HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002
DEPARTMENT OFMATHEMATICS
CHOICE BASED CREDIT SYSTEM
UG COURSE PATTERN
B.Sc MATHEMATICS
(FOR STUDENTS ADMITTED FROM THE YEAR 2015 ONWARDS)

Sem	Part	Component	Title of the course	Code	Hrs/ Week	Credits	Marks
I	I	Language	Tamil Paper I/ Hindi Paper I/ French Paper I	U15TL1TAM01/ U18HN1HIN01/ U16FR1FRE01	6	3	100
	II	English	English Paper I	U15EL1GEN01	6	3	100
	III	Major Core – 1	Calculus	U15MA1MCT01	7	5	100
		Allied – 1 (Compulsory)	Mathematical Statistics-I	U15MA1ACT01	4	4	100
		Allied – 2 (Compulsory)	Mathematical Statistics-II	U15MA1ACT06	4	3	100
	IV	Environmental Studies	Environmental Studies	U18RE1EST01	1	1	100
			Extension Activity		1	--	--
		Value Education	Ethics I/Bible Studies I/ Catechism I	U15VE2LVE01/ U15VE2LVB01/ U15VE2LVC01	1	--	--
TOTAL					30	19	600
II	I	Language	Tamil Paper II/ Hindi Paper II/ French Paper II	U15TL2TAM02/ U18HN2HIN02/ U16FR2FRE02	5	3	100
	II	English	English Paper II	U15EL2GEN02	6	3	100
	III	Major Core – 2	Multivariate Calculus	U15MA2MCT02	5	4	100
		Major Core – 3	Analytical Geometry of Two and Three Dimensions	U15MA2MCT03	5	5	100
		Allied – 3 (Compulsory)	Mathematical Statistics –III	U15MA2ACT08	4	3	100

	IV	Skill Based Elective -1	Soft Skill Development	U15RE2SBT01	2	2	100
		Skill Based Elective – 2	Sustainable rural Development and Students Social Responsibility	U18RE2SBT02	2	2	100
		Value Education	Ethics I /Bible Studies I/ Catechism I	U15VE2LVE01/ U15VE2LVB01/ U15VE2LVC01	1	1	100
		Internship/Field Work/Field Project 30 hours- Extra Credit		U18SP2ECC01	-	2(Extra Credit)	100
TOTAL					30	23+2	800+100
III	I	Language	Tamil Paper III/ Hindi Paper III/ French Paper III	U15TL3TAM03/ U15HN3HIN03/ U16FR3FRE03	6	3	100
	II	English	English Paper III	U15EL3GEN03	6	3	100
	III	Major Core – 4	Algebra and Trigonometry	U15MA3MCT04	5	5	100
		Major Core – 5	Real Analysis – I	U15MA3MCT05	5	5	100
		Allied – 4 (Optional)	Windows Accessories and MS – Office	U15MA3AOP12	4	3	100
	IV	Skill Based Elective – 3	Aptitude Mathematics	U15MA3SBT03	2	2	100
		Gender Studies	Gender Studies	U15WS3GST01	1	1	100
		Value Education	Ethics II /Bible Studies II / Catechism II	U15VE4LVE02/ U15VE4LVB02/ U15VE4LVC02	1	-	100
TOTAL					30	22	700
IV	I	Language	Tamil Paper IV/ Hindi Paper IV/ French Paper IV	U15TL4TAM04/ U15HN4HIN04/ U16FR4FRE04	5	3	100
	II	English	English Paper IV	U15EL4GEN04	6	3	100
	III	Major Core – 6	Modern Algebra – I	U15MA4MCT06	5	5	100

		Major Elective – 1	**Numerical Methods / Combinatorics / Mathematical Modelling**	**U15MA4MET01/ U15MA4MET04/ U15MA4MET05**	**5**	**5**	**100**
		Allied - 5 (Optional)	**Internet and Web Designing**	**U15MA4AOT16**	**4**	**4**	**100**
		Allied – 6 (Optional)	**Programming in C**	**U15MA4AOT19**	**4**	**3**	**100**
	IV		**Extension Activity**		**-**	**1**	
		Value Education	**Ethics II/Bible Studies II/ Catechism II**	**U15VE4LVE02/ U15VE4LVB02/ U15VE4LVC02**	**1**	**1**	**100**
		Internship/Field Work/Field Project 30 hours- Extra Credit		**U18SP4ECC01**	**-**	**2(Extra Credit)**	**100**
TOTAL					**30**	**25+2**	**700+100**
V	**III**	**Major Core – 7**	**Modern Algebra – II**	**U15MA5MCT07**	**5**	**4**	**100**
		Major Core – 8	**Optimization Techniques**	**U15MA5MCT08**	**5**	**4**	**100**
		Major Core - 9	**Graph theory**	**U15MA5MCT09**	**5**	**4**	**100**
		Major Core – 10	**Real Analysis – II**	**U15MA5MCT10**	**5**	**4**	**100**
		Major elective -2	**Mechanics/ Astronomy**	**U15MA5MET02/ U15MA5MET06**	**5**	**5**	**100**
	IV	**Non Major Elective - 1**	**Quick Mathematics**	**U15MA5NMT01**	**2**	**2**	**100**
		Skill Based Elective -4	**MATLAB Applications.**	**U15MA5SBT04**	**2**	**2**	**100**
		Value education	**Ethics III/Bible Studies III/ Catechism III**	**U15VE6LVE03/ U15VE6LVB03/ U15VE6LVC03**	**1**	**--**	**--**
TOTAL					**30**	**25**	**700**
	III	**Major Core – 11**	**Theory of Functions of a Complex Variable.**	**U15MA6MCT11**	**6**	**5**	**100**

VI		**Major Core – 12**	**Differential Equations , Laplace Transforms and Fourier Series**	**U15MA6MCT12**	**6**	**5**	**100**
		Major Core – 13	**Introduction to Fuzzy Mathematics**	**U15MA6MCT13**	**6**	**5**	**100**
		Major Elective 3	**Programming in C++/ Number Theory**	**U15MA6MET03/ U15MA6MET07**	**5**	**5**	**100**
	IV	**Non Major Elective – 2**	**Art of Programming**	**U15MA6NMT02**	**2**	**2**	**100**
		Skill Based Elective – 5	**Application of Algorithms**	**U15MA6SBT05**	**2**	**2**	**100**
		Skill Based Elective - 6	**Research Methodology**	**U15DS6SBT06**	**2**	**2**	**100**
		Value Education	**Ethics III /Bible Studies III / Catechism III**	**U15VE6LVE03/ U15VE6LVB03/ U15VE6LVC03**	**1**	**-**	**-**
		Internship/Field Work/Field Project 30 hours -Extra Credit		**U18SP6ECC01**	**-**	**2(Extra Credit)**	**100**
	IV	**Extension Activity**	**RESCAPES -Impact study of project**		**-**	**1**	**100**
TOTAL					**30**	**27+2**	**800+100**
GRAND TOTAL					**180**	**140+1+6**	**4300+300**

List of Allied Courses

Sem	Part	Component	Title	Code	Hours	Credits	Marks
I	III	Allied 1	Algebra , Calculus and Trigonometry (for Physics students)	U15MA1ACT02	4	4	100
I	III	Allied 1	Business Mathematics (for Commerce students)	U15MA1ACT03	4	4	100
I	III	Allied 1	Business Mathematics and Statistics (for Commerce-Vocational students)	U15MA1ACT04	4	4	100
I	III	Allied 2	Applied Mathematics –I (for B.C.A and Computer Science students)	U15MA1ACT05	4	3	100
I	III	Allied 2	Analytical Geometry of Three Dimensions and Vector Calculus (for Physics students)	U15MA1ACT07	4	3	100
I	III	Allied 2	Business Mathematics and Statistics for Managers (for BBA students)	U18BB1ACT02	4	3	100
II	III	Allied 3	Laplace Transforms , Partial Differential Equations and Fourier Series(for Physics students)	U15MA2ACT09	4	3	100
II	III	Allied 3	Business Statistics (for Commerce students)	U15MA2ACT10	4	3	100
II	III	Allied 3	Applied Mathematics –II (for B.C.A and Computer Science students)	U15MA2ACT11	4	3	100

III	**III**	**Allied 4**	**Applied Mathematics –III (for B.C.A and Computer Science students)**	**U15MA3AOT13**	**4**	**3**	**100**
III	**III**	**Allied 4**	**Differential Calculus and Trigonometry (For Chemistry students)**	**U15MA3AOT14**	**4**	**3**	**100**
III	**III**	**Allied 4**	**Mathematics for Competitive Examinations (For Commerce students)**	**U19MA3AOT15**	**4**	**3**	**100**
IV	**III**	**Allied 5**	**Algebra and Integral Calculus (For Chemistry students)**	**U15MA4AOT17**	**4**	**4**	**100**
IV	**III**	**Allied 5**	**Decision Making Techniques (For Commerce students)**	**U19MA4AOT18**	**4**	**4**	**100**
IV	**III**	**Allied 6**	**Analytical Geometry of Three Dimensions, Vector Calculus and Differential Equations (For Chemistry students)**	**U15MA4AOT20**	**4**	**3**	**100**
IV	**III**	**Allied 6**	**Numerical Methods and Testing Hypothesis (For Commerce students)**	**U19MA4AOT21**	**4**	**3**	**100**

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
Affiliated to Bharathidasan University
Nationally Accredited (3rd cycle) with 'A' Grade by NAAC
College with potential for Excellence
Tiruchirappalli - 620002

PG AND RESEARCH DEPARTMENT OF MATHEMATICS

PO No.	Programme outcomes *Upon completion of the B.Sc. Degree Programme, the graduate will be able to*
PO – 1	Obtain knowledge in basic concepts in pure and applied Mathematics
PO – 2	Develop aptitude Skills and skill based knowledge
PO – 3	Learn algorithmic approach and statistical analysis in scientific and social problems
PO – 4	Improve logical and reasoning capacity
PO – 5	Receive training for basics of research and methodology

PSO No.	Programme Specific outcomes *Upon completion of these Courses the graduates would have*
PSO – 1	Become an individual academic excellence to face eligibility exams
PSO – 2	Acquired knowledge for higher studies
PSO – 3	Gained the skills to become an entrepreneur in a tuition centre
PSO – 4	Become a management / software professional
PSO – 5	Been capable of executing research and research projects

(For Candidates admitted from 2015 onwards)

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

PG & RESEARCH DEPARTMENT OF TAMIL

First Year - Semester – I

Course Title	தமிழ்த்தாள் - 1
Total Hours	**90**
Hours/Week	**6 Hrs Wk**
Code	**U15TL1TAM01**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

தமிழ் இலக்கியப் பரப்பையும், பாரம்பரியத்தையும் அறிமுகப்படுத்துதல்.

- To find out the ways to handle the Tamil language effectively and productively.
- To introduce the tradition and grammar of Tamil language.
- To encourage the creative development.
- Creating curiosity to live a better life .
- Helps in creating healthy thoughts.

Course Objectives:

CO No.	Course Objectives
CO-1	தமிழ் இலக்கியப் பரப்பையும்,விழுமியங்களையும் அறிமுகப்படுத்துதல்.
CO-2	தமிழ் மொழியின் தொன்மை, தாய்மொழிப்பற்று, தன்னம்பிக்கை சூழல்களை எதிர்கொள்ளும் திறன் முதலியவற்றை அறிந்து கொள்வர்.
CO-3	கவிதையின் வாயிலாக அன்பு உணர்வினை வளர்க்கச் செய்தல்.
CO-4	கலைச்சொற்கள் வாயிலாக பிறமொழிச் சொற்களை ஆராயும் தன்மைப் பெறுவர்.
CO-5	படைப்பாற்றல் திறனை வளர்த்துக்கொள்வர்.

அலகு:1 செய்யுள்

1. பாரதியார் கவிதைகள் - தமிழ்
   கண்ணன் என் சேவகன்
2. பாரதிதாசன் கவிதைகள் - உலகம் உன்னுடையது
3. உமர்கய்யாம் - உமர்கய்யாம் பாடல்கள்
4. பட்டுக்கோட்டையார் - செய்யும் தொழிலே தெய்வம் **18 Hrs**
5. ந. பிச்சமூர்த்தி – ஒளியின் அழைப்பு
6. வைரமுத்து – ஐந்து பெரிது ஆறு சிறிது
7. சிற்பி – ஒரு கிராமத்து நதி

key Words (Extra Reading)

1. ந. காமராசு கவிதைகள்
2. தமிழன்பன் கவிதைகள்

அலகு:2 செய்யுள்

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

key Words (Extra Reading)

1. ந.முத்துக்குமார் கவிதைகள்
2. செனட்ரியூ கவிதைகள்

அலகு:3 **18Hrs**

தமிழ் இலக்கிய வரலாறு
தமிழாய்வுத்துறை வெளியீடு 20-ஆம் நூற்றாண்டு (தற்காலம்)

key Words (Extra Reading)

தமிழ் இலக்கிய வரலாறு -மு.வரதராசன்

அலகு:4

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

அலகு:5

பொதுப்பகுதி - கலைச்சொற்கள் **18Hrs**

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

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	To evaluate the importance of Tamil in terms of patriotism, self- discipline and unity.	PSO 1	U
CO-2	To evaluate poems and enrich knowledge in religious faith, preserving nature, social atrocities against women and resistance.	PSO 2	E
CO-3	To enhance the creative spirit among the youth through the present Tamil literatures	PSO 2	AN

CO-4	To be aware about human rights and humanism through short stories	PSO 3	AP
CO-5	To learn the culture of different languages	PSO 4	U

பார்வை நூல்கள்

பாட நூல்கள்

செய்யுள் - தமிழாய்வுத்துறை வுத்துறை வெளியீடு

தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறை வெளியீடு

சிறுகதைத் தொகுப்பு - தமிழாய்வுத்துறை வெளியீடு

கலைச்சொற்கள் - தமிழாய்வுத்துறை வெளியீடு

(For the candidates admitted from June 2018 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002
DEPARTMENT OF HINDI
SEMESTER – I

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

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

Course Objectives (CO):

The learner will be able to:

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

UNIT – I **(18 Hours)**

1. Aatma Nirbharatha
2. Idgah
3. Sangya

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

UNIT- II **(18 Hours)**

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

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

UNIT- III **(18 Hours)**

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

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

UNIT- IV **(18 Hours)**

1. Bharat Ek Hai
2. Sharandhata
3. Kriya

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

UNIT- V **(18 Hours)**

1. Mitrata
2. Vapasi
3. Ling Aur Vachan

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

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

Course Outcomes:

The learner will be able to:

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

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

Reference Books :

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

(For candidates admitted 2016 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF FRENCH

SEMESTER I

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

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

Course Objectives (CO):

The learner will be able to

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

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

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

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

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

Unit 2 Au travail! (15 Hours)

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

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

Unit 3 On se détend! (15 Hours)

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

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

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

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

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

Extra Reading (Key Words):La vie des personnalités célèbres

Unit 5 Bon appétit! (15 Hours)

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

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

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

TEXT BOOKS :

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

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

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

(For candidates admitted from June 2018 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), Tiruchirapalli – 620002
PG AND RESEARCH DEPARTMENT OF ENGLISH
I YEAR UG – SEMESTER I
PART II – ENGLISH 1 - GENERAL ENGLISH I

HOURS : 6 **CODE : U15EL1GEN01**
CREDIT : 3 **MARKS: 100**

OBJECTIVES

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

UNIT I - I, ME, MYSELF

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

TEXTS

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

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

UNIT II - MY FAMILY AND FRIENDS

Listening to identify the persons/ places/ things from descriptions
Speaking -Describing incidents, favorite places, traits of a person, analyzing the nature of a person.
Reading to get specific information and to analyze characters
Writing -Letters (personal),paragraphs-family profile and history
Grammar -adjectives and verbs
Vocabulary-synonyms and antonyms in context
Composition - Guided paragraph

TEXTS

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

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

UNIT III - THE WORLD AROUND ME

Listening To identify specific information

Speaking –Discussing and expressing opinions
Reading To infer meaning
Writing Descriptive and Diary writing
Grammar Uses of 'be' Verbs – subject verb concord
Vocabulary Coining new words with Prefix and suffix- converting one part of speech to another
Composition - Essay writing

TEXTS

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

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

UNIT IV - MY CONCERN AND RESPONSIBILITIES

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

TEXTS

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

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

UNIT V - MY PROFESSIONAL WORLD

Listening to short profile to get details –global comprehension
Speaking Discussion on secrets of success learnt from success stories
Reading to infer meaning – to trace the development and analyze the ratio of development
Writing resume and E-mail writing
Grammar- Four Types of sentences
Vocabulary-Idioms and phrases- meaning
Composition – Formal and imaginative writing

TEXTS

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

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

PRESCRIBED BOOK:

English for Communication –PoGo publication Trichy

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(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
Affiliated to Bharathidasan University
Nationally Accredited (3rd cycle) with 'A' Grade by NAAC
College with potential for Excellence

Tiruchirappalli - 620002

First Year - Semester - I

Course Title	**MAJOR CORE - 1 - CALCULUS**
Total Hours	**105**
Hours / Week	**7**
Code	**U15MA1MCT01**
Course type	**Theory**
Credits	**5**
Marks	**100**

General Objective:

To acquaint the students become familiar with techniques of differentiation and integration and apply them to solve problems

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand the methods of successive differentiation of various functions and formation of equations using derivatives.
CO – 2	Apply differentiation for finding maxima and minima, radius of curvature evolute and involute
CO – 3	Understand partial differentiation and application of Euler's theorem, Jacobian method
CO – 4	Understand integration of irrational functions of specific type and Bernoulli's formula.
CO – 5	Understand the properties of definite integrals and applying reduction formula for a specific standard integrals.

DIFFERENTIAL CALCULUS

UNIT I:DIFFERENTIATION **21Hrs**

Logarithmic differentiation– Differentiation of implicit functions - Successive differentiation – n^{th} derivative– Standard results – Trigonometrical transformations- Formation of equations involving derivatives - Leibnitz formula for the n^{th} derivative of a product (with proof).

Extra Reading/Key words*: Application of Leibnitz formula in practical problems*

UNIT II : APPLICATION OF DIFFERENTIATION **21 Hrs**

Increasing and Decreasing Functions - Maxima and minima of a function of a single variable - Curvature–Circle , radius and centre of curvature - Cartesian formula for the radius of curvature - The co-ordinates of the center of curvature – Evolute and involute.

Extra Reading/Key words*: Use of increasing and decreasing functions in marketing,Velocity and acceleration, differential geometry*

UNIT III: **PARTIAL DIFFERENTIATION** **21 Hrs**

Partial differentiation – Total differential coefficient –Implicit functions - Homogeneous functions – Euler's Theorem (with proof) - Partial derivatives of a function of two functions – Jacobians.

Extra Reading/Key words*: Euler's equation of motion,change of variables,transformation*

INTEGRAL CALCULUS

UNIT IV:INTEGRATION **21 Hrs**

Integration of irrational functions - Methods of integration of the following types only $\int \frac{dx}{\sqrt{ax^2+bx+c}}$, $\int \frac{(px+q)}{\sqrt{ax^2+bx+c}}dx$, $\int \sqrt{ax^2+bx+c}dx$, $\int (px+q)\sqrt{ax^2+bx+c}dx$ – Integration by parts - Bernoulli's formula.

Extra Reading/Key words*: Integration of irrational trigonometric functions and irrational fractions.*

UNIT V: **REDUCTION FORMULAE** **21Hrs**

Properties of definite integrals – Reduction formulae for $\int x^n e^{ax}dx$, $\int x^n \cos axdx$, $\int_0^{\frac{\pi}{2}} \sin^n xdx$, $\int_0^{\frac{\pi}{2}} \cos^n xdx$, $\int_0^{\frac{\pi}{2}} \sin^m x\cos^n xdx$, $\int \tan^n xdx$, $\int \cot^n xdx$, $\int \sec^n xdx$, $\int \cos ec^n xdx$, $\int x^m (\log x)^n dx$ – Simple problems only.

Extra Reading/Key words ***:****Even and odd functions, Periodic functions*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes(CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO – 1	Recognize and relate successive differentiation of various functions and illustrate how to compose equations	**PSO – 2**	**R,U**
CO – 2	Demonstrate and calculate maxima and minima, radius of curvature evolute and Involute.	**PSO -3**	**Ap, E**
CO – 3	Recognize and sketch partial differentiation , application of Euler's theorem and Jacobians	**PSO -1**	**E**
CO – 4	Calculate integration of irrational functions of specific type	**PSO -4**	**An**
CO – 5	Recall the properties of definite integrals and interpret reduction formula	**PSO -5**	**R,U**
CO – 6	To acquaint the students become familiar with techniques of differentiation and integration and apply them to solve problems - Skill Development	**PSO-2**	**Ap**

TEXT BOOK:
Treatment and content as in
1. Narayanan.S and Manicavachagom Pillay .T.K (2011),CALCULUS (Vol I &II) , S.Viswanathan (Printers and publishers),Chennai.
CALCULUS (VolI & II) by S. Narayanan and T.K. Manicavachagom Pillay for Units I , II and III.
Unit I – Chapter II : Sections 4 , 5 & 6 and Chapter III
Unit II - Chapter IV : Section 2.2
Chapter V : Sections 1.1 – 1.3 (upto exercise 19)
Chapter X : Sections 2.1 – 2.4
Unit III – Vol I : Chapter VIII : Section 1
Vol II : Chapter VI :Sections 1.1 , 1.2 , 2.3 & 2.4(Problems of finding Jacobians only)
CALCULUS (Vol II) by S. Narayanan and T.K. Manicavachagom Pillay for Units IV and V
Unit IV – Chapter I : Section 8 (cases (i) – (iv) only),Sections 12 & 15.1

Unit V – Chapter I: Sections 11 & 13.

REFERENCE BOOKS :

1. P. Kandasamy and Thilagavathy(2004),MATHEMATICS(Vol .I), S. Chand, New Delhi.
2. Thomas and Finney(2006),CALCULUS, Pearson Education, 9th Edition.
3. David V. Widder (2003),ADVANCED CALCULUS , Prentice Hall of India Delhi.
4. Piskunov.N ,DIFFERENTIAL AND INTEGRAL CALCULUS, Mir Publishers, Delhi
5. Schaums Outline series (2005) – THEORY AND PROBLEMS OFADVANCED CALCULUS.

(For candidates admitted from 2015 onwards)
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College with potential for Excellence
Tiruchirappalli - 620002
First Year - Semester - I

Course Title	**ALLIED 1 - MATHEMATICAL STATISTICS I**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA1ACT01**
Course type	**Theory**
Credits	**4**
Marks	**100**

General Objective:

To understand the various methods of collection of data and representing them through diagrams and graphs. To analyze the characteristics of data by using relevant statistical tools**.**

Course Objectives(CO):
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand various methods of collection of data and representing them through graphs
CO – 2	Analyse various measures of central tendency.
CO – 3	Understand to correlate data and fit into a linear regression curve.
CO – 4	Evaluate index number using Laspeyre's, Fisher's methods, Aggregate expenditure method and family Budget method.
CO – 5	Analyze time series with respect to different variation.

UNIT I: COLLECTION , PRESENTATION OF DATA AND MEASURES OF CENTRAL TENDENCY **12Hrs**

Definition of Statistics – Statistical data – primary and secondary – collection, classification and tabulation of data. Diagrammatic and graphical representation. Measures of Central Tendency –Mean , Median, Mode.

Extra Reading/ Keywords: *Business statistics, Descriptive statistics, Economics*

UNIT II: DISPERSION, SKEWNESS AND KURTOSIS **12 Hrs**

Dispersion – calculation of Mean Deviation, Quartile deviation, standard deviation, coefficient of variation and moments for frequency distributions- concept of skewness and kurtosis and their measures.

Extra Reading/ Keywords: *Grouped data, Gaussian Distribution, Laplace distribution*

UNIT III : CORRELATION AND REGRESSION **12 Hrs**

Simple Correlation – rank correlation - Concurrent Deviation – Linear regression. (Error analysis in chapter 12 omitted)

Extra Reading/ Keywords: *Least squares method, Multiple regression, Karl Pearson's method, Spearman's ranking method, Scatter diagram*

UNIT IV : INDEX NUMBERS **12 Hrs**

Index Numbers- Uses – Types – Laspeyre's-Paasche's-Fisher's and Bowley's index(other methods in weighted aggregate type omitted) -Tests of Consistency(Unit and Circular tests omitted)-Chain and fixed base index-Base shifting(Splicing and deflating indexes omitted) – Cost of Living Index – Aggregate Expenditure Method – Family Budget Method .

Extra Reading/ Keywords: *Policonomics, Order reversal test, Time and factor test, Weighted index numbers, Zero-based budget, Cash-Only budgeting*

UNIT V : ANALYSIS OF TIME SERIES **12 Hrs**

Analysis of time series- Uses- Mathematical model- Secular Trend (all types)-Seasonal Variation(Ratio to trend and ratio to moving averages methods omitted)-Cyclical Variation – Irregular Variation**.**

Extra Reading/ Keywords: *Forecasting, Analysis of economic and industrial time series, Measuring Seasonality*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes(CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO – 1	Recall various methods of collection of data and describe graphs	**PSO - 2**	**R,U**

CO – 2	Categorize and evaluate various measures of central tendency.	**PSO - 3**	**E**
CO – 3	Calculate correlation and regression	**PSO - 1**	**E,An**
CO – 4	Compute index number by Laspeyre's, Fisher's methods, expenditure method and family Budget method.	**PSO - 5**	**Ap**
CO – 5	Examine time series with respect to different variation	**PSO - 4**	**E,An**
CO – 6	Analyse various measures of central tendency. Understand to correlate data and fit into a linear regression curve- Skill Development	**PSO-1,2**	**An,Ap**

TEXT BOOKS:

Treatment and content as in Pillai R.S.N , Bagavathi .V (2007) STATISTICS S.Chand and Company , New Delhi

UNIT I: Chapter 1,2,4,6,7,8& 9
UNIT II: Chapters 10 and 11
UNIT III: Chapter 12 and 13 (Omit "Error analysis" in Chapter 12)
UNIT IV: Chapter 14
UNIT V: Chapter 15

REFERENCE BOOKS:

1. Arora .S, Sumeet Arora (2002),COMPREHENSIVE STATISTICAL METHODS, S.Chand and Company Ltd ,New Delhi.
2. Douglas A.Lind ,William G.Marchall ,Samuel A. Wathen (2003) ,BASIC STATISTICS FOR BUSINESSAND ECONOMICS, Mc Graw Hill, Delhi.
3. Gupta .S.C, Indra Gupta (2004) , BUSINESS STATISTICS ,Himalaya Publishing House , New Delhi.
4. Gupta .S.P (2006) , STATISTICAL METHODS, Sultan Chand & Sons ,New Delhi.
5. Sharma J.K, (2006) BUSINESS STATISTICS, Dorling Kindersley, (India) Pvt Ltd, Licensees of Pearson Education in South Asia.

(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
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Tiruchirappalli - 620002
First Year - Semester - I

Course Title	**ALLIED 2- MATHEMATICAL STATISTICS II**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA1ACT06**
Course type	**Theory**
Credits	**3**
Marks	**100**

General Objective:

To make the students understand various characteristics of discrete and continuous statistical distributions with mathematical techniques.

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand probability, conditional probability and its axiom and theorems
CO – 2	Understand discrete and continuous random variable and its properties and properties of two dimensional random variable.
CO – 3	Evaluate expectation and variance and its relevant theorems.
CO – 4	Evaluate binomial distribution Poisson distribution and their properties
CO – 5	Evaluate normal distribution and its properties

UNIT I: PROBABILITY **12 Hrs**

Introduction-Classical Definition, addition theorem, multiplication theorem, Odds in favour and odds against an event, Axiomatic Approach , Axioms of Probability, Conditional Probability, Multiplicative law of probability, Probability of an event in terms of conditional probability, Baye's theorem, Independent Events. (Problems Only)

Extra Reading/ Keywords: *Stock market, Tree diagram, Mutually exclusive*

UNIT II: RANDOM VARIABLES **12 Hrs**

Discrete and continuous random variable, cumulative distributive function, properties of distribution function, function of a random variable, two dimensional random variable, joint probability function, marginal probability distribution, conditional probability distribution, independent random variables.

Extra Reading/ Keywords: *Multinomial Distribution, Compound marginal distribution, Probability distribution fitting*

UNIT III: EXPECTATION AND VARIANCE **12 Hrs**

Expectation of a random variable - expectation of a function of a random variable, theorems on expectation. Variance – definition, theorems on variance, Tchebychev's inequality. **Extra Reading/ Keywords:** *Berry-Esseen Theorem, Equi oscillation theorem, Moment of inertia, Population variance*

UNIT IV: DISCRETE DISTRIBUTIONS **12 Hrs**

Binomial distribution– Definition, properties, binomial frequency distribution, moments, recurrence formula for moments, moment generating function, additive property, mode.
Poisson distribution– Definition, properties, Poisson frequency distribution, Poisson distribution as limiting form of binomial distribution, moments, recurrence formula for moments, moment generating function, mode.

Extra Reading/ Keywords: *Skellam distribution, Poisson approximation, Wald method, Hypergeometric distribution.*

UNIT V – CONTINUOUS DISTRIBUTION **12 Hrs**

Normal Distribution – Definition, moments, moment generating function, linearity property, mean deviation, mode and properties of normal distribution.(Points of inflection and normal probability integral are excluded).

Extra Reading/ Keywords: *Central limit theorem, Bernstein's theorem, Brownian motion*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes(CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO -1	Recognize and discuss probability, conditional probability and its axiom, Theorems .	**PSO - 3**	**R,U**

CO – 2	Explain and relate discrete and continuous random variable	**PSO - 5**	**U,Ap**
CO – 3	Compute expectation and variance and discuss relevant theorems.	**PSO - 1**	**E**
CO – 4	Recognize binomial distribution, Poisson distribution and describe their properties.	**PSO - 2**	**U, Ap**
CO – 5	Explain normal distribution and its properties	**PSO - 4**	**U, Ap**
CO – 6	Understand discrete and continuous random variable and its properties and properties of two dimensional random variable. Evaluate expectation and variance and its relevant theorems- Skill Development	**PSO – 2,3**	**U, An**

TEXT BOOK:

Treatment and content as in Vittal .P.R (2002) ,

MATHEMATICAL STATISTICS,Margham Publishers,Chennai.

Unit I - Chapter 1
Unit II - Chapter 2
Unit III - Chapters 3 and 4
Unit IV - Chapters 12 and 13
Unit V - Chapters 16

REFERENCE BOOKS:

1. Arora .S,Sumeet Arora (2002),COMPREHENSIVE STATISTICAL METHODS, S.Chand and
Company Ltd ,New Delhi.
2. Gupta .S.C, Kapoor.V.K (2002) , FUNDAMENTALS OF MATHEMATICAL STATISTICS
Sultan Chand & Sons ,New Delhi.
3. Gupta .S.P (2006) , STATISTICAL METHODS, Sultan Chand & Sons ,New Delhi.

(For candidates admitted from 2018 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B.Sc.,DEGREE EXAMINATION
SEMESTER I

Course Title	**ENVIRONMENTAL STUDIES**
Total Hours	**15**
Hours/Week	**1**
Code	**U18RE1EST01**
Course Type	Theory
Credits	**1**
Marks	**100**

General Objectives:
The Student will be able to understand the concept of ecosystem, biodiversity, conservation, disaster management, analyse the prospects of natural resources, evaluate the effect and control of pollution

Course Objectives:
The student will be able to

1. understand the prospects of the various natural resources.
2. analyse the concept and need for biodiversity
3. evaluate the effect of the different types of pollution.
4. understand the need for disaster management
5. understand the Environment and Social Issues

Unit I – Awareness and Natural Resources **3hrs**
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.
Extra reading (Key Words):*Non renewable sources- location in India*

Unit II – Ecosystems and Biodiversity **3hrs**
Ecosystem – concepts, structure and types – concept of food chains and food web – causes and effects of weakening food chains - Biodiversity – concept of genetic, species and ecological biodiversity – ecological and economic values – India, a megadiversity country, hotspots – threats to biodiversity and conservation measures
Extra reading (Key Words): *Red list (any 10 plants and animals)*

Unit III – Environmental Pollution **3hrs**
Causes, effects and control of water, and air pollution – global warming – ozone depletion – nuclear hazards. Population growth at national and global level
World food production – effects of modern agriculture on land ecosystems – GMOs and related issues .Environmental pollution and diseases – malaria, chikungunya
Extra reading (Key Words): *Environmental factors affecting human behaviour*

Unit IV – Disaster Management **3hrs**
Bomb Threat – Earthquake – Explosion – Hazardous material spill / release – campus shooting – Terrorist incidence – Financial emergency – a sudden health emergency, unexpected loss of income, death in the family or other family emergency. Rent in arrears and risk of eviction. Natural disasters

Extra reading (Key Words): *Causative factors of any 2 disasters*

Unit V – Environment and Social Issues **3hrs**

Rich – poor wide – at national and global levels

Urbanization – slums

Changing value systems – AIDS Family welfare programs

Extra reading (Key Words): *Scholarships and funds benefitting the welfare of the family*

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

Course Outcomes:

1. Explain the importance of the various natural resources.
2. Analyze the concepts, structure and types of ecosystem. Add note on the biodiversity concepts
3. Evaluate the effect of the different types of pollution
4. Explains the various disaster management.
5. Discuss the need of environment and the social issues

REFERENCES:

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

Chairas, D.D. (1985). Environmental Science. The Benjamin Cummings Publishing company., Inc.

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

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

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

Nebel, B.J. and Wright, R.T.(1996). Environmental Science, Prentice Hall, New Jersey

Odum, E.P.(2008) Fundamentals of Ecology.Indian Edition. Brooks / Cole.

Sharma, B.K. and Kaur (1997). Environmental Chemistry. Goel Publishing House, Meerut. Sharma, B.K. and Kaur, (1997). An Introduction to Environmental Pollution. Goel Publishing House, Meerut.

Sinhe, A.K. Boojh, R. and Vishwanathan, P. N. (1989). Water Pollution Conservation and Management, Gyansdaya Prakashan, Nainital.

(For Candidates admitted from June 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B.A/B. Sc/B.Com /B.C.A-DEGREE COURSES
LIFE ORIENTED EDUCATION
ETHICS – I: RELIGIONS AND VALUE SYSTEMS

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

OBJECTIVES:

- To enable the students to understand and appreciate all Religions and Culture
- To help the students to becom
- To aware of the negative forces of religions.

UNIT – I: RELIGION

God – Faith, Religion, Definition, Nature, Characteristics and Basic values of different religions. Impact of Globalization on religion – Importance of worship in holy places – celebration, Communion (come-union) – Socialization

UNIT – II: DIFFERENT RELIGIONS

Basic characteristics and basic thoughts of different religions: Buddhism, Christianity, Hinduism, Islam, Jainism and Sikhism

UNIT – III: UNITY OF RELIGION

Unity of Vision and Purpose- Respect for Other Religions, Inter Religious Co-operation, Religious Pluralism as a fact and Religious Pluralism as a value

UNIT – IV: FUNDAMENTALISM, COMMUNALISM AND SECULARISM

Meaning and impact of Fundamentalism, Communalism, Violence and Terrorism – Tolerance – Secularism – Individualism

UNIT – V: VALUE SYSTEMS

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

REFERENCES:

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

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

HRS / WK : 1 **CODE: U15VE2LVBO1**
CREDIT : 1 **MARKS : 100**

OBJECTIVE:

- To enable the students to develop the passion for the Word of God – Jesus and inculcate the thirst of Missionaries being a disciple of Christ.

UNIT – I: BIBLE – THE WORD OF GOD

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

UNIT – II: MINISTRY OF JESUS

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

UNIT – III: CHURCH – BIRTH AND GROWTH

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

- Comparison between early Church and present Church.

UNIT – IV: DISCIPLES AND APOSTLES

- Mother Mary (Mother of Jesus) (Luke 1: 27-35, John 2: 1-12, 19:35, Acts 1: 13-14)
- 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)
- St. Thomas (John 20:24-31)

UNIT – V: ST. PAUL'S LETTERS AND THE MESSAGE

- I & II Corinthians
- Galatians
- Ephesians
- Philippians
- I & II Timothy
- Titus

REFERENCES:

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

(For Candidates admitted from June 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI -2
B.A/B. Sc /B.Com/ B.C.A-DEGREE COURSES
LIFE ORIENTED EDUCATION
CATECHISM – I: GOD OF LIFE

HRS / WK : 1 **CODE: U15VE2LVC01**
CREDIT : 1 **MARKS : 100**

OBJECTIVES:

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

UNIT – I: CREATION AND COVENANT

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

(Pentateuch) -Our response to God's covenant -Reason for its success and failure -The relationship of God with Israel -Image of God in Old Testament-God and me

UNIT – II: GOD OF THE PROPHETS

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

UNIT – III: GOD OF WISDOM

God experience through wisdom Literature, its origin and growth

UNIT – IV: SYNOPTIC GOSPELS

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

UNIT – V: LUKE'S GOSPEL

Study of Luke's Gospel in detail – speciality 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. Vaazhvin Vazhiyil – St. John's Gospel- Fr. Eronimus
4. God's Word nourishes A catholic approach to the Scriptures Dr. Silvano Renu Rita, O.C.V. STD and Dr. Mascarenhas Fio S.J. D.mim. Catholic Bible I
5. Documents of Vatican II – St. Paul's Publications, Bombay 1966.

(For candidates admitted from 2015 onwards)
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Tiruchirappalli - 620002
First Year - Semester - I

Course Title	**Allied 1 – ALGEBRA, CALCULUS AND TRIGONOMETRY (For Physics Students)**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA1ACT02**
Course type	**Theory**
Credits	**4**
Marks	**100**

General Objective:

To give an in depth knowledge of matrices, trigonometry and calculus and inculcate the habit of problem solving.

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Evaluate eigen values and eigen vectors and evaluation of eigen values and eigen vectors using Cayley Hamilton theorem.
CO – 2	Understand about successive differentiation and evaluation using Libenitz methods and jacobians.
CO – 3	Evaluate double and triple integral
CO – 4	Apply reduction formula to different standard integrals.
CO – 5	Evaluate expansion of trigonometric function as multiple of θ and a series of powers of θ
CO – 6	Understand hyperbolic function, inverse hyperbolic function and separation into real and imaginary parts.

UNIT I : ALGEBRA **12Hrs**

Characteristic equation of a square matrix – Evaluation of Eigen values and Eigen vectors– Cayley – Hamilton theorem (without proof) and simple problems.

Extra Reading/ Keywords: *Cayley matrix algebra, Hessenberg method, Algebraic multiplicity*

UNIT II : DIFFERENTIAL CALCULUS **12 Hrs**

Successive differentiation –n^{th} derivative of standard functions – Leibnitz theorem (without proof) and application of the same to simple problems – Jacobians of two and three variables.

Extra Reading/ Keywords: *Chain rule, Polar co-ordinates, Wronskian, Reynolds transport theorem*

UNIT III : MULTIPLE INTEGRALS **12 Hrs**

Reduction formulae:$_0\int^{p/2}\sin^n x\,dx$, $_0\int^{p/2}\cos^n x\,dx$, $_0\int^{p/2}\sin^n x\cos^n x\,dx$ (Problems only) -Introduction to evaluation of double and triple (in Cartesian only)integrals(Change of order of integration excluded)

Extra Reading/ Keywords: *Hyper volumes, Cylindrical coordinates, Divergence theorem, Transcendental functions*

TRIGONOMETRY

UNIT IV: EXPANSIONS OF TRIGONOMETRIC FUNCTIONS **12 Hrs**

Expansions of cosnθ, sinnθ and tannθ (n being a positive integer) – Expansions of $sin^n\theta$ and $cos^n\theta$ in a series of sines and cosines of multiples of θ (n being a positive integer and θ in radians) – Expansions of sinθ, cosθ and tanθ in a series of powers of θ (Formation of equations excluded)

Extra Reading /Keywords: *Taylor series, Inverse trigonometric functions, Asymptotic expansion*

UNIT V : HYPERBOLIC FUNCTIONS **12 Hrs**

Hyperbolic functions - Inverse hyperbolic functions - Separation into real and imaginary parts.

Extra Reading /Keywords: *Hyperbolic angle, Inverse hyperbolic Cotangent, Secant, Cosecant*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes(CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO – 1	Compute eigen values and eigen vectors using Cayley Hamilton theorem.	**PSO - 2**	**E**

CO – 2	Recall successive differentiation and evaluation of successive differentiation using Leibnitz methods and jacobians.	**PSO - 5**	**U,Ap**
CO - 3	Evaluate double and triple integral.	**PSO - 1**	**E**
CO - 4	Demonstrate reduction formula to different standard integrals.	**PSO - 3**	**U, Ap**
CO - 5	Compute the expansion of trigonometric function as multiple of θ and a series of powers of θ Recall and evaluate hyperbolic function, inverse hyperbolic function and separation into real and imaginary parts.	**PSO - 4**	**U ,E**
CO - 6	Give an in depth knowledge of matrices, trigonometry and calculus and inculcate the habit of problem solving - Skill Development	**PSO- 2,3**	**Ap**

TEXT BOOKS :

1. Treatment and content as in Narayanan.S,ManicavachagomPillay.T.K,(2006),ANCILLARY MATHEMATICS–Volume I ,S.Viswanathan (Printers and publishers),Chennai for Units I, II, IVandV

UNITI: Chapter 3: Sec 3.4(Excluding 3.5)
UNITII: Chapter 6: 6.1 – 6.2
UNITIV: Chapter 5 : Sec 5.1 – 5.3(Excluding Approximations)
UNITV: Chapter 5: Sec 5.4

2. Treatment and content as inNarayanan.S, ManicavachagomPillay.T.K,(2006), Calculus- Volume II,S.Viswanathan (Printers and publishers),Chennai for Unit III

UNITIII: Chapter 1: Sec 1.3.3-1.3.5
Chapter 5 :Sec 2.2 (change of order of integration omitted)(Problems only)
Sec 4(change of order of integration omitted)(Problems only)

REFERENCE BOOKS:

1. Aggarwal.S,(2000) ALGEBRA-IS.Chand& Company(Pvt)Ltd.,New Delhi
2.Balasubrahmanyam P., VenkatacharyP.R. ,Venkataraman G.R.(1992), TEXT BOOK ON TRIGONOMETRY Published by ROC House &Sons,Chennai.
3. Narayanan.S,ManicavachagomPillay.T.K,(2006), TRIGONOMETRY, S.Viswanathan (Printers and publishers),Chennai.
4. Narayanan.S,ManicavachagomPillay.T.K,(2006),ANCILLARY MATHEMATICS–Volume II , S.Viswanathan (Printers and publishers),Chennai.

(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
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College with potential for Excellence
Tiruchirappalli - 620002
First Year - Semester - I

Course Title	**Allied 2 – ANALYTICAL GEOMETRY OF THREE DIMENSIONS AND VECTOR CALCULUS(For Physics Students)**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA1ACT07**
Course type	**Theory**
Credits	**3**
Marks	**100**

General Objective:

To make the students familiar with the basic concepts of three dimensional geometry, line surface and volume integrals.

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand direction cosines and direction ratios, the plane and its standard forms
CO – 2	Understand equation of line, coplanarity of lines, skew lines and shortest distance between them
CO – 3	Understand sphere and section of sphere by a plane.
CO – 4	Evaluate the application of differentiation of vectors to physics concepts
CO - 5	Evaluate line integral, surface integral and volume integrals and application of Gauss and stoke's theorem.

UNIT I: PLANE **12 Hrs**

Direction Cosines – Direction ratios – angle between two lines - The Plane – the general equation of the plane – Standard forms of equations of planes.

Extra Reading/ Keywords: *Hyperbolic plane, Euclidean plane, Stereographic projection, Geometry*

UNIT II: STRAIGHT LINES **12 Hrs**

Equation of a line - equation of the line of shortest distance (Cartesian only) – coplanarity of Straight lines - Skewlines – Shortest distance between two skewlines

Extra Reading/ Keywords: *Geodesic, Equation of a line in polar coordinates, Secant lines, Euler line, Regular Tetrahedron*

UNIT III: SPHERE **12 Hrs**

Sphere - General equation – tangent planes – section of a sphere by a plane - sphere through a given circle.

Extra Reading/ Keywords: *Pencil of spheres, Hypersphere, Spherical cap, Circle of a sphere*

UNIT IV: DIFFERENTIATION OF VECTORS **12 Hrs**

Velocity – acceleration – scalar and vector fields – Gradient, Divergence and curl – applications.

Extra Reading/ Keywords: *Relative velocity, Group velocity, Escape velocity, Curl in three dimensions, Covector, Tensor field*

UNIT V: VECTOR INTEGRATION **12 Hrs**

Line integral – surface integral – volume integral– application of Gauss and Stoke's theorems (Statement only) simple problems.

Extra Reading/ Keywords: *Path independence, Manifold, Inverse square law, Gauss's law for gravity*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes(CO) :

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recognize and compute direction cosines and direction ratios, the plane and its standard forms.	**PSO - 1**	**R,U**
CO - 2	Recall and relate equation of line, co planarity of lines, skew lines and shortest distance between them.	**PSO - 5**	**U,Ap**
CO - 3	Explain and describe sphere and section of sphere by a plane.	**PSO - 2**	**E**

CO - 4	Evaluate the application of differentiation of vectors to physics phenomena	**PSO - 3**	**U, Ap,E**
CO - 5	Comp Evaluate line integral, surface integral and volume integrals and Interpretation of Gauss and Stoke's theorem.	**PSO - 4**	**E**
CO - 6	Make the students familiar with the basic concepts of three dimensional geometry, line surface and volume integrals-Skill Development	**PSO – 1,2**	**R, Ap**

TEXT BOOKS:

Treatment and content as in

1.Manicavachagom Pillay. T.K, Natarajan T (2000) , A TEXT BOOK OF ANALYTICALGEOMETRY (Part II – Three Dimensions) , S.Viswanathan (Printers and publishers),Chennai for Unit I , II & III

UNIT I : Chapter 1 & 2

UNIT II : Chapter 3 (Section 1 to 8)

UNIT III: Chapter 4

2. P.R. Vittal , V.Malini (2009), VECTOR CALCULUS, FOURIER SERIES AND FOURER TRANSFORMS, Margham publications, Chennai for Unit IV & V.

UNIT IV: Chapter 1

UNIT V: Chapter 2

REFERENCE BOOKS:

1.Duraipandian .P,Laxmi Duraipandian & D.Mahilan(1990) , ANALYTICAL GEOMETRY, Emerald Publishers,Chennai.

2.Duraipandian.P ,Laxmi Duraipandian, (1998) , VECTOR ANALYSIS , Emerald Publishers Chennai.

3. Engineering Mathematics (Third year – Part B) by Dr. M.K. Venkatraman.

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Tiruchirappalli - 620002
First Year - Semester - I

Course Title	**ALLIED 1: BUSINESS MATHEMATICS (For commerce students)**
Total Hours	**75**
Hours / Week	**4**
Code	**U15MA1ACT03**
Course type	**Theory**
Credits	**4**
Marks	**100**

General Objective:

This course introduces the basic concepts of mathematics relevant to business and managerial skills

Course Objectives(CO):
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand mathematical finance, simple and compound interests, Depreciation and Discounting
CO – 2	Understand of matrices and test for consistency of equation using matrices
CO – 3	Apply differentiation for finding marginal functions, elasticity, maxima and minima
CO – 4	Evaluate of initial basic feasible solution to transportation problem
CO – 5	Evaluate assignment problem using Hungarian algorithm.

UNIT I: MATHEMATICS OF FINANCE **15 Hrs**

Mathematics of finance – Simple interest – Compound interest – Depreciation – discounting (Excluding Effective and nominal rate of interest in section 5, Annuities , Sinking Fund and Amortisation Table).

Extra Reading/ Keywords: *Financial modeling, Black-Scholes model, Fundamental theorem of asset pricing*

UNIT II: MATRICES **15 Hrs**

Matrices - inverse of a matrix - rank of a matrix –Test for Consistency of equations. (Excluding Algebra of Matrices , Determinants and also Input – Output Analysis) **Extra Reading/ Keywords:** *Eigen values, Eigen vectors, Matrix inversion method*

UNIT III: APPLICATIONS OF DIFFERENTIATION **15 Hrs**

Application of derivatives –marginal functions –elasticity –increasing and decreasing functions – maxima and minima

Extra Reading/ Keywords: *Rolle's Theorem, Arc elasticity, Critical number, Newton's method*

UNIT IV: TRANSPORTATION PROBLEM **15 Hrs**

Transportation problem– Initial basic feasible solution – North West Corner rule – Vogel's Approximation method – Matrix minima method (optimal solution excluded)

Extra Reading/ Keywords: *Modified Distribution, Sequencing problem, Job sequencing problem, Game theory*

UNIT V: ASSIGNMENT PROBLEM **15 Hrs**

Assignment problem (Travelling salesman problem excluded)

Extra Reading/ Keywords: *Travelling Salesman problem, Quadratic assignment problem, Secretary problem, Hungarian method*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes (CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO – 1	Record and assess mathematical finance, simple and compound interests, depreciation and discounting.	**PSO - 1**	**R,U,**
CO – 2	Recall matrices and test for consistency of system of equations	**PSO - 3**	**U,Ap**
CO – 3	Apply differentiation to estimate marginal functions, elasticity, maxima and minima	**PSO - 2**	**U,E**

CO – 4	Evaluate of initial basic feasible solution of the transportation problem	**PSO - 5**	**Ap,E**
CO – 5	Evaluate assignment problem using Hungarian algorithm.	**PSO - 4**	**E**
CO -6	Be Introduced to the basic concepts of mathematics relevant to business and managerial skills - Skill Development	**PSO-1,4**	**R, Ap**

TEXT BOOKS:

Treatment and content as in

1. Navaneetham P.A.(2007) , BUSINESS MATHEMATICS AND STATISTICS ,Jai Publishers Trichy for Units I , II and III.

UNIT I: Chapter 2 (Omit Sec. 7, 8 &9)

UNIT II: Chapter 4 (Omit Sec 1 to 8 (upto 4) and 13)

UNIT III: Chapter 7

2. KantiSwarup, Gupta P.K, Man Mohan (2007), OPERATIONS RESEARCH Sultan Chand & Sons, New Delhi for Units IV and V.

UNIT IV: Chapter 10 (Omit Sec 10.4,10.6,10.7,10.10 to 10.17)

UNIT V : Chapter 11 (Omit Sec 11.5 to 11.7)

REFERENCE BOOKS:

1.Vittal .P.R,(2004),BUSINESS MATHEMATICS ,MarghamPublishers,Chennai.

2.Aggarwal.D.R(2005), Business Mathematics Vrinda Publications, New Delhi.

3. Gupta P.K,.Hira D.S, Problems in Operations Research S.Chand& Co, New Delhi.

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Tiruchirappalli - 620002
First Year - Semester - I

Course Title	**ALLIED 1 : BUSINESS MATHEMATICS AND STATISTICS (For commerce students-vocational)**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA1ACT04**
Course type	**Theory**
Credits	**4**
Marks	**100**

General Objective:

To provide sufficient knowledge of statistics which enables them to compute various statistical measures . To solve socially relevant allocation problems.

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Apply of differentiation for finding marginal function, elasticity, maxima and minima
CO - 2	Evaluate of initial basic feasible solution to transportation and assignment problem
CO - 3	Understand various method of collection of data and its representation through graphs.
CO - 4	Understand measures of dispersion and correlation
CO - 5	Understand of index numbers and its types and uses.

UNIT I : APPLICATIONS OF DIFFERENTIATION **12 Hrs**

Application of derivatives –marginal functions –elasticity –increasing and decreasing functions –maxima and minima

Extra Reading/ Keywords: *Rolle's Theorem, Arc elasticity, Critical number, Newton's method*

UNIT II : TRANSPORTATION AND ASSIGNMENT PROBLEM **12 Hrs**

Transportation Problem –North-West Corner Rule –Matrix minima method-Vogels approximation method (only initial basic feasible solution) –Assignment Problem –Hungarian method.

Extra Reading/ Keywords: *Modified Distribution, Sequencing problem, Job sequencing problem, Game theory*

UNIT III : COLLECTION AND PRESENTATION OF DATA **12 Hrs**

Statistics –meaning and scope –collection of data –classification and tabulation –diagrams and graphs –histogram-polygon –cumulative frequency curves .

Extra Reading/ Keywords: *Ogive curve, Glaciology, Pareto chart, Ethnography*

UNIT IV :MEASURES OF DISPERSION AND CORRELATION **12 Hrs**

Measures of dispersion –range, quartile deviation ,mean deviation ,standard deviation , coefficient of variation-merits demerits –Karl Pearsons coefficient of correlation ,Rank correlation

Extra Reading/ Keywords: *Lorenz curve, Skewness, Kurtosis, Method of moments, Bowley's co-efficient*

UNIT V :INDEX NUMBERS **12 Hrs**

Index Numbers – Laspeyer's,fisher's and Paasche's index numbers- tests for Index Numbers - cost of living Index Number - uses of Index Numbers.

Extra Reading/ Keywords: *Order reversal test, Time and factor test, Weighted index numbers, Zero-based budget, Cash-Only budgeting, Splicing*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and Seminars.

Course Outcomes(CO) :

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Compute marginal function, elasticity, maxima and minima.	**PSO - 1**	**R,U**
CO - 2	Evaluate of initial basic feasible solution to transportation and assignment problem	**PSO - 3**	**U,Ap**
CO - 3	Recognize various method of collection of data and demonstrate through graphs.	**PSO - 2**	**U,E**

CO - 4	Assess and compare measures of dispersion and correlation.	**PSO - 5**	**Ap,E**
CO - 5	Recall index numbers and categorize its types and uses.	**PSO - 4**	**E**
CO - 6	Provide sufficient knowledge of statistics which enables them to compute various statistical measures. To solve socially relevant allocation problems- - Skill Development	**PSO -2,4**	**U, Ap**

TEXT BOOKS:

Treatment and content as in

1. Navnitham PA. Business Mathematics and Statistics (2009) , for Unit I.
2. KantiSwarup,Gupta P.K , ManmohanOPERATIONS RESEARCH ,Sultan Chand New Delhi for Unit II.
3. PillaiR.S.N ,Bagavathi .V (2007) STATISTICSS.Chand and Company ,New Delhi for Units III , IV and V

REFERENCE BOOKS:

1. HamdyTaha (2005), OPERATIONS RESEARCH Prentice Hall of India,New Delhi.
2. Gupta ,Hira (1989), OPERATIONS RESEARCHS.Chand Publishers, NewDelhi.
3. Arora .S,SumeetArora (2002),COMPREHENSIVE STATISTICAL METHODS, S.Chand and Company Ltd ,New Delhi.
4. Douglas A.Lind ,WilliamG.Marchall ,Samuel A. Wathen (2003) ,BASIC STATISTICS FOR BUSINESSAND ECONOMICS, McGraw Hill, Delhi.
5. Gupta .S.C, Indra Gupta (2004) ,BUSINESS STATISTICS ,Himalaya Publishing House , New Delhi.
6. Gupta .S.P (2006) ,STATISTICAL METHODS, Sultan Chand & Sons ,New Delhi.
7. Sharma J.K, (2006) BUSINESS STATISTICS, Dorling Kindersley, (India) PvtLtd,Licensees of Pearson Education in

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Tiruchirappalli - 620002
First Year - Semester - I

Course Title	**ALLIED 2 : APPLIED MATHEMATICS I (for BCA and B.Sc. Computer science students)**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA1ACT05**
Course type	**Theory**
Credits	**3**
Marks	**100**

General Objective:

To enable the students to understand the concept of mathematical logic. To provide sufficient knowledge of statistics which enables them to compute various statistical measures

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand the concept of logic and truth table
CO – 2	Understand WFF, Tautology and derivation of equivalence of formula
CO – 3	Evaluate measures of central tendency
CO – 4	Evaluate dispersion , Skewness, kurtosis
CO – 5	Evaluate Correlation and regression

UNIT 1: MATHEMATICAL LOGIC **12 Hrs**

Introduction – Notations – Negation – Conjunction – Disjunction - Conditional and bi-conditional Statements – Statement Formulas – Truth Table

Extra Reading/ Keywords: Symbolic logic, Formal logical system

UNIT II : MATHEMATICAL LOGIC (CONTINUED) 12 Hrs

Well formed formulae – Tautology – Equivalence of formulae – Truth table - Truth table method – Replacement Process

Extra Reading/ Keywords: *Logical operations, Logical equations, Tautologies*

UNIT III: MEASURES OF CENTRAL TENDENCY 12 Hrs

Mean – Median – Mode (Excluded: Graphic location of mode & median, Deciles &Percentile)

Extra Reading/ Keywords: *Geometric and harmonic mean, Appropriate and Positional measures, Deciles and percentile, Lorenz curve*

UNIT IV: DISPERSION, SKEWNESS & KURTOSIS 12 Hrs

Range – Quartile deviation – Mean deviation &Standard deviation – Karl Pearson's Coefficient of Skewness – Kurtosis.

Extra Reading/ Keywords: *Co-efficient of variation, Method of moments, Bowley's co-efficient of skewness, Sheppard's correction for moments, Kelly's co-efficient*

UNIT V : CORRELATION AND REGRESSION 12 Hrs

Karl Pearson's Coefficient of Correlation – Spearman's Rank Correlation Coefficient – Regression- Lines of Regression (Excluded Graphic method & standard error of estimate).

Extra Reading/ Keywords: *Index number, Time reversal test and factor reversal test, Least square method, Concurrent deviation method*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes (CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO –1	Recall logic and truth table	**PSO - 3**	**R,U**
CO –2	Recognize WFF, Tautology and Summarize equivalence of formula.	**PSO - 5**	**U,Ap**
CO –3	Compute measures of central tendency	**PSO - 2**	**U,E**
CO –4	Calculate and compare dispersion , Skewness, kurtosis	**PSO - 4**	**E**
CO –5	Evaluate Correlation and regression	**PSO - 1**	**E**
CO – 6	Enable the students to understand the concept of mathematical logic. To provide sufficient knowledge of statistics which enables them to compute various statistical measures- Skill Development	**PSO - 4**	**R,U, Ap**

TEXT BOOKS:

1. Treatment and content as in G.S.S. BHISHMA RAO, Discrete structure and graph theory(2006) , Scitech Publications Pvt Ltd., Hydrabad, for Units I & II
   UNIT I : Chapter 1 : Sections 1- 5
   UNIT II : Chapter 1 : Sections 6- 8

2. Treatment and content as in R.S.N. PILLAI & BHAGAVATHI (2007) , Statistics Theory &practice ,S.Chand and Company Ltd., for Units III , IV , V

   UNIT III : Chapter 9 (Relevant portions only)
   UNIT IV : Chapter 10 & 11 (Relevant portions only)
   UNIT V : Chapter 12 & 13 (Relevant portions only)

REFERENCE BOOKS :

1. J.N.Kapur&H.C..Saxena(2003), "MATHEMATICAL STATISTICS",
2. Shukla M.C(2000), "STATISTICS", S .Chand and S.Chand and Company, New Delhi.company, New Delhi.
3. Vittal .P.R.,(2004), "BUSINESS STATISTICS", Margham publishers, Chennai

(For Candidates admitted from 2015 onwards)

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

PG & RESEARCH DEPARTMENT OF TAMIL

First Year - Semester – II

Course Title	தமிழ்த்தாள் - **II**
Total Hours	**75**
Hours/Week	**5 Hrs Wk**
Code	**U15TL2TAM02**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

இறைச்சிந்தனை வழி மாணவர்களை ஒருமுகப்படுத்துதல்.

- To harmonize the students in Religious thoughts.
- To Introduce the specialties of Tamil laureates
- To infuse the friendly nature in students
- To improvise good habits among students

Course Objectives:

CO No.	Course Objectives
CO-1	இறைச்சிந்தனை வழி மாணவர்களை ஒருமுகப்படுத்துதல்.
CO-2	மதநல்லிணக்கத்தை உருவாக்குதல்.
CO-3	ஆளுமைத்திறனை வளர்த்தல்
CO-4	படைப்பாற்றல் திறனை ஊக்கப்படுத்துதல்.
CO-5	பிழையின்றி எழுதவும் படிக்கவும் மாணவர்களை தயார்ப்படுத்துதல்.

அலகு:1 செய்யுள் **15 Hrs**

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

key Words (Extra Reading)

1. அற்புதத்திருவந்தாதி - காரைக்கால் அம்மையார்
2. திருவாய்மொழி - நம்மாழ்வார்

அலகு:2 செய்யுள் **15 Hrs**

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

key Words (Extra Reading)

1. நந்திக்கலம்பகம்
2. குற்றாலக்குறவஞ்சி –திரிகூடராசப்பக்கவிராயர்

அலகு:3 **15 Hrs**

தமிழ் இலக்கிய வரலாறு –

பல்லவர்காலம்

நாயக்கர்காலம்

அலகு:4 **15Hrs**

படைப்பிலக்கியம் - புதினம்

கல்கி - பார்த்திபன் கனவு

key Words (Extra Reading)

வில்லோடு வா நிலவே – வைரமுத்து

அலகு:5 **15 Hrs**

கடிதம் எழுதுதல்

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

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	to evaluate the religious works and the growth of religious literature	PSO 1	U
CO-2	to bring-out the similarities in religious teachings and to ensure unity	PSO 2	AN
CO-3	to learn about the personalities about the Kings and their personalities	PSO 2	AP
CO-4	to enrich literature by reading, increase creativity and strengthen the vocabulary	PSO 3	U
CO-5	To learn the art of writing	PSO 4	U

பார்வை நூல்கள்

செய்யுள் - தமிழாய்வுத்துறை வெளியீடு

தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறை வுத்துறை வெளியீடு

நாவல்

கல்கி - பார்த்திபன் கனவு

கடித இலக்கியம் - பயிற்சி ஏடு

(For the candidates admitted from June 2018 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002
DEPARTMENT OF HINDI
SEMESTER – II

Course Title	**PART – I LANGUAGE** **HINDI – II DRAMA , NOVEL AND GRAMMAR –II**
Total Hours	**75**
Hours/Week	**5Hrs/Wk**
Code	**CODE: U18HN2HIN02**
Course Type	**Theory**
Credits	**3**
Marks	**100**

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

Course Objectives (CO):

The learner will be able to:

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

UNIT – I **(15 Hours)**

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

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

UNIT- II **(15 Hours)**

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

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

UNIT- III **(15 Hours)**

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

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

UNIT- IV **(15 Hours)**

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

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

UNIT- V **(15 Hours)**

1. Ashad ka ek dhin
2. Gaban

3.Yojak(Samuchaya Bhodak) Aur Dhyodak (Vismyadhi hodak)

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

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

Course Outcomes:

The learner will be able to:

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

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

Reference Books :

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

(For candidates admitted 2016 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF FRENCH

SEMESTER II

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

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

Course Objectives (CO):

The learner will be able to

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

Unit 1 Quelle journée ! (15 Hours)

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

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

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

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

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

Unit 3 Souvenez-vous ? (12 Hours)

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

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

Unit 4 On s'appelle ? (12 Hours)

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

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

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

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

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

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

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

TEXT BOOKS :

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

Books for Reference:

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

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

For candidates admitted from June 2018 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), Tiruchirapalli – 620002
PG AND RESEARCH DEPARTMENT OF ENGLISH
I YEAR UG – SEMESTER II
PART II – ENGLISH 2 - GENERAL ENGLISH II

HOURS : 6 **CODE : U15EL2GEN02**
CREDIT : 3 **MARKS: 100**

OBJECTIVES

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

UNIT I – SELF

Listening- Specific information from demonstration and instructions, transfer of information.
Speaking - Sharing expressions, dreams and expressing opinions.
Reading -Skimming and Scanning for specific information, reading for local comprehension.
Writing - Story Writing
Grammar - Articles and Sentence Pattern
Vocabulary - Meanings, Synonyms, Antonyms
Composition - Transfer of information: Paragraph to Bar graph/pie chart
General Essay - Courage is the key to success

TEXTS
1. *The Far and the Near* by Thomas Wolfe (Short Story)
2. *The Owl who was a God* by James Thurber (Short Story)
3. *Wings of Fire – Chapter I* by Dr. A.P.J. Abdul Kalam (Prose)

UNIT II – STRENGTHS

Listening - Listening to a process
Speaking - Telephone Etiquette
Reading - Loud reading with pause, intonation and expression in dialogue form
Writing - Writing about oneself (strengths& weaknesses, Have's & Have not's)
Grammar- Subject verb agreement, Prepositions
Vocabulary- One word substitute in the context
Composition- Letter Writing - informal letters
General essay – A bird in hand is worth two in bush.

TEXTS
1. *The Robe of Peace* by O' Henry (Short Story)
2. An extract from *Androcles and the Lion* by George Bernard Shaw (Play)

UNIT III - POSITIVE SHORTCOMINGS

Listening - Listening to facts and opinions and trying to differentiate it
Speaking - Pair Work – about have's & have not's, understanding the strengths and overcoming the weaknesses
Reading - Reading newspapers, articles, magazines, anecdotes for global and specific in analytical thinking
Writing - Filing Complaints, Travelogues
Grammar - Tenses, Direct and Indirect Speech
Vocabulary - Compound words
Composition - Dialogue Writing
General essay – Adversity is the seed of success.

TEXTS
1. *Six Thinking Hats* by Edward de Bono (Prose)
2. *A Cup of Tea* by Katherine Mansfield (Short Story)
3. An Extract from Shakespeare's *As You Like It (Act II Scene I lines 12 -17)*

UNIT IV POTENTIALS

Listening - Listening to the description of personalities, historical places and monuments
Speaking - Group Discussion – Totally controlled, partially controlled, Free
Reading - Parallel Reading, reading for pleasure
Writing - Letter writing – formal letters
Grammar - Adjectives, Degrees of Comparisons
Vocabulary - Idioms and Phrases
Composition - Debates and Discussions
General essay – My potentials

TEXTS
1. *Easy Ways to Avoid an Argument* by Sam Horn (Prose)
2. *Pygmalion* by George Bernard Shaw (Play)
3. My Heart Leaps up when I behold by William Wordsworth (Poem)
4. The Flower by Alfred Lord Tennyson (Poem)

UNIT V ACHIEVEMENTS
Listening - Listening to comparisons and arguments
Speaking - Performance
Reading - In-depth reading
Writing - Script writing of story to play
Grammar - Question Tags
Vocabulary - Homophones
Composition - Essay Writing
General essay - The reward of hard work.

TEXTS
1. *On Saying Please* by A.G. Gardiner (Prose)
2. *A Time of Green* by Anna Stillaman (Play)

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(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
Affiliated to Bharathidasan University
Nationally Accredited (3rd cycle) with 'A' Grade by NAAC
College with potential for Excellence
Tiruchirappalli - 620002
First Year - Semester - II

Course Title	**MAJOR CORE 2 – MULTI VARIATE CALCULUS**
Total Hours	**75**
Hours / Week	**5**
Code	**U15MA2MCT02**
Course type	**Theory**
Credits	**4**
Marks	**100**

General Objective:

To introduce the concepts of multiple integrals and some applications of integration to the students and to expose them the vector differential operator, vector differentiation , vector integration and the idea of line , surface and volume integrals.

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Evaluate Double and triple integral in Cartesian coordinates
CO - 2	Understand beta and gamma function and their properties
CO - 3	Apply vector differentiation to physics concepts.
CO - 4	Evaluate line integral surface integral and volume integral using vector integration
CO - 5	Apply Gauss divergence theorem and Stokes theorem.

MULTIPLE INTEGRALS **15Hrs**

UNIT I : DOUBLE & TRIPLE INTEGRALS

Double integral in Cartesian coordinates – Change of order of integration – Triple integral – Volume integral(simple problems only)

Extra Reading/ Keywords: *Cylindrical coordinates, Spherical coordinates, Tetrahedron, Order of integration*

UNIT II: BETA AND GAMMA FUNCTIONS **15 Hrs**

Special functions: Beta and Gamma Functions - Their properties and simple problems

Extra Reading/ Keywords: *Newton integrability, Dirichlet Distribution, Mellin transform, Holomorphic function*

UNIT III: VECTOR DIFFERENTIATION: **15 Hrs**

Derivatives of vector functions – velocity and acceleration – differential operators – directional derivatives, gradient, divergence and curl – solenoidal and irrotational vectors

Extra Reading/ Keywords: *Vector calculus, Directional derivatives, Closed surface, Infinitesimal balls*

UNIT IV: VECTOR INTEGRATION: **15 Hrs**

Line integrals– work done by a force – conservative field – surface integral and its applications – volume integral and its applications

Extra Reading/ Keywords: *Surface, Line integral, Curve, Scalar field, Vector field*

UNIT V: INTEGRAL THEOREMS : **15 Hrs**

Integral theorems (without proof) - Gauss divergence theorem, Stoke's theorem and their applications(simple problems only)

Extra Reading/ Keywords: *Curl theorem, Riemann integral, Contour integration, Lebesgue integral theorem*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes (CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Compute Double and triple integral in Cartesian coordinates	**PSO - 1**	**E**
CO - 2	Recall and relate beta and gamma function and their properties	**PSO - 5**	**U,K**
CO - 3	Apply vector differentiation to physics concepts	**PSO - 2**	**Ap, E**
CO - 4	Compute line integral surface integral and volume integral	**PSO - 4**	**E**

CO - 5	Apply and assess Gauss divergence theorem and Stokes theorem	**PSO - 3**	**Ap, E**
CO - 6	Introduce the concepts of multiple integrals and some applications of integration to the students and to expose them the vector differential operator, vector differentiation , vector integration and the idea of line , surface and volume integrals-Skill Development	**PSO-2,3**	**R, Ap**

TEXT BOOKS:

Treatment and content as in

S. Narayanan and T.K.ManicavachagomPillay (2007), CALCULUS, Volume II S. Viswanathan Publishers Pvt. Ltd,.for Units I & II

Unit I : Chapter 5: Sections 1, 2.1, 2.2 & 4

Unit II: Chapter 7: Sections 2.1 – 2.3, 3, 4, 5

Treatment and content as in

Dr.P.R.Vittal, Dr.V.Malini, (Reprint 2012)Vector Analysis , For Units III ,IV and V

Unit III: Chapter 1

Units IV& V: Chapter 2(excluding Green's Theorem)

REFERENCE BOOKS:

1. Vector Analysis,Schaum's outline series, Murray R. Spiegel., Seymour Lipschutz, Dennis Spellman, Second Edition, McGraw Hill Book Company, 2009.

2.Duraipandian.P ,Laxmi Duraipandian, (1998) , VECTOR ANALYSIS , Emerald Publishers Chennai.

3.Viswanathan .K and Selvaraj .S (1999) , VECTOR ANALYSIS , Emerald Publishers ,Chennai

4. Narayanan and Manickavachagom Pillay, T.K VectorAlgebra and Analysis, S.Viswanathan (Printers &Publishers) Pvt.Ltd.

(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
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Tiruchirappalli - 620002
First Year - Semester - II

Course Title	**MAJOR CORE -3 - ANALYTICAL GEOMETRY OF TWO AND THREE DIMENSIONS**
Total Hours	**75**
Hours / Week	**5**
Code	**U15MA2MCT03**
Course type	**Theory**
Credits	**5**
Marks	**100**

General Objective:

To enable the students to be familiar with the fundamental concepts of two dimension and enhance the knowledge of three dimensional geometry

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand straight line its general equation and analysis of their properties.
CO – 2	Understand and circle, its general equation and analysis of their properties.
CO – 3	Understand the concept of plane, angle between the plane, length of the perpendicular, line intersection of two given planes.
CO – 4	Understand different forms of straight line, coplanar lines, shortest distance between skewlines and the equation of the shortest distance.
CO – 5	Understand the concept of sphere, intersection of two sphere, plane section of a sphere and the equation of the tangent plane to the sphere

UNIT I: STRAIGHT LINE **15 Hrs**

Various form of Equation of straight line - points of intersection of two straight lines – angle between two straight lines – condition for two lines to be parallel and perpendicular – condition for three lines to be concurrent – bisecting the angle between two given lines.

Extra Reading/ Keywords: *pair of straight lines – equation of bisector of angles between lines.*

UNIT II: CIRCLE: **15 Hrs**

General equation of a circle- Length of the tangent - chord of contact of tangents

Extra Reading/ Keywords: *Pole And Polar - Equation Of Pair Of Tangents - Orthogonal Circles*

UNIT III: THE PLANE **15 Hrs**

The plane – the general equation of the plane – Several forms of equations of planes – angle between the planes-equation of the plane through the line intersection of two given planes - length of the perpendicular- planes bisecting the angle between the planes.

Extra Reading/ Keywords: *Three dimension coordinate space, Normal vector, Plane embedded in three dimensional Euclidean space, Plane of rotation, plane of incidence*

UNIT IV:THE STRAIGHT LINE **15 Hrs**

Different forms of equations of a straight line – the plane and the straight line – coplanar lines– the shortest distance between two skew lines – equations of shortest distance.

Extra Reading/ Keywords: *Interpretations of equations, Line of intersection of three planes, Volume of tetrahedron*

UNIT V: SPHERE **15 Hrs**

Equation of a sphere – Length of the tangent from a point – The plane section of a sphere - Intersection of two spheres - equation of the tangent planes to the sphere.

Extra Reading/ Keywords: *Equation of sphere in diameter form, Interior and exterior of sphere, Non- Coplanar points*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes(CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO –1	Recognize and discuss straight line	**PSO - 4**	**R,U**
CO –2	Recognize and discuss circle	**PSO - 1**	**U,E**
CO –3	Describe and analyze plane, angle between the plane, length of the perpendicular, line intersection of two given planes.	**PSO - 2**	**K, E**

CO –4	Explain straight line, coplanar lines, shortest distance between skew lines and its equation	**PSO - 5**	**U,E**
CO –5	Recall and summarize sphere, intersection of two sphere, plane section of a sphere and the equation of the tangent plane to the sphere.	**PSO - 3**	**U, E**
CO – 6	Enable the students to be familiar with the fundamental concepts of two dimension and enhance the knowledge of three dimensional geometry- Skill Development	**PSO-2,3**	**U,E**

TEXT BOOKS:

Treatment and content as in Manicavachagom Pillay. T.K, Natarajan T (2010) , A TEXT BOOK OF ANALYTICALGEOMETRY (Part I – Two Dimensions) , Viswanathan S (Printers and publishers),Chennai for Units I & II.

UNIT I: Chapter 2 : Sec 1- 15

UNIT II: Chapter4: Sec 1-10

Treatment and content as in Manicavachagom Pillay. T.K, Natarajan T (2010) , A TEXT BOOK OF ANALYTICALGEOMETRY (Part II – Three Dimensions) , Viswanathan S (Printers and publishers),Chennai for Units III , IV & V

UNIT III: Chapter II

UNIT IV: Chapter III:Sec 1-8(omit from 8.1)

UNIT V:Chapter IV

REFERENCE BOOKS:

1.Duraipandian .P,Laxmi Duraipandian & D.Mahilan , ANALYTICAL GEOMETRY-TWO DIMENSIONAL, Emerald Publishers,Chennai.

2.Duraipandian .P,Laxmi Duraipandian & D.Mahilan , ANALYTICAL GEOMETRY-THREE DIMENSIONAL, Emerald Publishers,Chennai.

(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
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Tiruchirappalli - 620002
First Year - Semester - II

Course Title	**ALLIED 3- MATHEMATICAL STATISTICS III**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA2ACT08**
Course type	**Theory**
Credits	**3**
Marks	**100**

General Objective:

To facilitate the students to apply acquired theoretical knowledge of tests of significance in real life problems.

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand and apply sampling theory, Chi-square test, Student t test and F test and their properties.
CO – 2	Understand estimators and method of maximum likelihood.
CO – 3	Understand Large sample and evaluate testing the hypothesis.
CO – 4	Understand Small sample and evaluate test of hypothesis using t and chi-square distribution.
CO – 5	Evaluate test of hypothesis using F distribution.

UNIT I: SAMPLING DISTRIBUTION **12 Hrs**

Sampling Theory - distribution –Chisquare, student-t and F distributions and their properties. **Extra Reading/Key words:***Sampling variability, non-central chi-squared distribution, Robust parametric modeling*

UNIT II: ESTIMATION **12 Hrs**

Point Estimation – unbiased estimator, efficient estimator, Cramer- Rao inequality, Rao – Blackwell theorem, consistent estimator, sufficient estimator, method of moments, method of maximum likelihood.

Extra Reading/Key words: *Multi variate case of cramer rao,method of moments lognormal distribution, mean squared error version*

UNIT III: TEST OF HYPOTHESIS FOR LARGE SAMPLES **12 Hrs**

Large samples– definitions, test of hypothesis – test for a specified mean, for the equality of two means, specified proportion, the equality of 2 proportions, standard deviation of the population , correlation coefficient.

Extra Reading/Key words:*Test of hypothesis for population proportion,systematic samples, purposive samples, cluster random samples*

UNIT IV:TEST OF HYPOTHESIS USING t AND CHI SQUARE DISTRIBUTIONS **12 Hrs**

SMALL SAMPLES : t Test for a specified population mean, for difference between two population means.

Chi square Test– definition, additive property, Pearson's Statistics, Uses of Chi-square test, test for a specified population variance, test of independence of attributes. Test of goodness of fit.

Extra Reading/Key words: *Pearson's correlation coefficient, Goodness of fit in regression analysis.*

UNIT V:TEST OF HYPOTHESIS USING F DISTRIBUTION **12 Hrs**

F test– for Equality of two population variances, Analysis of variance one way and two way classifications only.

Extra Reading/Key words: *F-test regression, Lack-of-fit sum of squares*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes (CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recognize and explain sampling theory, Chi-square test, Student t test and F test	**PSO - 2**	**R,E**
CO - 2	Recall and compute estimators and method of maximum likelihood.	**PSO - 3**	**Ap, E**

CO – 3	Explain Large sample and evaluate testing the hypothesis.	**PSO - 1**	**K, E**
CO – 4	Discuss Small sample and evaluate test of hypothesis using t and chi-square distribution	**PSO - 5**	**An,E**
CO – 5	Evaluate and apply test of hypothesis using F distribution	**PSO - 4**	**Ap, E**
CO – 6	Understand Large sample and evaluate testing the hypothesis. Understand Small sample and evaluate test of hypothesis using t and chi-square distribution- Skill Development	**PSO-4**	**U,E**

TEXT BOOK:

Treatment and content as in Vittal .P.R (2002) , MATHEMATICAL STATISTICS ,Margham Publishers,Chennai.

UNIT : I - Chapter 22

UNIT : II - Chapter 23 (omit page nos : 23.61 – 23.66) UNIT : III - Chapter 24 (omit page nos : 24.43 – 24.55) UNIT : IV - Chapter 25,27

UNIT : V - Chapter 26.

REFERENCE BOOKS:

1. Arora .S,Sumeet Arora (2002),COMPREHENSIVE STATISTICAL METHODS, S.Chand and Company Ltd ,New Delhi.
2. Gupta .S.C, Kapoor.V.K (2002) , FUNTAMENTALS OF MATHEMATICAL STATISTICSSultan Chand & Sons ,New Delhi.
3. Gupta .S.P (2006) , STATISTICAL METHODS, Sultan Chand & Sons ,New Delhi.

(For the candidates admitted from 2015onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI

B.A/B.Sc./B.Com/B.R.SC/B.C.A/ B.B.A DEGREE EXAMINATION

SEMESTER- II

Course Title	**SKILL – BASED ELECTIVE 1: SOFT SKILL DEVELOPMENT**
Total Hours	**30**
Hours/Week	**2**
Code	**U15RE2 SBT01**
Course Type	Theory
Credits	**2**
Marks	**100**

General Objective:

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

Course Outcomes:

The student will be able to

1. Understand the importance of self awareness, values and leadership skills in capacity building
2. Understand and analyze the factors affecting interpersonal skills
3. Understand and evaluate the concepts of vision, mission and goals for corporate skills
4. Understand, apply and analyze the importance of body language, time management and stress management
5. Understand the concept and need for self development plan

UNIT I: **6 hrs**

Individual Capacity Building

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

Extra reading / Key Words: *Biographies of any 2 Indian leaders*

UNIT II : **6 hrs**

Interpersonal skills

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

Extra reading / Key Words: *Tips for building relationship*

UNIT III: **6 hrs**

Corporate skills

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

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

UNIT IV: **6 hrs**

Management skills

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

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

UNIT V: **6 hrs**

Self Development Plan

Concept and Need for Self Development Plan – Preparing Self Development Plan 9 Format is used to complete the self development Plan), Monitoring and Evaluation of self Development plan – Developing indicators for self development introduction to National Skill Development Mission.

Extra reading / Key Words: *Case study*

Note: Extra reading/Key words are only for internal testing(Seminar/Assignment) Course

Course Outcome:

1. explain the importance of self awareness, values and leadership skills in capacity building
2. analyze the factors affecting interpersonal skills
3. evaluate the concepts of vision, mission and goals for corporate skills
4. apply and analyze the importance of body language, time management and stress management
5. summarize the concept and need for self development plan

REFERENCES:

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

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.

(For candidates admitted from 2018 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2

B.A./ B.Sc.,/B.Com./BCA & BBA, DEGREE EXAMINATION

SEMESTER II

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

General Objective:

The Student will be able to understand the concept of natural resources and resource mapping of villages and strengthen their leadership qualities, keeping in mind their responsibilities towards society.

Course Objectives:

The student will be able to:

1. understand the functioning of NGO's and SHG's
2. educate themselves about the different farming methods.
3. practice alternative agricultural methods
4. understand the need for social responsibility through NCC.
5. understand the Leadership and Man Management

Unit – I **6hrs**

Village – Survey of natural resources and resource mapping of villages , village level Participating Approach (VLPA) – Role of NGO'S and SHG'S – Impact of the Green Revolution.

Extra reading/Key word: *resource mapping tools*

Unit –II **6hrs**

Alternative agriculture models – Traditional Farming – Organic Farming – Zero budget farming – Precision Farming ,Terrace Farming and Kitchen garden.

Extra reading / Key word: *Practices in India*

Unit – III **6hrs**

Elements in Alternative Agriculture models ,Vermi compost, Azolla, Amirthakarasal ,Mulligai Puchiviratti and neem products

Extra reading/Key word*:Government policy for* Alternative Agriculture farming.

Unit IV- **6hrs**

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

Extra reading/Key word*: Benefits of being an NCC cadet.*

Unit -V **6hrs**

Leadership and Man Management – duties of citizen, leadership Training – Types, qualities – Discipline, Duty, Moral – Man Management, Civil Defense – Aims, Types, Services, Problems **Extra reading/Key word:** *Defense recruitment modes.*

Note: Extra Reading/ keywords are only for Internal Testing (Seminar/

Assignments)

Course Outcome:

1. Explain the functioning of NGO's and SHG's
2. Summarize themselves about the different farming methods.
3. Explain the alternative agricultural methods
4. Point out the need for social responsibility through NCC.
5. Evaluate the Leadership and Man Management

REFERENCES:

1. Packages of organic practices from Tamil Nadu Center for Indian Knowledge System(CIKS)
2. Tracey, S. and Anne, B. (2008). Sustainable development linking economy, society, environment. OECD insights.
3. www.fao.org.in

(For Candidates admitted from June 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B.A/B. Sc/B.Com /B.C.A-DEGREE COURSES
LIFE ORIENTED EDUCATION
ETHICS – I: RELIGIONS AND VALUE SYSTEMS

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

OBJECTIVES:

- To enable the students to understand and appreciate all Religions and Culture
- To help the students to becom
- To aware of the negative forces of religions.

UNIT – I: RELIGION

God – Faith, Religion, Definition, Nature, Characteristics and Basic values of different religions. Impact of Globalization on religion – Importance of worship in holy places – celebration, Communion (come-union) – Socialization

UNIT – II: DIFFERENT RELIGIONS

Basic characteristics and basic thoughts of different religions: Buddhism, Christianity, Hinduism, Islam, Jainism and Sikhism

UNIT – III: UNITY OF RELIGION

Unity of Vision and Purpose- Respect for Other Religions, Inter Religious Co-operation, Religious Pluralism as a fact and Religious Pluralism as a value

UNIT – IV: FUNDAMENTALISM, COMMUNALISM AND SECULARISM

Meaning and impact of Fundamentalism, Communalism, Violence and Terrorism – Tolerance – Secularism – Individualism

UNIT – V: VALUE SYSTEMS

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

REFERENCES:

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

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

HRS / WK : 1 **CODE: U15VE2LVBO1**
CREDIT : 1 **MARKS : 100**

OBJECTIVE:

- To enable the students to develop the passion for the Word of God – Jesus and inculcate the thirst of Missionaries being a disciple of Christ.

UNIT – I: BIBLE – THE WORD OF GOD

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

UNIT – II: MINISTRY OF JESUS

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

UNIT – III: CHURCH – BIRTH AND GROWTH

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

- Comparison between early Church and present Church.

UNIT – IV: DISCIPLES AND APOSTLES

- Mother Mary (Mother of Jesus) (Luke 1: 27-35, John 2: 1-12, 19:35, Acts 1: 13-14)
- 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)
- St. Thomas (John 20:24-31)

UNIT – V: ST. PAUL'S LETTERS AND THE MESSAGE

- I & II Corinthians
- Galatians
- Ephesians
- Philippians
- I & II Timothy
- Titus

REFERENCES:

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

(For Candidates admitted from June 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI -2
B.A/B. Sc /B.Com/ B.C.A-DEGREE COURSES
LIFE ORIENTED EDUCATION
CATECHISM – I: GOD OF LIFE

HRS / WK : 1 **CODE: U15VE2LVC01**
CREDIT : 1 **MARKS : 100**

OBJECTIVES:

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

UNIT – I: CREATION AND COVENANT

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

(Pentateuch) -Our response to God's covenant -Reason for its success and failure -The relationship of God with Israel -Image of God in Old Testament-God and me

UNIT – II: GOD OF THE PROPHETS

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

UNIT – III: GOD OF WISDOM

God experience through wisdom Literature, its origin and growth

UNIT – IV: SYNOPTIC GOSPELS

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

UNIT – V: LUKE'S GOSPEL

Study of Luke's Gospel in detail – speciality 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. Vaazhvin Vazhiyil – St. John's Gospel- Fr. Eronimus
4. God's Word nourishes A catholic approach to the Scriptures Dr. Silvano Renu Rita, O.C.V. STD and Dr. Mascarenhas Fio S.J. D.mim. Catholic Bible I
5. Documents of Vatican II – St. Paul's Publications, Bombay 1966.

(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
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Nationally Accredited (3rd cycle) with 'A' Grade by NAAC
College with potential for Excellence
Tiruchirappalli - 620002
First Year - Semester - II

Course Title	**Allied 3 :LAPLACE TRANSFORMS, PARTIAL DIFFERENTIAL EQUATIONS AND FOURIER SERIES (For Physics Students)**
	60
Hours / Week	**4**
Code	**U15MA2ACT09**
Course type	**Theory**
Credits	**3**
Marks	**100**

General Objective:

To expose the students to Laplace and inverse Laplace transforms, standard forms of partial differential equations, second order linear partial differential equations with constant coefficients and Fourier series and enable them to inculcate the habit of problem solving.

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand the concept of Laplace transform.
CO – 2	Apply inverse Laplace transform for solving ordinary differential equation with constant coefficient
CO – 3	Understand partial differential equation and finding General, Particular, Complete and Singular integral of partial differential equation
CO – 4	Understand second order partial differential equation and its application to Heat and wave equation.
CO – 5	Evaluate Full range Fourier series, half range Fourier series

UNIT I : LAPLACE TRANSFORMS **12 Hrs**

Laplace transforms of the functions e^{at}, e^{-at}, cosat, sinat, t^n, e^{-at}cosbt, e^{-at}sinbt, $e^{-at}t^n$, $f'(t)$, $f''(t)$, $f^n(t)$ (where n is a positive integer)

Extra Reading/Key words*: Laplace transform of Bessel function and error function, Mellin transform, Borel transform.*

UNIT II: INVERSE LAPLACE TRANSFORMS **12 Hrs**

Inverse transforms relating to the above standard functions – Application to solution of ordinary differential equations with constant coefficients.

Extra Reading/Key words*: Inverse laplace transform of heaviside function and dirac delta function, Mellin's inverse formula, Post's inversion formula***.**

UNIT III : PARTIAL DIFFERENTIAL EQUATIONS **12 Hrs**

Formation of equations by eliminating arbitrary constants and arbitrary functions- Definition of General, Particular, Complete and Singular integrals – Solutions of first order equations in their standard forms – F(p,q) = 0, F(x,p,q) = 0, F(y,p,q) = 0, F(z,p,q) = 0, F(x,p) = F (y,q), z= px+qy+F(p,q), Lagrange's equations Pp+Qq = R

Extra Reading/Key words*:Quasi linear equations, Linear heat equation and wave equation***.**

UNIT IV: SECOND ORDER PARTIAL DIFFERENTIAL EQUATIONS AND ITS APPLICATIONS **12 Hrs**

Second order linear partial differential equations with constant coefficients - Application of second order linear partial differential equations with constant coefficients .

Extra Reading/Key words*: Canonical form of parabolic, hyperbolic and elliptic functions.*

UNIT V: FOURIER SERIES **12 Hrs**

Full Range Fourier series [In the range $(0,2\pi)$ and $(-\pi, \pi)$] – Half range cosine and sine series (Excluding change of intervals)

Extra Reading/Key words*: Fourier series on a square, Least squares property, Fast fourier transform.*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes(CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO – 1	Recognize and express Laplace transform	**PSO - 5**	**R,E**
CO – 2	Apply inverse Laplace transform for solving ordinary differential equation with constant coefficient.	**PSO - 3**	**Ap, E**

CO – 3	Recall partial differential equation and finding its solution	**PSO - 4**	**R, E**
CO – 4	Explain second order partial differential equation and apply to Heat and wave equation.	**PSO - 2**	**Ap,E**
CO – 5	Compute Full range Fourier series, half range Fourier series	**PSO - 1**	**E**
CO – 6	Expose the students to Laplace and inverse Laplace transforms, standard forms of partial differential equations, second order linear partial differential equations with constant coefficients and Fourier series and enable them to inculcate the habit of problem solving-Skill Development	**PSO -1,2**	**R,E**

TEXT BOOKS:

1.For Units I,IIand III

Treatment and content as in Narayanan.S,ManicavachagomPillay.T.K,(2006), CALCULUS – VOLUME III, S.Viswanathan (Printers and publishers),Chennai.
Unit I: Chapter 5: sec 1-5
Unit II: Chapter 5: sec 6-8
Unit III: Chapter 4: 1-5.4, 6

2. **For Unit IV**:
Treatment and content as in Venkataraman M.K, ENGINEERING MATHEMATICS (VOL III),(2006) National publishing company Chennai

3. For Unit V:
Treatment and content as in Narayanan.S,ManicavachagomPillay.T.K,(2006), CALCULUS – VOLUME III, S.Viswanathan (Printers and publishers),Chennai.
Chapter 6 : Sec 1-5.2

REFERENCE BOOKS:

1Arumugam.S,ThangapandiIssac.A,Somasundaram.A,(2002) ENGINEERING MATHEMATICSVol III ,SCITECH Publishers, Chennai
2.Zafar Ahsan (2006) DIFFERENTIAL EQUATIONS AND THEIR APPLICATIONS,Prentice Hall of India Ltd,New Delhi.
3. Narayanan.S,ManicavachagomPillay.T.K,(2006), DIFFERENTIAL EQUATIONS, S.Viswanathan (Printers and publishers),Chennai.

(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
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Nationally Accredited (3rd cycle) with 'A' Grade by NAAC
College with potential for Excellence
Tiruchirappalli - 620002
First Year - Semester - II

Course Title	**ALLIED 3 - BUSINESS STATISTICS (For commerce students)**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA2ACT10**
Course type	**Theory**
Credits	**3**
Marks	**100**

General Objective:

To understand the various methods of collection of data and representing them through diagrams and graphs. To calculate various statistical parameters

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand various method of collection of data and its diagrammatic representation
CO – 2	Evaluate measures of averages and dispersion
CO – 3	Understand the concepts of Correlation and Regression and its properties, Evaluation of Correlation and Regression.
CO – 4	Analyse of Time series using measures of trend, measure of seasonal variation
CO – 5	Evaluate index number using Laspeyre's, Fishers, Paasche's methods and lot of living index numbers.

UNIT I: COLLECTION AND PRESENTATION OF DATA **12 Hrs**

Meaning – Scope – Importance and Limitations of Statistics - Collection of Data - Classification and Tabulation - Diagrammatic representation.

Extra Reading/Key words: *Benefits of charts, Online tutoring, Heterogeneous data*

UNIT II: MEASURES OF AVERAGES AND DISPERSION **12 Hrs**

Arithmetic Mean, Weighted – Geometric Mean – Harmonic Mean – Merits and demerits – Median – Quartiles and Deciles – Mode -Measures of Dispersion - Range - Quartile Deviation - Mean Deviation - Standard Deviation - Relative measures

Extra Reading/Key words:*Estimates of scale, Measurement uncertainty, Interquartile range*

UNIT III : CORRELATION AND REGRESSION **12 Hrs**

Correlation - Scatter Diagram - Karl Pearson's Coefficient of Correlation - Rank Correlation - (Correlation of a bivariate frequency distribution and Coefficient of concurrent Deviation to be excluded) Regression - Properties, Regression lines and problems.

Extra reading words:*Index number, Time reversal test and factor reversal test, Least square method, Concurrent deviation method*

UNIT IV : ANALYSIS OF TIME SERIES **12 Hrs**

Time Series - components of Time Series - measurement of trend - measures of seasonal variation(Methods of simple averages and Link relatives only) - problems (Deseasonalization is excluded)

Extra Reading/ Keywords: *Forecasting, Analysis of economic and industrial time series, Measuring Seasonality*

UNIT V : INDEX NUMBERS **12 Hrs**

Index Numbers– Laspeyer's,Fisher's and Paasche's index numbers- tests for Index Numbers - cost of living Index Number - uses of Index Numbers.

Extra Reading/ Keywords: *Policonomics, Order reversal test, Time and factor test, Weighted index numbers, Zero-based budget, Cash-Only budgeting*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes(CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO –1	Recall and relate various method of collection of data and its diagrammatic representation	**PSO - 2**	**R,U**
CO – 2	Explain and Compute measures of averages and dispersion.	**PSO - 1**	**U,E**

CO – 3	Recognize and calculate Correlation and Regression	**PSO - 3**	**R, E**
CO – 4	Discuss and evaluate Time series using measures of trend, measure of seasonal variation	**PSO - 5**	**U,E**
CO – 5	Evaluate index number by applying the Laspeyre's, Fishers, Paasche's methods	**PSO - 4**	**E**
CO – 6	Understand the various methods of collection of data and representing them through diagrams and graphs. To calculate various statistical parameters- Skill Development	**PSO – 3,5**	**U,E**

TEXT BOOK:

Treatment and content as in Vittal .P.R (2004) , BUSINESS STATISTICSMargham Publishers,Chennai.

UNIT I - Chapters 1 to 4
UNIT II - Chapters 5,6
UNIT III - Chapters 8, 9
UNIT IV - Chapter 12
UNIT V - Chapter 13

REFERENCE BOOKS:

1. R.S.N.Pillai V.Bagavathi (2007), STATISTICS ,S.Chand and Company Ltd. New Delhi.
2. Arora .S,Sumeet Arora (2002),COMPREHENSIVE STATISTICAL METHODS, S.Chand and Company Ltd ,New Delhi.
3.Douglas A.Lind ,William G.Marchall ,Samuel A. Wathen (2003) ,BASIC STATISTICS FOR BUSINESSAND ECONOMICS, Mc Graw Hill, Delhi.
4.Gupta .S.C, Indra Gupta (2004) , BUSINESS STATISTICS , Himalaya Publishing House , New Delhi.
5.Gupta .S.P (2006) , STATISTICAL METHODS, Sultan Chand & Sons ,New Delhi.
6.Sharma J.K, (2006) BUSINESS STATISTICS, Dorling Kindersley, (India) Pvt Ltd,Licensees of Pearson Education in South Asia.

(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
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Tiruchirappalli - 620002
First Year - Semester - II

Course Title	**ALLIED-3 APPLIED MATHEMATICS- II (For BCA & Computer Science students)**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA2ACT11**
Course type	**Theory**
Credits	**3**
Marks	**100**

General Objective:

To provide an understanding of basic concepts in Operations Research Techniques for Analysis and Modeling in computer applications

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand LPP and solving LPP using graphical and simplex method.
CO – 2	Understand Transportation problem and Evaluation of its initial basic feasible solution using North west corner rule, Least cost method, Vogel method.
CO – 3	Evaluate assignment problem using Hungarian algorithm.
CO – 4	Understand problem of sequencing and processing n jobs through 2 machines and 3 machines
CO – 5	Understand Network basic concepts, Rule of network construction and evaluation of PERT and CPM

UNIT I:LINEAR PROGRAMMING PROBLEM **12 Hrs**

Introduction –Mathematical formulation of the Problem – Solving LPP by graphical method – General LPP - Canonical and standard forms – Simplex method.**(Simple problems only) Extra Reading/ Keywords:** *Integer linear programming, Mixed integer programming Karmarkar's algorithm.*

UNIT II:TRANSPORTATION PROBLEM **12 Hrs**

Introduction – Mathematical Formulation –Initial basic feasible solution by North West Corner Rule – Least cost method – Vogel's approximation method- Unbalanced and maximization transportation problems.**(Initial basic feasible solution problems only)**
Extra Reading/ Keywords: *Modified distribution method (MODI), Russell's approximation method*

UNIT III:ASSIGNMENT PROBLEM **12 Hrs**

Assignment Problem – Hungarian method – Unbalanced AP – Maximization in AP.
Extra Reading/ Keywords*: Generalised assignment problem, Linear bottleneck assignment problem*

UNIT IV:SEQUENCING PROBLEM **12 Hrs**

Introduction – problem of sequencing- Basic terms - Processing n jobs through 2 machines & 3 machines.
Extra Reading/ Keywords*: Job-shop scheduling, Flow-shop scheduling*

UNIT V:NETWORK SCHEDULING BY PERT/CPM **12 Hrs**

Introduction – Network Basic components – logical sequencing – Rules of network construction – Concurrent activities - Critical path analysis.
Extra Reading/ Keywords*:Critical path analysis in project management, Graphical evaluation and review technique, Precedence diagram method.*
Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes(CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO – 1	Recognize and relate LPP and solving LPP using graphical and simplex method.	**PSO - 3**	**R,U,E**

CO – 2	Explain Transportation problem and Evaluate its initial basic feasible solution	**PSO -2**	**Ap, E**
CO – 3	Discuss and solve assignment problem using Hungarian algorithm.	**PSO -1**	**E**
CO – 4	Recall and evaluate the problem of sequencing with respect to processing n jobs through 2 machines and 3 machines.	**PSO -5**	**E**
CO – 5	Describe and Construct Network and compute PERT and CPM	**PSO -4**	**R,U,E**
CO – 6	Provide an understanding of basic concepts in Operations Research Techniques for Analysis and Modeling in computer applications Skill Development	**PSO – 2,5**	**U, Ap**

TEXT BOOK:

Treatment and content as in Kanti Swarup, Gupta P.K, Man Mohan (2007),13th revised edition **OPERATIONS RESEARCH**Sultan Chand & Sons, New Delhi.

Unit I : Chapter 2: Sections 2.1 to 2.4 , Chapter 3 : Sections 3.1 to 3.5, Chapter 4: Section 4.3
Unit II : Chapter 10 : Sections 10.1 to 10.3, 10.5,10.9,10.15
Unit III: Chapter 11: Sections 11.1, 11.2, 11.3 (4), 11.4
Unit IV: Chapter 12 : Section 12.1 to 12.5.
Unit V: Chapter 25 : Sections 25.1 to 25.6

REFERENCE BOOKS:

1. S.Kalavathy , (2nd Reprint 2011), OPERATIONS RESEARCH , 3rd edition, Vikas Publishing House Pvt.Ltd, New Delhi.
2. Gupta P.K., Hira S.(2005) , **OPERATIONS RESEARCH**, S.Chand & Co. Limited , New Delhi.
3. Mariappan P.(2001), **OPERATIONS RESEARCH METHODS & APPLICATIONS** New Century Book House Private Limited..
4. Panneer Selvam (2003), **OPERATIONS RESEARCH**, Prentice Hall of India Private Limited, New Delhi.
5. Sharma J.K.(2007), **OPERATION RESEARCH THEORY & APPLICATIONS**, Macmillan India Limited, Chennai.

(For Candidates admitted from 2015 onwards)

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

PG & RESEARCH DEPARTMENT OF TAMIL

Second Year - Semester – III

Course Title	தமிழ்த்தாள் - **III**
Total Hours	**90**
Hours/Week	**6 Hrs Wk**
Code	**U15TL3TAM03**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

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

- To explain the greatness of the values such as dharma, knowing the meaning of life
- To create awareness about social life.
- To strengthen the religious ideologies.

Course Objectives:

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

அலகு:1 செய்யுள் **18 Hrs**

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

key Words (Extra Reading)

சீவகசிந்தாமணி

அலகு:2 செய்யுள் **18 Hrs**

4. இரட்சணிய யாத்திரிகம் - மரணப்படலம்
5. சீறாப்புராணம் - ஒட்டகை பேசிய படலம்

அலகு:3 **18 Hrs**

தமிழ் இலக்கிய வரலாறு

சோழர் காலம்

அலகு:4 **18Hrs**

நாடகம்

சத்திய வேள்வி – அய்க்கண்

key Words (Extra Reading)

யாருக்கும் வெட்கமில்லை - சோ

அலகு:5 **18 Hrs**

கோயிற்கலை

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

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	To learn the life of the people through the epic stories	PSO 1	U
CO-2	to learn the values taught by religion	PSO 2	AN
CO-3	To study about the period of The King Chola, its epics, literature and grammar books	PSO 2	R
CO-4	to learn about the dramatic skills	PSO 3	U
CO-5	to teach students to evaluate the art, culture and other aspects of the temples in Tamil Literature.	PSO 4	U

பாட நூல்கள்

1. செய்யுள் - தமிழாய்வுத்துறை வுத்துறை வெளியீடு
2. தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறை வுத்துறை வெளியீடு
3. நாடகம்
   அய்க்கண் - சத்திய வேள்வி
4. கோயிற்கலை - தமிழ்நாட்டிலுள்ள ஆலயங்களைக் கலை நுணுக்கத்துடன் காணுதல்

(For the candidates admitted from June 2015 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002

DEPARTMENT OF HINDI

SEMESTER – III

Course Title	**Part – I Language** **Hindi Paper-III Poetry, Predics, History Of Hindi Literature**
Total Hours	**90**
Hours/Week	**6Hrs/Wk**
Code	**CODE: U15HN3HIN03**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objective : To enable the students to appreciate and critically evaluate the evolution of Hindi literature through the prescribed literary works

Course Objectives (CO):

The learner will be able to:

CO No.	**Course Objectives**
CO -1	Remember, understand and evaluate the poetry of the masters
CO- 2	Understand and analyze the history of Hindi literature in the literary works.
CO- 3	Understand and analyze the history of Hindi literature in the literary works.
CO- 4	Apply the rules of Poetry and create poems
CO- 5	Appreciate and analyze the life of poets with that of their works.

Unit 1 **(18 Hours)**

Shubhagaman, Man,Tere Ghar Ke Dwar Bahuth Hain

Memory poem: Kabir das ke dohe-6, Thulasidas ke dohe – 6, Rahim ke dohe - 6

Extra Reading (Key Words): Ayyodhya singh Upadyaya Hariyaoudh, Kabir das

Unit 2 **(18 Hours)**

History of Hindi literature: Veergatha kaal

Extra Reading (Key Words): Prithvi raj Raso, Chandrabhardaiee

Unit 3 **(18 Hours)**

History of Hindi literature: Bakthi kaal

Extra Reading (Key Words): Gyan margi Shakha, Premmargi Shakha

Unit 4 **(18 Hours)**

Poetics :

a. Ras – shringar, karun, hasya, veer
b. Alankar – anupras, yamak, upama, roopak
c. Chand – choupayee, baravai

Extra Reading (Key Words): Bharat muni, Shoak Ras

Unit 5 **(18 Hours)**

Kavi parichaya:

Ayodiya Singh Upadyaya Harioudh, Maithili Sharan Gupth, Siyaram Sharan Gupth, Kabir, Thulasidas

Extra Reading (Key Words): Harivamshrai Bachan, Sumitra nandan Panth

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

Course Outcomes:
The learner will be able to:

CO No.	Course Outcomes	Cognitive Level
CO -1	Critically analyze poetry works.	R, U, E
CO- 2	Analyze Hindi Literature.	U, An
CO- 3	Compare the Hindi Literary works.	U, An
CO- 4	Create Poems.	Ap, C
CO- 5	Study the poetry works with the poet's life	An

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

Books Prescribed :

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

(For candidates admitted 2016 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF FRENCH

SEMESTER III

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

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

Course Objectives (CO):

The learner will be able to

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

Unit 1 Vivement demain ! (18 Hours)

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

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

Unit 2 Tu as du boulot ? (18 Hours)

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

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

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

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

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

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

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

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

Unit 5 On se retrouve (18 Hours)

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

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

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

TEXT BOOKS :

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

Books for Reference:

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

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

(For candidates admitted from June 2017 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), Tiruchirapalli – 620002
PG AND RESEARCH DEPARTMENT OF ENGLISH
II YEAR UG – SEMESTER III
PART II – ENGLISH 3 - GENERAL ENGLISH III

HOURS : 6 **CODE : U15EL3GEN03**
CREDIT : 3 **MARKS: 100**

GROWING WITH VALUES

Objectives:

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

UNIT I – Love, Faith and Hope

Listening for comprehension and general significance
Speaking about one's fear and hope
Reading for specific and global comprehension.
Writing – creative writing
Grammar – reporting speeches
Vocabulary – shades of meaning, Idioms and phrases (10)
Composition – Writing Paragraphs

TEXTS

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

1. An extract from the Nobel Lecture by Mother Teresa
2. Angels Never Say "Hello!" by Dottie Walters
3. The Treasure by Alice Grey (Taken from Plant the seed by Timothy Kendrick)

UNIT II – Perseverance

Listening- for distinguishing / convert / summarize/(interview)
Speaking- a role play on the theme of perseverance (enactment of fables/ folk tales based on the theme)
Reading – read the passage (from encyclopedia) and draw a flowchart / tree diagram [main idea]
Writing- parallel writing
Grammar – descriptive discourse – degrees of comparison (describing person, city, places, things, weather climate)
Vocabulary – antonyms, idioms and phrases (10)
Composition – Creative writing

TEXTS

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

1. **The Perseverance of a Spider.**
2. Two Gentlemen of Verona by A.J Cronin
3. Faith of determination and perseverance (about Walt Disney)

UNIT III – Tolerance/Benevolence/Compassion

Listening- for developing / relating (speech)
Speaking- simulate any personality related to humanity
Reading – scan the passage (life of …) and write down key phrases to sum up [figurative languages]
Writing- case study / letter writing (personal)
Grammar –writing reports of events and processes (voices)
Vocabulary – Suffixes, idioms and phrases
Composition – imaginative writing

TEXTS:
Portrait of Gandhiji by Will Durant (1st Para) **(Internal Testing)**
1. Gitanjali (Poem No. 11) Leave this chanting – Rabindranath Tagore
2. The Selfish Giant – Oscar Wilde
3. The Price of a Miracle in *Rainbows follow rain* by Dan Clark

UNIT IV – Essential Life Skills/ Resilience

Listening- for deducing/ illustrating / subdivide to make notes (newspaper article)
Speaking- interviewing (gap activity) / picture description
Reading – in-depth reading to classify/ categorize [point of view]
Writing- Situational writing
Grammar – analysis of sentences – simple, compound, complex
Vocabulary – compound words, idioms and phrases
Composition – essay writing (proverb as title)

TEXTS:
The story of Rosa Parks **(Internal Testing)**
1. Life of Nelson Mandela
2. It's cool to be kechi by Juliet Hindell
3. 'Home they brought Her warrior dead' by Alfred Lord Tennyson

UNIT V – The Art of Living

Listening- for comparing and contrasting (personality/lives of two people)
Speaking- reporting from the magazine / newspaper
Reading - read the passage to draw inference / parallel reading [making connections]
Writing- creative writing
Grammar –'If' clause
Vocabulary – coinage, idioms and phrases
Composition – creative writing/imaginative writing

TEXTS:
"A Psalm of Life" by H.W. Longfellow **(Internal Testing)**
1. The Power of Limitless living - by Robin Sharma.
2. The Art of Understanding Other People by Clarence Hall
3. "Leisure" by William Henry Davies

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College with potential for Excellence
Tiruchirappalli - 620002
Second Year - Semester - III

Course Title	**MAJOR CORE –4: ALGEBRA AND TRIGONOMETRY**
Total Hours	**60**
Hours / Week	**5**
Code	**U15MA3MCT04**
Course type	**Theory**
Credits	**5**
Marks	**100**

General Objective:

To enable the students to understand the techniques of solving algebraic equations and to expose the basic ideas of summation of series and number theory. To make the students familiar with expansion of trigonometric functions and Hyperbolic functions facilitate ways of separating complex functions**.**

Course Objectives (CO):
The learner will be able to

CO No.	Course Objectives
CO - 1	Understand about number theory and related theorems.
CO - 2	Understand summation of Binomial, exponential, logarithmic and approximation
CO - 3	Understand the techniques for solving algebraic equations.
CO - 4	Evaluate the expansion of Trigonometric function
CO - 5	Understand hyperbolic function and their properties.

ALGEBRA

UNIT I: THEORY OF NUMBERS **12 Hrs**

Introduction – Divisors of a given number N – Euler's function Ø (N) – highest power of a prime p contained in n! – congruences– numbers in arithmetical progression – Fermats' theorem-Wilson's theorem – Lagranges' theorem(without proof).

Extra Reading/ Keywords: *Aliquot part of positive divisor, Euler's totient function, Modular arithmetic*

UNIT II:SUMMATION OF SERIES: **12 Hrs**

Summation of Binomial, Exponential and Logarithmic series and approximation (Problems only).

Extra Reading/ Keywords: *Covariance between two binomials, Bernoulli distribution, Poisson distribution, antilogarithm*

UNIT III: THEORY OF EQUATIONS: **12 Hrs**

Relation between roots and coefficients – Symmetric functions of roots in terms of the coefficients –Sum of the powers of the roots of an equation-Newton's Theorem on the sum of the powers of the roots - Transformation of equations – Reciprocal equations .

Extra Reading/ Keywords: *Fundamental theorem of algebra, Vieta's formulas, Newton's inequality, roots of a Polynomial*

TRIGONOMETRY

UNIT IV: EXPANSIONS OF TRIGONOMETRIC FUNCTIONS **12Hrs**

Expansions of Cosnθ, Sinnθ, tannθ where n is a positive integer (excluding formation of equations); Expansions of $Cos^n\theta$, $Sin^n\theta$ in a series of sines and cosines of multiples of θ, (θ in radians) and expansion of Cosθ, Sinθ, tanθ in a series of powers of θ – Approximations and limits.

Extra Reading/ Keywords: *Taylor series, Inverse trigonometric functions, Asymptotic expansion*

UNIT V: HYPERBOLIC FUNCTIONS **12 Hrs**

Hyperbolic functions – Inverse hyperbolic functions, separation into real and imaginary parts - Logarithm of complex numbers – General value of logarithm**.**

Extra Reading/ Keywords*: Hyperbolic angle, Inverse hyperbolic Cotangent, Secant, Cosecant*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes (CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recognize and relate number theory and its theorems.	**PSO - 1**	**R,U**
CO - 2	Recall and find summation of Binomial, exponential, logarithmic series	**PSO -3**	**Ap, E**

CO - 3	Explain the techniques for solving algebraic equations	**PSO -5**	**R,U**
CO - 4	Formulate the expansion of Trigonometric function	**PSO -2**	**R,U**
CO - 5	Summarize hyperbolic function and their properties.	**PSO -4**	**R,U**
CO - 6	Make the students familiar with expansion of trigonometric functions and Hyperbolic functions facilitate ways of separating complex functions- Skill Development	**PSO – 2,3**	**R,U**

TEXT BOOKS:

1. TREATMENT as in ALGEBRA VOL II by ManicavachagomPillay .T.K , Natarajan.T, Ganapathy K.S ,(2005),S.Viswanathan (Printers and publishers),Chennai. for UNIT I
UNIT I: Chapter 5
2.TREATMENT as in ALGEBRA VOLI by ManicavachagomPillay .T.K , Natarajan.T, Ganapathy K.S ,(2005),S.Viswanathan (Printers and publishers),Chennai. for units II & III
UNIT II: Chapter 3 – Section 10& 14 (Problems only)
Chapter 4 – Sections 3 and 7 (Problems only)
UNIT III: Chapter 6– Sections 11 – 16,16.1& 16.2
3.TREATMENT as in TRIGONOMETRY by Narayanan and ManicavachagomPillay ,S.Viswanathan (Printers and publishers),Chennai. for UNITS IV & V.
UNIT IV: Chapter III(Formation of equations excluded)
UNIT V: Chapter IV, Chapter V - Sections 5 ,5.1&5.2

REFERENCE:

1. Arumugam ,ThangapandiIssac,(2005) THEORY OF EQUATIONS AND TRIGONOMETRY , New Gamma Publishing House ,Delhi.
2. Kandasamy .P.Thilagavathy.K (2006) ,MATHEMATICSVol- I, S.Chand& Company, New Delhi.
3. Balasubrahmanyam P., Venkatachary P.R. ,Venkataraman G.R.(1992), TEXT BOOKON TRIGONOMETRY Published by ROC House&Sons,Chennai.

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Second Year - Semester - III

Course Title	**MAJOR CORE 5 – REAL ANALYSIS-I**
Total Hours	**60**
Hours / Week	**5**
Code	**U15MA3MCT05**
Course type	**Theory**
Credits	**5**
Marks	**100**

General Objective:

To facilitate the basic concepts of real valued functions , countability and least upper bound. Also enable to learn sequences and series of real numbers and the tests for their convergence in detail. To introduce the concept of metric space and continuous functions.

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand the concept of real valued function, sequence and limit of a sequence.
CO – 2	Understand Convergent sequence and Divergence sequence, Bounded sequence, Monotone sequence and Cauchy sequence.
CO – 3	Analyze the series of Real numbers.
CO – 4	Test convergence property using Comparison test, Cauchy's condensation test, D'Alembert's ratio test and Raabe's test.
CO – 5	Understand limits, metric space and continuous function on a real line.

UNIT I : REAL VALUED FUNCTIONS AND REAL SEQUENCES 12Hrs

Real valued functions – equivalence – countability – real numbers – least upper bound – definition of sequence and sub sequence – limit of a sequence

Extra Reading/Key words: *Aleph number, hyperreal numbers, shift rule, Limit of nets.*

UNIT II : CONVERGENT AND DIVERGENT SEQUENCES 12 Hrs

Convergent sequences – Divergent sequences – Bounded sequences -Monotone sequences – operations on convergent and divergent sequences – limit superior and limit inferior – Cauchy Sequences

Extra Reading/Key words*:* *Cauchy's sequence in topological vector spaces and groups***.**

UNIT III : SERIES OF REAL NUMBERS 12 Hrs

Series – Convergence and divergence of series – Series with non – negative terms – Alternating series – Conditional Convergence and absolute convergence-tests for absolute convergence.

Extra Reading/Key words *:**Hypergeometric series, Series acceleration, Pointwise cauchy- convergence.*

UNIT IV: TESTS OF CONVERGENCE 12 Hrs

Comparison test - Cauchy's condensation test - D' Alemberts ratio test - Cauchy's root test –Raabe's test(simple problems only).

Extra Reading/Key words *:**Integral test, Abel's test, Dirichlet's test, Bertrand's test*

UNIT V:LIMITS , METRIC SPACES AND CONTINUOUS FUNCTION 12 Hrs

Limit of a function on the real line metric spaces – limits in a metric spaces – function continuous at a point on the real line – functions continuous on the metric space.

Extra Reading/Key words*:* *Equicontinuity, Lipschitz continuity, Quotient metric space*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes(CO) :

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO – 1	Recognize real valued function, sequence and limit of a sequence.	**PSO - 3**	**R,U**
CO - 2	Recall Convergent sequence and Divergence sequence, Bounded sequence, Monotone sequence and Cauchy sequence.	**PSO -2**	**R,U**
CO - 3	Analyze the series of Real numbers.	**PSO -1**	**An**

CO - 4	Examine convergence property using Comparison test, Cauchy's condensation test, D'Alembert's ratio test and Raabe's test.	**PSO -5**	**U,An**
CO - 5	Explain limits, metric space and continuous function on a real line.	**PSO -4**	**R,U**
CO - 6	Test convergence property using Comparison test, Cauchy's condensation test, D'Alembert's ratio test and Raabe's test - Skill Development	**PSO-2**	**U,An**

TEXT BOOKS:

1.For Units I , II , III & V:

Richard R.Goldberg(1963), 'METHODS OF REAL ANALYSIS', Oxford & IBH Publishing Co.Pvt. Ltd, New Delhi, Indian Edition 1970.

UNIT I : CHAPTER 1 (Sec.1.4 – 1.7) ,CHAPTER 2 (Sec 2.1,2.2)

UNIT II : CHAPTER 2(Sec.2.3 - 2.10)

UNIT III : CHAPTER 3(Sec 3.1- 3.4 , 3.6)

UNIT V: CHAPTER 4 (Sec 4.1, 4.2(Examples 4&5 are not included) & 4.3) , CHAPTER 5 (Sec 5.1 & 5.3)

2.For Unit IV:

Manicavachagom Pillay, Natrarajan&Ganapathy , ALGEBRA (Vol I), S.Viswanathan (Printers and publishers),Chennai

UNIT IV : CHAPTER 2(Sec 12-20)

REFERENCE BOOKS:

1. Dr. S. Arumugam and others, REAL ANALYSIS ,New gamma publishing House,Palayamkottai
2. Dr. S.Arumugam. SEQUENCES AND SERIES ,New gamma publishing House,Palayamkottai
3. K. Chandrasekhara Rao, K.S.Narayanan, 'REAL ANALYSIS' Volume I, S. Viswanathan(Printers & Publishers) Pvt. Ltd., 2008 Edition
4. M.K.Singal and Asha Rani Singal (2008), 'A FIRST COURSE IN REAL ANALYSIS' S.Chand & Co. New Delhi.
5. Shanthi Narayan, 'A COURSE OF MATHEMATICAL ANALYSIS'"Margaum Publishers.
6. Shanthi Narayan, Dr.M.D.Raisighania(2014),' ELEMENTS OF REAL ANALYSIS' S.Chand& Co. New Delhi, Fifteenth Revised Edition.

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Second Year - Semester - III

Course Title	**ALLIED 4(Optional) – WINDOWS ACCESSORIES AND MS – OFFICE (for B.Sc. Mathematics students)**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA3AOP12**
Course type	**Practical**
Credits	**3**
Marks	**100**

General Objective:

To implement the concepts of windows, windows accessories and to make the students being aware of Ms word , Ms excel and Power point

Course Objectives (CO):
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand 'Textformatting, mail merge', mathematical equations water marking create backup files in MS word.
CO – 2	Understand the concept of MS power point presentation with animation and sound effects.
CO – 3	Create pay details, student mark ,different charts, import external data soft and filter in MS excel.
CO – 4	Create data base for at least three tables, queries, report generators

Extra Reading/ Keywords*: Formatting documents, Custom animation, Macros, SQL Statements, validation and consolidation , color and gradient fills, Transition effects.*

List of Practicals:

MS- WORD: **15 Hrs**

- ➢ Text formatting and table
- ➢ Mail merge
- ➢ Mathematical equations
- ➢ Watermarking
- ➢ Create backup file

MS-POWER POINT **15 Hrs**

- ➢ Create text and images with effects
- ➢ Create animation and sound effects

MS – EXCEL **15 Hrs**

- ➢ Create pay details of employees
- ➢ Calculate student mark details / calculate the CIA
- ➢ Create different type of charts.
- ➢ Import external data , sort & filter.

MS-ACCESS **15 Hrs**

- ➢ Create a database which consist of atleast three tables
- ➢ Queries
- ➢ Form design
- ➢ Report generation

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes (CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO – 1	Recall 'Text formatting, mail merge', mathematical equations water marking create backup files in MS word	**PSO – 3, PSO – 5**	**R,U**
CO – 2	Recognize MS power point presentation with animation and sound effects.	**PSO -2**	**R,U**
CO – 3	Arrange pay details, student mark ,different charts, import external data soft and filter in MS excel	**PSO -1**	**R,U**

CO – 4	Create data base for at least three tables, queries, report generators	**PSO -4**	**R,U**
CO – 5	Languages needed for further computer courses- Employability	**PSO-4**	**R,U**

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Second Year - Semester - III

Course Title	**SKILL BASED ELECTIVE 3 -APTITUDE MATHEMATICS**
Total Hours	**30**
Hours / Week	**2**
Code	**U15MA3SBT03**
Course type	**Theory**
Credits	**2**
Marks	**100**

General Objective:

To make the learners understand arithmetic facts related to numbers ratios, percentages,etc and to train them in problem solving techniques**.**

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Understand number system, simplification using formula and rule and evaluation of LCM and HCF
CO - 2	Understand averages, percentage and data representation through diagram
CO - 3	Evaluate profit and loss, ratio and proposition.
CO - 4	Understand time and work concept and its application to cisterns and pipes
CO - 5	Understand time and distance and applying to the problem of trains, boats and streams

UNIT I:NUMBER SYSTEM **6 Hrs**

Number System – Simplification using formulae and rules – L.C.M and H.C.F of 2 or more numbers

Extra Reading/Key words*: History of numbers, Algebraic numbers*

UNIT II:AVERAGE AND PERCENTAGE **6 Hrs**

Averages-Percentage – Data Analysis (Pie diagram and Bar diagram only)

Extra Reading/Key words*:* *Histogram, Line chart*

UNIT III:PROFIT AND RATIO **6 Hrs**

Profit and Loss -Ratio and Proportion

Extra Reading/Key words*:* *Partnership, Discount*

UNIT IV:TIME AND WORK **6 Hrs**

Time and Work – Cisterns and Pipes

Extra Reading/Key words*:* *Clocks, Business*

UNIT V:TIME AND DISTANCE **6 Hrs**

Time and Distance –Trains-Boats and Streams

Extra Reading/Key words*: Races and Games of skill,*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes(CO):

The learner will be able to

CO No.	**Course Outcomes**	**PSOs Addressed**	**Cognitive Level**
CO - 1	Demonstrate number system, simplification using formula and rule and evaluation of LCM and HCF	**PSO - 3**	**U,E**
CO - 2	Compute averages, percentage and data representation through diagram	**PSO -2**	**U, E**
CO - 3	Evaluate profit and loss ,ratio and proposition.	**PSO -1**	**U, E**
CO - 4	Recognize time and work concept and apply to cisterns and pipes.	**PSO -5**	**U, E**
CO - 5	Recall time and distance and apply trains, boats and streams.	**PSO -4**	**U, E**
CO - 6	Do Faster Computation for Competitive Exams-Employability	**PSO -1**	**U,E**

TEXT BOOK:

Aggarwal R.S. (2012), OBJECTIVE ARITHMETIC For Competitve Examinations, S.Chand and Company Ltd., Ram Nagar, New Delhi.

Unit I: Chapters 1, 2 and 4
Unit II: Chapters 6 , 10, 41 and 42
Unit III: Chapters 11 and 12
Unit IV: Chapters 15 and 16
Unit V: Chapters 17,18 and 19

REFERENCE BOOKS:

1. Competition Success Review for Bank Probationary Officer's Exam.
2. Competition Success Review for MBA Entrance Examinations.
3. 3.Any text book on Competitive Examinations**.**

(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B.Sc.,DEGREE COURSE
SEMESTER – III

Course Title	**GENDER STUDIES**
Total Hours	**15**
Hours/Week	**1**
Code	**U15WS3GST01**
Course Type	Theory
Credits	**1**
Marks	**100**

General Objective:

To help students to realize their strengths and weaknesses in leading an ethically enriched life and to enjoy a gender-balanced ambience

Course Objectives:

The student will be able to

1. understand the concepts of gender.
2. differentiate women studies from gender studies
3. analyze the areas of gender discrimination
4. analyze and evaluate the initiative and policies for women empowerment
5. remember the women's movements and safeguarding mechanisms

Unit I **3 hrs**

Concepts of Gender:

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

Extra reading /Key Words: *Acts on gender*

Unit II **3 hrs**

Women's Studies Vs Gender Studies:

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

Extra reading /Key Words: *Origin of Women's studies in India*

Unit–II **3hrs**

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.
Extra reading / Key Words: *Survey of level of discrimination*

Unit–IV **3hrs**

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.
Extra reading/Key Words: *Case study*

Unit–V **3hrs**

Women's Movements and Safeguarding Mechanism: In India National / State Commission for Women (NCW) – All Women Police Station – Family Court – Domestic Violence Act – Prevention of Sexual Harassment at Work Place Supreme Court Guidelines – Maternity Benefit Act – PNDT Act – Hindu Succession Act 2005 – Eve Teasing Prevention Act – Self Help Groups – 73_{rd}Amendment for PRIs.
Extra reading / Key Words: *Laws on gender equality*

Note: Extra Reading/ keywords are only for Internal Testing (Seminar/ Assignments)

Course Outcome:

1. evaluate the concepts of gender discrimination.
2. compare women's studies with gender studies.
3. describe the areas of gender discrimination.
4. evaluate the initiative and policies for women empowerment.
5. Explain the different women movement.

REFERENCES:

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

Bharathidasan University, Tiruchirappalli

Jane, P. & Imelda, W. (2004), 50 Key Concepts in Gender Studies.

(For Candidates admitted from June 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B.A. /B.Sc. / B.Com. / BBA/ B.C.A. DEGREE COURSE
LIFE ORIENTED EDUCATION
ETHICS – II: EMPOWERMENT OF WOMEN

HRS / WK : 1 **CODE: U15VE4LVE02**
CREDIT : 1 **MARKS : 100**

OBJECTIVES:

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

UNIT – I: GENDER ISSUES

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

UNIT – II: SOCIAL ISSUES RELATED TO WOMEN

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

UNIT – III: WOMEN AND MEDIA

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

UNIT – IV: WAYS OF EMPOWERING WOMEN

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

UNIT – V: CYBER CRIME AGAINST WOMEN

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

REFERENCES:

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

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

HRS / WK :1 **CODE: U15VE4LVBO2**
CREDIT : 1 **MARKS : 100**

OBJECTIVE:

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

UNIT – I: PURPOSE OF LIFE

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

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

UNIT – II: JUDGES AND KINGS

- 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)

UNIT – III: MINOR PROPHETS

Brief Life History and teachings of

- Amos
- Jonah
- Micah
- Nahum
- Habakkuk

UNIT – IV: MAJOR PROPHETS

Brief Life History and teachings of

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

UNIT – V: 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)

REFERENCES:

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

(For Candidates admitted from June 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
B.A./ B.Sc/ B.Com/ BBA/ B.C.A - DEGREE COURSES
LIFE ORIENTED EDUCATION
CATECHISM – II: CHURCH AND SACRAMENTS

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

CREDIT : 1 **MARKS : 100**

OBJECTIVES:

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

UNIT – I: MISSION OF THE CHURCH

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

UNIT – II: PARTICIPATORY CHURCH

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

UNIT – III: THE FUNCTIONARY CHURCH AND I

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

UNIT – IV: SACRAMENTS

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

UNIT – V: MARY AND SAINTS

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

REFERENCES:

1. "Vatican II Revised" Archbishop Angelo Fernandes Published by X.Diax de Rio S.J. Gujarat Sahitya Prakash, P.O.Box. 70, Gujarat, 388001, India.
2. "The Sacraments The Word of God at the Mercy of the Body" Claretian Publications, Malleswaram, Bangalore 560055.
3. Documents of Vatican II – St. Paul's Publications, Bombay 1966.

(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
Affiliated to Bharathidasan University
Nationally Accredited (3rd cycle) with 'A' Grade by NAAC
College with potential for Excellence
Tiruchirappalli - 620002
Second Year - Semester - III

Course Title	**Allied 4(Optional) - APPLIED MATHEMATICS III (for BCA and B.Sc. Computer Science students)**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA3AOT13**
Course type	**Theory**
Credits	**3**
Marks	**100**

General Objective:

To impart the knowledge on matrices and enable the students to know about different methods of solving numerical equations, methods of interpolation ,numerical differentiation and integration.

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Understand the types of matrices and its operations and finding solution of simultaneous linear equations
CO - 2	Evaluate Eigen values ,Eigen vector using Cayley Hamilton Theorem
CO - 3	Evaluate algebraic and transcendental equation using numerical methods.
CO - 4	Evaluate Polynomial using interpolation.
CO - 5	Evaluate integrals using trapezoidal and simpson $\frac{1}{3}$ rule
CO - 6	Evaluate differential equation of first order using Euler method, Runge Kutta method

UNIT 1: MATRICES **12 Hrs**

Types of matrices- operation on matrices-rank of a matrix-solution of simultaneous linear equation

Extra Reading/ Keywords: *Equivalent matrix, Echelon matrices, Method of inversion, Gaussian elimination method*

UNIT II : MATRICES (CONTINUED) **12 Hrs**

Eigen values – eigen vectors- similar matrices- cayley Hamilton theorem (without proof) - eigen values for symmetric matrices

Extra Reading/ Keywords: *Diagonalization, Linear transformation, nth power of matrix, Matrix function*

UNIT III : SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS AND INTERPOLATION

12 Hrs

Solving algebraic and transcendental equations – Bisection, False position and Newton Raphson methods. Newton Gregory forward and backward interpolation formulae

Extra Reading/ Keywords: *Hankel matrix, Newton forward (backward) dividend difference formula, Intermediate value theorem*

UNIT IV : SOLUTION OF SIMULTANEOUS EQUATIONS **12 Hrs**

Gauss elimination– Finding inverse of a matrix using Gauss elimination method – Iterative methods. Gauss Jacobi and Gauss Seidal methods.

Extra Reading/ Keywords: *Rate of convergence, Stationary iterative method, Newton's method, Eigen decomposition, Cholesky decomposition, Bell Polynomial*

UNIT V : NUMERICAL INTEGRATION AND SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS **12 Hrs**

Trapezoidal rule and Simpsons 1/3 rule (truncation error excluded). Solving differential equations (1^{st} order differential equations only) – solutions by Euler's method - Euler's modified method(excluding improved Euler's method) – Runge Kutta 2^{nd} and 4^{th} order method.

Extra Reading/ Keywords: *Local and Global truncation error, Explicit Runge Kutta method, Linear multistep method, Uniform grid and Non-Uniform grid*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes(CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall matrices and its operations and Solving simultaneous linear equations	**PSO - 3**	**R,U,E**

CO - 2	Compute Eigen values ,Eigen vector using Cayley Hamilton Theorem	**PSO -2**	**Ap, E**
CO - 3	Evaluate algebraic and transcendental equation using numerical methods	**PSO -1**	**E**
CO - 4	Formulation of Polynomial using interpolation .	**PSO -5**	**E**
CO - 5	Examine direct and iterative numerical methods of simultaneous equation. Solve differential equation using Euler method, Runge Kutta method.	**PSO -4**	**U,E**
CO - 6	impart the knowledge on matrices and enable the students to know about different methods of solving numerical equations, methods of interpolation ,numerical differentiation and integration- Skill Development	**PSO -2**	**U,E**

TEXT BOOKS:

For Units I and II

1. Narayanan S, Hanumantha Rao.R, Manicavachagom Pillay.T.K, Dr.Kandaswamy .P.(2000), ANCILLARY MATHEMATICS – VOLUME 1 - PART I – ALGEBRA, S.Viswanathan Printers and publishers Pvt Ltd, Chennai.

UNIT I Chapter 3 : Sections 3.1-3.3

UNIT II Chapter 3 : Sections 3.4,3.5

For Units III, IV and V

2. Venkataraman M. K(2006), "NUMERICAL METHODS IN SCIENCE AND ENGINEERING", National Publishing House, Chennai

UNIT III Chapter 3 : Sections 1,2,4,5 and Chapter 6: Sec 1-4

UNIT IV Chapter 4 Section 1-3,6

UNIT V Chapter 9 Section 8,10 and Chapter 11 Sections 10,12,14,16

REFERENCE BOOKS :

2. S. Arumugam and A. Thangapandi Isaac MODERN ALGEBRA, Scitech Publications (India) pvt ltd Chennai.

3.S. Arumugam, A. Thangapandi Isaac & A. Somasundaram NUMERICAL METHODS Scitech Publishers ,Chennai

4. A.Singaravelu (2008) ,ENGINEERING MATHEMATICS ,NUMERICAL METHODS- Meenakshi Publishers ,Chennai

5. ManicavachagomPillay .T.K , Natarajan.T, Ganapathy K.S ,(2005), ALGEBRA VOL II S.Viswanathan (Printers and publishers),Chennai

(For candidates admitted from 2015 onwards)
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College with potential for Excellence
Tiruchirappalli - 620002
Second Year - Semester - III

Course Title	**Allied 4 (Optional)- DIFFERENTIAL CALCULUS AND TRIGONOMETRY (For B.Sc. Chemistry students)**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA3AOT14**
Course type	**Theory**
Credits	**3**
Marks	**100**

General Objective:

To acquire knowledge in differentiation and some of its applications ,to understand partial differentiation, to expand trigonometric functions and to learn the relation between hyperbolic functions

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand successive differentiation and Leibnitz theorem
CO – 2	Apply differentiation for finding maxima and minima.
CO – 3	Understand PDE and Eulers theorem.
CO – 4	Evaluate the expansion of trigonometry function.
CO – 5	Understand Hyperbolic function and inverse hyperbolic functions

UNIT I:DIFFERENTIAL CALCULUS **12 Hrs**

Logarithmic Differentiation-Differentiation of implicit functions- Successive differentiation – n^{th} derivative of standard functions – Leibnitz theorem (without proof) Application to simple problems

Extra Reading/ Keywords: *Application of Leibnitz formula in practical problems*

UNIT II: APPLICATIONS OF DIFFERENTIATION **12 Hrs**

Conditions for maxima and minima (for single variable),increasing and decreasing functions(only conditions and simple problems).

Extra Reading/ Keywords:*Use of increasing and decreasing functions in marketing,Velocity and acceleration*

UNIT III :PARTIAL DIFFERENTIATION **12Hrs**

Introduction to Partial Differentiation -Partial Differentiation –Euler's Theorem

Extra Reading/ Keywords:*Euler's equation of motion, Heat equation, Wave equation*

TRIGONOMETRY:

UNIT IV : EXPANSIONS **12 Hrs**

Expansions of Cosnθ, Sinnθ and Tannθ (n being a positive integer) (formation of equations is excluded)– Expansions of $Sin^n\theta$ and $Cos^n\theta$ in a series of sines and cosines of multiples of θ (n being a positive integer and θ in radians) (only problems involving the above expansions) **Extra Reading/ Keywords:***Taylor series, Inverse trigonometric functions, Asymptotic expansion*

UNIT V: HYPERBOLIC FUNCTIONS **12 Hrs**

Hyperbolic functions, inverse hyperbolic functions, separation into real and imaginary parts.

Extra Reading/ Keywords:*Hyperbolic angle, Inverse hyperbolic Cotangent, Secant, Cosecant*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course outcomes (CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall successive differentiation and Leibnitz theorem	**PSO –1**	**R,U**
CO - 2	Compute maxima and minima applying Derivatives	**PSO -3**	**Ap, E**
CO - 3	Explain and Discuss PDE and Eulers theorem	**PSO – 5**	**R,U**
CO - 4	Evalute the expansion of trigonometry function	**PSO -2**	**E**
CO - 5	Recognize and Compute Hyperbolic function and inverse hyperbolic functions	**PSO -4**	**U,E**

CO - 6	Acquire knowledge in differentiation and some of its applications ,to understand partial differentiation, to expand trigonometric functions and to learn the relation between hyperbolic functions Skill Development	**PSO- 2,3**	**Ap, E**

TEXT BOOKS

Units I , II & III

Treatment and Content as in

S. Narayanan and T. K. ManicavachagomPillay,(2009) CALCULUS – VOLUME I

S. Viswanathan Printers & Publishers Pvt. Ltd.,

UNIT I:Chapter II:Sections 4.1, 4.2, 5, Chapter III Sections 1.1-1.3 & 2

UNIT II: Chapter V:Section 1.2,1.3(statement only with simple problems)

UNIT III: Chapter VIII: Sections 1.1 ,1.2& 1.6.

Units IV &V

Treatment and Content as in

S. Narayanan and T. K. ManicavachagomPillay (2003) TRIGONOMETRY, S. Viswanathan Printers & Publishers Pvt. Ltd.,.

UNIT IV: Chapter III: Sections 1-4.

UNIT V:Chapter IV :Sections 1 & 2.

REFERENCE BOOKS:

1.Kandasamy .P.Thilagavathy.K (2006) , MATHEMATICS VOLUME I,S.Chand & Company, New Delhi

2. Arumugam ,Thangapandi Issac,(2005) THEORY OF EQUATIONS AND TRIGONOMETRY , New Gamma Publishing House ,Delhi.

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HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
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Tiruchirappalli - 620002
Second Year - Semester - III

Course Title	**Allied 4 : MATHEMATICS FOR COMPETITIVE EXAMINATIONS (for B.Com Students)**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA3AOT15**
Course type	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

To bring in basic knowledge about number system. To make students familiar with the problems involving ratio and proportion , percentage, Time and work. To Practice solving problems quickly.

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Understand number system, simplification using formula and rule and evaluation of LCM and HCF
CO - 2	Understand averages, percentage, ratio and proposition.

CO - 3	Evaluate profit and loss, time and work
CO - 4	Understand time and distance concept and its application to boats and streams
CO - 5	Understand data representation through diagram

UNIT: I **12 HRS**

Numbers – Sum, difference, Multiplication and Division, squares and square roots, L.C.M. & H.C.F. of 2 or more numbers, Decimal fractions- Sum, Difference, Multiplication and Division only-simplification

Extra Reading/Key words*:* *History of numbers*

UNIT: II **12 HRS**

Averages -Percentage - Ratio and proportion.

Extra Reading/Key words*:* *Algebraic numbers*

UNIT: III **12 HRS**

Profit and Loss -Time and work – Pipes and Cisterns

Extra Reading/Key words*:**Partnership, Discount*

UNIT: IV **12 HRS**

Time and Distance- Problems involving trains ,boats and streams

Extra Reading/Key words*: Races and Games of skill,*

UNIT: V **12 HRS**

Data analysis – Bar diagram, Pie diagram and Line graphs.

Extra Reading/Key words*:* *Histogram, Line chart*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes(CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Demonstrate number system, simplification using formula and rule and evaluation of LCM and HCF	**PSO - 3**	**U,E**
CO - 2	Compute averages, percentage, ratio and proposition.	**PSO -2**	**U, E**
CO - 3	Evaluate profit and loss , time and work.	**PSO -1**	**U, E**
CO - 4	Recognize time and distance concept and apply to boats and streams	**PSO -5**	**U, E**
CO - 5	Recall data representation through diagram	**PSO -4**	**U, E**
CO - 6	Do Faster Computation for Competitive Exams-Employability	**PSO -1**	**U,E**

TEXT BOOK:

Aggarwal R.S. (2011), ARITHMETIC (Subjective and Objective) For Competitve Examinations, S.Chand and Company Ltd., Ram Nagar, New Delhi.

Unit I: Chapters 1, 2, 3 and 4

Unit II: Chapters 6,10 and 12

Unit III: Chapters 11,15 and 16

Unit IV: Chapters 17, 18 and 19

Unit V: Chapters 41, 42 and 43

REFERENCE BOOKS:

1. Competition Success Review for Bank Probationary Officer's Exam.

2. Competition Success Review for MBA Entrance Examinations.

3.Any text book on Competetive Examinations.

4. Arithmetic for Competitive Examinations by V.K. Subburaj

(For Candidates admitted from 2015 onwards)

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

PG & RESEARCH DEPARTMENT OF TAMIL

Second Year - Semester – IV

Course Title	தமிழ்த்தாள் - **IV**
Total Hours	**75**
Hours/Week	**5 Hrs Wk**
Code	**U15TL4TAM04**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

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

- Make the student to understand the cultural and tradition of Tamilians.
- Student will learn to understand the different religions
- Understand the depth of Tamil Literature & Culture.
- Know about the structure of the family, manners and discipline.
- Know about the rights of equality.

Course Objectives:

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

அலகு:1 செய்யுள் **15 Hrs**

1. குறுந்தொகை

1. கொங்கு தேர் வாழ்க்கை அஞ்சிறைத் தும்பி - இறையனார்
2. யாரும் இல்லை தானே கள்வன் - கபிலர்
3. வேம்பின் பைங்காய்என் தோழி தரினே – மிளைக்கந்தன்
4. உள்ளது சிதைப்போர் உளரெனப் படாஅர் - பாலை பாடிய பெருங்கடுங்கோ
5. நோற்றோர் மன்ற தோழி – குறுங்குடி மருதன்

2. நற்றிணை

1. மனையுறை புறவின் செங்கால் பேடை
2. நீள்மலைக் கலித்த பெருங்கோற் குறிஞ்சி - பாண்டியன் மாறன் வழுதி
3. ஆய்மலர் மழைக்கண் தெண்பனி உறைப்பவும் - நல்விளக்கனார்
4. சிறுவீ முல்லைப் பெரிது கமழ் அலரி - மதுரை பேராலவாயர்

3. கலித்தொகை

1. எறித்தரு கதிர்தாங்கி ஏந்திய குடைநீழல் - கபிலர்

2. பாடுகம் வா வாழி தோழி - கபிலர்

அலகு:2 **15 Hrs**

அகநானூறு

1.வானம் வாய்ப்பக் கவினிக் கானம் - சீத்தலைச் சாத்தனார்

2. எம்வெங் காம மியைவதாயின் - மாமூலனார்

5.புறநானூறு

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

6. பதிற்றுப்பத்து - ஐந்தாம் பத்து

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

7. திருக்குறள்

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

அலகு:3 **15 Hrs**

தமிழ் இலக்கிய வரலாறு

சங்ககாலம் - சங்கம் மருவியகாலம்

எட்டுத்தொகை, பத்துப்பாட்டு, பதினெண்கீழ்க்கணக்கு நூல்கள்

அலகு:4 **15 Hrs**

வாழ்க்கை வரலாறு

அன்னை தெரசா - பா. தீனதயாளன்

key Words (Extra Reading)

அக்னி சிறகுகள் - அப்துல் கலாம்

அலகு:5 **15 Hrs**

பொது – மொழிப்பெயர்ப்பு

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

Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	To develop an attitude to consider other living beings as equals	PSO 1	U
CO-2	To learn about the life style of traditional Tamil literature	PSO 2	AN

CO-3	to be inspired by the traditional culture and values	PSO 2	R
CO-4	To study about the dedicated service of mother Theresa and to practice the same	PSO 3	U
CO-5	to enhance skills in translation	PSO 4	C

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

(For the candidates admitted from June 2015 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002

DEPARTMENT OF HINDI

SEMESTER – IV

Course Title	**Part – I Language** **Hindi Paper-IV Functional Hindi & Translation**
Total Hours	**75**
Hours/Week	**5Hrs/Wk**
Code	**CODE: U15HN4HIN04**
Course Type	**Theory**
Credits	**3**
Marks	**100**

General Objective : To enable the students to apply translation techniques and evaluate contemporary Hindi Literature.

Course Objectives (CO):

The learner will be able to:

CO No.	**Course Objectives**
CO -1	Apply technical translation in Functional Hindi
CO- 2	Understand and analyze the contemporary Hindi literature in the literary works
CO- 3	Evaluate and create general essays
CO- 4	Apply the formats and create formal and informal letters
CO- 5	Apply translation techniques

Unit 1 **(15 Hours)**

Functional Hindi

Extra Reading (Key Words): Technical Terminology

Unit 2 **(15 Hours)**

History of Hindi literature : adhunic kaal

Extra Reading (Key Words): Prayogavad, Pragativad

Unit 3 **(15 Hours)**

General essays:

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

Extra Reading (Key Words): Computer, Dr. Ambedkar

Unit 4 **(15 Hours)**

Letter writing

Extra Reading (Key Words): Official Letter, Personal letter

Unit 5 **(15 Hours)**

Anuvad abhyas - III

Extra Reading (Key Words): Translation, Technical Terms

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

Course Outcomes:
The learner will be able to:

CO No.	Course Outcomes	Cognitive Level
CO -1	Translate technical terms	Ap
CO- 2	Evaluate Contemporary issues in par with the literary works.	U, An
CO- 3	Instill creative writing	E, C
CO- 4	Communicate in formal situation .	Ap, C
CO- 5	Understand the basic principles of translation	Ap

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

Books Prescribed :

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

(For candidates admitted 2016 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

DEPARTMENT OF FRENCH

SEMESTER IV

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

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

Course Objectives (CO):

The learner will be able to

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

Unit 1 C'est la fête ! (18 Hours)

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

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

Unit 2 Vous plaisentez ! (18 Hours)

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

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

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

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

Extra Reading (Key Words): les taboos

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

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

Extra Reading (Key Words):les sportifs français

Unit 5 La vie est dure (18 Hours)

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

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

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

TEXT BOOKS :

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

Books for Reference:

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

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

(For candidates admitted from June 2017 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), Tiruchirapalli – 620002
PG AND RESEARCH DEPARTMENT OF ENGLISH
II YEAR UG – SEMESTER IV
PART II – ENGLISH 4 - GENERAL ENGLISH IV

HOURS : 6 **CODE : U15EL4GEN04**
CREDIT : 3 **MARKS: 100**

EMPLOYABILITY SKILLS

OBJECTIVES:

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

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

Listening to identify a person's attitude, values, situation and the decision made.
Speaking about one's action, expressing opinions, character analysis.
Reading for comprehension(inferring a character's method of managing a situation, adaptability and the like).
Writing recommendations.
Grammar – use of appropriate adjectives and adverbs in contexts and reporting speeches
Vocabulary – differentiating shades of meaning, use of idioms and phrases in sentences
Composition – Your thoughts are the architects of your destiny – David O' Mckay
Honesty is the first chapter in the book of wisdom – Thomas Jefferson

TEXTS

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

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

Listening to differentiate dutyfrom obligation.
Speaking – Discussing one's knowledge about different subjects, learning skills, thirst for knowledge, learning form experiences.
Reading for comprehension exhibiting higher perception of life's experiences.
Writingparagraphs with cause and reason, analyzing motives behind people's actions and behavior.
Grammar – use of cohesive devices
Vocabulary – figures of speech– simile, metaphor.
Composition –
1. Excellence is not a destination, it is a continuous journey that never ends – Brian Tracy
2. To be perfect is to change often – Winston Churchill

TEXTS

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

UNIT III – Team skills

Listening to speaker's ideas, opinions, and suggestions and analyzing their character.
Speaking –Discussing, questioning, interacting, respecting, sharing and participating.
Reading for comprehension – absorbing the attitude of the people.
Writing – personal essays and report writing
Grammar – use of inverted structures
Vocabulary –New words in current usage.
Composition –1. "Talent wins games, but teamwork and intelligence wins championships."
2. "It takes two flints to make a fire."

TEXTS

1. "The Little Black Boy" by William Blake
2. How to get cooperation by Dale Carnegie.

UNIT IV – Communication skills for interpersonal relationship

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

TEXTS

1. The Refund by Fritz Karinthy

UNIT V –Presentation skills

Listening to commands,information, announcements, and discussions in a meeting.
Speaking –role play in panel discussion, mock parliament and public speaking.
Reading for comprehension.
Writingagenda, minutes, memo, notice, circular, project proposal.
Grammar – use of simple, compound, complex, imperative sentences and punctuations.
Vocabulary – Business terms.
Composition – writing a project.

TEXTS

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

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(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
Affiliated to Bharathidasan University
Nationally Accredited (3rd cycle) with 'A' Grade by NAAC
College with potential for Excellence
Tiruchirappalli - 620002
Second Year - Semester - IV

Course Title	**MAJOR CORE – 6: MODERN ALGEBRA I**
Total Hours	**75**
Hours / Week	**5**
Code	**U15MA4MCT06**
Course type	**Theory**
Credits	**5**
Marks	**100**

General Objective:

To make the students understand the concept of relations and mappings, characteristics of Algebraic structures like Groups, Rings .

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Understand relation and its types ,functions and binary operations
CO - 2	Understand the concept of groups and its classifications.
CO - 3	Understand cyclic groups ,normal groups,quotient groups ,Isomorphism and homomorphism.
CO - 4	Understand rings, its types,and elementary properties.
CO - 5	Understand the concept of ideals ,Maximal prime ideals and homomorphism of rings.

UNIT I: RELATIONS AND MAPPINGS **15 Hrs**

Relations - Equivalence Relations - Partial order - Functions - Binary Operations.

Extra Reading/ Keywords:*Lattices , Hasse diagram*

UNIT II: GROUPS **15 Hrs**

Introduction - Definition and Examples - Elementary Properties of a Group -Equivalent Definitions of a Group - Permutation groups - Subgroups.

Extra Reading/ Keywords: *Sylow groups, Galois theory*

UNIT III: GROUPS (CONTD) **15 Hrs**

Cyclic Groups - Order of an element - Cosets and Lagrange's Theorem - NormalSubgroups and Quotient Groups - Isomorphism - Homomorphisms.

Extra Reading/ Keywords: *splitting polynomial ,irreducible polynomial*

UNIT IV: RINGS **15 Hrs**

Definition and examples - Elementary properties of rings - Isomorphism -Types of rings - Characteristic of a ring - Sub rings

Extra Reading/ Keywords:*Euclidean domain, polynomial rings*

UNIT V: RINGS (CONTD) **15 Hrs**

Ideals - Quotient rings- Maximal and Prime ideals - Homomorphism of rings

Extra Reading/ Keywords: *UFD , polynomial over UFD*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes (CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall relation and its types ,functions and binary operations.	**PSO – 3**	**R,U**
CO - 2	Recognize groups and its classifications.	**PSO -2**	**R,U**
CO - 3	Explain cyclic groups ,normal groups, quotient groups ,Isomorphism and homomorphism.	**PSO -1**	**R,U**
CO - 4	Relate rings, its types and elementary properties.	**PSO -5**	**R,U**
CO - 5	Describe the concept of ideals ,Maximal ,prime ideals and homomorphism of rings	**PSO -4**	**R,U**
CO - 6	Make the students understand the concept of relations and mappings, characteristics of Algebraic structures like Groups and Rings- Skill Development	**PSO-2,3**	**R,U**

TEXT BOOK

S. Arumugam and A. Thangapandi Isaac, MODERN ALGEBRA (August 2003) , Scitech Publications (India) pvt ltd Chennai.

UNIT I: (Chapter 2 - Sec.2.1 to 2.5)
UNIT II: (Chapter 3 - Sec.3.0 to 3.5)
UNIT III: (Chapter 3 - Sec 3.6 to 3.11)
UNIT IV: (Chapter 4 - Sec 4.1 to 4.6)
UNIT V: (Chapter 4 - Sec 4.8 to 4.10)

REFERENCE BOOKS

1. Shanti Narayanan, A TEXT BOOK OF MODERN ABSTRACTALGEBRA. Margam Publishers
2. K. Sivasubramanian. ,MODERN ALGEBRA ,Allied publishers, New Delhi
3. R. Balakrishnan & N. Ramabadran, A TEXT BOOK OF MODERN ALGEBRA.
4. M.L. Santiago ,MODERN ALGEBRA, , Tata McGraw-Hill Publishing Co. Ltd, 2001.

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Tiruchirappalli - 620002
Second Year - Semester - IV

Course Title	**MAJOR ELECTIVE– 1: NUMERICAL METHODS**
Total Hours	**75**
Hours / Week	**5**
Code	**U15MA4MET01**
Course type	**Theory**
Credits	**5**
Marks	**100**

General Objective:

To make the students know about different methods of solving numerical equations and differential equations, methods of interpolation and numerical differentiation and integration.

Course Objectives(CO):
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand various methods for solving algebraic and transcendental equations
CO – 2	Understand the system of simultaneous equations and finding the solution of a system of simultaneous equations using numerical methods
CO – 3	Analyse numerical solution to ordinary differential equations using direct method
CO – 4	Apply finite difference to evaluate polynomial using interpolation for equal and unequal intervals.
CO – 5	Evaluate finite integrals using Trapezoidal and Simpson's rule.
CO – 6	Understand numerical differentiation and evaluation of maxima and minima

UNIT I :SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS 15 Hrs

Introduction - Bisection Method - The Method of False Position -Iteration Method - Newton - Raphson Method.

Extra Reading/ Keywords*:Rolle's theorem,,Taylor's series for a function of one variable*

UNIT II: SOLUTION OF LINEAR SYSTEMS OF EQUATIONS: 15 Hrs

Introduction – Matrix Inversion Method- Gaussian elimination, Gauss– Jordan, Gauss - Seidel and Gauss Jacobi methods.

Extra Reading/ Keywords*: LU Decomposition of matrices, Matrix Norms.*

UNIT III: NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS 15 Hrs

Introduction – Boundary Value Problems, Finite – Difference Method, Solution by Taylor's series , Euler's method , Modified Euler's method , Runge-Kutta method.

Extra Reading/ Keywords*:Picard,smethod,Adams – Bashforth method.*

UNIT IV: INTERPOLATION 15 Hrs

Introduction -Finite Differences , Forward and Backward differences only , Newton's formula for interpolation ,Interpolation formulae , Interpolation with unevenly spaced points , Lagrange's interpolation formula.

Extra Reading/ Keywords*:Stirling'sformula,Bessel's formula.*

UNIT V: NUMERICAL DIFFERENTIATION AND INTEGRATION 15 Hrs

Introduction - Numerical differentiation , Maximum and minimum values of a tabulated function, Numerical integration – Trapezoidal rule , Simpson's 1/3-rule.

Extra Reading/ Keywords*:Simpson,s 3/8 rule ,Boole's and Weddle's rule.*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes (CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Explain various methods for solving algebraic and transcendental equations.	**PSO –1**	**U,E**
CO - 2	Solving the system of simultaneous equations using numerical methods	**PSO -2**	**Ap, E**
CO - 3	Compute numerical solution to ordinary differential equations using direct method.	**PSO -5**	**E**
CO - 4	Formulate polynomial using interpolation for equal and unequal intervals.	**PSO -3**	**E**

CO - 5	Evaluate finite integrals using Trapezoidal and Simpson's rule. Explain numerical differentiation and evaluation of maxima and minima.	**PSO -4**	**U,E**
CO - 6	make the students know about different methods of solving numerical equations and differential equations, methods of interpolation and numerical differentiation and integration- Skill Development	**PSO -2**	**Ap, E**

TEXT BOOK

S.S.Sastry , , INTRODUCTORY METHODS OF NUMERICAL ANALYSIS , New Age Publishing Company, Fourth edition, April 1995.

UNIT I : Chapter 2 - Sec. 2.1 to 2.5

UNIT II : Chapter 6 - Sec.6.1, 6.3 ,6.3.1,6.3.2,6.3.3,6.4

UNIT III : Chapter 7 - Sec 7.1, 7.2. 7.4, 7.4.2, 7.5,7.10, 7.10.1

UNIT IV : Chapter 3 - Sec. 3.1, 3.3, 3.3.1, 3.3.2, 3.6, 3.7, 3.7.1 , 3.9, 3.9.1

UNIT V : Chapter 5 - Sec. 5.1 ,5.2, 5.3, 5.4, 5.4.1 and 5.4.2

REFERENCE BOOKS :

1.A.Singaravelu (2008) ,ENGINEERING MATHEMATICS ,NUMERICAL METHODS-MeenakshiPublishers,Chennai

2.S. Arumugam, A. Thangapandi Isaac & A. SomasundaramNUMERICAL METHODS Scitech Publishers ,Chennai

3.Dr. M.K. Venkataraman ,NUMERICAL METHODS IN SCIENCE AND ENGINEERING,National Publishing House, Chennai

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Tiruchirappalli - 620002
Second Year - Semester - IV

Course Title	**MAJOR ELECTIVE 1 - COMBINATORICS**
Total Hours	**75**
Hours / Week	**5**
Code	**U15MA4MET04**
Course type	**Theory**
Credits	**5**
Marks	**100**

General Objective:

To introduce some basic concepts and techniques in combinatorics such as basic counting methods, generating functions and recurrence relations

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Understand the basic concepts involved in Combinatorics.
CO - 2	Understand the principles of Inclusion and Exclusion.
CO - 3	Understand the concepts of generating functions involved in power series, function models and exponential generating functions.
CO - 4	Understand the concepts of recurrence relations using models and discussed the solution of recurrence relations and generating functions.
CO - 5	Understand the concepts of integer partitions and systems of distinct representatives.

COMBINATORICS

UNIT I : INTRODUCTIONS TO COMBINATORICS **15 Hrs**

Basic counting principles, Permutations and Combinations (with and without repetitions), Binomial theorem, Multinomial theorem, Counting subsets, Set-partitions, Stirling numbers.
Extra Reading/ Keywords: *Stirling's Formula,Fixed points, Pascal's Triangle.*

UNIT II:INCLUSION AND EXCLUSION **15 Hrs**

Principle of Inclusion and Exclusion, Derangements, Inversion Formulae.

Extra Reading/ Keywords: *Binomial theorem, Counting principle.*

UNIT III:GENERATING FUNCTIONS **15 Hrs**

Generating functions: Algebra of formal power series, Generating function models, Calculating generating functions, Exponential generating functions.

Extra Reading/ Keywords: *Partial fractions. Recurrence relation.*

UNIT IV:RECURRENCE RELATIONS **15 Hrs**

Recurrence relations: Recurrence relation models, Divide and conquer relations, Solution of recurrence relations, Solutions by generating functions

Extra Reading/ Keywords: *Combinatorial Identities, Fibonacci numbers*.

UNIT V:INTEGER PARTITIONS **15 Hrs**

Integer partitions, Systems of distinct representatives.

Extra Reading/ Keywords: *Sylvester and the Intrinsic Study of Partitions,Ferrers graph of the partition*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes(CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recognize the basic concepts involved in Combinatorics.	**PSO – 2**	**R,U**
CO - 2	Recognize the principles of Inclusion and Exclusion..	**PSO -3**	**Ap, E**
CO - 3	Recognize the concepts of generating functions involved in power series, function models and exponential generating functions.	**PSO -1**	**E**
CO - 4	Recognize the concepts of recurrence relations using models and calculates the solution of recurrence relations and generating functions.	**PSO -4**	**An**
CO - 5	Recall the concepts of integer partitions and systems of distinct representatives	**PSO -5**	**R,U**
CO - 6	To acquaint the students become familiar with techniques of recurrence relation and integer partitions and apply them to solve problems - Skill Development	**PSO-2**	**Ap**

TEXT BOOK

Sane, S. S.: "*Combinatorial Techniques*", Hindustan Book Agency

REFERENCE BOOKS :

1. Lint, J. H. van, and Wilson, R. M.: "*A Course in Combinatorics*", Cambridge University Press (2^{nd}Ed.)

2. Krishnamurthy, V.: "*Combinatorics: Theory and Applications*", Affiliated East-West Press

3. Cameron, P. J.:"*Combinatorics: Topics, Techniques, Algorithms*", Cambridge University Press

4. Hall, M. Jr.: "*Combinatorial Theory*", John Wiley & Sons (2^{nd} Ed.)
5. Brualdi, R. A.: "*Introductory Combinatorics*", Pearson Education Inc. (5^{th} Ed.)

(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
Affiliated to Bharathidasan University
Nationally Accredited (3rd cycle) with 'A' Grade by NAAC
College with potential for Excellence
Tiruchirappalli - 620002
Second Year - Semester - IV

Course Title	**MAJOR ELECTIVE 1 - MATHEMATICAL MODELLING**
Total Hours	**75**
Hours / Week	**5**
Code	**U15MA4MET05**
Course type	**Theory**
Credits	**5**
Marks	**100**

General Objective:

To study the mathematical models through ode and difference equations and train the students to develop mathematical models in real life problems.

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Understand the basic concepts involved in Mathematical Modelling using ordinary differential equations.
CO - 2	Understand the concepts of Mathematical Modelling through the system of first order ordinary differential equations by constructing population dynamic model and compartment model.
CO - 3	Understand the concepts of Mathematical Modelling through the system of second order ordinary differential equations by constructing satellite and compartment model.

CO - 4	Understand the concepts of mathematical modeling through the system of differential equations.
CO - 5	Understand the concepts of mathematical modelling through graphs.

UNIT I :MATHEMATICAL MODELLING THROUGH ORDINARY DIFFERENTIAL EQUATIONS **15 Hrs**

Linear Growth and Decay Models – Non-Linear Growth and Decay Models – Compartment Models – Dynamic problems – Geometrical problems.

Extra Reading/ Keywords:*Concavity, inflection points, increasing and decreasing functions; local and absolute extrema.*

UNIT II:MATHEMATICAL MODELLING THROUGH SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS OF FIRST ORDER **15 Hrs**

Population Dynamics – Epidemics – Compartment Models – Economics – Medicine, Arms Race, Battles and International Trade – Dynamics.

Extra Reading/ Keywords: *Doubling time, Half-life period.*

UNIT III:MATHEMATICAL MODELLING THROUGH ORDINARY DIFFERENTIAL EQUATIONS OF SECOND ORDER **15 Hrs**

Planetary Motions – Circular Motion and Motion of Satellites – Mathematical Modelling through Linear Differential Equations of Second Order – Miscellaneous Mathematical Models.

Extra Reading/ Keywords:*Newton's law of cooling and heating, Continuous compounding.*

UNIT IV:MATHEMATICAL MODELLING THROUGH DIFFERENCE EQUATIONS **15 Hrs**

Simple Models – Basic Theory of Linear Difference Equations with Constant Coefficients – Economics and Finance – Population Dynamics and Genetics – Probability Theory

Extra Reading/ Keywords:*Polynomial interpolation,Projectile motion*.

UNIT V:MATHEMATICAL MODELLING THROUGH GRAPHS **15 Hrs**

Solutions that can be Modelled Through Graphs – Mathematical Modelling in Terms of Directed Graphs, Signed Graphs, Weighted Digraphs and Unoriented Graphs.

Extra Reading/ Keywords: *Direct and Indirect Proportion,Parabolic relation, linear relation.*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes(CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recognize the basic concepts involved in Mathematical Modelling.	**PSO – 2**	**R,U**
CO - 2	Recognize the concepts of Mathematical Modelling through the system of first order ordinary differential equations.	**PSO -3**	**Ap, E**
CO - 3	Recognize the concepts of Mathematical Modelling through the system of second order ordinary differential equations	**PSO -1**	**E**
CO - 4	Recognize the concepts of Mathematical Modelling through difference equations.	**PSO -4**	**An**
CO - 5	Recall the concepts of graphs and solves the mathematical models using graphs.	**PSO -5**	**R,U**
CO - 6	To acquaint the students become familiar with mathematical models and apply them using ordinary differential equations to solve problems - Skill Development	**PSO-2**	**Ap**

TEXT BOOK

1. J.N. Kapur, Mathematical Modelling, Wiley Eastern Limited, New Delhi, 1988.
Unit 1: Chap 2, Sec 2.1 –2.6
Unit 2: Chap 3, Sec 3.1 –3.6
Unit 3: Chap 4, Sec 4.1 –4.4
Unit 4: Chap 5, Sec 5.1 –5.5
Unit 5: Chap 7, Sec 7.1 –7.5

REFERENCE BOOKS :

1. J.N. Kapur, Mathematical Models in biology and Medicine, EWP, New Delhi, 1985.
2. Keshet, L. E., "Mathematical Models in Biology", SIAM
3. Fred Brauer and Carlos Castillo-Chavez, Mathematical Models in Population Biology and Epidemiology, Springer.
4. Frank R. Giordano, William Price Fox, Maurice D. Weir, A First Course in Mathematical Modelling,4th Ed., Charlie Van Wagner.
5. Walter J. Meyer, Concept of Mathematical Modelling, McGraw-Hill.

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Tiruchirappalli - 620002
Second Year - Semester - IV

Course Title	**ALLIED 5: INTERNET AND WEB DESIGNING**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA4AOT16**
Course type	**Theory& Practical**
Credits	**4**
Marks	**100**

General Objective:

To enable the students to understand the basic concepts of internet and hypertext markup language.

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand the concept of internet and its technology and browsers.
CO – 2	Understand about HTML and its comment line.
CO – 3	Understand the design of a body section and ordered and unordered list
CO –4	Create HTML Table with specification
CO – 5	Understand styles and its classification
CO – 6	Understand frames and forms.

UNIT I: **12 Hrs**

INTRODUCTION TO THE INTERNET

Computers in Business – Networking – Internet – Electronic Mail – Resource Sharing – Gopher – World Wide Web – Usenet – Telnet – Bulletin Board Service – Wide Area Information Service.

INTERNET TECHNOLOGIES:

Modem – Internet Addressing - Physical Connections – Telephone Lines.

INTERNET BROWSERS:

Internet Explorer – Netscape Navigator.

Extra Reading/ Keywords*: Google Chrome, Yahoo*

UNIT II: **12 Hrs**

INTRODUCTION TO HTML:

Designing a Home Page– History of Html – Html Generations – Html Documents - Anchor Tag – Hyperlinks.

HEAD AND BODY SECTION:

Header Section – Title – Prologue – Links – Colorful Web Page – Comment Lines.

Extra Reading/ Keywords*:web pages*

UNIT III: **12 Hrs**

DESIGNING THE BODY SECTION:

Heading , Printing – Aligning the Headings – Horizontal Rule – Paragraph – Tab Settings – Images and Pictures – Embedding PNG Format Images.

ORDERED AND UNORDERED LISTS:

Lists – Unordered Lists - Heading in a List – Ordered Lists – Nested Lists.

Extra Reading/ Keywords*: JPEG format, GIF format, Definition list*

UNIT IV: **12 Hrs**

TABLE HANDLING:

Tables– Table Creation in Html – Width of the Table and Cells – Cell Spanning Multiple Rows/Columns – Coloring Cells – Column Specification.

DHTML AND STYLE SHEETS:

Defining Styles – Elements of Styles – Linking a Style Sheet to an Html Document – Inline Styles – External Style Sheets – Internal Style Sheets – Multiple Styles

Extra Reading/ Keywords*: creating program with different styles*

UNIT V: **12 Hrs**

Frameset Definition – Frame Definition - Nested Framesets.

FORMS:

Action Attribute – Method Attribute – Ectypes Attribute – Dropdown List – Sample Forms.

Extra Reading/ Keywords*: creating forms with picture*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes (CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall the concept of internet and its technology and browsers.	**PSO –5**	**R,U**
CO - 2	Discuss and describe HTML and its comment line	**PSO -4**	**R,U**
CO - 3	Recognize the design of a body section and ordered and unordered list.	**PSO -2**	**U,Ap**
CO - 4	Formulate HTML Table with specification.	**PSO -3**	**Ap**
CO - 5	Record styles and its classification.	**PSO -1**	**Ap**
CO - 6	Relate frames and forms.		**An**
CO - 7	Languages needed for further computer courses- Employability	**PSO -4**	**Ap**

TEXT BOOK:

1. C. Xavier, "World Wide Web Design With Html", Tata McGraw Hill Publishing Company Ltd , 2000.

REFERENCE BOOKS:

1. Wendy Willard , "Web Design – A Beginners Guide" , Tata McGraw Hill, 2001.
2. Thomas A. Powell , "The Complete Reference Web Design", Tata McGraw Hill Publishing Company Ltd , 2000.
3. John Macoy, " Mastering Web Design", Bpb Publications, 2002.
4. Jennifer NiederestO'reilly , "Web Design In A Nutshell ",First Edition – Shroff Publishers And Distributors Pvt,Ltd, 2000
5. Andy Holyer , "Html In Easy Steps", Tata McGraw Hill , 1998.

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Second Year - Semester - IV

Course Title	**ALLIED 6: PROGRAMMING IN C**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA4AOT19**
Course type	**Theory & Practical**
Credits	**3**
Marks	**100**

General Objective:

To introduce the concepts of C language which will enable them to write programmes for numerical methods

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand basic concepts of C language.
CO – 2	Understand decision making and control statements
CO – 3	Understand Arrays and its types.
CO – 4	Understand user defined function and Recursion
CO – 5	Understand file management and I/O operations on file

UNIT - I:INTRODUCTION **12 Hrs**

Constants, variables, data types, symbolic constants - operators and expressions - evaluation of expressions - reading and writing a character - formatted input and output - handling of character strings - operations on strings - string handling functions.

Extra Reading/ Keywords*:Basic structures of C*

UNIT - II: DECISION MAKING AND CONTROL STATEMENTS **12 Hrs**

Decision making and branching - Using IF, IF-ELSE, Nesting of IF-ELSE statements - ELSE-IF ladder - Switch statement - the conditional operator - GOTO statement - Decision making and looping - the WHILE, DO, FOR statements.

Extra Reading/ Keywords*:Concise test expressions*

UNIT - III: ARRAYS **12 Hrs**

Arrays - one dimensional, two dimensional, multi dimensional arrays

Extra Reading/ Keywords*:Character arrays, strings*

UNIT - IV: USER DEFINED FUNCTIONS **12 Hrs**

User defined functions - the form of C functions - Return values and their types - calling a function - category of functions - no arguments and no return values - Arguments but no return values - Arguments with return values - Nesting of functions - Recursion - Function and arrays - the scope and life time of variables in functions.

Extra Reading/ Keywords*: Structures, Unions*

UNIT - V: FILE MANAGEMENT **12 Hrs**

File management - Defining and opening a file - Closing a file - I/O operations on files

Extra Reading/ Keywords*:Pointers , Array of Pointers*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes (CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall the concepts of C language.	**PSO - 5**	**R,U**
CO - 2	Recognize decision making and control statements.	**PSO -3**	**U**
CO - 3	State Arrays and its types.	**PSO -2**	**U**
CO - 4	List user defined function and Recursion.	**PSO -1**	**U**
CO - 5	Describe file management and I/O operations on file.	**PSO -4**	**U**
CO - 6	Languages needed for further computer courses- Employability	**PSO -4**	**U**

TEXT BOOK

E. Balagurusamy. PROGRAMMING IN ANSI C Fifth Edition Mcgraw Hill Publishing company ,New Delhi

UNIT - I: Chapters 2,3,4 and 8

UNIT - II: Chapters 5 and 6

UNIT - III: Chapters 7

UNIT - IV: Chapter 9

UNIT - V: Chapter 12

REFERENCE BOOKS:

C - V.Rajaraman ,PROGRAMMING IN C - Schaum's Series

Annexure:

1. Solution of Quadratic Equation
2. Sum of Natural numbers , Squares of natural numbers , even and odd numbers.
3. Finding the sum of odd numbers and even numbers from the given list of numbers.
4. Finding the biggest and smallest element in an array.
5. Arranging the numbers in ascending and descending order
6. Arranging names in alphabetical order.
7. Addition , subtraction and multiplication of matrices.
8. Payroll Processing
9. Finding factorial of a given number and nPr and nCr.
10. Students result processing using files.

(For Candidates admitted from June 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B.A. /B.Sc. / B.Com. / BBA/ B.C.A. DEGREE COURSE
LIFE ORIENTED EDUCATION
ETHICS – II: EMPOWERMENT OF WOMEN

HRS / WK : 1 **CODE: U15VE4LVE02**
CREDIT : 1 **MARKS : 100**

OBJECTIVES:

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

UNIT – I: GENDER ISSUES

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

UNIT – II: SOCIAL ISSUES RELATED TO WOMEN

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

UNIT – III: WOMEN AND MEDIA

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

UNIT – IV: WAYS OF EMPOWERING WOMEN

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

UNIT – V: CYBER CRIME AGAINST WOMEN

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

REFERENCES:

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

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

HRS / WK :1 **CODE: U15VE4LVBO2**
CREDIT : 1 **MARKS : 100**

OBJECTIVE:

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

UNIT – I: PURPOSE OF LIFE

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

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

UNIT – II: JUDGES AND KINGS

- 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)

UNIT – III: MINOR PROPHETS

Brief Life History and teachings of

- Amos
- Jonah
- Micah
- Nahum
- Habakkuk

UNIT – IV: MAJOR PROPHETS

Brief Life History and teachings of

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

UNIT – V: 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)

REFERENCES:

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

(For Candidates admitted from June 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
B.A./ B.Sc/ B.Com/ BBA/ B.C.A - DEGREE COURSES
LIFE ORIENTED EDUCATION
CATECHISM – II: CHURCH AND SACRAMENTS

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

CREDIT : 1 **MARKS : 100**

OBJECTIVES:

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

UNIT – I: MISSION OF THE CHURCH

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

UNIT – II: PARTICIPATORY CHURCH

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

UNIT – III: THE FUNCTIONARY CHURCH AND I

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

UNIT – IV: SACRAMENTS

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

UNIT – V: MARY AND SAINTS

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

REFERENCES:

1. "Vatican II Revised" Archbishop Angelo Fernandes Published by X.Diax de Rio S.J. Gujarat Sahitya Prakash, P.O.Box. 70, Gujarat, 388001, India.
2. "The Sacraments The Word of God at the Mercy of the Body" Claretian Publications, Malleswaram, Bangalore 560055.
3. Documents of Vatican II – St. Paul's Publications, Bombay 1966.

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Tiruchirappalli - 620002
Second Year - Semester - IV

Course Title	**ALLIED 5: ALGEBRA AND INTEGRAL CALCULUS (For Chemistry students)**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA4AOT17**
Course type	**Theory**
Credits	**4**
Marks	**100**

General Objective:

To make the students understand matrices, some methods of solving equations, the methods of integration and reduction formulae

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand about matrices and its operations
CO – 2	Evaluate rank of the matrices and consistency in system of equations applying rank
CO – 3	Understand groups with its elementary properties and classifications
CO – 4	Evaluate integration of irrational functions
CO – 5	Evaluate special type of integrals using reduction formula and knowledge About properties of definite integrals

UNIT I : MATRICES **12 Hrs**

Types of matrices, operations between matrices, matrix inversion method of solving equations.

Extra Reading/ Keywords*: Linear transformation, trace of a matrix*

UNIT II : RANK OF A MATRIX **12 Hrs**

Rank of a matrix, consistency in system of equations and solution using rank. (only statement of conditions and simple problems)

Extra Reading/ Keywords*: determinant, eigen value and eigen vectors*

UNIT III : INTRODUCTION TO GROUP THEORY **12 Hrs**

Definition and examples of group - Elementary Properties of a group – subgroups (Definition , Statements of theorem(without proof) and simple problems)– Cyclic groups (Definition and simple problems only)

Extra Reading/ Keywords*: rings, modules*

UNIT IV: INTEGRATION **12 Hrs**

Introduction - Integration of irrational functions - Methods of integration of the following types only:

$\int \frac{dx}{\sqrt{ax^2+bx+c}}$, $\int \frac{(px+q)}{\sqrt{ax^2+bx+c}}dx$, $\int \sqrt{ax^2+bx+c}dx$, $\int (px+q)\sqrt{ax^2+bx+c}dx$

integration by parts, Bernoulli's formula.

Extra Reading/ Keywords*: symbolic integration , integration by substitution*

UNIT V: REDUCTION FORMULAE **12 Hrs**

Formulae to evaluate $\int_0^{\frac{\pi}{2}} \sin^n x dx$, $\int_0^{\frac{\pi}{2}} \cos^n x dx$, $\int_0^{\frac{\pi}{2}} \sin^m x \cos^n x dx$. Properties of definite integrals

Extra Reading/ Keywords*: differentiation integration formulas , reduction formula for tan*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes (CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall matrices and its operations	**PSO –4**	**R,U**
CO - 2	Compute rank of the matrices and solve the system of equations	**PSO -2**	**E**
CO - 3	Recognize groups with its elementary properties and classifications	**PSO -3**	**R,U**
CO - 4	Evaluate integration of irrational functions	**PSO -1**	**E**
CO - 5	Examine reduction formula and the properties of definite integrals	**PSO -5**	**Ap,E**

CO - 6	Make the learners understand arithmetic facts related to numbers , ratios, percentages, etc .and to train them in problem solving techniques- Skill Development	**PSO - 1**	**Ap,E**

TEXT BOOKS:

For UNITS I & II

T.K. ManicavachagomPillay, T.Natarajan & K S Ganapathy (2008), "ALGEBRA, Volume II", Viswanathan Publishers, Chennai

UNIT I Chapter 2:Sections 1-8 &10

UNIT II Chapter 2:Sections 11 &16

For UNIT III

S. Arumugam and A. Thangapandi Isaac "TREATMENT AS IN MODERN ALGEBRA "(August 2003) ,Scitech Publications (India) Pvt Ltd Chennai

UNIT III Chapter 3 : Sections 3.1 , 3.2 , 3.5 and 3.6 (Definition and simple problems only)

For UNITS IV AND V

S. Narayanan and T. K. Manicavachagom Pillay, (2009) Calculus – Volume II by S. Viswanathan Printers & Publishers Pvt. Ltd.

UNIT IV Chapter 1: Section 8 Cases (i)-(iii), Section12, 15.1

UNIT V Chapter 1: Sections 8 13.3-13.5, 11

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Second Year - Semester - IV

Course Title	**ALLIED 5: DECISION MAKING TECHNIQUES**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA4AOT18**
Course type	**Theory**
Credits	**4**
Marks	**100**

General Objective:

To enable the students to convert any real life situation into a mathematical model and solve them using an appropriate algorithm.

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand L.P.P and finding solution by Graphical and Simplex Method.
CO – 2	Understand Game Theory and finding solution by Graphical method
CO – 3	Understand sequencing problem and obtaining the sequence of processing n jobs through two machine and k machines
CO – 4	Understand inventory control theory and finding EOQ
CO – 5	Evaluate PERT and CPM.

UNIT I : LINEAR PROGRAMMING PROBLEM **12 Hrs**

Introduction to Linear Programming Problem – Mathematical formulation – Graphical Solution Method. Definitions of objective functions,constraints,non negative restrictions, solution,feasible solution and optimal solution

Extra Reading/ Keywords*:Revised simplex method , Dual simplex method.*

UNIT II : GAME THEORY **12 Hrs**

Introduction to Game Theory – Two person zero sum game – The maximin– minimax principle – Games without saddle – Solution of 2 x 2 rectangular games – Graphical method.

Extra Reading/ Keywords*:Game against passivity, Rectangular Games*

UNIT III: TRANSPORTATION PROBLEM **12 Hrs**

Transportation Problem –Definition – Mathematical formulation-Initial basic feasible solution – North –West Corner rule-Row Minima Method-Column Minima Method-Matrix Minima Method- Vogel's Approximation Method – Unbalanced Transportation Problem-Maximization type.

Extra Reading/ Keywords *:Stepping stone solution method,Dual of the Assignment problem*

Unit IV: Inventory Control **12 Hrs**

Inventory Control – Types of inventory – Economic order quantity – Deterministic inventory problem (with and without shortages(instantaneous replenishment only))– EOQ problem with price breaks.

Extra Reading/ Keywords*:*Multi-item Deterministic problems

UNIT V: NETWORK SCHEDULING **12 Hrs**

Network scheduling PERT – CPM – time calculation in Networks – Critical Path Method (CPM) – PERT calculation. (Expected value and variance of μ_i only)

Note: Only Numerical problems (Derivations are excluded)

Extra Reading/ Keywords*:Time cost Optimization Algorithm,Resource allocation and scheduling*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes(CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall L.P.P and Solving LPP by Graphical and Simplex Method	**PSO - 3**	**U,E**
CO - 2	Solve game theory by graphical method	**PSO -2**	**E**

CO - 3	Recognize and solve sequencing problem	**PSO -4**	**E**
CO - 4	Discuss inventory control theory and compute EOQ.	**PSO -1**	**U,E**
CO - 5	Evaluate PERT and CPM	**PSO -5**	**E**
CO - 6	Enable the students to convert any real life situation into a mathematical model and solve them using an appropriate algorithm- Skill Development	**PSO – 1,PSO -2**	**U,E**

Text Book:

1.KantiSwarup, Gupta and ManMohan,"OPERATION RESEARCH"(2009), Sultan Chand and Sons, New Delhi.

Unit I : Chapter 2: 2.1 – 2.4,Chapter 3:3.1-3.4

Unit II : Chapter17: 17.1 to17.6

Unit III: Chapter10: 10.1, 10.9, 10.15, 10.16

Unit IV:Chapter 19: 19.1-19.6, 19.10 (case1only),19.11(case 1 only)

Unit V:Chapter 25: 25.1 – 25.4 ,25.6

REFERENCE BOOKS:

1. Problems in Operations Research by P.K.Gupta and D.S.Hira

2.Operations Research by Hamdy, Taha ,Prema Publishers,1995,Bangalore

(For candidates admitted from 2015 onwards)
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Tiruchirappalli - 620002
Second Year - Semester - IV

Course Title	**ALLIED 6 : ANALYTICAL GEOMETRY OF THREE DIMENSIONS, VECTOR CALCULUS AND DIFFERENTIAL EQUATIONS (For Chemistry students)**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA4AOT20**
Course type	**Theory**
Credits	**3**
Marks	**100**

General Objective:

To make the students understand the concepts of three dimensional geometry, linear ordinary differential equations and vector differentiation and integration.

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand plane and its standard forms of equations.
CO – 2	Understand coplanar lines, skewlines and evaluating shortest distance between two lines
CO – 3	Evaluate differential equation of using variable separable method.
CO – 4	Apply vector differentiation in physics
CO – 5	Evaluate line, surface integral and volume integral

UNIT I: PLANES **12 Hrs**

The Plane – the general equation of the plane – Standard forms of equations of planes

Extra Reading/ Keywords *: planes bisecting the angles between planes*

UNIT II: COPLANAR LINES **12 Hrs**

The condition that two different straight lines should be coplanar – The shortest distance between two given lines – The equation of two skew lines in a simplified form.

Extra Reading/ Keywords*: angle between the planes , symmetrical form of equation of line*

UNIT III:DIFFERENTIAL EQUATIONS **12 Hrs**

Equations of first order and first degree-Variable separable method - Homogeneous and non-homogeneous equations-Linear differential equation of second order with constant coefficients - Particular integrals for e^{ax}, sin ax &cos ax.

Extra Reading/ Keywords*: non linear differential equation , separable equations, IVP*

UNIT IV: VECTOR DIFFERENTIATION **12 Hrs**

Velocity – acceleration – scalar and vector fields – Gradient, Divergence and curl – Applications.

Extra Reading/ Keywords *: Partial differentiation*

UNIT V: VECTOR INTEGRATION **12 Hrs**

Line integral – Surface integral – Volume integral.

Extra Reading/ Keywords*: Stokes theorem, Greens theorem*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes(CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall plane and its standard forms of equations.	**PSO - 4**	**R,U**
CO - 2	Recognize coplanar lines, skewlines and evaluating shortest distance between two lines.	**PSO -3**	**U,E**
CO - 3	Evaluate differential equation of using variable separable method.	**PSO -2**	**E**
CO - 4	Apply vector differentiation in physics.	**PSO -1**	**Ap,E**
CO - 5	Compute line, surface integral and volume integral	**PSO -5**	**E**
CO - 6	Make the students understand the concepts of three dimensional geometry , linear ordinary differential equations and vector differentiation and integration- Skill development	**PSO - 2**	**E**

TEXT BOOKS

For UNITS I & II:

Treatment and content as in

T.K. ManicavachagomPillay& T Natarajan (2010), "A Text book of Analytical Geometry ,Part II – Three Dimensions", Viswanathan Publishers ,Chennai.

Unit I :Chapter II :Sections 1-10,10.1&10.2

Unit II:Chapter III: Sections 7, 8,8.1&8.2

For UNIT III :Treatment and content as in

Narayanan and T.K. Manicavachagom Pillay(2004), CALCULUS Volume III –Viswanathan publishers.

Unit III:Chapter 1:Sections 2.1 – 2.3,Chapter 2:Sections 1 – 4,4(a) &4(b)(only simple problems)

For UNITS IV &V:Treatment and content as in

Dr.P.R.Vittal,Dr.V.Malini,(2009)VECTOR CALCULUS,FOURIER SERIES AND FOURIER TRANSFORMS

Unit IV:Chapter 1

Unit V:Chapter 2(only vector integrals – excluding integral theorems)

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College with potential for Excellence
Tiruchirappalli - 620002
Second Year - Semester - IV

Course Title	**ALLIED 6: NUMERICAL METHODS AND TESTING HYPOTHESIS**
Total Hours	**60**
Hours / Week	**4**
Code	**U15MA4AOT21**
Course type	**Theory**
Credits	**3**
Marks	**100**

General Objectives:

To introduce numerical methods to solve equations, to interpolate using polynomials, to differentiate and integrate functions using numerical methods.To facilitate students to apply statistical measures

Course Objectives(CO):
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand various methods for solving algebraic and transcendental equations
CO – 2	Apply finite difference to evaluate polynomial using interpolation for equal and unequal intervals.
CO – 3	Analyse numerical solution to ordinary differential equations using direct method. Evaluate finite integrals using Trapezoidal and Simpson's rule.
CO – 4	Understand Large sample and evaluate testing the hypothesis. Understand Small sample and evaluate test of hypothesis using chi-square distribution.
CO – 5	Evaluate test of hypothesis using t and F distribution.

UNIT I: ALGEBRAIC AND TRANSCENDENTAL EQUATIONS 12 Hrs

Introduction to Numerical analysis.(Excluding Error concepts.) Solving algebraic and transcendental equations – Bisection Method- Method of False position,Newton-Raphson method.

Extra Reading/ Keywords*:Rolle'stheorem,,Taylor's series for a function of one variable*

UNIT II: INTERPOLATION: 12 Hrs

Newton Gregory forward and backward interpolation formulae-Lagrange's Interpolation formula.

Extra Reading/ Keywords*:Stirling'sformula,Bessel's formula.*

UNIT : III NUMERICAL DIFFERENTIATION AND NUMERICAL INTEGRATION 12 Hrs

Introduction - Numerical differentiation - Maximum and minimum values of a tabulated function - Numerical integration – Trapezoidal rule - Simpson's 1/3-rule.

Extra Reading/ Keywords*:Simpson,s 3/8 rule ,Boole's and Weddle's rule.*

UNIT IV:LARGE SAMPLES 12 Hrs

Large sample tests-Introduction – sampling of attributes-Test for single proportion Test of significance for difference of proportions. Test of significance for a single mean – Test of Significance for difference of means – Test of significance of difference of standard deviations. Chi _ square Test – chi _ square test for independence of attributes - 2×2 contingency table.

Extra Reading/Key words:*Test of hypothesis for population proportion,systematic samples, purposive samples, cluster random samples*

UNIT V:SMALL SAMPLES 12 Hrs

Small sample test – test of significance based on t and F distributions- Application of t distribution – Test for single mean – test of significance for difference of means- test of significance of an observed Sample - correlation coefficient – F test for equality of Population variances. Note : Derivations not included numerical problems only

Extra Reading/Key words*: Pearson's correlation coefficient, Goodness of fit in regression analysis.*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes (CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Explain various methods for solving algebraic and transcendental equations.	**PSO –1**	**U,E**
CO - 2	Formulate polynomial using interpolation for equal and unequal intervals.	**PSO -2**	**Ap, E**
CO - 3	Compute numerical solution to ordinary differential	**PSO -5**	**E**

	equations using direct method. Evaluate finite integrals using Trapezoidal and Simpson's rule.		
CO - 4	Explain Large sample and evaluate testing the hypothesis. Discuss Small sample and evaluate test of hypothesis using chi-square distribution	**PSO -3**	**E**
CO - 5	Evaluate and apply test of hypothesis using t and F distribution	**PSO -4**	**U,E**
CO - 6	Make the students know about different methods of solving numerical equations and differential equations, methods of interpolation and numerical differentiation and integration. Understand Large sample and evaluate testing the hypothesis-Skill Development	**PSO -2**	**Ap, E**

TEXT BOOK:

1 .S.S.SASTRY ,INTRODUCTORY METHODS OF NUMERICAL ANALYSIS"(Third Edition, Twenty third printing, June, 1998)

Unit I – Chapter II : Sections 2.1, 2.2, 2.4, 2.5 (2.5.1 omitted)

Unit II – Chapter III : Sections 3.6, 3.9, 3.9.1

Unit III – Sections 5.1, 5.2, (5.2.1 omitted)5.3, 5.4.1, 5.4.2

For Units IV, V - Treatment as in Fundamentals of statistics by S.C. Gupta, Sixth revised and Enlarged edition, Himalaya Publishing House, New Delhi (2010).

Unit IV- Chapter 17-17.1 to 17.4 & Chapter 18- 18.6 to 18.9.

Unit V- Chapter 19- 19.4 to 19.6, 19.8, 19.10.4,19.11.

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Tiruchirappalli - 620002
Third Year - Semester - V

Course Title	**MAJOR CORE- 7: MODERN ALGEBRA II**
Total Hours	**75**
Hours / Week	**5**
Code	**U15MA5MCT07**
Course type	**Theory**
Credits	**4**
Marks	**100**

General Objective:

To study vector spaces as an abstract algebraic system and establish some of the properties of such systems.

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand vector space and its properties.
CO – 2	Understand about basis, dimension, rank, matrix linear transformation
CO – 3	Understand of inner product space and its properties.
CO – 4	Understand the theory of matrices.
CO – 5	Understand eigen values and eigen vector and its application

UNIT I: VECTOR SPACES **15 Hrs**

Definition and examples - Subspaces - Linear transformation - Span of a set - Linear Independence .

Extra Reading/ Keywords: Set,Vectors

UNIT II: VECTOR SPACES (CONTN) **15 Hrs**

Basis and dimension – Rank and nullity- Matrix of a Linear Transformation.

Extra Reading/ Keywords: subspace, Linearly Independent

UNIT III: INNER PRODUCT SPACES **15 Hrs**

Definition and examples of inner product spaces- Orthogonality- Orthogonal complement.

Extra Reading/ Keywords: Vector Space, Dot Product

UNIT IV: THEORY OF MATRICES **15 Hrs**

Types of Matrices- Inverse of a matrix- Elementary Transformation- Rank of a Matrix- Consistency of system of non-homogenous linear equation- Simultaneous Linear Equations.

Extra Reading/ Keywords: Echelon form, singular matrix

UNIT V: THEORY OF MATRICES(CONTN) **15 Hrs**

Characteristic Equation - Cayley Hamilton Theorem and its application -Eigen Values and Eigen Vectors .

Extra Reading/ Keywords: Matrices, Square matrix

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes (CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO – 1	Recall vector space and its properties	**PSO - 1**	**R,U**
CO – 2	Recognize basis, dimension, rank, matrix linear transformation	**PSO -2**	**R,U**
CO – 3	Describe inner product space and its properties	**PSO -5**	**R,U**
CO – 4	Recall matrix theory	**PSO -3**	**R,U**
CO – 5	Compute eigen values and eigen vector and its application	**PSO -4**	**U,E**
CO – 6	Study vector spaces as an abstract algebraic system and establish some of the properties of such systems- Skill Development	**PSO -2**	**R,U**

TEXT BOOK

S. Arumugam , A. Thangapandi Isaac "TREATMENT AS IN MODERN ALGEBRA" (August 2003) , Scitech Publications (India) pvt ltd Chennai

UNIT I – Chapter 5 (section 5.1 to 5.5)

UNIT II- Chapter 5 (section 5.6 to 5.8)

UNIT III - Chapter 6

UNIT IV - Chapter 7 (section 7.2 to 7.6)

UNIT V - Chapter 7 (section 7.7 & 7.8)

REFERENCE BOOKS

1. Shanti Narayanan, A TEXT BOOK OF MODERN ABSTRACTALGEBRA. Margam Publishers
2. Topics in Algebra,SecondEdition,I.N.Herstein,Wiley Student edition,2009.
3. K. Sivasubramanian. ,MODERN ALGEBRA ,Allied publishers, New Delhi
4. R. Balakrishnan & N. RamabadranA TEXT BOOK OF MODERN ALGEBRA.

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Third Year - Semester - V

Course Title	**MAJOR CORE- 8: OPTIMIZATION TECHNIQUES**
Total Hours	**75**
Hours / Week	**5**
Code	**U15MA5MCT08**
Course type	**Theory**
Credits	**4**
Marks	**100**

General Objective:

To enable the students to convert any real life situation into a mathematical model and solve them using an appropriate algorithm.

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand L.P.P and finding solution by Graphical and Simplex Method.
CO – 2	Evaluate of solution of L.P.P by Big M method and Two phase Method
CO – 3	Understand sequencing problem and obtaining the sequence of processing n jobs through two machine and k machines
CO – 4	Understand inventory control theory and finding EOQ
CO – 5	Evaluate PERT and CPM.

UNIT I : LINEAR PROGRAMMING PROBLEM AND SIMPLEX ALGORITHM. **15 Hrs**

Introduction to OR - Mathematical formulation of the problem - Graphical solution methods - General Linear Programming Problem - Canonical and standard forms of L.P.P. The Simplex Method - Simplex Algorithm.

Extra Reading/ Keywords*:Revised simplex method , Dual simplex method.*

UNIT II : ARTIFICIAL VARIABLES AND SEQUENCING PROBLEM 15 Hrs

Artificial variables - Charnes Method of penalties (Big - M method) - Two-Phase Simplex method – Sequencing problem - processing n jobs through two machines - processing n jobs through k machines .

Extra Reading/ Keywords*:Fractional cut method ,Processing 2 jobs through k machines*

UNIT III : TRANSPORTATION PROBLEM AND ASSIGNMENT PROBLEM 15 Hrs

Transportation Problem - Initial basic feasible solution - North west corner rule - Row minima method - Column minima method - Matrix minima Method - Vogel's approximation method - Optimal solution - u - v method - Degeneracy - Unbalanced Transportation Problem- Assignment problem-Hungarian method-unbalanced assignment problem, Travelling salesman problem.

Extra Reading/ Keywords *:Stepping stone solution method,Dual of the Assignment problem*

UNIT IV: INVENTORY CONTROL 15 Hrs

Types of inventory - Economic order quantity - Deterministic inventory problems with shortages - Deterministic inventory problems without shortages - Problems of EOQ with price breaks.

Extra Reading/ Keywords*:*Multi-item Deterministic problems

UNIT V :NETWORK SCHEDULING 15 Hrs

Introduction to network problems-Network scheduling by CPM and PERT.

Extra Reading/ Keywords*:Time cost Optimization Algorithm,Resource allocation and scheduling*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes(CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall L.P.P and Solving LPP by Graphical and Simplex Method	**PSO - 3**	**U,E**
CO - 2	Solve L.P.P by Big M method and Two phase Method	**PSO -2**	**E**
CO - 3	Recognize and solve sequencing problem	**PSO -4**	**E**
CO - 4	Discuss inventory control theory and compute EOQ.	**PSO -1**	**U,E**

CO - 5	Evaluate PERT and CPM	**PSO -5**	**E**
CO - 6	Enable the students to convert any real life situation into a mathematical model and solve them using an appropriate algorithm- Skill Development	**PSO – 1,PSO -2**	**U,E**

TEXT BOOK :

Kantiswarup,P.K.Gupta& Man Mohan , (2009) OPERATIONS RESEARCH ,
UNIT - I - Chapters 2 ,Chapter 3 : 3.1 -3.5 ,Chapter 4: 4.1- 4.3
UNIT II- Chpter 4: 4.4 ;Chapter 12:12:1-12:5
UNIT III - Chapter 10 : 10.1 – 10.3 , 10.5, 10.8 -10.13,10.15, Chapter 11-11.1 to 11.4,11.7
UNIT IV - Chapter 19: 19.1 - 19:12
UNIT V - Chapter 25

REFERENCE BOOKS:

1. H. Taha(IV Edition) OPERATIONS RESEARCH ,Prentice Hall of India
2. P. K. Gupta, D. S. Hira, (2001) PROBLEMS IN OPERATIONS RESEARCH, S.Chand ,New Delhi

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Third Year - Semester - V

Course Title	**MAJOR CORE - 9: GRAPH THEORY**
Total Hours	**75**
Hours / Week	**5**
Code	**U15MA5MCT09**
Course type	**Theory**
Credits	**4**
Marks	**100**

General Objective:

To understand the concepts of graph theory as an application of mathematics in information technology related fields.

Course Objectives (CO) :
The learner will be able to

CO No.	**Course Objectives**
CO - 1	Understand the concept of graph and its operations.
CO - 2	Understand the characteristics of graph
CO - 3	Understand about special graphs
CO – 4	Understand directed graphs and its properties
CO – 5	Apply graph theory to travelling salesman problem

UNIT I : INTRODUCTION AND OPERATIONS ON GRAPHS. 15 Hrs

Introduction- graphs and subgraphs-isomorphism- Independent sets and coverings - Matrices - Operations on graphs.

Extra Reading/ Keywords: Ramsey numbers, Subdivision of graphs.

UNIT II : CHARACTERISTICS OF GRAPH **15 Hrs**

Degree sequence-graphic sequences-walks, trails and paths-connectedness & components-blocks-connectivity.

Extra Reading/ Keywords:Clique number, Matching.

UNIT III :SPECIAL GRAPHS **15 Hrs**

Eulerian, Hamiltonian graphs and trees.

Extra Reading/ Keywords: Unicyclic and bicyclic trees

UNIT IV : DIRECTED GRAPHS **15 Hrs**

Introduction – Definitions and Basic Concepts –Paths and Connections –Digraphs and Matrices –Tournaments .

Extra Reading/ Keywords: Colouring of Digraphs

UNIT V : APPLICATIONS OF GRAPH THEORY **15 Hrs**

Introduction –Connector Problem –Shortest Path Problem –Transformation and kinematic Graph –Designing One Way Traffic System – Applications - The travelling salesman problem – Job sequencing problem.

Extra Reading/ Keywords: Mapping problem

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes(CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall and relate graph and its operations	**PSO - 4**	**R, U**
CO - 2	Recognize the characteristics of graph	**PSO -5**	**U**
CO - 3	List and relate special graphs**.**	**PSO -2**	**U**
CO - 4	Describe directed graphs and its properties.	**PSO -3**	**U**
CO - 5	Apply graph theory to travelling salesman problem**.**	**PSO -1**	**U,Ap**
CO - 6	Understand the concepts of graph theory as an application of mathematics in information technology related fields-Skill Development	**PSO-2**	**U, Ap**

TEXT BOOK

Dr.S.Arumugam and Dr.S.RamachandranTREATMENT AS IN "INVITATION TO GRAPH THEORY" by 1994 edition.

UNIT I : Chapters 1 and 2(omit section 2.5 & 2.7)
UNIT II : Chapters 3 and 4
UNIT III : Chapter 5 and 6
UNIT IV : Chapter 10
UNIT V : Chapter 11

REFERENCE BOOKS:

1. Harary ,GRAPH THEORY, Narosa Publishing House ,New Delhi,
2. NarsinghDeo, GRAPH THEORY WITH APPLICATIONS TO ENGINEEERING AND COMPUTER SCIENCE Prentice Hall of India, New Delhi.

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Third Year - Semester - V

Course Title	**MAJOR CORE – 10 : REAL ANALYSIS - II**
Total Hours	**75**
Hours / Week	**5**
Code	**U15MA5MCT10**
Course type	**Theory**
Credits	**4**
Marks	**100**

General Objective:

To introduce the concepts of open sets, closed sets, connected and bounded sets in a metric space. To enable the students to know about completeness, compactness, derivatives and Riemann integration.

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Understand open set and closed set.
CO - 2	Understand the concepts of connected sets and bounded sets.
CO - 3	Understand the concepts of completeness, compactness and uniform continuity
CO – 4	Understand derivatives, Rolle's theorem and Taylor's theorem.
CO – 5	Understand Riemann integral, properties of Riemann integrals and improper integral.

UNIT I : OPEN , CLOSED SETS **15 Hrs**

Open sets - Closed sets – More about open sets

Extra Reading/ Keywords: *Properties of interior points and closure*.

UNIT II : CONNECTED AND BOUNDED SETS **15 Hrs**

Connected sets - Bounded and totally bounded sets

Extra Reading/ Keywords: *Equi continuous, Path connectedness, disconnected, von newmann bounded.*

UNIT III :COMPLETENESS , COMPACTNESS AND UNIFORM CONTINUITY 15 Hrs

Complete metric space , Compact metric spaces – Uniform Continuity .

Extra Reading/ Keywords: Lindeloff, continuity and connectedness, continuity and compactness, Monotonic functions.

UNIT IV : DERIVATIVES **15 Hrs**

Derivatives - Rolle's theorem - The law of the mean – Fundamental theorem of calculus- Taylor's Theorem.

Extra Reading/ Keywords: *Binomial theorem, L'Hospital rule, differentiation of vector-valued functions*

UNIT V : RIEMANN INTEGRAL **15 Hrs**

Definition of the Riemann Integral – Existence and Properties of the Riemann Integral – Improper integrals.

Extra Reading/ Keywords:*Riemann criterion, Riemann Stieljes integral.*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes (CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall open set and closed set.	**PSO - 4**	**R**
CO - 2	Describe connectedness and boundedness	**PSO -1**	**R,U**
CO - 3	Describe completeness, compactness and uniform continuity	**PSO -5**	**U**
CO - 4	Recognize derivatives, Rolle's theorem, Taylor's theorem.	**PSO -3**	**R,U**
CO - 5	Discuss Riemann integral and properties of Riemann integrals.	**PSO -2**	**U**
CO - 6	Introduce the concepts of open sets, closed sets , connected and bounded sets in a metric space. To enable the students to know about completeness, compactness , derivatives and Riemann integration.- Skill Development	**PSO -1,2**	**R,U**

TEXT BOOK:

Richard R.Goldberg(1963), 'METHODS OF REAL ANALYSIS', Oxford &IBH Publishing Co.pvt. ltd, New Delhi.

UNIT I : CHAPTER 5 (Sec.5.4 ,5.5) ,CHAPTER 6 (Sec 6.1)
UNIT II : CHAPTER 6 (Sec.6.2 & 6.3)
UNIT III : CHAPTER 6 (Sec.6.4, 6.5 & 6.8)
UNIT IV : CHAPTER 7(Sec 7.5 -7.8), CHAPTER 8(8.5)
UNIT V: CHAPTER 7(Sec 7.2 – 7.4 and 7.9)

REFERENCE BOOKS:

1. Dr. S. Arumugam and others REAL ANALYSIS ,New gamma publishing House,Palayamkottai
2. K. ChandrasekharaRao, K.S.Narayanan, 'REAL ANALYSIS' Volume I, S. Viswanathan(Printers & Publishers) Pvt. Ltd., 2008 Edition
3. M.K.Singal and Asha Rani Singal(2008) 'A FIRST COURSE IN REAL ANALYSIS' S.Chand& Co. New Delhi.
4. Shanthi Narayan 'A COURSE OF MATHEMATICAL ANALYSIS'"Margaum Publishers.
5. Tom Apostol, 'MATHEMATICAL ANALYSIS', Narosa Publishing House, New Delhi, 1985.

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Third Year - Semester - V

Course Title	**MAJOR ELECTIVE-2: MECHANICS**
Total Hours	**75**
Hours / Week	**5**
Code	**U15MA5MET02**
Course type	**Theory**
Credits	**5**
Marks	**100**

General Objective:

To enable the students to know about the concepts of types of forces, moments ,couples, Equilibrium of strings, projectiles, impulsive forces and collision elastic bodies

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Understand the concept of equilibrium of forces and related theorem.
CO - 2	Understandparallel forces ,couple, resultant of couple and a force
CO - 3	Understand equilibrium of strings and its application to centenary
CO – 4	Understand projectile and evaluation of its characteristics
CO – 5	Apply impulsive forces, & different types of impact

UNIT : I EQUILIBRIUM OF FORCES **15 Hrs**

Force – Types of Forces – Equilibrium – Forces acting at a point Parallelogram of forces – Triangle of forces Polygon of forces - Lami's theorem – Resolution of a force – Composition of forces – Resultant – Conditions of equilibrium.

Extra Reading/ Keywords*: Laws of friction , angle of friction , equilibrium of a body*

UNIT: II PARALLEL FORCES **15 Hrs**

Parallel Forces – Like and Unlike parallel forces – Resultants – Moment of a force about a point - Varignon's Theorem on Moments – Principle of Moments – Moment of a force about an axis.

Extra Reading/ Keywords*: Center of gravity of simple uniform bodies*

UNIT III : EQUILIBRIUM OF STRINGS **15 Hrs**

Equilibrium of strings – Common catenary – equations – tension at any point – geometrical properties – Parabolic catenary – Suspension Bridge.

Extra Reading/ Keywords*: Equilibrium of uniform homogeneous strings*

UNIT IV :PROJECTILE ON HORIZONTAL PLANE **15 Hrs**

Projectiles – Path of a projectile – Characteristics of the motion of a projectile – Greatest height - Time of flight - Horizontal range – Maximum horizontal range – Directions of projection – Velocity of the projectile – Simple problems.

Extra Reading/ Keywords*: projectile on inclined plane , two trajectories with given speed and range*

UNIT V: IMPULSIVE FORCES **15 Hrs**

Impulsive forces– Impact of two bodies – Motion of a shot and gun – Collision of elasticbodies – Fundamental laws of impact – Impact of a smooth sphere on a fixed plane – Direct impact – Oblique impact – Simple problems.

Extra Reading/ Keywords*: Dissipation of energy due to impact , Compression and restitution, Impact of a particle on a rough plane*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment andseminars

Course Outcomes (CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall equilibrium of forces and related theorem.	**PSO –5**	**R,U**
CO - 2	Recognize and list parallel forces ,couple, resultant of couple and a force	**PSO -2**	**R,U**
CO - 3	Discuss equilibrium of strings and its application to catenary	**PSO -1**	**U**
CO - 4	Describe projectile and evaluation of its characteristics	**PSO -3**	**U,E**

CO - 5	Illustrate impulsive forces, & different types of impact	**PSO -4**	**U,E**
CO - 6	Enable the students to know about the concepts of types of forces, moments ,couples, Equilibrium of strings, projectiles, impulsive forces and collision elastic bodies-Skill Development	**PSO-2,3**	**R,U**

TEXT BOOKS

TREATMENT AS IN

Dr. M.K. Venkataraman, STATICSAgasthiar Publications, Trichy (2013).

Unit: I - Chapters 1 & 2

Unit: II – Chapters 3 & 4

Unit: III – Chapter 11

Dr. M.K. Venkataraman.(2008), DYNAMICS,Agasthiar Publications, Trichy-2.

Unit: IV –Chapter VI(6.1-6.11)

Unit:V – Chapter VII – 7.1 to 7.5, Chapter VIII - 8.1 to 8.8

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Third Year - Semester - V

Course Title	**MAJOR ELECTIVE-2: ASTRONOMY**
Total Hours	**75**
Hours / Week	**5**
Code	**U15MA5MET06**
Course type	**Theory**
Credits	**5**
Marks	**100**

General Objectives:

To enable the students to know about the exciting world of astronomy and help them to study spherical trigonometry in the field of astronomy. To understand the movements of the celestial objects .

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Recall and Understand the concept of Sphere and Celestial sphere.
CO - 2	Understand stars and its properties.
CO - 3	Understand refraction and its laws.
CO – 4	Understand Kepler's law and its verification.
CO – 5	Understand celestial moon and its phase.

UNIT : I SPHERE **15 Hrs**

Relevant properties of sphere and formulae in spherical trigonometry (no proof, no problems) - Celestial sphere and diurnal motion -Celestial coordinates-sidereal time.
Extra Reading/ Keywords*: Motion of planets and birth of modern astronomy*

UNIT: II STARS **15 Hrs**

Morning and evening stars -circumpolar stars- diagram of the celestial sphere - zones of earth -perpetual day-dip ofhorizon-twilight.
Extra Reading/ Keywords*:Stellar Structure,Extragalactic Astronomy*

UNIT III : REFRACTION **15 Hrs**

Refraction - laws of refraction -tangent formula-Cassini's formula - horizontal refraction- geocentric parallax -horizontal parallax.
Extra Reading/ Keywords*:planetary ring and their formation, Roche limit*

UNIT IV : KEPLER'S LAWS **15 Hrs**

Kepler's laws of planetary motion- verification of 1st and 2nd laws in the case of earth - Anomalies -Kepler's equation - Seasons -causes -kinds of years.
Extra Reading/ Keywords*: newton's law of planetary motion*

UNIT V : MOON **15 Hrs**

Moon-sidereal and synodic months - elongation - phase of moon - eclipses-umbra and penumbra - lunar and solar eclipses - ecliptic limits - maximum and minimum number of eclipses near a node and in a year -Saros.
Extra Reading/ Keywords*:The Galilean moon of Jupiter*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment andseminars

Course Outcomes (CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall the concept of sphere and its formulae.	**PSO –5**	**R,U**
CO - 2	Recognize and list the types of stars.	**PSO -2**	**R,U**

CO - 3	Discuss refraction and laws of refractions.	**PSO -1**	**U**
CO - 4	Describe Kepler's laws and its verification	**PSO -3**	**U,E**
CO - 5	Illustrate moon and its phases.	**PSO -4**	**U,E**
CO - 6	Enable the students to know about the exciting world of astronomy and help them to study spherical trigonometry in the field of astronomy and understand the movements of the celestial objects .- Skill Development	**PSO-2,3**	**R,U**

TEXT BOOKS
TREATMENT AS IN

Kumaravel,S.andSusheelaKumaravel,***Astronomy*** ,8thEdition,SKV Publications,2004.

Unit 1: Sec: 39-79
Unit 2: Sec: 80-90,106-116
Unit3: Sec: 117-144
Unit 4: Sec:146-162,173-178
Unit 5: Sec:229-241,256-275

REFERENCE BOOKS:

1. G V Ramachandran, Text Book of Astronomy, Mission Press, Palayamkottai, 1965.

(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
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Nationally Accredited (3rd cycle) with 'A' Grade by NAAC
College with potential for Excellence
Tiruchirappalli - 620002
Third Year - Semester - V

Course Title	**NON MAJOR ELECTIVE – 1: QUICK MATHEMATICS**
Total Hours	**30**
Hours / Week	**2**
Code	**U15MA5NMT01**
Course type	**Theory**
Credits	**2**
Marks	**100**

General Objective:

To revise arithmetic facts related to numbers , ratios, percentages, etc and to train them in problem solving techniques**.**

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand number system, simplification using formula and rule and evaluation of LCM and HCF
CO – 2	Understand averages, percentage and data representation through diagram
CO – 3	Evaluate profit and loss ,ratio and proposition
CO – 4	Understand time and work concept and its application to cisterns and pipes.
CO – 5	Understand time and distance and applying to the problem of trains, boats and streams.

UNIT I:NUMBER SYSTEM **6 Hrs**

Number System – Simplification using formulae and rules – L.C.M and H.C.F of 2 or more numbers

Extra Reading/Key words*:* *History of numbers, Algebraic numbers*.

UNIT II:AVERAGE AND PERCENTAGE **6 Hrs**

Averages-Percentage

Extra Reading/Key words*:* *Histogram, Line chart*

UNIT III:PROFIT AND RATIO **6 Hrs**

Profit and Loss -Ratio and Proportion

Extra Reading/Key words*:* *Partnership, Discount*

UNIT IV:TIME AND WORK **6 Hrs**

Time and Work – Cisterns and Pipes

Extra Reading/Key words*:* *Clocks, Business*

UNIT V:TIME AND DISTANCE **6 Hrs**

Time and Distance –Trains-Boats and Streams

Extra Reading/Key words*: Races and Games of skill*

Note:Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars.

Course Outcomes (CO):

The learner will be able to

CO No.	**Course Outcomes**	**PSOs Addressed**	**Cognitive Level**
CO - 1	Demonstrate number system, simplification using formula and rule and evaluation of LCM and HCF	**PSO - 2**	**E**
CO - 2	Compute averages, percentage and data representation through diagram	**PSO 3**	**E**
CO - 3	Evaluate profit and loss ,ratio and proposition.	**PSO -1**	**E**
CO - 4	Recognize time and work concept and apply to cisterns and pipes.	**PSO -4**	**R,E**
CO - 5	Recall time and distance and apply trains, boats and streams.	**PSO -5**	**R,E**
CO - 6	Faster Computation for Competitive Exams-Employability.	**PSO -1**	**E**

TEXT BOOK:

Aggarwal R.S. (2012), OBJECTIVE ARITHMETIC For Competitve Examinations, S.Chand and Company Ltd., Ram Nagar, New Delhi.

Unit I: Chapters 1, 2 and 4
Unit II: Chapters 6 and 10
Unit III: Chapters 11 and 12
Unit IV: Chapters 15 and 16
Unit V: Chapters 17,18 and 19

REFERENCE BOOKS:

1. Competition Success Review for Bank Probationary Officer's Exam.
2. Competition Success Review for MBA Entrance Examinations.
3. 3.Any text book on Competitive Examinations

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Tiruchirappalli - 620002
Third Year - Semester - V

Course Title	**SKILL BASED ELECTIVE - IV: MATLAB APPLICATION**
Total Hours	**30**
Hours / Week	**2**
Code	**U15MA5SBT04**
Course type	**Theory**
Credits	**2**
Marks	**100**

General Objective:
To introduce the Mathematical software MATLAB for high-performance numerical computations and visualization.

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Understand about MATLAB
CO - 2	Understand matrix vector indexing and creating vector in MATLAB platform
CO - 3	Understand matrix and array operation.
CO – 4	Create inline and built in function
CO – 5	Plot 2D diagrams

UNIT – I **6 Hrs**

Introduction to MATLAB, Basics of MATLAB, MATLAB windows, online help, input-output, File types, Platform dependence
Extra Reading/ Keywords *Saving and executing*

UNIT – II **6 Hrs**

Matrix and Vectors, Indexing, Matrix Manipulation, Creating Vectors

Extra Reading/ Keywords: *Subscripting*

UNIT – III **6 Hrs**

Matrix and Array operations, Arithmetic operations, Relational operations, logical operations, elementary math functions, matrix functions, character strings.

Extra Reading/ Keywords*:Manipulation*

UNIT – IV **6 Hrs**

Creating Inline functions, using Inline functions, using built-in functions.

Extra Reading/ Keywords*: Saving data*

Unit – V **6 Hrs**

Plotting simple graphs, 2D plots using fplot, ezplot, ezpolar, 3D plots using ezplot3, ezcontour, ezcontourf, ezsurf, ezsurfc

Extra Reading/ Keywords*: Graphics*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes (CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall MATLAB	**PSO - 5**	**R**
CO - 2	Recognize and relate matrix vector indexing and creating vector in MATLAB platform.	**PSO -4**	**R,U**
CO - 3	Describe matrix and array operation.	**PSO -1**	**U**
CO - 4	Formulate inline and built in function.	**PSO -3**	**U**
CO - 5	Sketch 2D and 3D diagrams	**PSO -2**	**U**
CO - 6	Developing skills for high performance language for technical computing it also integrates computation, visualization and programming – Employability	**PSO-4**	**U**

TEXT BOOK:

Getting started with MATLAB 7 (2008) RudraPratap, Oxford University Press.

Unit I	:CHAPTER I (1.1, 1.2, 1.6)
Unit II	: CHAPTER II(3.1)
Unit III	: CHAPTER III(3.2) Unit
IV	: CHAPTER IV(3.3, 3.4)
Unit V	: CHAPTER V(3.6)

REFERENCE BOOKS:

1. Brian R.Hunt, Ronald L.Lipsman,Jonathan M. Rosenberg, A guide to MATLAB beginners and Experienced Users, Cambridge University Press edition, 2002.
Website: www.ann.jussieu.fr/free.htm
2. MATLAB–The language of technical computing, The MATH WORKS Inc., Version 5 1996 (http:\\www.mathworks.com)
3. L.F. Shampine, I.Gladwell, S. Thompson , Solving ODEs with MATLAB, Cambridge University press 2003.

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

HRS / WK : 1 **CODE: U15VE6LVE03**
CREDIT : 1 **MARKS : 100**

OBJECTIVES:

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

UNIT – I: PERSONAL COMPETENCE

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

UNIT – II: MARRIAGE AND FAMILY

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

UNIT – III: PARENTHOOD

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

UNIT – IV: PERSONALITY DEVELOPMENT

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

UNIT – V: CAREER CHOICE

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

REFERENCES:

1. Tony B and Barry Buzan(2003), The mind map book, BBC world wide limited, London.
2. Susan Nash(2005), Turning team performance inside out, Jai CO. publishing House, New Delhi.
3. Fr. Ignacimuthu (1999) "Values for Life", Vaigarai Pathipagam.
4. Grose. D.N. (2000), "A text book on Value Education", Dominant Publishers.

HOLY CROSS COLLEGE(AUTONOMOUS) TRICHIRAPALLI-2.
B.A/B.SC/B.COM/ B.C.A – DEGREE COURSES
LIFE ORIENTED EDUCATION
BIBLE STUDIES – III: ESSENCE OF CHRISTIAN LIVING

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

CREDIT : 1 **MARKS : 100**

OBJECTIVE:

- To prepare the students to practice Christian principles in family, church and society as young women

UNIT – I: ESSENTIALS OF CHRISTIAN FAITH

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

UNIT – II: MARRIAGE AND FAMILY LIFE

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

UNIT – III: CHRISTIAN HOME

- Parental Responsibilities and bringing up children – Abraham (Gen 22), Eli (I Sam 2: 24-36,3: 11- 18), Mary, Mother of Jesus (Luke 2: 51,52)
- Caring for the Aged (I Sam 2: 31,32)

UNIT – IV: CHRISTIAN ETHICS

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

UNIT – V: MISSIONARIES DOWN THE LANE

- William Carrie (Calcutta)
- Pandithar Rama Bai (Karnataka)
- Amy Carcheal (Dohnavur)
- Dr. Ida Scuddar (Vellore)
- Devasagayam (Nagercoil)
- St. John De Britto (Oriyur)
- Graham Staines & Family (Odisha)
- St. Mother Teresa (Calcutta)

REFERENCES:

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

(For Candidates admitted from June 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2
B.A./B.Sc/B.Com/BBA/B.C.A - DEGREE COURSES
LIFE ORIENTED EDUCATION
CATECHISM – III: LITURGY AND CHRISTIAN LIFE

HRS / WK : 1 **CODE:U15VE6LVC03**
CREDIT : 1 **MARKS : 100**

OBJECTIVES:

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

UNIT – I: LITURGY

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

UNIT – II: HOLY SACRIFICE OF THE MASS

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

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

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

UNIT – IV: CHRISTIAN FAMILY

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

UNIT – V: CONSECRATED LIFE

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

REFERENCES:

1. Compendium – Catechism of the Catholic Church Published by Vaigarai Publishing House for the Catholic Church of India.
2. You are the light of the World, A course on Christian living for II year Religion published by Department of Foundation Courses, St.Joseph's College (Autonomous), Tiruchirappalli–620 002.
3. Documents of Vatican II – St. Paul's Publications, Bombay 1966.

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Tiruchirappalli - 620002
Third Year - Semester - VI

Course Title	**MAJOR CORE – 11: THEORY OF FUNCTIONS OF A COMPLEX VARIABLE**
Total Hours	**90**
Hours / Week	**6**
Code	**U15MA6MCT11**
Course type	**Theory**
Credits	**5**
Marks	**100**

General Objective:

To extend the idea of integration in the complex field by using residues and evaluating contour integrals. To understand the concept of bilinear transformation and visualizing their images

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Understand the concept of complex variable, Analytic functions and holmonic functions.
CO - 2	Understand about bilinear transformation and its properties
CO - 3	Evaluate definite integrals using Cauchy's theorem and cauchy's integral formula
CO – 4	Understand zeros, pole and singularties of an analytic functions and their expressions using Taylor's theorem and Laurent's theorem
CO – 5	Evaluate residues using cauchy's residue theorem.
CO – 6	Evaluate definite integrals between limits $-\infty$ to ∞

UNIT I : ANALYTIC FUNCTIONS **18 Hrs**

Introduction –Functions of a complex variable- Limits – Theorems on limits-Continuous functions –Differentiability- Cauchy - Riemann equations- Analytic Functions -Harmonic functions .

Extra Reading/ Keywords*:conformal mapping*

UNIT II : BILINEAR TRANSFORMATIONS **18 Hrs**

Introduction- Elementary transformations - Bilinear transformations - Cross ratio - Fixed points of Bilinear transformations - some special bilinear transformations.

Extra Reading/ Keywords*: sequences and series of functions , power series.*

UNIT III : COMPLEX INTEGRATION **18 Hrs**

Introduction –Definite integral- Cauchy's theorem -Cauchy's integral formula (Riemann's proof only) and its extension – Higher derivatives.

Extra Reading/ Keywords*: winding number, Argument function*

UNIT IV : SERIES EXPANSION **18 Hrs**

Introduction -Taylor's theorem - Laurent's theorem – Zeros of an analytic function - Pole - singularities.

Extra Reading/ Keywords*: Rational functions , Calculation of definite integrals*

UNIT V : CALCULUS OF RESIDUES **18 Hrs**

Introduction -Residues - Cauchy's Residue theorem - Evaluation of Definite Integrals between limits (-μ to μ) - Jordan's lemma (Statement only)- Evaluation of Sinax f(x) dx, Cosax f(x)dx where a > 0 and (i) f(z) does not have a pole on the real axis (ii) f(z) have poles on the real axis .

Extra Reading/ Keywords*: Sums of infinite series , The principle of argument*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes (CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall complex variable, Analytic functions and holmonic functions.	**PSO - 1**	**R,U**
CO - 2	Explain and relate bilinear transformation and its properties	**PSO -2**	**U,E**
CO - 3	Apply Cauchy's theorem and cauchy's integral formula to compute definite integrals	**PSO -5**	**Ap,E**

CO - 4	Recognize zeros, pole and singularities of an analytic functions and their expressions using Taylor's theorem and Laurent's theorem	**PSO -3**	**U,E**
CO - 5	Calculate residues using cauchy's residue theorem.	**PSO -4**	**E**
CO - 6	Compute definite integrals between limits $-\infty$ to ∞	**PSO -5**	**E**
CO - 7	Extend the idea of integration in the complex field by using residues and evaluating contour integrals and to understand the concept of bilinear transformation and visualizing their images- Skill Development	**PSO -2,3**	**U,E**

TEXT BOOK :

S.Arumugam, A.Thankapandi Isaac and A.Somasundaram (2006), COMPLEX ANALYSIS , Scitech Publishers, Chennai

UNIT I: Chapter 2(Sec 2.0 to 2.8)
UNIT II : Chapter 3 (Sec.3.0 to 3.5)
UNIT III : Chapter 6 (Sec 6.0 to 6.4)
UNIT IV : Chapter 7 (Sec 7.0 to 7.4)
UNIT V : Chapter 8 (Sec 8.0 to 8.3)

REFERENCE BOOKS:

1. V.Karunakaran ,(2006) COMPLEX ANALYSIS , Narosa publishing House ,New Delhi.
2.Howie, M.John (2008), COMPLEX ANALYSIS ,WileyDremtechpvt ltd

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Third Year - Semester - VI

Course Title	**MAJOR CORE- 12:DIFFERENTIAL EQUATIONS ,LAPLACE TRANSFORMS AND FOURIER SERIES**
Total Hours	**90**
Hours / Week	**6**
Code	**U15MA6MCT12**
Course type	**Theory**
Credits	**5**
Marks	**100**

General Objective:

To expose the standard forms of partial differential equations, Laplace transform, inverse of Laplace transform ,Fourier series and applications of partial differential equations and enable the students to apply in problems

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	.Evaluate ordinary differential equation with variable coefficient by the method of variation of parameter
CO - 2	Form PDE and to solve PDE
CO - 3	Understand Laplace transform and to find Laplace transforms for standard Functions
CO – 4	Understand inverse Laplace transforms and to apply ILT for finding the Solution of ordinary differential equations
CO – 5	Understand Fourier series and find Full range and half range cosine and sine Series

UNIT I : ORDINARY DIFFERENTIAL EQUATIONS **18 Hrs**

Linear homogeneous equations with variable coefficients. Equations reducible to the linear homogeneous equation. Method of variation of parameters.

Extra Reading/ Keywords: non linear differential equation , separable equations, IVP

UNIT II : PARTIAL DIFFERENTIAL EQUATIONS **18 Hrs**

Formation of partial differential equations by eliminating arbitrary constant and functions - solutions - General, particular and complete integrals - solutions to first order equations in four standard forms – $F(p, q) = 0$, $F(z,p,q) = 0$, $F(x,p,q) = 0$,$F(y,p,q) = 0$, $F_1(x,p) = F_2(y,q)$, $z = px+qy+f(p,q)$, Lagranges method of solving linear equation $Pp + Qq = R$.

Extra Reading/ Keywords:Heat equation, Wave equation

UNIT III : LAPLACE TRANSFORMS **18 Hrs**

Definition - Laplace transforms of functions e^{at}, Cosat, Sinat, t^n (n is a +ve integer),e^{at}cosbt, e^{at}sinbt, f'(t), f''(t), $f^n(t)$, $t^n f(t)$, $f(t)/ t$

Extra Reading/ Keywords: Solving IVP using Laplace transforms, non constant coefficient of IVP

UNIT IV : INVERSE LAPLACE TRANSFORMS **18 Hrs**

Inverse transforms relating to the above standard functions - application to solution of ordinary differential equations with constant coefficients.

Extra Reading/ Keywords*: Partial Fractions*

UNIT V : FOURIER SERIES **18 Hrs**

Full Range series – Half range cosine and sine series (Change of interval excluded)

Extra Reading/ Keywords*:Fourier Integrals,Relation between fourier series and fourier integrals*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes (CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Apply Variation of parameters to solve ordinary differential equation	**PSO - 4**	**Ap, E**
CO - 2	Form PDE and to solve PDE	**PSO -3**	**U,Ap**
CO - 3	Recall Laplace transform and Compute Laplace transforms for standard Functions	**PSO -2**	**U,E**
CO - 4	Recognize inverse Laplace transforms and to apply ILT solving ordinary differential equations	**PSO -1**	**U,E**

CO - 5	Recall Fourier series and evaluate Full range and half range cosine and sine Series	**PSO -5**	**U,E**
CO - 6	Expose the standard forms of partial differential equations, Laplace transform, inverse of Laplace transform ,Fourier series and applications of partial differential equations and enable the students to apply in problems- Skill Development	**PSO-2,3**	**U,Ap**

TEXT BOOK:

1.Narayanan.S , ManicavachagomPillay.T.K, DIFFERENTIAL EQUATIONS, S.Viswanathan (Printers and publishers),Chennai.
UNIT:I Chapter V - Sections 5 & 6 and Chapter VIII - Section 4
UNIT:II Chapter XII - Sections 1 to 5.4
UNIT:III Chapter IX – Sections 1,2,4 and 5
UNIT:IV Chapter IX – Sections 6 to 9
2. Calculus (volume III) by S.Narayanan and T.K.ManicavachagamPillay, S.Viswanathan (Printers and publishers),Chennai.
UNIT:V Chapter 6 – Sections 1 to 5(Change of interval excluded)

REFERENCE BOOKS:

1.Arumugam.S,ThangapandiIssac.A,Somasundaram.A,(2002) ENGINEERING MATHEMATICSVol III ,SCITECH Publishers, Chennai
2.Raisinghania.M.D,(2002),ORDINARYAND PARTIAL DIFFERENTIAL EQUATIONS ,S.Chand&Company ,New Delhi.
3.ZafarAhsan (2006) DIFFERENTIAL EQUATIONS AND THEIR APPLICATIONS,Prentice Hall of India Ltd,New Delhi.
4.Thomas /Finanera(1984), CALCULUS AND ANALYTIC GEOMETRYNarosa Publishing House,Delhi.

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Tiruchirappalli - 620002
Third Year - Semester - VI

Course Title	**MAJOR CORE – 13: INTRODUCTION TO FUZZY MATHEMATICS**
Total Hours	**90**
Hours / Week	**6**
Code	**U15MA6MCT13**
Course type	**Theory**
Credits	**5**
Marks	**100**

General Objective:

To enable the students to have better applications of uncertainty through fuzzy mathematics for problems in physical and social sciences.

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand fuzzy set theory
CO – 2	Evaluate the operation on fuzzy sets.
CO – 3	Understand and evaluate fuzzy relations and its operators .
CO – 4	Understand fuzzy implications and approximate reasoning.
CO – 5	Understand fuzzy logic and fuzzy inference

UNIT I : FUZZY SET THEORY **18 Hrs**

Introduction- Fuzzy versus Crisp -Concept of a fuzzy set-Types of fuzzy sets-Properties of Fuzzy sets – Operations on fuzzy set- General properties : Fuzzy Vs Crisp.

Extra Reading/ Keywords : Fuzzy representation On Venn diagrams

UNIT II: OPERATION ON FUZZY SETS **18 Hrs**

Introduction-Some important theorems –Fuzzy Complements- Further operations on fuzzy sets- Extension Principle for Fuzzy sets.

Extra Reading/ Keywords: Fuzzy numbers

UNIT III: FUZZY RELATIONS **18 Hrs**

Introduction-Projections and cylindrical Fuzzy Relations - Composition –Properties of Min- Max Composition – Binary Relation on a Single set.

Extra Reading/ Keywords: Fuzzy ordering relation, Fuzzy graph

UNIT IV: APPROXIMATE REASONING **18 Hrs**

Introduction - Fuzzy implications or S- implications – R- implications - QL-implications - Axioms of Fuzzy implications - Selection of Fuzzy implications - Multi conditional Approximate Reasoning.

Extra Reading/ Keywords: Connectives

UNIT V: FUZZY LOGIC **18 Hrs**

Fuzzy Logic - Fuzzy Connectives – Fuzzy Inference – Fuzzy Propositions – Fuzzy Quantifiers – Linguistic Hedges – Inference from Conditional Fuzzy Propositions – Generalization of hypothetical syllogism - Inference from Conditional and Qualified Propositions.

Extra Reading/ Keywords: Fuzzy controllers, Defuzzification

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes (CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall and relate fuzzy set theory	**PSO - 2**	**R,U**
CO - 2	Recognize and relate the operation on fuzzy sets.	**PSO -4**	**U,Ap**
CO - 3	Recall and evaluate fuzzy relations and its operators	**PSO -1**	**U,E**
CO - 4	Describe and discuss fuzzy implications and approximate reasoning.	**PSO -3**	**U,Ap**
CO - 5	Reproduce fuzzy logic and fuzzy inference	**PSO -5**	**U,Ap**
CO - 6	Enable the students to have better applications of uncertainty through fuzzy mathematics for problems in physical and social sciences - Skill Development	**PSO-2**	**U,Ap**

TEXT BOOKS

Dr. Sudhir K. Pundir& Dr. RimplePundir , (2013) FUZZY SETS AND THEIR APLLICATION, PragatiPrakashan Educational Publishers, Meerut.

UNIT I : CHAPTER 1 - Secs. (1.1, 1.2, 1.16 to 1.21)
UNIT II : CHAPTER 2 - Secs (2.1 to 2.5 , 2.10)
UNIT III : CHAPTER 4 - Secs. (4.1 to 4.5)
UNIT IV : CHAPTER 6 - Secs. (6.1 to 6.7)
UNIT V : CHAPTER 7 - Secs. (7.13 to 7.21)

REFERENCE BOOKS:

1. A.Kaufmann, (2005)INTRODUCTION TO FUZZY THEORY,Academic press ,Newyork .
2. George J .Kler /Bo yuan, (2005).FUZZY SETS AND FUZZY LOGIC –THEORY AND APPLICATIONS, Prentice Hall of India ,New Delhi .
3.M.Ganesh , (2006) INTRODUCTION TO FUZZY SETS AND FUZZY LOGIC, Prentice Hall of India Pvt. Limited, New Delhi.
4. T.M.Ross(2006),FUZZY ENGINEERING APPLICATION ,Wiley Western Company.

(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
Affiliated to Bharathidasan University
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College with potential for Excellence
Tiruchirappalli - 620002
Third Year - Semester - VI

Course Title	**MAJOR ELECTIVE – 3: PROGRAMMING IN C++**
Total Hours	**60**
Hours / Week	**5**
Code	**U15MA6MET03**
Course type	**Theory & Practical**
Credits	**5**
Marks	**100**

General Objective:

To enable the students to understand the concept of OOPS which will enable them to write programs.

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Understand the keywords, identifier, data type, symbolic constants, variable of C++.
CO - 2	Understand operations of functions of C++.
CO - 3	Understand Classes, Objects and constructors of C++.
CO – 4	Understand constructors and its types
CO – 5	Apply constructors overload binary and urinary operations

UNIT I : BEGINNING WITH C++: 12 Hrs

Introduction to C++-Applications of C++ statements-structure of C++ programs - Tokens, keywords, identifiers, data types - symbolic constants -type compatibility-defining variables.

Extra Reading/ Keywords*:Benefits of OOP, object oriented languages*

UNIT II : OPERATORS AND FUNCTIONS: 12 Hrs

Operators in C++ - Manipulators -Type cast operator- Expressions – Operator Overloading- control structures -Main function-Function prototyping-call by reference-return by reference-inline functions-default arguments-constant arguments-Recursion- Function overloading.

Extra Reading/ Keywords*:Friend and Virtual functions.*

UNIT III : CLASSES, OBJECTS AND CONSTRUCTORS 12 Hrs

Specifying a class – Defining member functions –Making an outside function inline – Nesting of member functions – Arrays within a class – Memory allocation for objects-Constructors – Parameterized constructors –Multiple constructors in a class – Constructors with default arguments

Extra Reading/ Keywords*: Static data members, static member functions*

UNIT IV :CONSTRUCTORS (CONTD) AND OPERATOR OVERLOADING 12 Hrs

Dynamic initialization of objects – Copy constructor –Dynamic constructor - Destructors- Defining operator overloading – Overloading unary , binary operators.

Extra Reading/ Keywords*:const objects*

UNIT V : OPERATOR OVERLOADING(CONTD) AND INHERITANCE 12 Hrs

Binary operators overloading using friends – Manipulation of strings using operators - Rules for overloading operators –Defining derived classes – Single Inheritance– Making a private member inheritable – Multilevel, Multiple, Hierarchical and Hybrid inheritance.

Extra Reading/ Keywords*: type conversions , Virtual base classes*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

PRACTICAL WORK :

1. Sorting numbers in ascending and descending order
2. Implementation of Default arguments
3. Implementation of Reference variables
4. Friend Function
5. Inline Functions
6. Constructor and Destructor
7. Students Mark list
8. Employee Information System
9. Multiple Inheritance
10. Function Overloading

NOTE: PROGRAMS MUST BE TAKEN ONLY FROM THE PRACTICAL WORK.

Course Outcomes (CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall the keywords, identifier, data type, symbolic constants, variable of C++.	**PSO - 2**	**R,U**
CO - 2	Recognize operations of functions of C++.	**PSO -1**	**U**
CO - 3	Reproduce Classes, Objects and constructors of C++.	**PSO -5**	**U**
CO - 4	Relate constructors and its types	**PSO -3**	**U**
CO - 5	Apply constructors overload binary and urinary operations	**PSO -4**	**U,Ap**
CO - 6	Languages needed for further computer courses- Employability	**PSO -4**	**U,Ap**

TEXT BOOK :
E. Balagurusamy (sixth edition 2014), " OBJECT ORIENTED PROGRAMMING WITH C++", TATA MCGRAW HILL.
UNIT I: Chapter 2 (Sec 2.1 -2.6), Chapter 3 (Sec 3.1 -3.13)
UNIT II: Chapter 3 (Sec 3.14 -3.25), Chapter 4 (Sec 4.1 - 4.10)
UNIT III: Chapter 5 (Sec 5.1 – 5.10),Chapter 6(Sec6.1 – 6.5)
UNIT IV: Chapter 6(Sec6.6 – 6.8,6.11) , Chapter 7 (Sec 7.1 – 7.4)
UNIT V: Chapter 7 (Sec 7.5 – 7.8),Chapter 8 (Sec 8.1 – 8.8)

REFERENCE BOOKS:

1. M.A.Jayaram and D.S. Rajendra Prasad,(2002) "OBJECT ORIENTED PROGRAMMING WITH C++" ,Mumbai, Himalaya Publishing.
2. D.Ravichandran ,(1999), "PROGRAMMING WITH C++" ,New York, Mcgraw Hill.
3. Maria Litvin and Gary Litvin ,(2001), "PROGRAMMING IN C++" ,New Delhi,Vikas Publishing House Pvt. Ltd.,
   Nell Dale,Chip Weems and Mark Headington(1999), "PROGRAMMING IN C++",New

(For candidates admitted from 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
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College with potential for Excellence
Tiruchirappalli - 620002
Third Year - Semester - VI

Course Title	**MAJOR ELECTIVE – 3: NUMBER THEORY**
Total Hours	**75**
Hours / Week	**5**
Code	**U15MA6MET07**
Course type	**Theory**
Credits	**5**
Marks	**100**

General Objective:

To highlight the niceties and nuances in the world of numbers and prepare the students for coding through congruences.

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Understand the basic concepts of Divisibility involving Euclid's Division Lemma and Linear Diophantine Equation.
CO - 2	Understand the basic concepts of Permutations and Combinations using Fermat's Little Theorem and Wilson's Theorem.
CO - 3	Understand the basic Properties of Congruences Residue Systems by using the theorems of Fermat and Wilson Revisited.
CO - 4	Understand the concepts of Polynomial Congruences using Chinese Remainder theorem.

CO - 5	Understand the concepts of multiplicative arithmetic function using Mobius Inversion Formula.

NUMBER THEORY

UNIT I : DIVISIBILITY **15 Hrs**

Euclid's Division Lemma – Divisibility – The Linear Diophantine Equation – The Fundamental Theorem of Arithmetic.

Extra Reading/ Keywords*: Primality testing, Division algorithm, Gauss's Lemma.*

UNIT II :PERMUTATIONS AND COMBINATIONS **15 Hrs**

Permutations and Combinations – Fermat's Little Theorem – Wilson's Theorem – Generating Functions.

Extra Reading/ Keywords: *Counting principle, perfect number, transcendental number*

UNIT III : CONGRUENCES **15 Hrs**

Basic Properties of Congruences -Residue Systems. Linear Congruences – The Theorems of Fermat and Wilson Revisited.

Extra Reading/ Keywords: *Elliptic Curve, Continued fractions.*

UNIT IV : POLYNOMIAL CONGRUENCES **15 Hrs**

The Chinese Remainder Theorem – Polynomial Congruences – Combinational Study of F(n).

Extra Reading/ Keywords: *Miller-Rabin primality test, pseudo primality.*

UNIT V : ARITHMETIC FUNCTION **15 Hrs**

Formulae for d(n) and s(n) – Multiplicative Arithmetic Function – The Mobius Inversion Formula.

Extra Reading/ Keywords: *Liouville function, Euler phi function,totient function.*

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes(CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recognize the basic concepts of Divisibility involving Euclid's Division Lemma and Linear Diophantine Equation.	**PSO – 2**	**R,U**

CO - 2	Recognize the basic principles on Permutations and Combinations using Fermat's Little Theorem and Wilson's Theorem.	**PSO -3**	**Ap, E**
CO - 3	Recognize the basic Properties of Congruences Residue Systems by using the theorems of Fermat and WilsonRevisited .	**PSO -1**	**E**
CO - 4	Recognize the concepts of Polynomial Congruences using Chinese Remainder theorem.	**PSO -4**	**An**
CO - 5	Recall the concepts the concepts of Arithmetic functions using Mobius Inversion formula.	**PSO -5**	**R,U**
CO - 6	To acquaint the students become familiar with the concepts of divisibility and arithmetic functions and apply them to solve problems - Skill Development	**PSO-2**	**Ap**

TEXT BOOK :

Number Theory by ***George E.Andrews,*** Hindustan Publishing Corporation – 1984, Edition.

1. UnitI : Chapter - 2 Sec. 2.1 – 2.4 pages12-29
2. UnitII : Chapter – 3 Sec. 3.1, 3.4 pages30-44
3. UnitIII : Chapter – 4Sec. 4.1 – 4.2 Pages 49 – 55, Sec. 5.1- 5.2 Pages58-65
4. UnitIV : Chapter – 4 Sec. 5.3 – 5.4 pages 66-74, Sec. 6.1 Pages75-81
5. UnitV : Chapter – 5 Sec. 6.2 – 6.3 Pages82-92

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Third Year - Semester - VI

Course Title	**NON MAJOR ELECTIVE 2-- ART OF PROGRAMMING**
Total Hours	**30**
Hours / Week	**2**
Code	**U15MA6NMT02**
Course type	**Theory**
Credits	**2**
Marks	**100**

General Objective:

To acquire knowledge about Algorithms ,Flow Chart and to write Simple programs independently.

Course Objectives (CO) :
The learner will be able to

CO No.	Course Objectives
CO – 1	Understand about flow chart and preparation of flow chart.
CO – 2	Prepare algorithm for square, rectangle, circle and triangle, calculate simple interest and compound interest.
CO – 3	Understand Hardware and Software
CO - 4	Understand statements and application of statements for simple programs.
CO - 5	Understand arrays.

UNIT I : FLOW CHART **6Hrs**

Flow chart –Definition – Symbols

Flow Chart for:

(i) To find the area of a square , rectangle ,circle and triangle

(ii) To calculate simple interest and compound interest

(iii)To find the sum of first n natural numbers

(iv)To find the sum of n given numbers and their average and standard deviation

(v)To pick the largest of 3 given numbers.

Extra Reading/ Keywords: *Flow chart for perimeter for the above given shapes*.

UNIT II : ALGORITHMS **6 Hrs**

Algorithm-Definition-Algorithm for those ((i) to (v)) mentioned in unit I

Extra Reading/ Keywords: *Algorithm for perimeter for the above given shapes in unit I.*

UNIT III:CONSTANTS,VARIABLES AND EXPRESSIONS **6 Hrs**

Low level and High Level Languages – Hardware and Software

Alphabet- Constants- Variables- Arithmetic Expressions-Precedence rules of arithmetic operators-Logical expressions-Library functions – SIN , COS ,TAN,SQRT,EXP and LOG.

Extra Reading/ Keywords: *Algebraic expression*

UNIT IV:STATEMENTS **6 Hrs**

Comment Statement

Input –Output Statements

Assignment Statement

Conditional Statement –THE BLOCK IF CONSTRUCT

Loop Statement – THE BLOCK DO LOOP

Extra Reading/ Keywords :*DO WHILE LOOP*

UNIT V: SIMPLE PROGRAMS **6 Hrs**

Arrays

PROGRAMS:

For those mentioned in Unit I ((i) to (v))

(vi) For income Tax Calculation **(Example Program 6.6)**

(vii) To find the result of students in a class and the % of pass **(Example Program 8.1 / 8.3)**

(viii) To find the first mark in a class of n students**(Example Program 7.11)**

(ix) To find the average height of boys and girls in a class **(Example Program 7.4)**

(x) For adding / multiplying two matrices

Extra Reading/ Keywords: Structures, pointers

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes(CO):
The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall flow chart and preparation of flow chart	**PSO - 1**	**R,U**
CO - 2	Design algorithm for square, rectangle, circle and triangle, calculate simple interest and compound interest.	**PSO -2**	**U**
CO - 3	Reproduce and relate Hardware and Software	**PSO -5**	**U**
CO - 4	Recognize statements and application of statements for simple programs.	**PSO -3**	**U**
CO - 5	List arrays and its types	**PSO -3**	**U**
CO - 6	Languages needed for further computer courses - Skill Development.	**PSO - 4**	**U**

TEXT BOOK

1.P.S .Grover 1996 COMPUTER PROGRAMMING IN BASIC Allied Publishers Ltd, New Del hi for Units I &II

2. V.Rajaraman ,COMPUTER PROGRAMMING IN FORTRAN 90 AND 95 Prentice Hallof India, New Delhi for Units III, IV &V

Unit III :

Chapter 3 (3.1 and 3.2)

Chapter 4 (4.1 and 4.5)

Chapter 6 (6.1)

Chapter 8 (8.2 and 8.3)Unit IV:Chapter 4 (4.6 and 4.7)Chapter 5 (5.1 and 5.2)Chapter 6 (6.2)Chapter 7 (7.1)Unit V:Chapter 10 (10.2 , 10.3)

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Third Year - Semester - VI

Course Title	**SKILL BASED ELECTIVE– 5: APPLICATION OF ALGORITHMS**
Total Hours	**30**
Hours / Week	**2**
Code	**U15MA6SBT05**
Course type	**Theory**
Credits	**2**
Marks	**100**

General Objective:

Motivating the students to take interest in understanding the matrix representation of a graph and algorithmic approach for various aspects of graph theory

Course Objectives(CO) :
The learner will be able to

CO No.	Course Objectives
CO - 1	Understand Matrix representation and its type
CO - 2	Understand the relationship between matrices and cut set matrices
CO - 3	represent graph and finding minimal spanning tree using Prism's algorithm and Kruskal algorithm
CO – 4	Understand Fundamental circuit algorithm and applications of Dijikstras algorithm
CO – 5	Apply travelling salesman problem algorithm and David Huffman algorithm

Unit I: **6 Hrs**

MATRIX REPRESENTATION

Incidence matrix– Reduced incidence matrix – Circuit matrix– Fundamental circuit matrix (Proof of the theorem excluded)

Extra Reading/ Keywords: *Matrices, Matrix operations*

Unit II: **6 Hrs**

Cut set matrix – Fundamental cut set matrix – Relationship between matrices – Adjacency matrix – Path matrix(Proof of the theorem excluded)

Extra Reading/ Keywords: *Different types of graphs , Cut set vertex*

Unit III: **6 Hrs**

ALGORITHMIC APPROACH

Introduction – Computer representation of a graph –Kruskal algorithm and R.C Prim's algorithm for finding minimal spanning tree.

Extra Reading/ Keywords: *Breadth first **search**, Depth – first search*

Unit IV: **6 Hrs**

All fundamental circuits algorithm – Dijikstras algorithm - Dijikstras algorithm for weighted graphs.

Extra Reading/ Keywords: *Labeling procedure*

Unit V: **6 Hrs**

Travelling salesman problem algorithm – Algorithm for finding all spanning trees – David Huffman algorithm .

Extra Reading/ Keywords: Travelling Salesman Insertion method

Note: Tests given in the Extra Reading /Key Word: must be tested only through assignment and seminars

Course Outcomes(CO):

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recognize Matrix representation and its type	**PSO - 5**	**R,U**
CO - 2	Recall and relate the relationship between matrices and cut set matrices	**PSO -3**	**U**
CO - 3	Apply Prism's algorithm and Kruskal algorithm for finding minimal spanning tree	**PSO -2**	**U,Ap**
CO - 4	Reproduce Fundamental circuit algorithm and to apply Dijikstras algorithm	**PSO -1**	**U,Ap**
CO - 5	Apply travelling salesman problem algorithm and David Huffman algorithm	**PSO -4**	**U,Ap**
CO - 6	To get equip in getting optimum solutions to data driven problems and to provide working solutions in time especially with dynamic problem definition - Skill Development	**PSO-2**	**U,Ap**

TEXT BOOK:

Treatment as in ,“A TEXT BOOK OF GRAPH THEORY AND ITS APPLICATIONS” by B. SOORYANARAYANAN and G. K. RANGANATH,(2001), S. Chand company ltd , New Delhi.

Unit 1 and 2 : Chapter 8(8.-8.9)

Unit 3,4 and 5 : Chapter 11(11.1 , 11.2, 11.5 to 11.7, 11.10, 11.11, 11.13, 11.14 and 11.16)

REFERENCE BOOKS:

1. Kenneth H. Rosen(2005)Fifth edition “DISCRETE MATHEMATICS AND IT’S APPLICATIONS” , Tata McGraw Hill Publishing company limited , New Delhi.

2. Harary , “GRAPH THEORY” , Narosa Publishing House New Delhi, Bombay.

3. NarsinghDeo , “GRAPH THEORY WITH APPLICATIONS TO ENGINEEERING AND COMPUTER SCIENCE”, Prentice Hall of India, New Delhi.

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Third Year - Semester - VI

Course Title	**SKILL BASED ELECTIVE 6 : RESEARCH METHODOLOGY**
Total Hours	**30**
Hours/Week	**2**
Code	**U15DS6SBT06**
Course Type	(Theory cum Project)
Credits	**2**
Marks	**100**

General Objective:
Students get introduced to concept of research and to carry out research projects.

Course Objective:
The student will be able to
1. understand the different types of research.
2.analyze the research objectives and frames the hypothesis
3.understand the structure of dissertation.
4.evaluate their research work.

Unit I **6Hrs**
Introduction to research: Concept of research – types of research – introduction to research literature base – collection of research information from different sources; maintenance of information.
Extra reading / Key Words: *Primary data, Secondary data collection*

Unit II **6Hrs**
Research focusing: identifying research area – drawing objectives\ hypothesis – designing the work – data collection – analysis.
Extra reading / Key Words: *Test of Hypothesis and Levels of significance.*

Unit III **6Hrs**
Preparation of dissertation: Structure of dissertation – editing – bibliography.
Extra reading / Key Words: *Summarizing any Two research article.*

Unit IV Project work **12Hrs**
Note: 1.Extra reading/Key words are only for internal testing(Seminar/Assignment)

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

REFERENCES:

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

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

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

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

HRS / WK : 1 **CODE: U15VE6LVE03**
CREDIT : 1 **MARKS : 100**

OBJECTIVES:

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

UNIT – I: PERSONAL COMPETENCE

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

UNIT – II: MARRIAGE AND FAMILY

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

UNIT – III: PARENTHOOD

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

UNIT – IV: PERSONALITY DEVELOPMENT

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

UNIT – V: CAREER CHOICE

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

REFERENCES:

1. Tony B and Barry Buzan(2003), The mind map book, BBC world wide limited, London.
2. Susan Nash(2005), Turning team performance inside out, Jai CO. publishing House, New Delhi.
3. Fr. Ignacimuthu (1999) "Values for Life", Vaigarai Pathipagam.
4. Grose. D.N. (2000), "A text book on Value Education", Dominant Publishers.

HOLY CROSS COLLEGE(AUTONOMOUS) TRICHIRAPALLI-2.
B.A/B.SC/B.COM/ B.C.A – DEGREE COURSES
LIFE ORIENTED EDUCATION
BIBLE STUDIES – III: ESSENCE OF CHRISTIAN LIVING

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

CREDIT : 1 **MARKS : 100**

OBJECTIVE:

- To prepare the students to practice Christian principles in family, church and society as young women

UNIT – I: ESSENTIALS OF CHRISTIAN FAITH

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

UNIT – II: MARRIAGE AND FAMILY LIFE

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

UNIT – III: CHRISTIAN HOME

- Parental Responsibilities and bringing up children – Abraham (Gen 22), Eli (I Sam 2: 24-36,3: 11- 18), Mary, Mother of Jesus (Luke 2: 51,52)
- Caring for the Aged (I Sam 2: 31,32)

UNIT – IV: CHRISTIAN ETHICS

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

UNIT – V: MISSIONARIES DOWN THE LANE

- William Carrie (Calcutta)
- Pandithar Rama Bai (Karnataka)
- Amy Carcheal (Dohnavur)
- Dr. Ida Scuddar (Vellore)
- Devasagayam (Nagercoil)
- St. John De Britto (Oriyur)
- Graham Staines & Family (Odisha)
- St. Mother Teresa (Calcutta)

REFERENCES:

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

(For Candidates admitted from June 2015 onwards)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2

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

LIFE ORIENTED EDUCATION CATECHISM – III:

LITURGY AND CHRISTIAN LIFE

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

CREDIT : 1 **MARKS : 100**

OBJECTIVES:

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

UNIT – I: LITURGY

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

UNIT – II: HOLY SACRIFICE OF THE MASS

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

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

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

UNIT – IV: CHRISTIAN FAMILY

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

UNIT – V: CONSECRATED LIFE

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

REFERENCES:

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

2. You are the light of the World, A course on Christian living for II year Religion published by Department of Foundation Courses, St.Joseph's College (Autonomous), Tiruchirappalli– 620 002.
3. Documents of Vatican II – St. Paul's Publications, Bombay 1966.