Free radicals: formation, detection, properties, stability.
3.2 Carbocation, Carbanion, Carbenes, – formation, stability and reactions. Benzyne- Evidence in favour of benzyne mechanism.
3.3 Dyes: Theory of colour and constitution – classification based on structure and application.
3.4 Preparation and uses of the following dyes. Azodyes – Methyl Orange and Bismark brown. Triphenyl methane dyes - malachite green. Phthalein dyes – Phenolphthalein and Fluorescein. Vat dyes – indigo. Anthraquinone dyes – Alizarin.

UNIT IV:

Heterocyclic compounds:

4.1 Aromatic characteristics of heterocyclic compounds. Importance of Heterocyclic compounds.

4.2 Five membered Hetero cyclics- Furan, pyrrole, thiophene- Preparation, properties .

4.2 Six membered hetero cyclics – pyridine- Preparation, Properties. Comparison of basicity of pyrrole and pyridine with Aniline.

4.4 Condensed Hetero cyclics - Indole, Quinoline, isoquinoline, synthesis and reactions.

4.5 Herterocyclics containing more than one Hetero atom- Purine, Pyrimidine- Synthesis.

UNIT V:

Natural Products

5.1 Terpenes: Introduction, classification, Isoprene rule, structural elucidation of Menthol and α – terpineol.

5.2 Alkaloids: Introduction, General methods of structural elucidation, Structural elucidation of Coniine, Piperine and Nicotine.

5.3 Vitamins: Introduction, structural elucidation of Ascorbic acid and Pyridoxine.

BOOKS RECOMMENDED:

Text Books:

1. Advanced Organic Chemistry by Jerry March.
2. I.L. Finar Vol-II, Organic Chemistry.
3. Parmar V.S. and Chawla H.M. (1978) "Principles of reaction mechanism in Organic Chemistry", 2nd edition, Sultan Chand.
4. Soni P.L. and Chawla H.M. (1997) "Text Book of Organic Chemistry", 27th edition, Sultan Chand.
5. Subhash Chandra Rastogi, Satis Kumar Agarwala, Ashok Kumar Sharma, "Chemistry of Natural Products", Vol I & Vol. II, I Edition 1974-75. Jai Prakash Nath & Co., Leading Educational Publishers.

Reference Book:

1. Jani M.K. "Organic Chemistry", 12th edition, Shoban Lai Nagin Chand and Co.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER VI
MAIN CORE – 12 : PHYSICAL CHEMISTRY – II
[SPECTROSCOPY]

Hours : 5 Hrs./Wk.
Credits : 5 **Code: U08CH6MCT13**

OBJECTIVES:

To expose the students to various types of spectroscopic techniques.

UNIT I:

1.1 Properties of electromagnetic radiation, electromagnetic spectrum, Molecular energies, interaction of electromagnetic radiation with matter.
1.2 Microwave spectroscopy – rotation of molecules, rotational spectra – diatomic molecules.
1.3 Rotational spectra of polyatomic molecules – linear molecules, symmetric top molecules. Applications to simple molecules.

UNIT II:

2.1 Infra – red spectroscopy – energy of a diatomic molecule, the simple harmonic oscillator, the anharmonic oscillator – fundamental absorption, overtones and hot bands.
2.2 The diatomic vibrating rotator, the vibrations of polyatomic molecules – CO_2 and H_2O, combination and difference bands.
2.3 Analysis by infrared techniques – finger print region, group frequencies, hydrogen bonding, structure of thio acetic acid.

UNIT III:

3.1 Raman spectroscopy – Occurrence of Raman lines, stokes and antistokes lines, classical theory of Raman effect, Quantum theory of Raman effect.
3.2 Pure rotational Raman spectrum of linear molecules, symmetric top molecules, Raman activity of vibrations of CO_2 and water, Rule of mutual exclusion.
3.3 Structure determination from Raman and infrared spectroscopy – CO_2, N_2O, H_2O, SO_2, NH_3, NO_3^- ClO_3^- and ClF_3.

UNIT IV:

4.1 Electronic spectroscopy of molecules – Electronic spectra of diatomic molecules, Born-Oppenheimer Approximation, Vibrational course structure, Intensity of vibrational electronic spectra - Franck–Condon principle.
4.2 Dissociation energy – Birge–Sponer method of determining the dissociation energy – Pre–dissociation.
4.3 Mass spectrometry – Basic Principles of Mass spectrometry – Molecular ion peak – Base peak – isotopic peak – Meta stable peak – nitrogen rule – Modes of fragmentation of simple organic compounds - n-butane, 2& 3 pentanone.

UNIT V:

5.1 Nuclear Magnetic Resonance spectroscopy – spin of nucleus – Theory of NMR spectroscopy.

5.2 Chemical shift – spin-spin splitting – NMR spectrum of ethanol – Applications to simple organic molecules like simple alkanes, alkenes, alkyl halides, aldehydes, ketones and benzene.

5.3 Electron Paramagnetic Resonance spectroscopy – Theory of EPR spectroscopy – presentation of the spectrum – Hyperfine splitting in some simple systems – proton, methyl free radical. General rules governing hyperfine splitting – applications to simple organic radicals like methyl, ethyl, benzene, naphthalene, anthracene and para semibenzoquinone.

BOOKS RECOMMENDED:

Text Books:

1. Colin Bannwell N and Elaine McCash M, Fundamentals of molecular spectroscopy, 4th edition, McGraw hill Publishing company limited.

2. Sharma L.R. (1989) Elementary Organic spectroscopy, Chand S. and Co.

Reference Books:

1. Russell S. Drago, (1978). Physical methods in Inorganic Chemistry, East West student edition.

2. Manas Chanda (1972), Atomic structure and Chemical Bond Including Molecular Spectroscopy, Tata McGraw-Hill Publishing Company Ltd.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER VI
MAJOR ELECTIVE – 3- ENVIRONMENTAL POLLUTION

Hours: 5Hrs/Wk
Credits : 5 **Code: U08CH6MET01**

GENERAL OBJECTIVES:

To learn the various forms of pollution and contaminants of the environment, solid waste management and environment acts.

UNIT I
Air pollution:

1.1 Atmosphere – structure of atmosphere, hydrosphere, hydrological cycle, Lithosphere, Biosphere.
1.2 Air pollution – composition of air – major sources of air pollution – classification and effects of air pollutants. Particulates – effect and control of particulates.
1.3 Effect of ozone on man and plants, effect of photochemical smog – chlorofluorocarbons –green house effect – major source and consequences of green house effect. Acid rain formation – adverse effects of acid rain, control of acid rain.
1.4 Prevention and control of air pollution – control by fuel selection and utilization, control by process modification, control by site selection and zoning, general method of air pollution control, control at source, control by devices, stacks, planting trees and growing vegetation.

UNIT II:

2.1 Definition – types of water pollution, sources of water pollution, sewage and domestic wastes, harmful effects of sewage and domestic waste, industrial effluents.
2.2 Agricultural discharges – fertilizers, effect of fertilizer and detergents. Pesticides – biodegradation of pesticides – farm waste – biofertilizers.
2.3 Industrial wastes – characteristics, types, principles, treatment and disposal of industrial waste with organic and inorganic impurities. Sewage – municipal waste water – composition, properties, method of treatment – removal of P, N from waste water, Aerobic and Anaerobic biological oxidation of plants.
2.4 Prevention, control of water pollution and recycling and reuse of waste water.

UNIT III
3.1 Chemistry of soil, soil irrigation by effluents, Agricultural pollution, role of micro nutrients in soil, Analysis of micronutrients in soil.
3.2 Pesticides and pollution – DDT problem, classification of pesticides, degradation of pesticides, disease caused by soil pollution, impact of soil pollution on air quality.
3.3 Control of sewage, domestic and industrial waste, ecoforming and ecotecnology, integrated nutrient management, genetic resource management, hand use systems, water management.
3.4 Ecotechnology – ecological farming system, organic farming, advantages of organic, farming, biotechnology – integrated plant nutrient management integrated pest management, soil solarisation, water shed management.

UNIT IV

Solid wastes – pollution, treatment and disposal:

4.1 Introduction, classification and origin, characteristics of solid wastes, objectives and consideration in solid waste management .

4.2 Biomedical wastes, chemical wastes – environmental effects, Love canel episode, toxic chemicals identification of hazardous wastes, management of hazardous wastes – treatment and disposal – physical, chemical and biological process, co disposal, security land fill.

4.3 Microbiology involved in solid waste disposal, methods of solid waste disposal – composting, sanitary land filling – economic, aesthetic and environmental problems.

4.4 Thermal process of solid waste disposal – incineration, pyrolysis, recycling and reuse of solid wastes, bioconversion.

UNIT V

Environmental Management:

5.1 Introduction, objectives, component, Environmental impact assessment (EIA), elements of the EIA process, participants of EIA process, contents of EIS, Design of EIA.

5.2 The wild life protection act, the forest conservation act, the water prevention and control act, Air prevention and control of pollution act.

5.3 Environment protection act – preliminary, general powers of the central Government, prevention, control and abatement of environmental protection.

5.4 Hazardous wastes management and Handling rules, the hazardous micro-organisms rules.

Text Books:

1. Dara S.S.,(2002) A Text Book of Environmental Chemistry and Pollution Control, S. Chand and Company, 5th Revised edition.
2. Sharma B.K. (2005) Environmental Chemistry, Goel publishing house, Meerut 9th Edn.

Reference Books:

1. Kudesia V.P. and Ritu (2003), Environmental Chemistry, Pragathi Prakashan, Meerut 2nd Edn.
2. Mukherjee S & Ghosh A(2002), Environmental studies, Books and Allied (P) Ltd, 3rd Edn.
3. Kaur H, (2005), Environmental studies, Pragati Prakashan, Ist Edn.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER VI
MAJOR ELECTIVE – 3 : DYE CHEMISTRY

Hours: 5 Hrs,/Wk.
Credits : 5 **Code: U08CH6MET02**

General Objectives:

To make the students understand and learn about the different types of dyes, properties, applications and hands on training on dyeing.

UNIT I: 12 Hrs.

Dyes and Dye Intermediates

1.1 Dye – definition – colour and constitution.
1.2 Classification of dyes (based on their use and on their structures) – Classes of Dyes for dyeing on different fabrics (Natural & Man Made).
1.3 Important dye stuff intermediates – their names.
1.4 General properties of dye stuff-linearity, co planarity, fastness, fluorescence and optical brighteners.

UNIT II 12 Hrs.

Fibre Science

2.1 Fibre classification, properties – Count, Denier, Tex, stable length, spinning properties, strength, elasticity and creep.
2.2 Natural fibres – cotton, wool and silk – General characteristics. Synthetic fibres – poly amide (Nylon 6,6), polyester fibre, polyacrylonitrile and viscose (properties only)

UNIT III: 12 Hrs.

Dye Application I Pretreatments

3.1 Sizing and designing – purpose, designing methods (Hydrocytic & Enzymatic).
3.2 Scouring – purpose – Kier boiling – Alkali scouring – Acid scouring – Principles involved in these methods.
3.3 Bleaching – Methods (peroxide and bleaching powder bleaching)

UNIT IV 12 Hrs.

4.1 Dye bath preparation – M.L Ratio – Fixation of dye and additive concentration on the basis of weight of the material – Methods of expressing the concentrations in dye bath (gpl).
4.2 Dyeing assistants – Wetting agent (Turkey red oil) – (preparation and purpose), Anionic and non-ionic detergents, leveling agents, fastness improvers, dispersing agents, exhausting agents (examples and functions). Mordants Ingrain.
4.3 Dye bath receipe model – (Dyeing of cotton with reactive dyes, sulfur dyes, azoic dyes. Dyeing of polyester with disperse dyes with and without carriers. Dyeing silk with metal complex dyes.

UNIT V 12 Hrs.

Dye Application-II Dyeing process

5.1 Vat dyeing – classification of vat dyes, Vatting, Dyeing procedure.
5.2 Reactive dyeing – Hot and cold brand – Principles involved in the dyeing process.
5.3 Dyeing of polyester and blends – function of dispersing agents, fibre swelling, carrier dyeing, High temperature dyeing and selection of dye stuff.

PRACTICALS 15 Hrs.

Dyeing using direct dyes and Batik printing.

REFERENCES:

1. Shenai V.A. – 'An introduction to dye stuff and intermediates', Sevak publications, Wadelka Bombay-3.
2. Abrahard E.N. – 'Out lines of chemistry of dye stuff and intermediates', chemical publishing, New York.
3. Shenai V.A – 'Technology of textiles processing'.
    a. Textiles fibres – Vol-I.
    b. Techniques of bleaching Vol-III.
    c. Principles of dyeing Vol-IV
4. Charwal and Anand, 'Synthetic Organic dyes', Himalaya publishing House.
5. Sharma B.K., 'Industrial Chemistry', COEL Publishing house, Meert.
6. Venkataraman K., 'The Chemistry of synthetic dyes'. Academic press Vol-I – VIII.
7. Gites C.H., 'A laboratory course in Dyeing', the society of Dyes and coloursits.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER VI
MAJOR ELECTIVE – 3 : FOOD CHEMISTRY

Hours: 5 Hrs,/Wk.
Credits : 5 **Code: U08CH6MET03**

General objective:
The student learns various concepts of all the nutrients, food preparation, preservation and adulteration.

UNIT 1-NUTRIENTS –I

1.1 Protein – functions, sources, deficiency diseases, daily allowances.
1.2 Carbohydrates – functions, sources, deficiency diseases, daily allowances.
1.3 Fats and oils – functions, sources, deficiency diseases, daily allowances, disorders due to excess of fat.
1.4 Minerals – Ca, P, Fe, I, Na – functions, sources, deficiency diseases and disorders of taking excess. Importance of micronutrients.

Extra reading/Keywords: *Organic sources of nutrients*.

UNIT 2 -NUTRIENTS –II

2.1 Vitamins – H_2O soluble and fat soluble vitamins – sources, functions, deficiency and disorders of taking excess of vitamins.
2.2 H_2O – functions, sources, deficiency diseases.
Fibre – functions, requirements and sources. Effects of deficiency of fibre.
2.4 Algae and fungi as foods, Toxicants naturally present in foods. Fermented foods and pickles.

Extra reading/Keywords: *Preparation of Spirulina and dosage*

UNIT 3 - FOOD PREPARATION

3.1 Food preparation - Effect of cooking and heat processing on the nutritive value of foods. Food faddism and faulty food habits.
3.2 Cooking methods: Moist heat methods and dry heat methods – merits and demerits. Biofortification and Nutraceuticals – definition and examples.
3.3 Retention of nutritive value during preparation. Microwave cooking, solar cooking – description, advantages and disadvantages.

Extra reading/Keywords: *Obesity*

UNIT 4 - FOOD PRESERVATION

4.1 Food preservation: Importance of food preservation, causes of food spoilage.Principles of food preservation. Home scale methods of food preservation.
4.2 Methods of food preservation: Low temperature, high temperature, preservatives, osmotic pressure, dehydration, irradiation – merits and demerits.
4.3 Practical rules for good sanitation, food selection, purchase and storage – Non perishable foods, semi-perishable and perishable foods.
4.4 Browning reactions in foods – enzymic browning and non-enzymic browning.

Extra reading/Keywords: *Organic insecticides*

UNIT 5 - FOOD ADULTERATION AND TASTE SENSATION

5.1 Food Adulteration – Types, international, Metallic, incidental adulteration and their ill effects.

5.2 Simple physical and chemical tests for detection of food adulterants, consumer protection.

5.3 Packaging hazards, Food borne diseases. Control of insects and rodents.

5.4 Physiological and chemical aspects of taste sensation – mechanism of sensation of aste, factors affecting taste response. Relation between chemical structure and taste.

Extra reading/Keywords: *Adulteration in Maida*

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

TEXT BOOKS:

1. Dr. M. Swaminathan, Hand book of food and Nutrition' Reprint, published by The Bangalore printing and publishing co. ltd. 2008.
2. B. Srilakshmi, Food Sceince, Third Edition, New Age international publishers, 2003.

BOOKS FOR REFERENCE:

1. Dr. M. Swaminathan, Food Science Chemistry and Experimental foods, second enlarged edition, published by Bangalore press. (1987)
2. Dr. M. Swaminathan, 'Advanced test Book on Food and Nutrition' Volume I and II second edition, The Bangalore printing and publishing co. ltd.
3. Sumathi.R. Mudambi, 'Fundamentals of food and Nutrition', Second edition, Wiley Eastern Limited, "1983.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER VI
MAJOR ELECTIVE – 3 : ANALYTICAL CHEMISTRY

Hours: 5hrs./wk.
Credits : 5 **Code: U08CH6MET04**

OBJECTIVES:

Student learns about laboratory hygiene and safety, data analysis, separation techniques, gravimetric analysis and thermo analytical methods, visible spectrophotometry and colorimetry and analytical electro chemistry.

UNIT I:

Laboratory, Hygiene and Safety:

1.1 Storage and Handling of chemicals – carcinogenic chemicals – Handling of Ethers – Toxic and Poisonous chemicals – safe limits of vapour concentrations.
1.2 Waste disposal – Fume dsiposal - precautions for avoiding accidents.
1.3 First Aid techniques – Precautions to avoid poisoning – Treatment for specific poisons – Laboratory safety Measures.

UNIT II:

Data Analysis:

2.1 The Mean – Significant Numbers, The Median – Precision accuracy – Confidence limits, Standard Deviation.
2.2 Errors – methods for Improving Accuracy – Rejection of Data – Presentation of Tabulated Data – Scalter diagrams – Method of Least Squares – S.I. units.

Separation Techniques:

2.3 Precipitation – solvent extraction – chromatography – Types, Colum chromatography – Thin layer chromatography.
2.4 Paper chromatography – Paper electrophoresis – Ion exchange chromatography – Gas liquid chromatography.

UNIT III:

Gravimetric analysis and Thermo analytical methods:

3.1 Principles of Gravimetric analysis:- Methods of gravimetric analysis – requirements of gravimetric analysis. Precipitation – Theory of precipitation.
3.2 Types of precipitates – co-precipitation, post precipitation and precipitation from homogeneous solution – Digestion, filtration and washing, drying and ignition. Inorganic and organic precipitating agents, sequestering agents, types, care and use of crucibles.

3.3 Thermogravimetric analysis – Principles, thermal analysis of silver nitrate, methods of obtaining thermograms – Derivative thermogravimetry. Factors influencing the thermogram – TGA. Instrumentation – precautions in the use of thermobalance – Application of TGA.

3.4 Differential thermal analysis - DTA of calcium oxalate monohydrate – thermal analysis of calcium acetate monohydrate.

UNIT IV:

Visible Spectrophotometry and Colorimetry:

4.1 Theory of spectrophotometry and colorimetry, Derivation of Beer-Lamberts law, Molar absorptivity and absorbance, deviation from Beer's law.

4.2 Instrumentation – Radiation sources, filters and monochromators, photo tubes, photomultiplier tubes, power supply.

4.3 Visual comparators – multiple standard methods, duplication and dilution method, balance method, photoelectric colorimeter, spectrophotometer.

4.4 Criteria for satisfactory colorimetric estimation – advantages of colorimetric estimation, determination of composition of complexes, colorimetric estimation of iron, cobalt and nickel.

UNIT: V

Analytical Electro Chemistry:

5.1 Application of Electro deposition, Electro plating, Electro gravimetry.

Analytical Chemistry in Consumer Protection:

5.2 Detection of Adulteration in some common food items: Milk, Meat, Oils, Ghee, Coffee Powder, Asafoetida, Chilli Powder, Turmeric Powder, Pulses.

5.3 Food additives: Sweeteners, Preservatives, Flavours, Colourants, Pesticide Residues in Food – National Food Poisons.

<u>BOOKS RECOMMENDED</u>:

Text Books:

1. Gopalan R, Subramanian PS and Rengarajan K (1993) 'Elements of Analytical Chemistry' Second revised edition, Sultan chand.
2. Gurdeep R. Chatwal, Sham K. Anand (2005) Instrumental methods of chemical analysis, Himalaya publishing house.
3. P.N. Kapil, K.L. Gakhar, R.P. Katyal, Advanced College Practical Chemistry, Volume 1, Pradeep Publications 1986.
4. Venkateswaran V., Veeraswamy R., Kulandaivelu A.R., (1993) 'Basic Principles of Practical Chemistry', First edition, sultan chand.
5. Vogel A.I., Text Book of Quantitative Inorganic Analysis, 'The English Language Book Society, Fourth Edition.

(For Candidates admitted from June 2008 onwards)
HOLY CROSS COLLEGE (Autonomous), TIRUCHIRAPPALLI – 2
PG AND RESEARCH DEPARTMENT OF CHEMISTRY
SEMESTER VI
SKILLED BASED ELECTIVE – 5 : FORENSIC SCIENCE

Hours: 2Hrs./Week
Credit : 2 **Code: U12CH6SBT05**

OBJECTIVES: To make the students learn about the basics of forensic science, poisons and its treatment, Examination of blood, handwriting, comparison and drugs.

UNIT-I

Definition and scope of Forensic Science – History and development of Forensic Science - Basic services provided by Forensic science Laboratories.

UNIT-II

Poison – classification – General treatments - causes modifying the action of poison - Gastric lavage – uses of antidote –Isolation, purification and identification of organophosphorus, organochlorine, vegetable and metallic poisons from viscera.

UNIT-III

Nature of blood – Characterization of blood – Forensic importance of Hairs, fibers, Saliva and seminal stains – DNA – DNA typing

UNIT-IV

Handwriting comparison – Handwriting characteristic of an individual –signature forgeries - Anonymous letters - Procedure for obtaining suitable standards for comparison –Alteration, Erasures and Obliteration – Decipherment of charred documents – Cryptography.

UNIT-V

Drugs – Drug Dependence – Narcotic drugs – Hallucinogens –Depressants – Stimulants – Anabolic steroids.

References:

1. Toxicology at a Glance by S.K. Singhal
2. Criminalistics an Introduction to Forensic Science by Richard Saferstein.
3. Modern techniques of Bomb detection and Disposal by Majr. T V Narayanan (Retd)
4. Foot prints Tracks and Trails in Criminal Investigation and Trials by Dr. B.R. Sharma
5. Identification of disputed documents, finger prints and ballistics revised by K. Kumar

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI -2
UG – SEMESTER: VI
SKILL BASED ELECTIVE: 6
RESEARCH METHODOLOGY

CODE: U13DS6SBT06

HRS /WEEK: 2 **CREDITS: 2**

COURSE OBJECTIVE:
To help the students develop research skills

To expose the students to the concept of research and to implement a research project.

UNIT: 1- INTRODUCTION TO RESEARCH

Definition, type, nature and scope of research - Research design

UNIT: 2 –DATA COLLECTION

Types – Primary and secondary data – Data Processing – Hypothesis testing

UNIT: 3- PLAN AND EXECUTION

Methodology – plan and execution – Analysis - Documentation

UNIT: 4- FORMAT AND PRESENTATION OF PROJECT REPORT

Art of writing and Structure of a project report – Viva - voce

UNIT: 5- PROJECT

Project Work

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 COURSE

LIFE ORIENTED EDUCATION

ETHICS – III: FAMILY AND CAREER DEVELOPMENT

HRS / Wk : 1 **CODE: U12VE6LVE03**

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) 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), 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),
  Eli (I Sam 2: 24-36,3: 11- 18), Mary Mother of Jesus (Luke 2: 51,52
- Caring for the Aged (I Sam 2: 31,32)
- 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:

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