HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002
DEPARTMENT OF MATHEMATICS
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/ U15HN1HIN01/ U15FR1FRE01	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	U15RE1EST01	2	2	100
		Value Education	Ethics I/Bible Studies I/ Catechism I	U15VE2LVE01/ U15VE2LVB01 / U15VE2LVC01	1	--	--
		TOTAL			30	20	600
II	I	Language	Tamil Paper II/ Hindi PaperII/ French PaperII	U15TL2TAM02/ U15HN2HIN02/ U15FR2FRE02	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	Rural Enrichment and Sustainable Development	U15RE2SBT02	2	2	100
		Value Education	Ethics I /Bible Studies I/ Catechism I	U15VE2LVE01 / U15VE2LVB01/ U15VE2LVC01	1	1	100
		TOTAL			30	23	800

	I	Language	Tamil Paper III/ Hindi Paper III/ French Paper III	U15TL3TAM03/ U15HN3HIN03/ U15FR3FRE03	6	3	100
	II	English	English Paper III	U10EL3GEN03	6	3	100
	III	Major core - 4	Algebra and Trigonometry	U15MA3MCT04	5	5	100
		Major core - 5	Real Analysis – I	U15MA3MCT05	5	5	100
III		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	U12VE4LVE02/ U12VE4LVB02/ U12VE4LVC02	1	-	-
			TOTAL		30	22	700
	I	Language	Tamil Paper IV/ Hindi Paper IV/ French PaperIV	U15TL4TAM04/ U15HN4HIN04/ U15FR4FRE04	5	3	100
	II	English	English Paper IV	U13EL4GEN04	6	3	100
	III	Major core – 6	Modern Algebra - I	U15MA4MCT06	5	5	100
IV		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	Value Education	Ethics II/Bible Studies II/ Catechism II	U12VE4LVE02 U12VE4LVB02 U12VE4LVC02	1	1	100
			TOTAL		30	24	700
	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
V		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	U13VE6LVE03 U12VE6LVB03 U12VE6LVC03	1	--	--
			TOTAL		30	25	700
VI	III	Major core – 11	Theory of Functions of a Complex Variable.	U15MA6MCT11	6	5	100
		Major core – 12	Differential Equations , Laplace Transforms	U15MA6MCT12	6	5	100

		and Fourier Series				
	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	U13VE6LVE03 U12VE6LVB03 U12VE6LVC03	1	-	-
IV	Extension Activity	RESCAPES -Impact study of project	U15RE6ETF01	-	1	100
TOTAL				30	27	800
GRAND TOTAL				180	140+1	4300

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
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)	U15MA3AOT15	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)	U15MA4AOT18	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)	U15MA4AOT21	4	3	100

BA/ B.SC/ B.COM DEGREE
Part - I : Language: Tamil Paper - 1

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

நோக்கங்கள்:

1. தாய்மொழியை வலுவோடும், பொலிவோடும் கையாளும் வழி முறைகளைக் கண்டறியச் செய்தல்.

2. தமிழ் இலக்கியப் பரப்பையும், பாரம்பரியத்தையும் அறிமுகப்படுத்துதல்.

3. படைப்பாற்றலை வளர்த்துக் கொள்ள ஊக்கம் அளித்தல்.

4. உயர்ந்த பண்பாடுகளின் அடிப்படையில் வாழ்க்கையை அமைத்துக் கொள்ளும் உள்ளார்ந்த விருப்பத்தைத் தோற்றுவித்தல்.

5. மனித உரிமைகளை வலியுறுத்தி மனித நேயத்தை வளர்த்தல்.

6. நாம் வாழும் நாட்டையும், உலகையும் பற்றிய விழிப்புணர்வை ஊட்டி சமய நல்லிணக்கத்தையும், சமூக நல்லுறவையும் பேணிக்காக்கத் துணைப்புரிதல்.

7. ஆரோக்கியமான சிந்தனைகள் வளர ஆக்கம் அளித்தல்.

பயன்கள்:

1. தற்காலத் தமிழ் இலக்கிய வரலாற்றை வளர்க்க வழிகாட்டல்.

2. மாணவர்களின் தன்னம்பிக்கையை வளர்த்தல்

3. வாழ்வியல் நெறிகளை உணர்த்தல்.

4. பிழையின்றி எழுத பேச பயிற்சி அளித்தல்.

பாடத்திட்டம்

அலகு:1 செய்யுள்

    1. பாரதியார் கவிதைகள் - தமிழ்
                          கண்ணன் என் சேவகன்

    2. பாரதிதாசன் கவிதைகள் - உலகம் உன்னுடையது

    3. உமர்கய்யாம்   - உமர்கய்யாம் பாடல்கள

4. பட்டுக்கோட்டையார் - செய்யும் தொழிலே தெய்வம்

5. ந. பிச்சமூர்த்தி – ஒளியின் அழைப்பு

6. வைரமுத்து – ஐந்து பெரிது ஆறு சிறிது

7. சிற்பி – ஒரு கிராமத்து நதி

அலகு:2 செய்யுள்

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

அலகு:3

தமிழ் இலக்கிய வரலாறு

20-ஆம் நூற்றாண்டு (தற்காலம்)

தமிழாய்வுத்துறை வெளியீடு

அலகு:4

படைப்பிலக்கியம் - சிறுகதைத் தொகுப்பு

அலகு:5

பொதுப்பகுதி   - கலைச்சொற்கள்

தமிழாய்வுத்துறை வெளியீடு

பாட நூல்கள்

செய்யுள்	- தமிழாய்வுத்துறை வெளியீடு
தமிழ் இலக்கிய வரலாறு	- தமிழாய்வுத்துறை வெளியீடு
சிறுகதைத் தொகுப்பு	- தமிழாய்வுத்துறை வெளியீடு
கலைச்சொற்கள்	- தமிழாய்வுத்துறை வெளியீடு

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

HRS/WEEK:6   **CODE:U15HN1HIN01**

CREDITS:3   **MARKS :100**

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

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

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

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

UNIT-V   : Anuvad Abhyas –II

Books Prescribed :
- GalpaSanchayan   - D.B.H.P. Sabha Publishers,Chennai-17
- Naveen Hindi Patamala–I   - D.B.H.P. Sabha Publishers,Chennai-17
- Naveen Hindi Patamala–II   - D.B.H.P. Sabha Publishers,Chennai-17
- SugamHindiVyakaran   - D.B.H.P. Sabha Publishers,Chennai-17
- Anuvad Abhyas– II   - D.B.H.P. Sabha Publishers,Chennai-17

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2

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

HRS/WEEK :6   **CODE : U15FR1FRE01**
CREDIT:3   **MARKS :100**

Unit 1 Parcours d'initiation ; Vous comprenez

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

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

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

Unit 3 On se détend!

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

Unit 4 Racontez-moi ! ; Bon voyage !

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

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

Unit 5 Bon appétit!

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

TEXT BOOKS :

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

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

HOURS – 6 PER WEEK
CREDIT : 3

CODE : U15EL1GEN01

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

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

TEXTS

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

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

TEXTS

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

UNIT III -THE WORLD AROUND ME
Listening To identify specific information
Speaking –Discussing and expressing opinions
Reading To infer meaning
Writing Descriptive and Diary writing
Grammar Uses of 'be' Verbs – subject verb concord
Vocabulary Coining new words with Prefix and suffix- converting one part of speech to
another
Composition - Essay writing

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

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

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

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

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

Prescribed Book:
English for Communication –PoGo publication Trichy

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
B.Sc., MATHEMATICS
(For the candidates admitted from 2015 onwards)
SEMESTER – I
MAJOR CORE - 1 - CALCULUS

Total Hours: 105
Hours/Week: 7   **Code:U15MA1MCT01**
Credits:5   **Marks:100**

OBJECTIVE:

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

PRE REQUESITE: Definition of continuity and differentiability

<u>**DIFFERENTIAL CALCULUS**</u>

UNITI: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 nth derivative of a product (with proof).

UNIT II : APPLICATIONOFDIFFERENTIATION   **(21HRS)**
      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.

UNIT III:**PARTIALDIFFERENTIATION**   **(21HRS)**
      Partial differentiation – Total differential coefficient –Implicit functions - Homogeneous functions – Euler's Theorem (with proof) - Partial derivatives of a function of two functions – Jacobians.

<u>**INTEGRAL CALCULUS**</u>

UNITIV:INTEGRATION   **(21HRS)**
Integration of irrational functions - Methods of integration of the following types only
$$\int \frac{dx}{\sqrt{ax^2+bx+c}} \;,\; \int \frac{dx(px+q)}{\sqrt{ax^2+bx+c}} \qquad \sqrt{ax^2+bx+c}dx, \int (px+q) \qquad \sqrt{ax^2+bx+c}dx \quad - \text{Integration}$$
by parts - Bernoulli's formula.

UNIT V:REDUCTIONFORMULAE **(21HRS)**

Properties of definite integrals – Reduction formulae for $\int x^n e^{ax} dx$, $\int x^n \cos ax dx$,

$\int_0^{\frac{\pi}{2}} \sin^n x dx$, $\int_0^{\frac{\pi}{2}} \cos^n x dx$, $\int_0^{\frac{\pi}{2}} \sin^m x \cos^n x dx$, $\int \tan^n x dx$, $\int \cot^n x dx$, $\int \sec^n x dx$, $\int \cos ec^n x dx$,

$\int x^m (\log x)^n dx$ – Simple problems only.

TEXT BOOK:
Treatment and content as in
1. Narayanan.S and Manicavachagom Pillay .T.K (2011),<u>CALCULUS</u> (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),<u>MATHEMATICS(Vol .I),</u> S.Chand, New Delhi.
2. Thomas and Finney(2006),<u>CALCULUS</u>, Pearson Education, 9th Edition.
3. David V. Widder (2003),<u>ADVANCED CALCULUS</u> , Prentice Hall ofIndia
   Delhi.
4. Piskunov.N , <u>DIFFERENTIAL AND INTEGRAL CALCULUS,</u>Mir Publishers,
   Delhi
5. Schaums Outline series (2005) – <u>THEORY AND PROBLEMSOF</u>
   <u>ADVANCED CALCULUS.</u>

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
B.Sc., MATHEMATICS
(For the candidates admitted from 2015 onwards)
SEMESTER – I
ALLIED 1 - MATHEMATICAL STATISTICS I

Total Hours: 60
Hours/Week: 4   **Code:U15MA1ACT01**
Credits:4   **Marks:100**

OBJECTIVE:
     To understand the various methods of collection of data and representing themthrough diagrams and graphs. To analyse the characteristics of data by using relevant statisticaltools.

UNIT I: COLLECTION , PRESENTATION OF DATA AND MEASURES OF CENTRALTENDENCY   (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.

UNIT II: DISPERSION, SKEWNESS ANDKURTOSIS   (12HRS)

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

UNIT III : CORRELATIONANDREGRESSION   (12HRS)

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

UNIT IV :INDEXNUMBERS   (12HRS)

     Index Numbers- Uses – Types – Laspeyre's, Fisher's -Tests of Consistency –Cost of Living Index – Aggregate Expenditure Method – Family Budget Method .

UNIT V : ANALYSIS OFTIMESERIES   (12HRS)

     Analysis of time series-Method of average-link relative method- Secular Trend-Seasonal Variation-Cyclical Variation – Irregular Variation.

TEXT BOOKS:

Treatment and content as in Pillai R.S.N , Bagavathi .V (2007) <u>STATISTICS</u> 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: Chapter14

UNIT V: Chapter15

REFERENCE BOOKS:

1.Arora .S,Sumeet Arora (2002),<u>COMPREHENSIVE STATISTICAL METHODS</u>, S.Chandand Company Ltd ,New Delhi.

2.Douglas A.Lind ,William G.Marchall ,Samuel A. Wathen (2003) ,<u>BASIC STATISTICSFOR BUSINESSAND ECONOMICS</u>, Mc Graw Hill,Delhi.

3.Gupta .S.C, Indra Gupta (2004) ,<u>BUSINESS STATISTICS</u> ,Himalaya Publishing House , New Delhi.

4.Gupta .S.P (2006) ,<u>STATISTICAL METHODS,</u> Sultan Chand & Sons ,NewDelhi.

5.Sharma J.K, (2006) <u>BUSINESS STATISTICS,</u> Dorling Kindersley, (India) Pvt Ltd, Licensees of Pearson Education in SouthAsia.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
B.Sc., MATHEMATICS
(For the candidates admitted from 2015 onwards)
SEMESTER – I
ALLIED 2- MATHEMATICAL STATISTICS II

Total Hours: 60
Hours/Week: 4   **Code:U15MA1ACT06**
Credits:3   **Marks:100**

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

UNITI: PROBABILITY   **(12HRS)**

    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 ofan event in terms of conditional probability, Baye's theorem, Independent Events. (ProblemsOnly)

UNIT II:RANDOMVARIABLES   **(12HRS)**

    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.

UNIT III: EXPECTATIONAND VARIANCE   **(12HRS)**

    Expectation of a random variable - expectation of a function of a random variable, theorems on expectation. Variance – definition, theorems on variance, Tchebychev's inequality.

UNIT IV:DISCRETE DISTRIBUTIONS   **(12HRS)**

    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.

UNIT V –CONTINUOUSDISTRIBUTION   **(12HRS)**

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

TEXT BOOK:

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

UnitI	-	Chapter1
UnitII	-	Chapter2
UnitIII	-	Chapters 3 and 4
UnitIV	-	Chapters 12 and
13 UnitV	-	Chapters 16

REFERENCEBOOKS:

1.Arora .S,Sumeet Arora (2002),<u>COMPREHENSIVE STATISTICAL METHODS</u>, S.Chand and Company Ltd ,New Delhi.

2.Gupta .S.C, Kapoor.V.K (2002) , <u>FUNDAMENTALS OF MATHEMATICALSTATISTICS</u> Sultan Chand &Sons ,New Delhi.

3.Gupta .S.P (2006) ,<u>STATISTICAL METHODS,</u> Sultan Chand & Sons ,NewDelhi.

Hrs– 2/Week   **CODE:U15RE1EST01**
                                                                   CREDITS :2

Unit I–Awareness and Natural Resources

Awareness of Environmental issues and management strategies–need of the hour

Renewable and non-renewable resources-uses, present status and management of forest, water, land and energy resources.

Unit II–Ecosystems and Biodiversity

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

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

Unit III–Environmental Pollution

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

Unit IV–Human population and Environment

Population growth at national and global level.

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

Environmental pollutions and diseases-malaria- chikungunya

Unit V–Environment and Social Issues

Rich–poor wide–at national and global levels

Urbanization –slums

Changing value systems -AIDS

Family welfare programs

REFERENCES:

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

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

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2
B.A. /B.Sc. / B.Com. / B.R.Sc. / B.C.A. DEGREE COURSE
LIFE ORIENTED EDUCATION
ETHICS – I: RELIGION AND VALUE SYSTEMS

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

OBJECTIVES:

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

UNIT – I: RELIGION

God – concept of faith, Faith, Meaning, Definition, Nature, Characteristics and Basic values of different religions. Impact of Globalization on religion – Importance of worship in holy places – celebration, come-union,socialization.

UNIT – II: DIFFERENT RELIGIONS

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

UNIT – III: UNITY OF RELIGION

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

UNIT – IV: FUNDAMENTALISM, COMMUNALISM AND SECULARISM

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

UNIT – V: VALUE SYSTEMS

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

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:thelivingfaithsoftheworld,2001.DepartmentofFoundationCourses,Loyola College,Chennai-34.
4. Sydney Am Meritt, 1997. Guided meditations foryouth.
5. Marie Migon Mascarenhas,1986. Family life education- Value Education, A text book for Collegestudents.

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

OBJECTIVE:

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

UNIT – I: BIBLE – THE WORD OF GOD

- Books of the Bible – Division into Old Testament and New Testament – history of the Bible-

- Messiah Prophecies(Isaiah 9:6,40:3,53:1-12,61:1-3,Micah5:2)

- The Birth and Ministry of John the Baptist (Luke 1:1-80,Mat3:1-17,14:1-12)

- The Birth, Passion and Resurrection of Jesus (Luke 1:26-80,2:1-52,John 1:18-21)

UNIT – II: MINISTRY OF JESUS

- Miracles (Mark 2:1-12,Luke 4:38-41,6:6-11,7:1-17,8:26-56,John2:1-12)

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

- Preaching

  - ➢ Sermon on the mount (Mat5-7)

  - ➢ 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,Mark14:32-42)

- Rich and Poor (Luke 16: 19-31,21:1-4)

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

- Women in the NewTestament

- Martha & Maria (Luke 10: 38- 42, John 11:1-46)

UNIT – III: CHURCH – BIRTH AND GROWTH

- EarlyChurch

- Birth (Acts2:1-41)

- Unity and sharing (Acts2:42-47,4:1-37,5:1-11)

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

- Comparison between early Church and presentChurch.

UNIT – IV: DISCIPLES AND APOSTLES

- Mother Mary (Mother of Jesus) (Luke 1: 27-35, John 2: 1-12, 19:35, Acts 1:13-14)

- Betrayal and the change in the life of St.Peter (Luke 22:1-7,Acts2:1-41,12:1-17)

- St.Andrew (Mat 4:18-20,John1:35-42,6:1-14)

- St.Stephen (Acts6,7)

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

UNIT – V: MISSIONARIES AND EVANGELISTS

- St.Thomas (John 20:24-31) & Missionary to India\Pandithar RamaBai

- WilliamCarrie

- Dr.Ida Scuddar& St. Britto (Oriyur)

- AmyCarcheal

- Mother Teresa(Calcutta)

- Devasagayam(Nagercoil)

- Staines &Family

REFERENCES:

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

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-2
B.A/B.Sc./B.Com/B.R.Sc/B.C.A-DEGEECOURSES
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 HolyBible
- To enable the students to know about the PaschalMystery

UNIT – I: CREATION AND COVENANT
          Study from petty catechism - Genesis - God revealed himself in creation -God who preserves creation throughcovenants
(Pentateuch) -Our response to God's covenant -Reason for its success and failure -The relationship of God with Israel -Image of God in Old Testament-God and me

UNIT – II: GOD OF THE PROPHETS
          God's care for the humanity through Prophets-Major (Isaiah, Jeremiah) Minor (Amos) and Women (Deborah) - Prophets-Their life and mission - Theology of Prophets -Concept of sin and collective sins expressed by prophets and God's saving love

UNIT – III: GOD OF WISDOM
God experience through wisdom Literature, its origin and growth

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

UNIT – V: LUKE'S GOSPEL
          Study of Luke's Gospel in detail – specialty of the gospel – main emphasis of the message – meaning and blessing of suffering and paschal joy in one's life.
Passion – Paschal mystery

REFERENCES:

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

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
(For the candidates admitted from 2015 onwards)
SEMESTER - I
Allied 1 – ALGEBRA, CALCULUS AND TRIGONOMETRY
(For Physics Students)

Total Hours: 60
Hours/Week: 4   **Code:U15MA1ACT02**
Credits:4   **Marks:100**

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

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.

UNIT II :DIFFERENTIALCALCULUS   **(12HRS)**

        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.

UNIT III :MULTIPLEINTEGRALS   **(12HRS)**

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

TRIGONOMETRY

UNIT IV: EXPANSIONS OFTRIGONOMETRICFUNCTIONS   **(12HRS)**

        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)

UNIT V :HYPERBOLICFUNCTIONS   **(12HRS)**

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

TEXT BOOKS :

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

<u>UNIT I</u>: Chapter 3: Sec 3.4(Excluding 3.5)

<u>UNIT II</u>: Chapter 6: 6.1 − 6.2

<u>UNIT IV</u>: Chapter 5 : Sec 5.1 − 5.3(Excluding Approximations)

<u>UNIT V</u>: Chapter 5: Sec 5.4

2. Treatment and content as inNarayanan.S,ManicavachagomPillay.T.K,(2006),<u>Calculus-Volume II,</u>S.Viswanathan (Printers and publishers),Chennai for UnitIII

<u>UNIT III</u>: 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) <u>ALGEBRA-I</u>S.Chand& Company(Pvt)Ltd.,New Delhi
2.Balasubrahmanyam P., VenkatacharyP.R. ,Venkataraman G.R.(1992), <u>TEXT BOOK ON TRIGONOMETRY</u> Published by ROC House &Sons,Chennai.
3. Narayanan.S,ManicavachagomPillay.T.K,(2006), <u>TRIGONOMETRY,</u>
S.Viswanathan (Printers andpublishers),Chennai.
4. Narayanan.S,ManicavachagomPillay.T.K,(2006),<u>ANCILLARY MATHEMATICS</u>−<u>VolumeII</u>
, S.Viswanathan (Printers and publishers),Chennai.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
(For the candidates admitted from 2015 onwards)
SEMESTER - I
ALLIED 1: BUSINESS MATHEMATICS
(For commerce students)

Total Hours: 60
Hours/Week: 4   **Code:U15MA1ACT03**
Credits:4   **Marks:100**

OBJECTIVE:

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

UNIT I: MATHEMATICSOFFINANCE   **(12HRS)**

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).

UNITII: MATRICES   **(12HRS)**

Matrices - inverse of a matrix rank of a matrix –Test for Consistency of equations.

(Excluding Algebra of Matrices , Determinants and also Input – Output Analysis)

UNIT III: APPLICATIONS OFDIFFERENTIATION   **(12HRS)**

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

UNIT IV:TRANSPORTATIONPROBLEM   **(12HRS)**

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

UNIT V:ASSIGNMENTPROBLEM   **(12HRS)**

Assignment problem (Travelling salesman problem excluded)

TEXT BOOKS:

Treatment and content as in

1. Navaneetham P.A.(2007) , <u>BUSINESS MATHEMATICS AND STATISTICS</u> ,JaiPublishers Trichy for Units I , II andIII.

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

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

UNITIII: Chapter 6 and7

2. KantiSwarup, Gupta P.K, Man Mohan (2007), <u>OPERATIONSRESEARCH</u>

Sultan Chand & Sons, New Delhi for Units IV andV.

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

UNITV: Chapter 11 (Omit Sec 11.5 to11.7)

REFERENCE BOOKS:

1. Vittal   .P.R,(2004),<u>BUSINESS   MATHEMATICS</u>   ,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.

HOLY CROSS COLLEGE (AUTONOMOUS) TRICHIRAPPALLI – 620002
(For the candidates admitted from 2015 onwards)
SEMESTER - I
ALLIED 1 : BUSINESS MATHEMATICS AND STATISTICS
(For commerce students-vocational)

Total Hours: 60
Hours/Week: 4   Code:U15MA1ACT04
Credits:4   Marks:100

OBJECTIVE:

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

UNIT I : APPLICATIONSOFDIFFERENTIATION   (12HRS)

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

functions –maxima and minima

UNIT II : TRANSPORTATION ANDASSIGNMENTPROBLEM   (12HRS)

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

UNIT III : COLLECTION AND PRESENTATIONOFDATA   (12HRS)

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

UNIT IV :MEASURES OF DISPERSIONANDCORRELATION   (12HRS)

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

UNIT V:INDEX NUMBERS   (12HRS)

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

TEXT BOOKS:

Treatment and content as in

1.Navnitham PA. Business Mathematics and Statistics (2009) , for UnitI.

2. KantiSwarup,Gupta P.K , ManmohanOPERATIONS RESEARCH ,SultanChand

New Delhi for UnitII.

3. PillaiR.S.N ,Bagavathi .V (2007) STATISTICSS.Chand and Company ,New Delhifor

   Units III , IV and V

REFERENCE BOOKS:

1. HamdyTaha (2005), OPERATIONS RESEARCH Prentice Hall of India,NewDelhi.
2. Gupta ,Hira (1989), OPERATIONS RESEARCHS.Chand Publishers,NewDelhi.
3. Arora .S,SumeetArora (2002),COMPREHENSIVE STATISTICAL METHODS, S.Chandand   Company Ltd ,NewDelhi.
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 ,NewDelhi.
7. Sharma J.K, (2006) BUSINESS STATISTICS,Dorling Kindersley, (India) PvtLtd,Licensees of Pearson Education in SouthAsia.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
(For the candidates admitted from2015 onwards)
SEMESTER - I
ALLIED 2 : APPLIED MATHEMATICS I
(for BCA and B.Sc. Computer science students)

Total Hours: 60
Hours/Week: 4   **Code:U15MA1ACT05**
Credits:3   **Marks:100**

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

UNIT 1:MATHEMATICALLOGIC   **(12HRS)**
   Introduction – Notations – Negation – Conjunction – Disjunction - Conditional and bi-
conditional Statements – Statement Formulas – Truth Table

UNIT II : MATHEMATICAL LOGIC (CONTINUED)   **(12HRS)**
   Well formed formulae – Tautology – Equivalence of formulae – Truth table - Truth table
method – Replacement Process.

UNIT III: MEASURES OFCENTRALTENDENCY   **(12HRS)**
   Mean – Median – Mode

UNIT IV: DISPERSION, SKEWNESS&KURTOSIS   **(12HRS)**
   Range – Quartile deviation – Mean deviation &Standard deviation – Karl Pearson's
Coefficient of Skewness – Kurtosis.

UNIT V : CORRELATIONANDREGRESSION   **(12HRS)**
   Karl Pearson's Coefficient of Correlation – Spearman's Rank Correlation Coefficient –
Regression- Lines ofRegression.

TEXTBOOKS:

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
   UNITI: Chapter 1 : Sections 1-5
   UNITII: 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
   UNIT IV : Chapter 10 & 11
   UNIT V : Chapter 12 & 13

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

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
(For the candidates admitted from2015 onwards)
SEMESTER I
Allied 2 – ANALYTICAL GEOMETRY OF THREE DIMENSIONS
AND VECTOR CALCULUS
(For Physics Students)

Total Hours: 60
Hours/Week: 4   **Code:U15MA1ACT07**
Credits:3   **Marks:100**

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

UNITI:PLANE **(12HRS)**

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

UNITII:STRAIGHTLINES **(12HRS)**

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

UNIT III:SPHERE **(12HRS)**

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

UNIT IV: DIFFERENTIATIONOFVECTORS **(12HRS)**

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

UNIT V:VECTORINTEGRATION **(12HRS)**

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

TEXT BOOKS:

Treatment and content as in

1.Manicavachagom Pillay. T.K, Natarajan T (2000) , <u>A TEXT BOOK OF ANALYTICALGEOMETRY</u> (Part II – Three Dimensions) , S.Viswanathan (Printersand 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 ANDFOURER 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) , <u>ANALYTICAL GEOMETRY</u>, EmeraldPublishers,Chennai.

2.Duraipandian.P ,Laxmi Duraipandian, (1998) , <u>VECTOR ANALYSIS</u> , EmeraldPublishers Chennai.

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

HOLY CROSS COLLEGE (Autonomous), Tiruchirappalli - 620 002.
TAMIL DEPARTMENT
BA/ B.SC/ B.COM DEGREE
Part - I : Language: Tamil Paper - II

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

நோக்கங்கள்:

1. இறைச் சிந்தனை வழி மாணவர்களை ஒருமுகப்படுத்துதல்.

2. தமிழ்ச் சான்றோர்களின் சிறப்புகளை அறிமுகப்படுத்துதல்.

3. மாணவர்களின் நல்லெண்ணங்களை மேம்படுத்துதல்.

4. நட்புணர்வை மாணவர்கள் மனதில் பதியவைத்தல்.

பயன்கள்:

1. இப்பாடம் மாணவர்களிடையே ஆன்மீக அறிவு அறிமுகமாகவும், வளரவும், ஆழப்படவும் துணைபுரிகின்றது. இது ஓர் இயற்கைப் பூங்கா.

2. தமிழை நேசித்து, தமிழ்ச் சான்றோர்களின் மீது மதிப்புக் கொள்ளவும், தானும் சான்றோர் ஆகவும் இது ஒரு பாலமாக பயன்படுகிறது.

3. ஊற்றுக்களாய் மாணவிகளிடையே மறைந்து கிடக்கும் நல்லெண்ணங்களை வெளிக்கொணரவும் நேர்மறைச் சிந்தனைகள் தோன்றவும் பயன்படுவதால் இது ஒரு நூலகமாகும்.

4. வாழ்க்கையில் நட்பின் தேவையை உணர வைக்கும் வழிகாட்டியாகத் திகழ்கிறது. இது வாழ்க்கைப் பெட்டகம்.

பாடத்திட்டம்

அலகு:1 செய்யுள்

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

5. நாலாயிர திவ்வியபிரபந்தம் - குலசேகராழ்வார் (பெருமாள் திருமொழி)

அலகு:2 செய்யுள்

6. மீனாட்சியம்மை பிள்ளைத்தமிழ் - குமரகுருபரர்
7. இரட்சணிய யாத்திரிகம் - எச்.ஏ.கிருட்டிணப்பிள்ளை

8. வேதநாயகம் சாஸ்திரியார் பாடல்கள்- வேதநாயகம் பிள்ளை
9. நபிகள் நாயக மான்மிய மஞ்சரி - செய்கு தம்பிப் பாவலர்

அலகு:3

தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறை வெளியீடு
பல்லவர்காலம்
நாயக்கர்காலம்

அலகு:4

படைப்பிலக்கியம் - புதினம்
கல்கி - பார்த்திபன் கனவு

அலகு:5

கடிதம் எழுதுதல்

பாட நூல்கள்

செய்யுள்	- தமிழாய்வுத்துறை வெளியீடு
தமிழ் இலக்கிய வரலாறு	- தமிழாய்வுத்துறை வெளியீடு
கல்கி	- பார்த்திபன் கனவு
கடித இலக்கியம்	- பயிற்சி ஏடு.

(for the candidates admitted from June 2015 onwards)
HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002
DEPARTMENT OF HINDI
PART – I LANGUAGE HINDI FOR B.A, B.Sc & B.Com
HINDI PAPER-II PROSE, DRAMA, GRAMMAR-II, COMPREHENSION
SEMESTER –II

HRS/WEEK:5   **CODE:U15HN2HIN02**
CREDITS:3   **MARKS :100**

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

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

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

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

UNIT-V   : Comprehension – Prosepassages

   Books Prescribed :
   ☐ NaveenGadhyaChayanika   – D.B.H.P. Sabha Publishers,Chennai-17
   ☐ SathyamevaJayathe   – D.B.H.P. Sabha Publishers,Chennai-17
   ☐ GeneralGrammar   – D.B.H.P. Sabha Publishers,Chennai-17

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

HRS/WEEK :5   **CODE : U15FR2FRE02**
CREDIT: 3   **MARKS :100**

Unit 1 Quelle journée !

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

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

Unit 3 Souvenez-vous ?

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

Unit 4 On s'appelle ?

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

Unit 5 Un bon conseil ! ; Parlez-moi de vous !
L'expression de déroulement de l'action, les phrases rapportées – le corps, la santé et la maladie – téléphoner, prendre rendez-vous, exposer un problème – les conseils pour faire face aux situations d'urgence.

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

TEXT BOOKS :
ECHO A1 – METHODE DE FRANÇAIS & CAHIER PERSONNEL D'APPRENTISSAGE
Authors: J. Girardet and J. Pécheur

Publication: CLÉ INTERNATIONAL, 2012.

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

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

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

UNIT I – SELF

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

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

UNIT II – STRENGTHS

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

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

UNIT III - POSITIVE SHORTCOMINGS

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

TEXTS

1. *The Ballad of father Gilligan* by Alexander Pope (poem)
2. *Six thinking hats* by Edward de Bono (prose)
3. *A cup of tea* by Katherin Mansfield (Short Story)
4. An extract from Shakespeare's *As you like it (Act II Scene I lines 12 -17)*

UNIT IV   POTENTIALS

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

TEXTS

1. *The flower* by Tennyson (poem)
2. *How to avoid argument* by Sam Horn (prose)
3. *The child is father of man* by Wordsworth (poem)
4. An extract from *Pygmalion* by G.B. Shaw

UNIT V   ACHIEVEMENTS

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

TEXTS

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

B.Sc., MATHEMATICS
(For the candidates admitted from 2015 onwards)
SEMESTER –II
MAJOR CORE 2 – MULTI-VARIATE CALCULUS

Total Hours: 75

Hours/Week: 5   Code:U15MA2MCT02

Credits:4   Marks:100

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.

MULTIPLE INTEGRALS

UNIT I : DOUBLE &TRIPLEINTEGRALS   **(15HRS)**

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

UNIT II : BETA ANDGAMMAFUNCTIONS   **(15HRS)**

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

UNIT III:VECTORDIFFERENTIATION: **(15HRS)**

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

UNIT IV:VECTORINTEGRATION: **(15HRS)**

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

UNIT V: INTEGRALTHEOREMS :   **(15HRS)**

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

TEXT BOOKS:

Treatment and content as in

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

Unit I : Chapter 5: Sections 1, 2.1, 2.2 , 3.1 & 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, MurrayR. Spiegel., Seymour Lipschutz, Dennis Spellman, Second Edition, McGraw Hill Book Company,2009.
2.Duraipandian.P ,Laxmi Duraipandian, (1998) , <u>VECTOR ANALYSIS</u> , EmeraldPublishers Chennai.

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

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

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
B.Sc., MATHEMATICS
(For the candidates admitted from 2015 onwards)
SEMESTER –II
MAJOR CORE -3 - ANALYTICAL GEOMETRY OF TWO AND THREE DIMENSIONS

Total Hours: 75
Hours/Week: 5   **Code:U15MA2MCT03**
Credits:5   **Marks:100**

OBJECTIVE:

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

UNIT I: CONICS -PARABOLA   **(15HRS)**

Equation of parabola- tangents-chord of contact of tangents- equation of pair oftangents
-parametric form of a point – chord joining two points - tangent at a point.(propertiesexcluded).

UNIT II: ELLIPSEANDHYPERBOLA   **(15HRS)**

Equations of ellipse and hyperbola - tangents-chord of contact of tangents- equation of pair of tangents -parametric form of a point – chord joining two points - tangent at a point.(properties excluded).

General second degree equation-tracing of Conics- Parabola, Ellipse and Hyperbola.

UNIT III:THEPLANE   **(15HRS)**

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 theplanes.

UNIT IV:THESTRAIGHTLINE   **(15HRS)**

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.

UNITV:SPHERE   **(15HRS)**

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.

TEXT BOOKS:

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

UNIT I: Chapter 6:**S**ec 1-8

UNIT II: Chapter7**: S**ec1-9

      Chapter8:**S**ec1-3

      Chapter 10:Sec 3 & 8

Treatment and content as in Manicavachagom Pillay. T.K, Natarajan T (2010) , <u>A TEXTBOOK OF ANALYTICALGEOMETRY</u> (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 , <u>ANALYTICALGEOMETRY-TWO DIMENSIONAL</u>, EmeraldPublishers,Chennai.

2. Duraipandian .P,Laxmi Duraipandian & D.Mahilan , <u>ANALYTICAL GEOMETRY-THREE DIMENSIONAL</u>, EmeraldPublishers,Chennai.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002
B.Sc., MATHEMATICS
(For the candidates admitted from 2015 onwards)
SEMESTER II
ALLIED 3- MATHEMATICAL STATISTICS III

Total Hours: 60
Hours/Week: 4   Code:U15MA2ACT08
Credits:3   Marks:100

OBJECTIVE:

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

UNIT I:SAMPLINGDISTRIBUTION   **(12HRS)**

Sampling Theory - distribution –Chisquare, student-t and F distributions and their properties..

UNITII:ESTIMATION   **(12HRS)**

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

UNIT III: TEST OF HYPOTHESIS FORLARGESAMPLES   **(12HRS)**

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.

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.

UNIT V:TEST OF HYPOTHESIS USINGFDISTRIBUTION   **(12HRS)**

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

TEXT BOOK:

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

UNIT:I   - Chapter22

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),<u>COMPREHENSIVE STATISTICAL METHODS</u>, S.Chand and
Company Ltd ,New Delhi.

2.Gupta .S.C, Kapoor.V.K (2002) , <u>FUNTAMENTALS OF MATHEMATICALSTATISTICS</u>
, Sultan Chand &Sons ,New Delhi.

3.Gupta .S.P (2006) ,<u>STATISTICAL METHODS,</u> Sultan Chand & Sons ,NewDelhi.

SBE-1 SOFT SKILLDEVELOPMENT

Credits -2
Hrs–2/Week   **Code:U15RE2SBT01**

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

UNIT I:
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.

UNIT II :
Interpersonal skills

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

UNIT III:
Corporate skills

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

UNIT IV:
Management skills

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

UNIT V:
Self Development Plan

Concept and Need for Self Development Plan–Preparing Self Development Plan9 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.

REFERENCES:

Delhi Meena K.AyothiV. (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).Communications of skills for Professional Excellence,1st Ed., GracePublishers,

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

RURAL ENRICHMENT AND SUSTAINABLE DEVELOPMENT

Hrs– 2/Week   **Code:U15RE2SBT02**
                                                               CREDITS :2

Course Objective:

The students are able to understand practically the Environmental concerns of rural areas and develop an alternative thinking through various field based intervention.

Unit–I
Village–Public Administration- Survey of natural resources and resource mapping of villages, village level Participating Approach (VLPA) – Role of NGO'S and SHG'S, Department of Rural development(central and state):

Unit–II
Green Revolution and industrialization cost climatic changes and mismanagement of natural resources- Reduced economic returns from agriculture-resultant social issues- poverty and farmer suicide- introduction to WTO, GATT and LPG and its impact on green Revolution.

Unit–III
Sustainable Development-Concepts , Environmental , social and economic aspects of sustainable development, sustainable development as solution to address rural issue-successful case studies from India

Unit-IV
Elements in sustainable development-Comparison and Compliments of Traditional water shedand modern water shed management techniques-water shed management practices-rain water harvesting, managing existing rain water drainage canals, desilting, buns construction, check dams, micro irrigation, agroforestry and alternative agriculture models and agriculture implements –Afforestation- Honey Beerearing-dairyfarming.
.

Unit-V
Elements in sustainable development –addressing agriculture issues-traditional farming technology-organic farming-Zero budget farming-organic manures vermicompost-azolla cultivation panchakavya- amirthakaraisal, organic pesticides mulikaipuchiviratti-neem products-natural management in soil-precision farming soil fertility. Ecological sanitation-bio-diversity and natural resource-terrace farming-seed banking and kitchen garden.

REFERENCES:
1. Packages of organic practices from Tamil Nadu Center for Indian Knowledge System(CIKS)
2.www.fao.org.in

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

OBJECTIVES:

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

UNIT – I: RELIGION
God – concept of faith, Faith, Meaning, Definition, Nature, Characteristics and Basic values of different religions. Impact of Globalization on religion – Importance of worship in holy places – celebration, come-union,socialization.

UNIT – II: DIFFERENT RELIGIONS
Basic characteristics and basic thoughts- Buddhism, Christianity, Hinduism, Islam, Jainism and Sikhism

UNIT – III: UNITY OF RELIGION
Unity of Vision and Purpose- Respect for Other's Faith, Inter Religious Co-operation, Religious Pluralism as a fact and Religious Pluralism as a value.

UNIT – IV: FUNDAMENTALISM, COMMUNALISM AND SECULARISM
Meaning and impact of Fundamentalism-Communalism-Violence and terrorism – Tolerance – Secularism -Individualism

UNIT – V: VALUE SYSTEMS
Value and Value Systems - Moral Values -Individuals and the need to stand for values inthe concept of Globalization – Consumerism - Will power to live up to your values - Healthy body for empowerment – Physical health and Mental hygiene, food andexercises.

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:thelivingfaithsoftheworld,2001.DepartmentofFoundationCourses,Loyola College,Chennai-34.
4. Sydney Am Meritt, 1997. Guided meditations foryouth.
5. Marie Migon Mascarenhas,1986. Family life education- Value Education, A text book for Collegestudents.

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

OBJECTIVE:

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

UNIT – I: BIBLE – THE WORD OF GOD

- Books of the Bible – Division into Old Testament and New Testament – history of the Bible-

- Messiah Prophecies(Isaiah 9:6,40:3,53:1-12,61:1-3,Micah5:2)

- The Birth and Ministry of John the Baptist (Luke 1:1-80,Mat3:1-17,14:1-12)

- The Birth, Passion and Resurrection of Jesus (Luke 1:26-80,2:1-52,John 1:18-21)

UNIT – II: MINISTRY OF JESUS

- Miracles (Mark 2:1-12,Luke 4:38-41,6:6-11,7:1-17,8:26-56,John2:1-12)

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

- Preaching

  - ➢ Sermon on the mount (Mat5-7)

  - ➢ 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,Mark14:32-42)

- Rich and Poor (Luke 16: 19-31,21:1-4)

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

- Women in the NewTestament

- Martha & Maria (Luke 10: 38- 42, John 11:1-46)

UNIT – III: CHURCH – BIRTH AND GROWTH

- EarlyChurch

- Birth (Acts2:1-41)

- Unity and sharing (Acts2:42-47,4:1-37,5:1-11)

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

- Comparison between early Church and presentChurch.

UNIT – IV: DISCIPLES AND APOSTLES

- Mother Mary (Mother of Jesus) (Luke 1: 27-35, John 2: 1-12, 19:35, Acts 1:13-14)

- Betrayal and the change in the life of St.Peter (Luke 22:1-7,Acts2:1-41,12:1-17)

- St.Andrew (Mat 4:18-20,John1:35-42,6:1-14)

- St.Stephen (Acts6,7)

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

UNIT – V: MISSIONARIES AND EVANGELISTS

- St.Thomas (John 20:24-31) & Missionary to India\Pandithar RamaBai

- WilliamCarrie

- Dr.Ida Scuddar& St. Britto (Oriyur)

- AmyCarcheal

- Mother Teresa(Calcutta)

- Devasagayam(Nagercoil)

- Staines &Family

REFERENCES:

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

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-2
B.A/B.Sc./B.Com/B.R.Sc/B.C.A-DEGEECOURSES
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 HolyBible
- To enable the students to know about the PaschalMystery

UNIT – I: CREATION AND COVENANT
Study from petty catechism - Genesis - God revealed himself in creation -God who preserves creation throughcovenants
(Pentateuch) -Our response to God's covenant -Reason for its success and failure -The relationship of God with Israel -Image of God in Old Testament-God and me

UNIT – II: GOD OF THE PROPHETS
God's care for the humanity through Prophets-Major (Isaiah, Jeremiah) Minor (Amos) and Women (Deborah) - Prophets-Their life and mission - Theology of Prophets -Concept of sin and collective sins expressed by prophets and God's saving love

UNIT – III: GOD OF WISDOM
God experience through wisdom Literature, its origin and growth

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

UNIT – V: LUKE'S GOSPEL
Study of Luke's Gospel in detail – specialty of the gospel – main emphasis of the message – meaning and blessing of suffering and paschal joy in one's life.
Passion – paschal mystery REFERENCES:

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

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
(For the candidatesadmitted from 2015 onwards)
SEMESTER II
Allied 3 :LAPLACE TRANSFORMS, PARTIAL DIFFERENTIAL EQUATIONS AND FOURIER SERIES
(For Physics Students)

Total Hours: 60
Hours/Week: 4   **Code:U15MA2ACT09**
Credits:3   **Marks:100**

OBJECTIVE:

To expose the students to Laplace and inverse Laplace transforms,standard forms of partialdifferentialequations, secondorder linearpartialdifferentialequationswithconstant coefficients and Fourier series and enable them to inculcate the habit ofproblemsolving.

UNIT I :LAPLACETRANSFORMS   **(12HRS)**

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)

UNIT II: INVERSELAPLACETRANSFORMS   **(12HRS)**

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

UNIT III : PARTIALDIFFERENTIALEQUATIONS   **(12HRS)**

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

UNIT IV: SECOND ORDER PARTIAL DIFFERENTIAL EQUATIONS
ANDITSAPPLICATIONS   **(12HRS)**
Second order linear partial differential equations with constant coefficients - Application of second order linear partial differential equations with constant coefficients .

UNIT V:FOURIERSERIES   **(12HRS)**

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

TEXT BOOKS:

1.For Units I,IIandIII

Treatment and content as in Narayanan.S,ManicavachagomPillay.T.K,(2006), <u>CALCULUS –</u> <u>VOLUME III,</u>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 UnitIV**:

Treatment and content as in Venkataraman M.K, <u>ENGINEERING MATHEMATICS</u> <u>(VOLIII),</u>(2006) National publishing company Chennai

3. For UnitV:

Treatment and content as in Narayanan.S,ManicavachagomPillay.T.K,(2006), <u>CALCULUS –</u> <u>VOLUME III,</u>S.Viswanathan (Printers and publishers),Chennai.

Chapter 6 : Sec 1-5.2

REFERENCES:

1Arumugam.S,ThangapandiIssac.A,Somasundaram.A,(2002) <u>ENGINEERINGMATHEMATICS</u><u>Vol III</u> ,SCITECH Publishers, Chennai

2.Zafar Ahsan (2006) <u>DIFFERENTIAL EQUATIONS AND THEIRAPPLICATIONS,</u>Prentice Hall of India Ltd,New Delhi.

3. Narayanan.S,ManicavachagomPillay.T.K,(2006), <u>DIFFERENTIALEQUATIONS,</u>

S.Viswanathan (Printers andpublishers),Chennai.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI - 2
(For the candidates admitted from 2015 onwards)
SEMESTER II
ALLIED 3 - BUSINESS STATISTICS
(For commerce students)

Total Hours: 60

Hours/Week: 4   **Code:U15MA2ACT10**

Credits:3   **Marks:100**

OBJECTIVE:

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

UNIT I: COLLECTION AND PRESENTATIONOFDATA   (12HRS)

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

UNIT II: MEASURES OF AVERAGESANDDISPERSION   (12HRS)

　　　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

UNIT III : CORRELATIONANDREGRESSION   (12HRS)

　　　Correlation - Scatter Diagram - Karl Pearson's Coefficient of Correlation - RankCorrelation - (Correlation of a bivariate frequency distribution and Coefficient of concurrent Deviation to be excluded)

　　　Regression - Properties, Regression lines and problems.

UNIT IV : ANALYSIS OFTIMESERIES   (12HRS)

　　　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)

UNIT V :INDEX NUMBERS   (12HRS)

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

TEXT BOOK:

Treatment and content as in Vittal .P.R (2004) ,<u>BUSINESS STATISTICS</u>Margham Publishers,Chennai.

UNIT I   - Chapters 1 to 4

UNITII   - Chapters 5,6

UNIT III - Chapters 8, 9

UNIT IV - Chapter 12

UNIT V - Chapter 13

REFERENCEBOOKS:

1. R.S.N.Pillai V.Bagavathi (2007), STATISTICS ,S.Chand and Company Ltd. NewDelhi.

2. Arora .S,Sumeet Arora (2002),<u>COMPREHENSIVE STATISTICAL METHODS</u>,S.Chand and   Company Ltd ,NewDelhi.

3.Douglas A.Lind ,William G.Marchall ,Samuel A. Wathen (2003) ,<u>BASIC STATISTICSFOR BUSINESSAND ECONOMICS</u>, Mc Graw Hill, Delhi.

4.Gupta .S.C, Indra Gupta (2004) ,<u>BUSINESS STATISTICS</u> , Himalaya Publishing House , NewDelhi.

5.Gupta .S.P (2006) ,<u>STATISTICAL METHODS,</u> Sultan Chand & Sons ,NewDelhi.

6.Sharma J.K, (2006) <u>BUSINESS STATISTICS,</u> Dorling Kindersley, (India) Pvt Ltd,Licensees of Pearson Education in SouthAsia.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620002
(For the candidates admitted from2015 onwards)
SEMESTER – II
ALLIED-3 APPLIED MATHEMATICS- II
(For BCA & Computer Science students)

Total Hours: 60
Hours/Week: 4   **Code:U15MA2ACT11**
Credits:3   **Marks:100**

OBJECTIVES:
- ➢ To provide an understanding of basic concepts in Operations Research Techniquesfor Analysis and Modeling in computerapplications.
- ➢ To understand, develop and solve mathematical model of linearprogramming, Transportation and assignmentproblems.
- ➢ To understand network modeling for planning and scheduling the projectactivities.

UNIT I: LINEARPROGRAMMINGPROBLEM   **(12HRS)**
Introduction –Mathematical formulation of the Problem – Solving LPP by graphical method – General LPP - Canonical and standard forms – Simplexmethod.
(Simple problems only)

UNIT II:TRANSPORTATIONPROBLEM   **(12HRS)**
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)

UNIT III: ASSIGNMENT PROBLEM   **(12HRS)**
Assignment Problem – Hungarian method – Unbalanced AP – Maximization in AP.

UNIT IV:SEQUENCINGPROBLEM   **(12HRS)**
Introduction – problem of sequencing- Basic terms - Processing n jobs through 2 machines & 3 machines.

UNIT V: NETWORK SCHEDULINGBYPERT/CPM   **(12HRS)**
Introduction – Network Basic components – logical sequencing – Rules of network construction – Concurrent activities - Critical path analysis.

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.

UnitI   : Chapter 2: Sections 2.1 to 2.4 , Chapter 3 : Sections 3.1 to 3.5, Chapter 4: Section4.3

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, NewDelhi.

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 IndiaPrivate Limited, NewDelhi.

5.Sharma J.K.(2007), **OPERATION RESEARCH THEORY &APPLICATIONS**, Macmillan India Limited, Chennai.

Total Hours : 90		**Code : U15TL3TAM03**
Hrs : 6Hrs /Wk		**Marks : 100**
Credit : 3		

நோக்கங்கள்:

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

2. சமூக வாழ்க்கைப் பற்றிய விழிப்புணர்வினைத் தோற்றுவித்தல்

3. ஆன்மீக உணர்வுகளை வலுப்படுத்துதல்

பயன்கள்:

1. காப்பியங்களைப் பயில்வதன் மூலமாக மாணவர்கள் அறக்கருத்துக்களை
உணர்ந்து கொள்ளுதல்.

2. சமூக மாற்றங்களைக் கண்டறிந்து மேம்பாடுகளை உருவாக்கச் செய்தல்

3. கலைநுட்பங்களையும் பண்பாட்டுச் சிறப்புக்களையும் உணர்ந்து கொள்ளச்
செய்தல்

அலகு:1 செய்யுள்

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

அலகு:2 செய்யுள்

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

அலகு:3

தமிழ் இலக்கிய வரலாறு
சோழர் காலம்

அலகு:4

நாடகம்

சத்திய வேள்வி – அய்க்கண்

அலகு:5

கோயிற்கலை   - திட்டக்கட்டுரை, வினாடி வினா

பாட நூல்கள்

1. செய்யுள்   - தமிழ்த்துறை வெளியீடு

2. தமிழ் இலக்கிய வரலாறு   - தமிழ்த்துறை வெளியீடு

3. நாடகம்

அய்க்கண்   -   சத்திய வேள்வி

4. கோயிற்கலை   - தமிழ்த்துறை வெளியீடு

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002
DEPARTMENT OF HINDI
PART – I LANGUAGE HINDI FOR B.A, B.Sc & B.Com
HINDI PAPER-III POETRY, PREDICS, HISTORY OF HINDI LITERATURE
SEMESTER – III

HRS/WEEK: 6   CODE:U15HN3HIN03
CREDITS:3   MARKS :100

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

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

UNIT- III : Bakthi Kaal

UNIT- IV : Poetics

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

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

      Books Prescribed :

        •   NaveenPadhyaRathnakar   – D.B.H.P. Sabha Publishers,Chennai-17
        •   PracheenPadhya Sangrah   – D.B.H.P. Sabha Publishers,Chennai-17
        •   Hindi Sahitya KaSanshitptaItihas   – Rajnath Sharma, AgrwalPublication,
                                                  Uttar Prakash
        •   KavyaPradeep   –   Ram Bahori Shukla, Hindi Bhavan,Illahabad.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2
DEPARTMENT OF FRENCH
SEMESTER III
PART I - LANGUAGE - FRENCH PAPER III [LANGUAGE & CIVILISATION
(ÉCHO A2 2e édition)]
(For candidates admitted 2013 onwards)

HRS/WEEK :6   **CODE : U15FR3FRE03**
CREDIT:3   **MARKS :100**

Unit 1 Vivement demain !
Le futur, la comparaison des qualités, des quantités et des actions – la santé – le travail dans trente ans – la vie quotidienne - l'éducation et la formation (l'enseignement en France) – faire des projets.

Unit 2 Tu as du boulot ?

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

Unit 3 Qu'en pensez-vous?
L'emploi du subjonctif , l'expression de la quantité – revue de presse – entrée en politique – la naissance des départements –la vie politique - l'organisation administrative et politique de la France.

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

Unit 5 On se retrouve

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

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

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

OBJECTIVES

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

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

UNIT II
The Avenger :*Anton Chekov*

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

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

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

BOOKS FOR REFERENCE

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

List of Idioms and Phrases:

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

16. On a fool's errand
17. To be taken aback
18. To storm
19. Trouble spots
20. Flood of humanity

GENERAL ESSAY TOPICS

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

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HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
B.Sc., MATHEMATICS
(For the candidates admitted from2015 onwards)
SEMESTER – III
MAJOR CORE –4: ALGEBRA AND TRIGONOMETRY

Total Hours: 75

Hours/Week: 5   Code:U15MA3MCT04

Credits:5   Marks:100

OBJECTIVES:

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 studentsfamiliar with expansion of trigonometric functions and Hyperbolic functionsfacilitate ways of separating complexfunctions.

ALGEBRA

UNIT I:THEORYOFNUMBERS   **(15HRS)**

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).

UNIT II:SUMMATIONOFSERIES: **(15HRS)**

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

UNIT III:THEORYOFEQUATIONS: **(15HRS)**

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 .

TRIGONOMETRY

UNIT IV: EXPANSIONS OFTRIGONOMETRICFUNCTIONS   **(15HRS)**

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.

UNIT V:HYPERBOLICFUNCTIONS   **(15HRS)**

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

TEXT BOOKS:

1. TREATMENT as in <u>ALGEBRA VOL II</u> by ManicavachagomPillay .T.K ,Natarajan.T, Ganapathy K.S ,(2005),S.Viswanathan (Printers and publishers),Chennai. for UNITI

<u>UNIT I</u>: Chapter 5

2.TREATMENT as in <u>ALGEBRA VOL I</u> by ManicavachagomPillay .T.K , Natarajan.T, Ganapathy K.S ,(2005),S.Viswanathan (Printers and publishers),Chennai. for units II &III

<u>UNIT II</u>: Chapter 3 – Section 10& 14 (Problems only)

        Chapter 4 – Sections 3 and 7 (Problems only)

<u>UNIT III</u>: Chapter 6– Sections 11 – 16,16.1 & 16.2

3.TREATMENT as in <u>TRIGONOMETRY</u> by Narayanan andManicavachagomPillay ,S.Viswanathan (Printers and publishers),Chennai. for UNITS IV &V.

<u>UNITIV</u>:   Chapter III(Formation of equationsexcluded)

<u>UNIT V</u>: Chapter IV, Chapter V - Sections 5 ,5.1&5.2

REFERENCE:

1. Arumugam ,ThangapandiIssac,(2005) <u>THEORY OF EQUATIONSAND TRIGONOMETRY ,</u> New Gamma Publishing House,Delhi.

2. Kandasamy .P.Thilagavathy.K (2006) ,<u>MATHEMATICS</u>Vol- I, S.Chand& Company,

  New0Delhi.

3. Balasubrahmanyam P., Venkatachary P.R. ,VenkataramanG.R.(1992),

 <u>TEXT BOOK ON TRIGONOMETRY </u>Published by ROC House&Sons,Chennai.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
B.Sc., MATHEMATICS
(For the candidates admitted from2015 onwards)
SEMESTER – III
MAJOR CORE 5 – REAL ANALYSIS-I

Total Hours: 75

Hours/Week: 5   Code:U15MA3MCT05

Credits:5   Marks:100

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.

UNIT I : REAL VALUED FUNCTIONS ANDREALSEQUENCES   (15HRS)

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

UNIT II : CONVERGENT ANDDIVERGENTSEQUENCES   (15HRS)

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

UNIT III : SERIES OFREALNUMBERS   (15HRS)

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

UNIT IV: TESTSOFCONVERGENCE   (15HRS)

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

UNIT V:LIMITS , METRIC SPACES ANDCONTINUOUSFUNCTION   (15HRS)

   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.

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 UnitIV:

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

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALI-2
(For the candidates admitted from2015 onwards)
SEMESTER III
ALLIED 4 – WINDOWS ACCESSORIES AND MS – OFFICE
(for B.Sc. Mathematics students)

Total Hours: 60
Hours/Week: 4   **Code:U15MA3AOP12**
Credits:3   **Marks:100**
OBJECTIVE:

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

List of Practicals:

MS- WORD:

- ➢ Text formatting andtable
- ➢ Mailmerge
- ➢ Mathematicalequations
- ➢ Watermarking
- ➢ Create backupfile

MS-POWER POINT

- ➢ Create text and images witheffects
- ➢ Create animation and soundeffects

MS – EXCEL

- ➢ Create pay details ofemployees
- ➢ Calculate student mark details / calculate theCIA
- ➢ Create different type ofcharts.
- ➢ Import external data , sort &filter.

MS-ACCESS

- ➢ Create a database which consist of atleast threetables
- ➢ Queries
- ➢ Formdesign
- ➢ Reportgeneration

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPALLI - 2.
B.Sc., MATHEMATICS
(For the candidates admitted from2015 onwards)
SEMESTER III
SKILL BASED ELECTIVE 3 - APTITUDE MATHEMATICS

Total Hours: 30
Hours/Week: 2   **Code:U15MA3SBT03**
Credits:2   **Marks:100**

OBJECTIVES:

To revise arithmetic facts related to numbers , ratios, percentages,etc .

To practice doing problems of competitive examination quickly.

UNITI: **(6HRS)**

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

UNITII: **(6HRS)**

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

UNITIII: **(6HRS)**

Profit and Loss -Ratio and Proportion

UNITIV: **(6HRS)**

Time and Work – Cisterns and Pipes

UNITV: **(6HRS)**

Time and Distance –Trains-Boats and Streams

TEXT BOOK:

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

UnitI: Chapters 1, 2 and4

UnitII: Chapters 6 , 10, 41 and42

UnitIII: Chapters 11 and 12

UnitIV: Chapters 15 and 16

UnitV: Chapters 17,18 and19

REFERENCE BOOKS:

1. Competition Success Review for Bank Probationary Officer'sExam.

2. Competition Success Review for MBA EntranceExaminations.

3.Any text book on CompetetiveExaminations.

GENDER STUDIES

Hours:1Hr/wk   **CODE:U15WS3GST01**
                                                     CREDITS: 1

Objectives

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

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

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

Unit I

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

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

Unit –III Areas of Gender Discrimination : Family – Sex Ratio – Literacy – Health – Governance – Religion Work Vs Employment – Market – Media – Politics – Law – Domestic Violence – Sexual Harassment – State Politics andPlanning.

Unit – IV Women Development and Gender Empowerment : Initiatives – International Women's Decade – International Women's Year – National Policy for Empowerment of Women – Women Empowerment Year 2001 – Mainstreaming Global Policies.

Unit – V

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

BOOK FOR STUDY

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

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

HRS /WK:1
<div align="right">

CODE: U12VE4LVE02
CREDIT :1
MARKS : 100
</div>

OBJECTIVES:

- To make the learners aware of various Social, Gender issues and CyberCrimes.
- To make them aware of the propertyrights.
- To make them understand and appreciate the role of media, in facing the challengeson various lifeissues.

UNIT – I: GENDER ISSUES

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

UNIT – II: WOMEN AND MEDIA

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

UNIT – III: SOCIAL ISSUES RELATED TO WOMEN

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

UNIT – IV: WAYS OF EMPOWERING WOMEN

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

UNIT – V: CYBER CRIME AGAINST WOMEN

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

REFERENCES:

1. Dr.M.Arumairaj et al., 1999, "Marching towards the Milleniumahead".

2. Thomas Anjugandam, 1999, "Grow Free Live Free" SalesianPublicaiton.

3. H.C PrettiNandhiniUpretti, jaipur 2000 "Women and problems of GenderDiscrimination".

4. Thomas B.Jayaseelan, 2002, "Women: Rights and law" Indian Social Institute, NewDelhi.

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

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

HRS /Wk :1   **CODE:U12VE4LVBO2**
                                                     CREDIT :1
                                                     MARKS : 100

OBJECTIVE:
- Understanding the desires of God through Prophetic revelation and becoming sensitiveto the heart beat ofGod.

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 (Gen12-18);
- Joseph (Gen 37-40); Moses (Exo4-5);
- Joshua (Joshua1-8)

UNIT – II: JUDGES AND KINGS
- **JUDGES:** Deborah (Judges 4); Samson (Judges 6-8); Gideon (Judges13-16)
- **KINGS:** David (I Sam 17-31, II Sam 1-12); Solomon (I Kings 1-11, Proverbs1-5,31)

UNIT – III: WOMEN IN THE BIBLE
- Women in the OldTestament
- Eve (Gen3)
- Ruth (Ruth1-4)
- Hannah (I Sam1:1-28)
- Esther (Esther1-6)

UNIT – IV: MINOR PROPHETS
- Brief Life History and teachingsof
- Amos
- Jonah
- Micah
- Nahum
- Habakkuk

UNIT – V: MAJOR PROPHETS:
- Brief Life History and teachingsof
- Isaiah (Is1,6,11,36-38,40-42,44,50,53,61)
- Jeremiah (Jer1-3,7-12,18-19,23)
- Ezechial (chapters 1,2,3,5,8,12visions)
- Daniel (Daniel1-6)

REFERENCES:

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

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

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

OBJECTIVES:
- To instruct the students to live in relationship withGod.
- To offer God's gift of the HolySpirit.
- To build relationship withJesus.
- To learn Sacraments and Prayer life through which a Christian is able to live inrelationship withChrist.
- To enrich our devotion to Mother Mary andSaints.

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

UNIT – II: PARTICIPATORY CHURCH (AS LAY FAITHFUL) AS A COMMUNITY
Work of the holy Spirit- Salt and leaven in the world "Church of modern World" Church as community – Its important aspect, early Christian Church – People of God as Church- Its characteristic and structure

UNIT – III: THE FUNCTIONARY CHURCH AND I
Ministerial Church – Relating Church –Parish Church- Role of lay faithful in the Church – Its challenges – Church and I.
Sacraments – Initiation- Social – Healing (all the seven) - stress on Confession, Confirmation and Holy Communion - Sacramental: holy "things" used –their sanctity

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

UNIT – V: MARY AND WOMEN IN THE BIBLE- RUTH, ESTHER, JUDITH
Mary as a young virgin- Disciple- Her role in the Catholic Church-Annual feasts-Pilgrimages- Devotion to Mary, Theologies. Saints in the Church- 10 women saints. Ex. Mother Teresa, St.Alphonse.

REFERENCES:

1. "Vatican II Revised" Archbishop Angelo Fernandes Published by X.Diax de Rio S.J. Gujarat Sahitya Prakash, P.O.Box. 70, Gujarat, 388001, India.

2. "The Sacraments The Word of God at the Mercy of theBody" Claretian Publications, Malleswaram, Bangalore560055.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
(For the candidates admitted from2015 onwards)
SEMESTER III
Allied 4(Optional) - APPLIED MATHEMATICS III
(for BCA and B.Sc. Computer Science students)

Total Hours: 60

Hours/Week: 4   **Code:U15MA3AOT13**

Credits:3   **Marks:100**

OBJECTIVES:

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.

UNIT1:MATRICES   **(12HRS)**

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

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

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

UNIT III : SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS
ANDINTERPOLATION   **(12HRS)**

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

UNIT IV : SOLUTION OFSIMULTANEOUSEQUATIONS   **(12HRS)**

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

UNIT V : NUMERICAL INTEGRATION AND SOLUTION OF ORDINARY
DIFFERENTIALEQUATIONS:(12HRS)

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

TEXTBOOKS:

For Units I andII

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 SCIENCEAND 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 :

1. S. Arumugam and A. Thangapandi Isaac MODERN ALGEBRA, Scitech Publications(India) pvt ltdChennai.

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

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

4. ManicavachagomPillay .T.K , Natarajan.T, Ganapathy K.S ,(2005), ALGEBRA VOL II S.Viswanathan (Printers andpublishers),Chennai

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPALLI-2.
(For the candidates admitted from2015 onwards)
SEMESTER III
Allied 4 (Optional)- DIFFERENTIAL CALCULUS AND TRIGONOMETRY
(For B.Sc. Chemistry students)

Total Hours: 60
Hours/Week: 4   **Code:U15MA3AOT14**
Credits:3   **Marks:100**

OBJECTIVES:

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.

UNITI:DIFFERENTIALCALCULUS: **(12HRS)**

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

UNIT II: APPLICATIONSOFDIFFERENTIATION   **(12HRS)**

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

UNIT III:PARTIALDIFFERENTIATION   **(12HRS)**

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

TRIGONOMETRY:

UNIT IV: EXPANSIONS   **(12HRS)**

Expansions of $\text{Cos}n\theta$, $\text{Sin}n\theta$ and $\text{Tan}n\theta$ (n being a positive integer) (formation of equations is excluded)– Expansions of $\text{Sin}^n\theta$ and $\text{Cos}^n\theta$ 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)

UNIT V:HYPERBOLICFUNCTIONS   **(12HRS)**

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

TEXTBOOKS

Units I , II &III

Treatment and Content as in

S. Narayanan and T. K. ManicavachagomPillay,(2009) <u>CALCULUS – VOLUME I</u>

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) <u>TRIGONOMETRY,</u>
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) , <u>MATHEMATICS VOLUME I</u>,S.Chand & Company, New Delhi

2. Arumugam ,Thangapandi Issac,(2005) <u>THEORY OF EQUATIONSAND TRIGONOMETRY ,</u> New Gamma Publishing House,Delhi.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI -2
(Forthe candidates admitted from2015 onwards)
SEMESTER III
Allied 4 : MATHEMATICS FOR COMPETITIVE EXAMINATIONS
(for B.Com Students)

Total Hours: 60
Hours/Week:4   **Code:U15MA3AOT15**
Credits:3   **Marks:100**

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.

UNIT:I   **(12HRS)**

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

UNIT: II   **(12HRS)**

Averages -Percentage - Ratio and proportion.

UNIT: III   **(12HRS)**

Profit and Loss -Time and work – Pipes and Cisterns

UNIT: IV   **(12HRS)**

Time and Distance- Problems involving trains ,boats and streams

UNIT:V   **(12HRS)**

Data analysis – Bar diagram, Pie diagram and Line graphs.

TEXT BOOK:

Aggarwal R.S. (2011), ARITHMETIC (Subjective and Objective) For Competitve Examinations, S.Chand and Company Ltd., Ram Nagar, New Delhi.

UnitI: Chapters 1, 2, 3 and4

UnitII: Chapters 6,10 and12

UnitIII: Chapters 11,15 and16

UnitIV: Chapters 17, 18 and19

UnitV: Chapters 41, 42 and43

REFERENCE BOOKS:

1. Competition Success Review for Bank Probationary Officer'sExam.

2. Competition Success Review for MBA EntranceExaminations.

3.Any text book on CompetetiveExaminations.

4. Arithmetic for Competitive Examinations by V.K. Subburaj.

Total Hours : 75	**Code : U15TL4TAM04**
Hrs : 5Hrs /Wk	**Marks : 100**
Credit : 3	

நோக்கங்கள்:

1. மாணவர்களுக்குத் தமிழர்தம் வாழ்வியல் விழுமியங்களை உணர்த்துதல்.

2. அறநெறிகள் வாழ்க்கைக்கு வழிகாட்டும் விதத்தினை எடுத்துரைத்தல்

3. சிகரம் தொட்ட சாதனையாளரின் வாழ்வியலைப் புலப்படுத்துதல்

4. மொழித்திறன் வளர்த்தல்.

பயன்கள்:

1. வாழ்க்கையின் பல்வகை நிலைகளையும் உணர்ந்து செயல்படச் செய்தல்

2. தன்னைத் தானே நெறிப்படுத்திக்கொள்ள, பயன்பாடடைய இலக்கியம் வழிகாட்டுவதை புரிந்துகொள்ளச் செய்தல்.

3. இடைவிடாத முயற்சியின் வெற்றிப்படிகளைக் கண்டுணர்ந்து மேன்மை அடையச் செய்தல்.

4. இருமொழிப் புலமையை வளர்த்தல்.

அலகு:1 செய்யுள்

1. குறுந்தொகை

1. கொங்கு தேர் வாழ்க்கை அஞ்சிறைத் தும்பி - இறையனார்
2. யாரும் இல்லை தானே கள்வன் - கபிலர்
3. வேம்பின் பைங்காய்என் தோழி தரினே – மிளைக் கந்தன்
4. உள்ளது சிதைப்போர் உளரெனப் படாஅர் - பாலை பாடிய
   <div align="right">பெருங்கடுங்கோ</div>
5. நோற்றோர் மன்ற தோழி – குறுங்குடி மருதன்

2. நற்றிணை

1. மனையுறை புறவின் செங்கால் பேடை
2. நீள்மலைக் கலித்த பெருங்கோர் குறிஞ்சி - பாண்டியன் மாறன் வழுதி
3. ஆய்மலர் மழைக்கண் தெண்பனி உறைப்பவும் - நல்விளக்கனார்
4. சிறுவீ முல்லைப் பெரிது கமழ் அலரி - மதுரை பேராலவாயர்

3. கலித்தொகை

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

அலகு:2   செய்யுள்

4.புறநானூறு

1. நின் நயந்து உறைநர்க்கும் - பெருஞ்சித்திரனார்
2. காய்நெல் அறுத்துக் கவளம் கொளினே - பிசிராந்தையார்
3. படைப்புப் பலபடைத்து -   பாண்டியன் அறிவுடைநம்பி
4. கேட்டல் மாத்திரை – கோப்பெருஞ்சோழன்
5. ஈன்று புறந்தருதல் என்தலைக் கடனே - பொன்முடியார்

5. பதிற்றுப்பத்து - ஐந்தாம் பத்து

1. சுடர் வீ வேங்கை
2. தசும்பு துளங்கு இருக்கை
3. ஊன்துவை அடிசில்

6. திருக்குறள்

1. அறத்துப்பால் - இனியவை கூறல்
2. பொருட்பால்   - வினை செயல்வகை
3. காமத்துப்பால் - புலவி நுணுக்கம்

அலகு:3

தமிழ் இலக்கிய வரலாறு (துறை வெளியீடு)

சங்ககாலம் - சங்கம் மருவியகாலம்

எட்டுத்தொகை, பத்துப்பாட்டு, பதினெண்கீழ்க்கணக்கு நூல்கள்

அலகு:4

வாழ்க்கை வரலாறு

அன்னை தெரசா   - பா. தீனதயாளன்

அலகு:5

பொது– மொழிபெயர்ப்பு

பாட நூல்கள்

1. செய்யுள் நூல்   - தமிழாய்வுத்துறை வெளியீடு
2. தமிழ் இலக்கிய வரலாறு   - தமிழாய்வுத்துறை வெளியீடு
3. **வாழ்க்கை வரலாறு**

பா.தீனதயாளன்   - அன்னை தெரசா

4. மொழிபெயர்ப்பு   - தமிழாய்வுத்துறை வெளியீடு

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI-620002
DEPARTMENT OF HINDI
PART – I LANGUAGE HINDI FOR B.A, B.Sc & B.Com HINDI PAPER-IV
FUNCTIONAL HINDI &TRANSLATION SEMESTER –IV

HRS/WEEK: 5   **CODE:U15HN4HIN04**
CREDITS:3   **MARKS :100**

UNIT–I   Functional Hindi

UNIT-II   Adhunic Kaal

UNIT- III GeneralEssays

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

UNIT-IV   LetterWriting

UNIT-V Anuvad Abhyas - III Books Prescribed:

       ☐   GeneralEssays   - D.B.H.P. Sabha Publishers,Chennai-17
       ☐   AbinavaPatra Lekhan   - D.B.H.P. Sabha Publishers,Chennai-17
       ☐   AnuvadAbhyas   –   III   - D.B.H.P. Sabha Publishers,Chennai-17

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

HRS/WEEK :5   **CODE : U15FR4FRE04**
CREDIT:3   **MARKS :100**

Unit 1 C'est la fête !

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

Unit 2 Vous plaisantez !
Le conditionnel présent, la distinction du futur et du conditionnel – le mouvement en général – raconter une anecdote – journée de détente – la naissance d'un chef d'œuvre - l'art au début du 20ᵉ siècle – le plaisir de jeux de mots.

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

Unit 4 À vos risqué et périls !

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

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

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

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

HOURS – 6 PER WEEK   **CREDIT : 3**
                                                                          CODE :U13EL4GEN04

OBJECTIVES

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

To develop skills required for referential and independent learning.

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

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

UNIT I: READ AND COMMUNICATE: HISTORICAL SKETCHES
The Renaissance
India under the British Raj
UNIT II: READ AND COMMUNICATE : MODERN FABLES
Nonchi Nona and Kotiya the Cat
The Competition
UNIT III: READ AND COMMUNICATE : MODERN FABLES
The Nightingale and the Rose
The Butterfly that Stamped
UNIT IV -READ AND COMMUNICATE : BIOGRAPHIES AND MODERN FABLES
Napoleon Bonaparte
The Hiding Place

UNIT V
GRAMMAR   - Tenses
COMPREHENSION   - General
COMPOSITION   - 1. Note making
                                    2. Dialogue
                                    3. Creative Writing
                                    4. Narrative Writing
                                    5. Imaginative Writing
GENERAL ESSAY – 5 TOPICS
1. Should capital punishment be abolished?
2. Is a corruption- free India a dream?
3. The nuclear family and its consequent changes in society.
4. The threat of terrorism.
5. If man becomes immortal…
THINK BETTER - READ AND COMMUNICATE : MODERN FABLES
1 – 10 for Internal Testing
BOOKS FOR REFERENCE
Oranee Jansz : EXPLORATIONS *A Course in reading, thinking and communication skills*.   New delhi: Cambridge university press. 2004. Print.
*****
List of words \ compound words\phrases for making sentences:
1. Store house of knowledge
2. Genre

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

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI -620002
B.Sc., MATHEMATICS
(Forthe candidates admitted from2015 onwards)
SEMESTER IV
MAJOR CORE – 6: MODERN ALGEBRA I

Total Hours: 75
Hours/Week: 5   **Code:U15MA4MCT06**
Credits:5   **Marks:100**

OBJECTIVE:

To make the students understand the concept of relations and mappings, characteristics of Algebraic structures like Groups, Rings .

UNIT I: RELATIONSANDMAPPINGS   **(15HRS)**

Relations - Equivalence Relations - Partial order - Functions - Binary Operations.

UNITII: GROUPS   **(15HRS)**

Introduction - Definition and Examples - Elementary Properties of a Group - Equivalent Definitions of a Group - Permutation groups - Subgroups.

UNIT III:GROUPS(CONTD)   **(15HRS)**

Cyclic Groups -Order of an element - Cosets and Lagrange's Theorem - Normal Subgroups and Quotient Groups - Isomorphism - Homomorphisms.

UNITIV:RINGS   **(15HRS)**

Definition and examples - Elementary properties of rings - Isomorphism -Types of rings - Characteristic of a ring - Sub rings

UNIT V:RINGS(CONTD)   **(15HRS)**

Ideals - Quotient rings- Maximal and Prime ideals - Homomorphism of rings

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, NewDelhi

3. R. Balakrishnan & N. Ramabadran, A TEXT BOOK OF MODERNALGEBRA.

4. M.L. Santiago ,MODERN ALGEBRA, , Tata McGraw-Hill Publishing Co. Ltd,2001.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI - 620002.
B.SC. MATHEMATICS
(For the candidates admitted from2015 onwards)
SEMESTER IV
MAJOR ELECTIVE– 1: NUMERICAL METHODS

Total Hours: 75
Hours/Week: 5   **Code:U15MA4MET01**
Credits:5   **Marks:100**

OBJECTIVE:

   To make the students know about different methods of solving numerical equations and differential equations, methods of interpolation and numerical differentiation andintegration.

UNITI: **(15HRS)**

SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS:

   Introduction - Bisection Method - The Method of False Position -Iteration Method - Newton - Raphson Method.

UNIT II: SOLUTION OF LINEAR SYSTEMSOFEQUATIONS: **(15HRS)**

   Introduction - Gaussian elimination,Gauss – Jordan, Gauss -Seidel and Gauss Jacobi methods.

UNITIII: **(15HRS)**

NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS:

   Introduction – Boundary Value Problems, Finite – Difference Method, Solution by Taylor's series , Euler's method , Modified Euler's method , Runge-Kutta method .

UNITIV:INTERPOLATION   **(15HRS)**

   Introduction -Finite Differences , Forward and Backward differences only , Newton's formula for interpolation ,Interpolation formulae , Interpolation with unevenly spaced points , Lagrange's interpolation formula.

UNIT V: NUMERICAL DIFFERENTIATIONANDINTEGRATION: **(15HRS)**

   Introduction - Numerical differentiation , Maximum and minimum values of a tabulated function, Numerical integration – Trapezoidal rule , Simpson's 1/3-rule.

TEXT BOOK

S.S.Sastry , , <u>INTRODUCTORY METHODS OF NUMERICAL ANALYSIS</u> , New Age Publishing Company, Fourth edition, April 1995.

UNITI   : Chapter 2 - Sec. 2.1 to2.5

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) ,<u>ENGINEERING MATHEMATICS ,NUMERICAL METHODS</u>-MeenakshiPublishers ,Chennai

2.S. Arumugam, A. Thangapandi Isaac & A. Somasundaram<u>NUMERICAL METHODS</u> Scitech Publishers ,Chennai

3.Dr. M.K. Venkataraman , NUMERICAL METHODS IN SCIENCE AND ENGINEERING,National Publishing House, Chennai

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
B.Sc., MATHEMATICS
(For the candidates admitted from 2015 onwards)
SEMESTER – IV
MAJOR ELECTIVE1   - COMBINATORICS

Total Hours: 75
 Hours/Week: 5   **Code:U15MA4MET04**
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

UNIT I : INTRODUCTIONSTOCOMBINATORICS   **(15HRS)**

        Basic counting principles, Permutations and Combinations (with and without repetitions), Binomial theorem, Multinomial theorem,Counting subsets, Set-partitions, Stirling numbers

UNIT II:INCLUSIONANDEXCLUSION   **(15HRS)**

        Principle of Inclusion and Exclusion, Derangements, InversionFormulae.

UNITIII:GENERATINGFUNCTIONS   **(15HRS)**

        Generating functions: Algebra of formal power series, Generating function models, Calculating generating functions, Exponential generating functions.

UNITIV:RECURRENCERELATIONS   **(15HRS)**

        Recurrence relations: Recurrence relation models, Divide andconquer relations, Solution of recurrence relations, Solutions by generating functions

UNITV:INTEGERPARTITIONS   **(15HRS)**

        Integer partitions, Systems of distinct representatives.

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(2ndEd.)
2. Krishnamurthy, V.: "*Combinatorics: Theory and Applications*", Affiliated East-WestPress
3. Cameron,P.   J.:"*Combinatorics:Topics,   Techniques,   Algorithms*", Cambridge UniversityPress
4. Hall, M. Jr.: "*Combinatorial Theory*", John Wiley & Sons (2ndEd.)
5. Brualdi, R. A.: "*Introductory Combinatorics*", Pearson Education Inc. (5thEd.)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
B.Sc., MATHEMATICS
(For the candidates admitted from 2015 onwards)
SEMESTER – IV
MAJOR ELECTIVE 1   - MATHEMATICALMODELLING

Total Hours: 75
Hours/Week: 5   **Code:U15MA4MET05**
Credits:5   **Marks:100**

GENERAL OBJECTIVE:

　　　　To study the mathematical models through ode and differenceequations and train the students to develop mathematical models in real lifeproblems.

UNIT   I   :MATHEMATICAL   MODELLING   THROUGH   ORDINARY DIFFERENTIAL EQUATIONS   (15HRS)

　Linear Growth and Decay Models – Non-Linear Growth and Decay Models – Compartment Models – Dynamic problems – Geometricalproblems.

UNIT II:MATHEMATICAL MODELLING THROUGH SYSTEMS OF ORDINARY DIFFERENTIAL EQUATIONS OFFIRSTORDER   (15HRS)

　Population Dynamics – Epidemics – Compartment Models – Economics – Medicine, Arms Race, Battles and International Trade – Dynamics.

UNIT III:MATHEMATICAL MODELLING THROUGH ORDINARYDIFFERENTIAL EQUATIONS OFSECONDORDER   (15HRS)

　Planetary Motions – Circular Motion and Motion of Satellites – Mathematical Modelling through Linear Differential Equations of Second Order – Miscellaneous MathematicalModels.

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

UNIT V:MATHEMATICAL MODELLINGTHROUGHGRAPHS   (15HRS)

Solutions that can be Modelled Through Graphs – Mathematical Modelling in Terms of Directed Graphs, Signed Graphs, Weighted Digraphs and Unoriented Graphs.

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

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALI-620002
B.SC.,MATHEMATICS
(For the candidates admitted from2015 onwards)
SEMESTER IV
ALLIED 5: INTERNET AND WEB DESIGNING

Total Hours: 60
Hours/Week: 4   **Code:U15MA4AOT16**
Credits:4   **Marks:100**

OBJECTIVE: To enable the students to understand the basic concepts of internet and hypertext markup language.

UNITI: **(12HRS)**

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.

UNITII: **(12HRS)**
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.

UNITIII: **(12HRS)**
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.

UNITIV: **(12HRS)**

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.

UNITV: **(12HRS)**

FRAMES:

       Frameset Definition – Frame Definition - Nested Framesets.

FORMS:

       Action Attribute – Method Attribute – Ectypes Attribute – Dropdown List – Sample Forms.

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.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPALLI - 620002.
B.SC., MATHEMATICS
(For the candidates admitted from2015 onwards)
SEMESTER IV
ALLIED 6: PROGRAMMING IN C

Total Hours: 60

Hours/Week: 4   **Code:U15MA4AOT19**

Credits:3   **Marks:100**

OBJECTIVES:

To introduce the concepts of C language which will enable them to write programmes for numerical methods.

UNIT-I:INTRODUCTION   **(12HRS)**

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.

UNIT - II: DECISION MAKING ANDCONTROLSTATEMENTS   **(12HRS)**

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.

UNIT -III:ARRAYS   **(12HRS)**

Arrays - one dimensional, two dimensional, multi dimensional arrays

UNIT - IV: USERDEFINEDFUNCTIONS   **(12HRS)**

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.

UNIT - V:FILEMANAGEMENT   **(12HRS)**

File management - Defining and opening a file - Closing a file - I/O operations on files

TEXT BOOK

E. Balagurusamy. <u>PROGRAMMING IN ANSI C</u> 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 ,<u>PROGRAMMING IN C</u> - Schaum's Series

Annexure:

1. Solution of QuadraticEquation
2. Sum of Natural numbers , Squares of natural mumbers , even and oddnumbers.
3. Finding the sum of odd numbers and even numbers from the given list ofnumbers.
4. Finding the biggest and smallest element in anarray.
5. Arranging the numbers in ascending and descendingorder
6. Arranging names in alphabeticalorder.
7. Addition , subtraction and multiplication ofmatrices.
8. PayrollProcessing
9. Finding factorial of a given number and nPr andnCr.
10. Students result processing usingfiles.

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

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

OBJECTIVES:

- To make the learners aware of various Social, Gender issues and CyberCrimes.
- To make them aware of the propertyrights.
- To make them understand and appreciate the role of media, in facing the challengeson various lifeissues.

UNIT – I: GENDER ISSUES

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

UNIT – II: WOMEN AND MEDIA

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

UNIT – III: SOCIAL ISSUES RELATED TO WOMEN

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

UNIT – IV: WAYS OF EMPOWERING WOMEN

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

UNIT – V: CYBER CRIME AGAINST WOMEN

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

REFERENCES:

1. Dr.M.Arumairaj et al., 1999, "Marching towards the Milleniumahead".

2. Thomas Anjugandam, 1999, "Grow Free Live Free" SalesianPublicaiton.

3. H.C PrettiNandhiniUpretti, jaipur 2000 "Women and problems of GenderDiscrimination".

4. Thomas B.Jayaseelan, 2002, "Women: Rights and law" Indian Social Institute, NewDelhi.

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

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

HRS /Wk :1   **CODE:U12VE4LVBO2**
                                                                 CREDIT :1
                                                                 MARKS : 100

OBJECTIVE:
- Understanding the desires of God through Prophetic revelation and becoming sensitiveto the heart beat ofGod.

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 (Gen12-18);
- Joseph (Gen 37-40); Moses (Exo4-5);
- Joshua (Joshua1-8)

UNIT – II: JUDGES AND KINGS
- **JUDGES:** Deborah (Judges 4); Samson (Judges 6-8); Gideon (Judges13-16)
- **KINGS:** David (I Sam 17-31, II Sam 1-12); Solomon (I Kings 1-11, Proverbs1-5,31)

UNIT – III: WOMEN IN THE BIBLE
- Women in the OldTestament
- Eve (Gen3)
- Ruth (Ruth1-4)
- Hannah (I Sam1:1-28)
- Esther (Esther1-6)

UNIT – IV: MINOR PROPHETS
- Brief Life History and teachingsof
- Amos
- Jonah
- Micah
- Nahum
- Habakkuk

UNIT – V: MAJOR PROPHETS:
- Brief Life History and teachingsof
- Isaiah (Is1,6,11,36-38,40-42,44,50,53,61)
- Jeremiah (Jer1-3,7-12,18-19,23)
- Ezechial (chapters 1,2,3,5,8,12visions)
- Daniel (Daniel1-6)

REFERENCES:

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

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

HRS / WK:1

CODE : U12VE4LVC02
CREDIT : 1
MARKS : 100

OBJECTIVES:
- To instruct the students to live in relationship withGod.
- To offer God's gift of the HolySpirit.
- To build relationship withJesus.
- To learn Sacraments and Prayer life through which a Christian is able to live inrelationship withChrist.
- To enrich our devotion to Mother Mary andSaints.

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

UNIT – II: PARTICIPATORY CHURCH (AS LAY FAITHFUL) AS A COMMUNITY
Work of the holy Spirit- Salt and leaven in the world "Church of modern World" Church as community – Its important aspect, early Christian Church – People of God as Church- Its characteristic and structure

UNIT – III: THE FUNCTIONARY CHURCH AND I
Ministerial Church – Relating Church –Parish Church- Role of lay faithful in the Church – Its challenges – Church and I.
Sacraments – Initiation- Social – Healing (all the seven) - stress on Confession, Confirmation and Holy Communion - Sacramental: holy "things" used –their sanctity

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

UNIT – V: MARY AND WOMEN IN THE BIBLE- RUTH, ESTHER, JUDITH
Mary as a young virgin- Disciple- Her role in the Catholic Church-Annual feasts-Pilgrimages- Devotion to Mary, Theologies. Saints in the Church- 10 women saints. Ex. Mother Teresa, St.Alphonse.

REFERENCES:

1. "Vatican II Revised" Archbishop Angelo Fernandes Published by X.Diax de Rio S.J. Gujarat Sahitya Prakash, P.O.Box. 70, Gujarat, 388001, India.

2. "The Sacraments The Word of God at the Mercy of theBody" Claretian Publications, Malleswaram, Bangalore560055.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
(For the candidates admitted from2015 onwards)
SEMESTER IV
ALLIED 5: ALGEBRA AND INTEGRAL CALCULUS
(For Chemistry students)

Total Hours: 60
Hours/Week: 4   **Code:U15MA4AOT17**
Credits:4   **Marks:100**

OBJECTIVES:

To make the students understandmatrices, some methods of solving equations, the methods of integration and reduction formulae,

UNITI: MATRICES (12HRS)

Types of matrices,operations between matrices,matrix inversion method of solving equations.

UNIT II: RANK OF AMATRIX (12HRS)

Rank of a matrix, consistency in system of equations and solution using rank. (onlystatement of conditions and simple problems)

UNIT III: INTRODUCTION TOGROUPTHEORY (12HRS)

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)

UNITIV:INTEGRATION (12HRS)

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.

UNITV:REDUCTIONFORMULAE **(12HRS)**

Formulae to evaluate $\int\limits_{0}^{\frac{\pi}{2}^{--}}\sin^{n}x\,dx$, $\int\limits_{0}^{\frac{\pi}{2}}\cos^{n}x\,dx$, $\int\limits_{0}^{\frac{\pi}{2}}\sin^{m}x\cos^{n}x\,dx$. Properties of definite

integrals

TEXT BOOKS
For UNITS I & II

T.K. ManicavachagomPillay,T.Natarajan&K S Ganapathy (2008), "ALGEBRA, Volume II", ViswanathanPublishers,Chennai

UNIT I Chapter 2:Sections 1-8 &10

UNIT IIChapter 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. ManicavachagomPillay, (2009) Calculus – Volume II by S. Viswanathan Printers & Publishers Pvt. Ltd.

UNIT IVChapter 1: Section 8 Cases (i)-(iii), Section12, 15.1

UNIT VChapter 1: Sections 8 13.3-13.5, 11

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
(For the candidates admitted from 2015 onwards)
SEMESTER – IV
Allied 5 - DECISION MAKING TECHNIQUES.

Total Hours: 60
Hours/Week: 4   **Code:U15MA4AOT18**
Credits:4   **Marks:100**

UnitI :   **(12HRS)**

Introduction to Linear Programming Problem – Mathematical formulation – Graphical Solution Method.Definitions of objective functions,constraints,non negativerestrictions,solution,feasible solution and optimal solution

UnitII: **(12HRS)**

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.

UnitIII: **(12HRS)**

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.

UnitIV: **(12HRS)**

Inventory Control – Types of inventory – Economic order quantity – Deterministic inventory problem (with and without shortages(instantaneous replenishment only))– EOQ problem with price breaks.

UnitV: **(12HRS)**

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) 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 andD.S.Hira

2.Operations Research by Hamdy, Taha ,PremaPublishers,1995,Bangalore

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
(For the candidates admitted from2015 onwards)
SEMESTER IV
ALLIED 6 : ANALYTICAL GEOMETRY OF THREE DIMENSIONS, VECTOR
CALCULUS AND DIFFERENTIAL EQUATIONS
(For Chemistry students)

Total Hours: 60
Hours/Week: 4   **Code:U15MA4AOT20**
Credits:3   **Marks:100**

OBJECTIVES:

To make the students understand the concepts of three dimensional geometry , linear ordinary differential equations and vector differentiation and integration.

UNITI:PLANES   **(12HRS)**

The Plane – the general equation of the plane – Standard forms of equations of planes.

UNIT II:COPLANARLINES   **(12HRS)**

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.

UNITIII: DIFFERENTIALEQUATIONS   **(12HRS)**

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.

UNIT IV:VECTORDIFFERENTIATION   **(12HRS)**

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

UNIT V:VECTORINTEGRATION   **(12HRS)**

Line integral – Surface integral – Volume integral.

TEXT BOOKS

For UNITS I & II:

Treatment and content as in

1.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. ManicavachagomPillay(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)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
(For the candidates admitted from 2015 onwards)
SEMESTER – IV
Allied Optional 6 - Numerical Methods and TestingHypothesis

Total Hours: 60
Hours/Week: 4   **Code:U15MA4AOT21**
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

UNIT I: ALGEBRAIC ANDTRANSCENDENTALEQUATIONS   (12HRS)

Introduction to Numerical analysis .(Excluding Error concepts.) Solving algebraic and transcendental equations – Bisection Method- Method of False position,Newton-Raphson method.

UNITII: INTERPOLATION: (12HRS)

Newton Gregory forward and backward interpolation formulae-Lagrange's Interpolation formula.

UNIT:III   (12HRS)

 NUMERICAL DIFFERENTIATION AND NUMERICAL INTEGRATION

Introduction - Numerical differentiation - Maximum and minimum values of a tabulated function - Numerical integration – Trapezoidal rule - Simpson's 1/3-rule.

UNITIV: (12HRS)

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 contingencytable.

UNITV: (12HRS)

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

1 .S.S.SASTRY ,<u>INTRODUCTORY METHODS OF NUMERICAL ANALYSIS</u>"(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.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPALLI - 620002.
B.SC. MATHEMATICS
(For the candidates admitted from2015 onwards)
SEMESTER V
MAJOR CORE- 7: MODERN ALGEBRA II

Total Hours: 75
Hours/Week: 5   **Code:U15MA5MCT07**
Credits:4   **Marks:100**

OBJECTIVE:

To study vector spaces as an abstract algebraic system and establish some of the properties of such systems.

UNIT I:VECTORSPACES   **(15HRS)**

Definition and examples - Subspaces - Linear transformation - Span of a set - Linear Independence .

UNIT II: VECTOR SPACES(CONTN)   **(15HRS)**

Basis and dimension – Rank and nullity-Matrix of a Linear Transformation.

UNIT III: INNERPRODUCTSPACES   **(15HRS)**

Definition and examples of inner product spaces- Orthogonality-Orthogonalcomplement.

UNIT IV: THEORYOFMATRICES   **(15HRS)**

Types of Matrices- Inverse of a matrix- Elementary Transformation- Rank of a Matrix-Consistency of system of non-homogenous linear equation- Simultaneous Linear Equations

UNIT V: THEORYOFMATRICES(CONTN)   **(15HRS)**

Characteristic Equation - - Cayley Hamilton Theorem and its application -Eigen Values and Eigen Vectors .

TEXT BOOK

S. Arumugam, A. Thangapandi Isaac, " MODERN ALGEBRA" (August 2003), Scitech Publications (India) Pvt .Ltd.Chennai.

UNIT I: (Chapter 5 - Sec 5.1 to 5.5)

UNIT II: (Chapter 5 - Sec 5.6 to 5.8)

UNIT III: (Chapter 6 - Sec 6.1 to6.3)

UNIT IV: (Chapter 7 –Sec 7.2 to 7.6)

UNIT V: (Chapter 7 –Sec 7.7 and 7.8)

REFERENCE BOOKS

1. Shanti Narayanan, <u>A TEXT BOOK OF MODERN ABSTRACTALGEBRA</u>,Margam

    Publishers.

2. A.R. Vasishtha, Modern Algebra, Krishna Prakashan Media(P) Ltd,2014.

3. K. Sivasubramanian, <u>MODERN ALGEBRA</u> ,Allied publishers, NewDelhi

4. R. Balakrishnan & N. Ramabadran, <u>A TEXT BOOK OF MODERNALGEBRA</u>.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPALLI - 620002.
B.SC. MATHEMATICS
(For the candidates admitted from 2015 onwards)
SEMESTER V
MAJOR CORE- 8: OPTIMIZATION TECHNIQUES

Total Hours: 75
Hours/Week: 5   **Code:U15MA5MCT08**
Credits:4   **Marks:100**

OBJECTIVE:

       To enable the students to convert any real life situation into a mathematical model and solve them using an appropriate algorithm.

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.

 UNIT II : ARTIFICIAL VARIABLES ANDSEQUENCINGPROBLEM   (15HRS)

        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 kmachines

 UNIT III : TRANSPORTATION PROBLEM AND ASSIGNMENT PROBLEM

(15 HRS)

       Transportation Problem - Initial basic feasible solution - Northwest 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

 UNIT IV:INVENTORYCONTROL   **(15HRS)**

       Types of inventory - Economic order quantity - Deterministic inventory problems with shortages - Deterministic inventory problems without shortages - Problems of EOQ with price breaks.

UNIT V:NETWORKSCHEDULING **(15HRS)**

Introduction to network problems-Network scheduling by CPM and PERT .

TEXT BOOK :

Kanti Swarup,P.K.Gupta& Man Mohan, (2009), <u>OPERATIONS RESEARCH</u> ,

UNIT - I - Chapters 2 ,Chapter 3 : 3.1 -3.5 ,Chapter 4: 4.1-4.3

UNIT II- Chapter 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 - 11.4

UNIT IV - Chapter 19: 19.1 - 19:12

UNIT V - Chapter 25 ,

REFERENCE:

1. H. Taha,<u>OPERATIONS RESEARCH</u> ,Prentice Hall of India, IVEdition.

2. P. K. Gupta, D. S. Hira, <u>PROBLEMS IN OPERATIONS RESEARCH</u>, S.Chand,

New Delhi,(2001).

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPALLI - 2.
B.SC. MATHEMATICS
(Forthe candidates admitted from2015 onwards)
SEMESTER V
MAJOR CORE - 9: GRAPH THEORY

Total Hours: 75

Hours/Week: 5   **Code:U15MA5MCT09**

Credits:4   **Marks:100**

OBJECTIVES:

To understand the concepts of graph theory as an application of mathematics in information technology related fields.

UNIT I : INTRODUCTION AND OPERATIONSONGRAPHS.   **(15HRS)**

Introduction- graphs and subgraphs-isomorphism- Independent sets and coverings - Matrices - Operations on graphs.

UNIT II : CHARACTERISTICSOFGRAPH   **(15HRS)**

Degree sequence-graphic sequences-walks, trails and paths-connectedness & components-blocks-connectivity.

UNIT III:SPECIALGRAPHS   **(15HRS)**

Eulerian and Hamiltonian graphs and trees.

UNIT IV :DIRECTEDGRAPHS   **(15HRS)**

Introduction – Definitions and Basic Concepts –Paths and Connections –Digraphs andMatrices –Tournaments .

UNIT V : APPLICATIONS OFGRAPH THEORY   **(15HRS)**

Introduction –Connector Problem –Shortest Path Problem –Transformation and kinematic Graph –Designing One Way Traffic System – Applications - The travelling salesman problem – Job sequencing problem.

TEXT BOOK

Dr.S.Arumugam and Dr.S.Ramachandran<u>TREATMENT AS IN "INVITATION TO GRAPHTHEORY"</u> by 1994edition.

UNIT I : Chapters 1 and 2(omit section 2.5&2.7)

UNIT II : Chapters 3 and4

UNIT III : Chapter 5 and 6

UNIT IV : Chapter 10

UNIT V : Chapter 11

REFERENCE BOOKS:

1. Harary ,<u>GRAPH THEORY</u>, Narosa Publishing House ,NewDelhi,

2. NarsinghDeo, <u>GRAPH THEORY WITH APPLICATIONS TO ENGINEEERINGAND COMPUTER SCIENCE</u> Prentice Hall of India, NewDelhi.

HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002.
B.Sc., MATHEMATICS
(Forthe candidates admitted from2015 onwards)
SEMESTER – V
MAJOR CORE – 10 : REAL ANALYSIS - II

Total Hours: 75

Hours/Week: 5   **Code:U15MA5MCT10**

Credits:4   **Marks:100**

OBJECTIVES:

 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.

UNIT I : OPEN , CLOSED SETS   **(15 HRS)**

   Open sets - Closed sets – More about open sets

UNIT II : CONNECTED AND BOUNDED SETS   **(15 HRS)**

   Connected sets - Bounded and totally bounded sets

UNIT III : COMPLETENESS , COMPACTNESS AND UNIFORM CONTINUITY

                                                         (15 HRS)

   Complete metric space , Compact metric spaces – Uniform Continuity .

UNIT IV: DERIVATIVES   **(15HRS)**

   Derivatives - Rolle's theorem - The law of the mean – Fundamental theorem of calculus- Taylor's Theorem.

UNIT V :RIEMANNINTEGRAL   **(15HRS)**

   Definition of the Riemann Integral – Existence and Properties of the Riemann Integral – Improper integrals.

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. NewDelhi.

4. Shanthi Narayan 'A COURSE OF MATHEMATICAL ANALYSIS'"Margaum Publishers

5. Tom Apostol, 'MATHEMATICAL ANALYSIS', Narosa Publishing House, New Delhi, 1985.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
B.SC., MATHEMATICS
(Forthe candidates admitted from2015 onwards)
SEMESTER V
MAJOR ELECTIVE-2: MECHANICS

Total Hours: 75

Hours/Week: 5   Code:U15MA5MET02

Credits:5   Marks:100

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

UNIT : I EQUILIBRIUMOFFORCES   **(15HRS)**

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.

UNIT: IIPARALLELFORCES   **(15HRS)**

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.

UNIT III : EQUILIBRIUMOFSTRINGS   **(15HRS)**

Equilibrium of strings – Common catenary equations – tension at any point – geometrical properties – Parabolic catenary – Suspension Bridge.

UNIT IV :PROJECTILE ONHORIZONALPLANE   **(15HRS)**

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.

UNIT V: IMPULSIVE FORCES &COLLISION OFELASTICBODIES   **(15HRS)**

Impulsive forces – Impact of two bodies – Motion of a shot and gun – Collision of elastic bodies – Fundamental laws of impact – Impact of a smooth sphere on a fixed plane – Direct impact – Oblique impact – Simple problems.

TEXT BOOKS

<u>TREATMENT AS IN</u>

Dr. M.K. Venkataraman, <u>STATICS,</u>Agasthiar Publications, Trichy (2013).

Unit: I - Chapters 1 & 2

Unit: II – Chapters 3

Unit: III – Chapter 11

Dr. M.K. Venkataraman.(2008), <u>DYNAMICS,</u>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

REFERENCE BOOKS:

1.   A.V. Dharmapadam <u>STATICS ,</u> VISWANATHAN PUBLISHERS,CHENNAI

2.   Raisinghania M.D (2006).., <u>DYNAMICS</u> S.Chand &Company Ltd, NewDelhi.

3.   Venkatachalapathy.S.G (2002), <u>MECHANICS,</u> MarghamPublication,Chennai.

4.   Viswanatha Naik .K , Kasi M.S (2001) ,<u>DYNAMICS,</u> Emerald Publishers,Chennai.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620 002.
B.SC., MATHEMATICS
(For the candidates admitted from2015 onwards)
SEMESTER V
MAJOR ELECTIVE-2: ASTRONOMY

Total Hours: 75
Hours/Week: 5   **Code:U15MA5MET06**
Credits:5   **Marks:100**

OBJECTIVE:

   To enable the students to know about the exciting world of astronomy and help them to study spherical trigonometry in the field ofastronomy. To understand the movements of the celestialobjects .

UNIT:I   SPHERE   **(15HRS)**

   Relevant properties of sphere and formulae in spherical trigonometry (no proof, no problems) - Celestial sphere and diurnal motion -Celestial coordinates-sidereal time.

UNIT: II   STARS   **(15HRS)**

   Morning and evening stars -circumpolar stars- diagram of the celestial sphere - zones of earth -perpetual day-dip ofhorizon-twilight.

UNITIII: REFRACTION   **(15HRS)**

   Refraction - laws of refraction -tangent formula-Cassini's formula - horizontal refraction- geocentric parallax -horizontal parallax.

UNITIV: KEPLER'S LAWS   **(15HRS)**

   Kepler's laws - verification of 1st and 2nd laws in the case of earth - Anomalies -Kepler's equation - Seasons -causes -kinds of years.

UNIT V :   MOON   **(15HRS)**

   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.

TEXT BOOKS

<u>TREATMENT AS IN</u>

Kumaravel,S.andSusheela Kumaravel,*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.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPALLI - 620002.
III UG
(For the candidates admitted from2015 onwards)
SEMESTER V
NON MAJOR ELECTIVE – 1: QUICK MATHEMATICS

Total Hours: 30
Hours/Week: 2   **Code:U15MA5NMT01**
Credits:2   **Marks:100**

OBJECTIVES:

   To revise arithmetic facts related to numbers , ratios, percentages, etc .To practice doing problems of competitive examination quickly.

UNITI: **(6HRS)**

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

UNITII: **(6HRS)**

   Averages-Percentage

 UNITIII: **(6HRS)**

   Profit and Loss -Ratio and Proportion

UNITIV: **(6HRS)**

   Time and Work – Cisterns and Pipes

UNITV: **(6HRS)**

   Time and Distance –Trains-Boats and Streams

TEXT BOOK:

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

UnitI: Chapters 1, 2 and4

UnitII: Chapters 6 and10

UnitIII: Chapters 11 and 12

UnitIV: Chapters 15 and 16

UnitV: Chapters 17,18 and19

REFERENCE BOOKS:

1. Competition Success Review for Bank Probationary Officer'sExam.

2. Competition Success Review for MBA EntranceExaminations.

3.Any text book on CompetetiveExaminations.

HOLY CROSS COLLEGE (AUTONOMOUS),TIRUCHIRAPPALLI – 620 002.
B.Sc., MATHEMATICS
(Forthe candidates admitted from2015 onwards)
SEMESTER – IV
SKILL BASED ELECTIVE - IV: MATLAB APPLICATIONS

Total Hours: 30

Hours/Week: 2   **Code:U15MA5SBT04**

Credits:2   **Marks:100**

Objectives:
         To introduce the Mathematical software MATLAB for high-performance numerical computations and visualization.To give theoretical and practical knowledge of essential MATLAB commands.

UNIT –I   **(6HRS)**

I/P, O/P, Variables, Vectors, Matrices.

UNIT– II   **(6HRS)**

Interface, Menu, Workspace, Working Directory, Command Window, Diary, Printing.

UNIT– III   **(6HRS)**
Built-in functions, User-defined functions, Script M-files, Variables in M-files.

UNIT– IV   **(6HRS)**
Complex Arithmetic, Solving linear systems, Eigen Values and Vectors, Calculus.

Unit–V   **(6HRS)**
ezplot, 2D plots, 3D plots.

List of Practicals :

1.WriteaMATLABprograminvolvingmatrixmanipulationssuchasmultiplication,inverse, determinant, random, magicetc.
2.Write a MATLAB program to solve a system of linearequations.
3.Use MATLAB commands to plot 2D and 3Dgraphs.
4.Write a MATLAB program to solve quadraticequation.
5.Write a MATLAB program to check the given string is palindrome ornot.
6.Using the function for n! Write a MATLAB program to find the binomial coefficient nCr.
7.Write a MATLAB program to generate Fibonaccinumbers.
8.Write a MATLAB program to solve an algebraic equation using bisectionmethod.
9.Write a MATLAB program to solve an algebraic equation using Newton Raphsonmethod.

BOOK FOR STUDY:
Getting started with MATLAB 7 (2008) RudraPratap, Oxford University Press.

REFERENCE:
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 51996 (http:\\www.mathworks.com)
3. L.F. Shampine, I.Gladwell, S. Thompson , Solving ODEs with MATLAB,Cambridge University press2003.

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

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

OBJECTIVES:
   a. To help the students learn skills, knowledge, talent to lead a meaningfullife.
   b. To help the students understand marriagelife.
   c. To make the students learn skills of nurturing family andchildren.
   d. To make them aware of emotional intelligence and choose theircarrier.

UNIT – I: PERSONAL COMPETENCE

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

UNIT – II: MARRIAGE AND FAMILY

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

UNIT – III: MOTHERHOOD

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

UNIT – IV: PERSONALITY DEVELOPMENT

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

UNIT – V: CAREER CHOICE

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

REFERENCES:
1. Tony B and Barry Buzan(2003), The mind map book, BBC world wide limited,London.
2. Susan Nash(2005), Turning team performance inside out, Jai CO. publishing House,New Delhi.
3. Fr. Ignacimuthu (1999) "Values for Life",VaigaraiPathipagam.
4. Grose. D.N. (2000), "A text book on Value Education", DominantPublishers.

HOLY CROSS COLLEGE (AUTONOMOUS), TRICHIRAPALLI-2.
B.A/B.SC/B.COM/B.R.SC/B.C.A – DEGREE COURSES
LIFE ORIENTED EDUCATION
BIBLE STUDIES – III: ESSENCE OF CHRISTIAN FAITH

HRS / Wk:1
CODE:U12VE6LVBO3
CREDIT :1
MARKS : 100

Objective:

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

UNIT – I: ESSENTIALS OF CHRISTIAN FAITH

- Salvation   – Deliverance from sin (Is 53),Assurance of salvation and New life (II Cor5:17)

- Sacraments – Baptism (Luke 3: 6-14), Lord's Supper (I Cor 10: 16,17; 11:23-29)

- Trinity   – One in three and three in one. Illustrations from the Bible. (John 14:16,17)

- Heaven and Eternal life (John 14: 13, 3:13-21)

UNIT – II: MAARIAGE AND FAMILY LIFE

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

- Man and woman as Partners – Abraham and Sarah (Gen16-18,22)

                          Aquila and Priscilla (Acts 18:1-3,26)

- Evils to be avoided – Premarital Sex, ExtramaritalSex,

                  Homosexuality, Abortion(Heb 13: 4, Psalm 127 : 4)

- Ideal Wife – Sarah (I Peter 3: 1-6), Ruth, Eph5

UNIT – III: CHRISTIAN HOME

- Parental Responsibilities and bringing up children – Abraham (Gen22),

            Eli (I Sam 2: 24-36,3: 11- 18), Mary Mother of Jesus (Luke 2:51,52

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

- Entertainments (I Cor 10:23)

UNIT – IV: CHRISTIAN ETHICS

- Holiness – Joseph (Gen 39:9)Levi 11: 45, Ecc12

- Obedience to God - Abraham (Gen 12) ; St. Paul (Acts9)

- Freedom andAccountability

- Justice andLove

- Choices in Life – Making Decisions(Studies, job, lifePartner)

- Model to follow – Who is your model? (John 15:1-17)
- Social Evils – Dowry, Caste discrimination, Accumulation ofwealth
- Freedom of Options, Time Management, Work Ethics (I Peter 2:11-25)

UNIT – V: ROLE IN CHURCH AND SOCIETY

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

REFERENCES:

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

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

HRS /WK:1   **CODE:U12VE6LVC03**
                                                       CREDIT :1
                                                       MARKS : 100

OBJECTIVES:
- To prepare the students to participate meaningfully in the liturgical celebrationand experience GOD in their day todaylife.
- To become a living witness to Jesus Christ in their personal, family and sociallife.

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

UNIT – II: HOLY SACRIFICE OF THE MASS
Significance – meaning and need for spiritual growth – mass prayers – part of the mass – liturgical year, its division and its significance. –Creed – Act of contrition – Discernment of spirits – Counseling – Spiritual direction.

UNIT – III: CHRISTIAN VOCATION AS DISCIPLE FOR THE KINGDOM OF GOD
Who am I as a Christian? – Christian dignity and others – The values of the Kingdom opposing to the values of the World – Christian social conscience – Christian in the reformation of the world – a call to be salt and light in today's context.

UNIT – IV: CHRISTIAN FAMILY
Holy family- characteristic of good family – Bible centered, Prayer centered, Christian centered–Responsibilities of parents, and children in the family – church – laws towards marriage-Pro life (Abortion, Euthanasia) – Lay Vocation – Lay Participation – Lay associates.

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

REFERENCES:

1. Compendium – Catechism for the Catholic Church Published by Vaigarai PublishingHouse for the Catholic Church ofIndia.
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–620002.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPALLI - 620002.
B.SC. MATHEMATICS
(For the candidates admitted from2015 onwards)
SEMESTER VI
MAJOR CORE–11:   THEORY OF FUNCTIONS OF A COMPLEXVARIABLE

Total Hours: 90
Hours/Week: 6   **Code:U15MA6MCT11**
Credits:5   **Marks:100**
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

UNIT I :ANALYTICFUNCTIONS   **(18HRS)**

Introduction –Functions of a complex variable- Limits – Theorems on limits-Continuous functions –Differentiability- Cauchy - Riemann equations- Analytic Functions -Harmonic functions .

UNIT II :BILINEAR TRANSFORMATIONS   **(18HRS)**

Introduction-Elementary transformations - Bilinear transformations - Cross ratio - Fixed points of Bilinear transformations - some special bilinear transformations.

UNIT III :COMPLEXINTEGRATION   **(18HRS)**

Introduction –Definite integral- Cauchy's theorem -Cauchy's integral formula (Riemann's proof only) and its extension – Higher derivatives.

UNIT IV :SERIES EXPANSION   **(18HRS)**

Introduction -Taylor's theorem - Laurent's theorem – Zeros of an analytic function - Pole - singularities.

UNIT V : CALCULUSOFRESIDUES   **(18HRS)**

Introduction -Residues - Cauchy's Residue theorem - Evaluation of Definite Integrals between limits ($-\infty$ to ∞) - Jordan's lemma (Statement only)- Evaluation of

$\int Sinax\ f(x)\ dx, \int Cosax\ f(x)dx$ 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 .

TEXT BOOK :

S.Arumugam, A.Thankapandi Isaac and A.Somasundaram (2006), <u>COMPLEX ANALYSIS</u> ,Scitech Publishers, Chennai

      UNIT I: Chapter 2(Sec 2.0 to2.8)

      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) <u>COMPLEX ANALYSIS</u> , Narosa publishing House ,New Delhi.

2.Howie, M.John (2008), <u>COMPLEX ANALYSIS</u> ,WileyDremtechpvt ltd

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2.
B.SC. MATHEMATICS
(For the candidates admitted from2015 onwards)
SEMESTER VI
MAJOR CORE- 12:DIFFERENTIAL EQUATIONS ,LAPLACE TRANSFORMS AND FOURIER SERIES

Total Hours: 90
Hours/Week: 6   **Code:U15MA6MCT12**
Credits:5   **Marks:100**

OBJECTIVES:

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.

UNIT I : ORDINARYDIFFERENTIALEQUATIONS   **(18HRS)**

Linear homogeneous equations with variable coefficients. Equations reducible to the linear homogeneous equation. Method of variation of parameters.

UNIT II : PARTIALDIFFERENTIALEQUATIONS   **(18HRS)**

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 $Pp + Qq = R$.

UNIT III :LAPLACETRANSFORMS   **(18HRS)**

Definition - Laplace transforms of functions e^{at}, Cosat, Sinat, t^n (n is a +ve integer), e^{at}cosbt, e^{at} sinbt, $f'(t)$, $f''(t)$, $f^n(t)$, $t^n f(t)$, $f(t)/ t$

UNIT IV : INVERSELAPLACETRANSFORMS   **(18HRS)**
Inverse transforms relating to the above standard functions - application to solution of ordinary differential equations with constantcoefficients.

UNIT V :FOURIERSERIES   **(18HRS)**

Full Range series – Half range cosine and sine series (Change of interval excluded)

TEXT BOOK:

1.Narayanan.S , ManicavachagomPillay.T.K, <u>DIFFERENTIALEQUATIONS</u>, S.Viswanathan (Printers andpublishers),Chennai.

UNIT:I Chapter V - Sections 5 & 6 and Chapter VII - 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 andT.K.ManicavachagamPillay, S.Viswanathan (Printers andpublishers),Chennai.

UNIT:V Chapter 6 – Sections 1 to 5(Change of interval excluded)

REFERENCE BOOKS:

1.Arumugam.S,ThangapandiIssac.A,Somasundaram.A,(2002) <u>ENGINEERING MATHEMATICS</u>Vol III ,SCITECH Publishers,Chennai

2.Raisinghania.M.D,(2002),<u>ORDINARYAND PARTIAL DIFFERENTIALEQUATIONS</u>

,S.Chand&Company ,New Delhi.

3.ZafarAhsan (2006) <u>DIFFERENTIAL EQUATIONS AND THEIRAPPLICATIONS</u>,Prentice Hall of India Ltd,New Delhi.

4.Thomas /Finanera(1984), <u>CALCULUS AND ANALYTIC GEOMETRY</u>NarosaPublishing House,Delhi

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620002
B.SC., MATHEMATICS
(For the candidates admitted from2015 onwards)
SEMESTER - VI
MAJOR CORE – 13: INTRODUCTION TO FUZZY MATHEMATICS

Total Hours: 90
Hours/Week: 6   **Code:U15MA6MCT13**
Credits:5   **Marks:100**

OBJECTIVES:

To enable the students to have better applications of uncertainty through fuzzy mathematics for problems in physical and social sciences.

UNIT   I :FUZZYSETTHEORY   **(18HRS)**

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.

UNIT   II: OPERATION ONFUZZYSETS   **(18HRS)**

Introduction-Some important theorems –Fuzzy Complements- Further operations on fuzzy sets- Extension Principle for Fuzzy sets.

UNIT III:FUZZYRELATIONS   **(18HRS)**

Introduction-Projections and cylindrical Fuzzy Relations - Composition – Properties of Min- Max Composition – Binary Relation on a Single set.

UNIT   IV:APPROXIMATEREASONING   **(18HRS)**

Introduction - Fuzzy implications or S- implications – R- implications - QL- implications - Axioms of Fuzzy implications - Selection of Fuzzy implications - Multi conditional Approximate Reasoning.

UNIT   V:FUZZYLOGIC   **(18HRS)**

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.

TEXT BOOKS

Dr. Sudhir K. Pundir& Dr. RimplePundir , (2013) FUZZY SETS AND THEIRAPLLICATION, PragatiPrakashan Educational Publishers, Meerut.

UNITI   :   CHAPTER 1 - Secs. (1.1, 1.2, 1.16 to1.21)

UNITII   :   CHAPTER 2 -Secs (2.1 to 2.5 , 2.10)

UNITIII   :   CHAPTER 4 - Secs. (4.1 to 4.5)

UNITIV   :   CHAPTER 6 - Secs. (6.1 to 6.7)

UNITV   :   CHAPTER 7 - Secs. (7.13 to7.21)

REFERENCE BOOKS:

1. A.Kaufmann, (2005)INTRODUCTION TO FUZZY THEORY,Academicpress ,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.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620002
B.Sc. MATHEMATICS
(For the candidates admitted from2015 onwards)
SEMESTER VI
MAJOR ELECTIVE – 3: PROGRAMMING IN C++

Total Hours: 75
Hours/Week: 5   **Code:U15MA6MET03**
Credits:5   **Marks:100**
Objective:

To enable the students to understand the concept of OOPS which will enable them to write programs.

UNIT I : BEGINNINGWITHC++:   **(15HRS)**
Introduction to C++-Applications of C++ statements-structure of C++ programs.
TOKENS,EXPRESSIONS AND CONTROL STRUCTURES:
Tokens, keywords, identifiers, data types - symbolic constants - defining variables - operators in C++ - Type cast operator-control structures-Programming examples.

UNIT II : FUNCTIONS INC++:   **(15HRS)**
Main function-Function prototyping-call by reference-return by reference-inline functions-default arguments-constant arguments-Function overloading, friend and virtual functions.
CLASSES AND OBJECTS :
Specifying a class – Defining member functions –Making an outside function inline – Nesting of member functions – Arrays within a class – Memory allocation for objects – Static members functions.

UNIT III : CONSTRUCTORS ANDDESTRUCTORS :   **(15HRS)**
Constructors – Parametrized constructors –Multiple constructors in a class – Constructors with default arguments – Dynamic initialization of objects – Copy constructor –Destructors.
OPERATOR OVERLOADING AND TYPE CONVERSIONS :
Defining operator overloading – Overloading unary , binary operators – binary operators overloading using friends – rules for overloading operators – Type conversions.

UNIT IV : INHERITANCE,EXTENDINGCLASSES: **(15HRS)**
Introduction – Defining derived classes – Single Inheritance – Making a private member inheritable – Multilevel,Multiple, Hierarchical classes - Nesting of classes.

UNIT V : MANAGING CONSOLE I/OOPERATIONS :   **(15HRS)**

Introduction – C++ streams – C++ stream classes –Unformatted I/O Operations – Formatted console I/O operations – Managing output with manipulators.

WORKING WITH FILES :

Introduction – Classes for file stream operations – Opening and closing a file-Detecting end-of-file.

PRACTICAL WORK :

1. Sorting numbers in ascending and descendingorder
2. Implementation of Defaultarguments
3. Implementation of Referencevariables
4. FriendFunction
5. InlineFunctions
6. VirtualFunctions
7. Constructor andDestructor
8. StudentsMark list
9. Employee InformationSystem
10. Operator Overloading (Comparison of twostrings)
11. Single Inheritance
12. Multiple Inheritance
13. FunctionOverloading

TEXT BOOK :

E. Balagurusamy (2006), " OBJECT ORIENTED PROGRAMMING WITH C++",

TATA MCGRAW HILL.

UNIT I: Chapter 2 (Sec 2.1 -2.6), Chapter 3 (Sec 3.1 -3.25)

UNIT II:Chapter 4 (Sec 4.1 - 4.11), Chapter 5 (Sec 5.1 –5.12)

UNIT III: Chapter 6(Sec6.1 – 6.11) , Chapter 7 (Sec 7.1 –7.9)

UNIT IV:Chapter 8 (Sec 8.1 – 8.12)

UNIT V: Chapter 10 (Sec 10.1 – 10.6), Chapter 11(11.1-11.4)

REFERENCE BOOKS:

1. M.A.Jayaram and D.S. Rajendra Prasad,(2002) "OBJECTORIENTED PROGRAMMING WITH C++" ,Mumbai, HimalayaPublishing.
2. D.Ravichandran ,(1999), "PROGRAMMING WITH C++" ,New York, McgrawHill.
3. Maria Litvin and Gary Litvin ,(2001), "PROGRAMMING IN C++" ,New Delhi,Vikas Publishing House Pvt.Ltd.,
4. Nell Dale,Chip Weems and Mark Headington(1999), "PROGRAMMING INC++",New Delhi, Narosa PublishingHouse.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 620002
B.Sc. MATHEMATICS
(For the candidates admitted from 2015 onwards)
SEMESTER VI
MAJOR ELECTIVE – 3: NUMBER THEORY

Total Hours: 75
Hours/Week: 5   **Code:U15MA6MET07**
Credits:5   **Marks:100**
 Objective:

To highlight the niceties and nuances in the world ofnumbers and prepare the students for coding throughcongruences.

UNIT I:DIVISIBILITY   **(15HRS)**

Euclid's Division Lemma – Divisibility – The Linear Diophantine Equation – The Fundamental Theorem of Arithmetic

UNIT II :PERMUTATIONSANDCOMBINATIONS   **(15HRS)**

Permutations and Combinations – Fermat's Little Theorem – Wilson's Theorem – Generating Functions

UNIT III:CONGRUENCES   **(15HRS)**

Basic Properties of Congruences - Residue Systems. Linear Congruences – The Theorems of Fermat and WilsonRevisited.

UNIT IV :POLYNOMIALCONGRUENCES   **(15HRS)**

The Chinese Remainder Theorem – Polynomial Congruences – Combinational Study of F(n).

UNIT V :ARITHMETICFUNCTION   **(15HRS)**

Formulae for d(n) and s(n) – Multiplicative Arithmetic Function – The Mobius Inversion Formula.

TEXT BOOK :

Number Theory by *George E.Andrews,* Hindustan Publishing Corporation – 1984, Edition.

UnitI   : Chapter - 2 Sec. 2.1 – 2.4pages12-29
UnitII   : Chapter – 3 Sec. 3.1, 3.4pages30-44
UnitIII   : Chapter – 4Sec. 4.1 – 4.2 Pages 49 – 55, Sec. 5.1- 5.2Pages58-65
UnitIV   : Chapter – 4 Sec. 5.3 – 5.4 pages 66-74, Sec. 6.1 Pages75-81
UnitV   : Chapter – 5 Sec. 6.2 – 6.3Pages82-92

REFERENCE BOOKS:

1. Basic Number Theory by S.B.Malik, Vikas Publishing HousePvt.Ltd.,
2. A First Course Theory of Numbers by K.C.Chowdhury. Asian BooksPvt. Ltd.,IEdition(2004)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPALLI - 2.
III UG
(For the candidates admitted from2015 onwards)
SEMESTER VI
NON MAJOR ELECTIVE 2-- ART OFPROGRAMMING

Total Hours: 30
Hours/Week: 2   **Code:U15MA6NMT02**
Credits:2   **Marks:100**

OBJECTIVES:

To acquire knowledge about Algorithms ,Flow Chart .

To Facilitate to write Simple programs independently.

UNIT I :FLOW CHART   **(6HRS)**

Flow chart –Definition – Symbols

Flow Chart for:

(i) To find the area of a square , rectangle ,circle andtriangle

(ii) To calculate simple interest and compoundinterest

(iii)To find the sum of first n naturalnumbers

(iv)To find the sum of n given numbers and their average and standard deviation

(v)To pick the largest of 3 given numbers.

UNIT II:ALGORITHMS   **(6HRS)**

Algorithm-Definition-Algorithm for those ((i) to (v)) mentioned in unit I

UNIT III:CONSTANTS,VARIABLESANDEXPRESSIONS   **(6HRS)**

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.

UNITIV:STATEMENTS **(6HRS)**

Comment Statement

Input –Output Statements

Assignment Statement

Conditional Statement –THE BLOCK IF CONSTRUCT

Loop Statement – THE BLOCK DO LOOP

UNIT V: SIMPLEPROGRAMS **(6HRS)**

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 Program7.11)**

(ix) To find the average height of boys and girls in a class **(Example Program 7.4)**

(x) For adding / multiplying two matrices

TEXT BOOK

1.P.S .Grover 1996 COMPUTER PROGRAMMING IN BASIC Allied Publishers Ltd,

New De hi for Units I &II

2. V.Rajaraman ,COMPUTER PROGRAMMING IN FORTRAN 90AND 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 and5.2)Chapter 6 (6.2)Chapter 7 (7.1)Unit V:Chapter 10 (10.2 , 10.3)

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPALLI -620002.
B.SC.,MATHEMATICS
(For the candidates admitted from2015 onwards)
SEMESTER VI
SKILL BASED ELECTIVE– 5: APPLICATION OF ALGORITHMS

Total Hours: 30
Hours/Week: 2   **Code:U15MA6SBT05**
Credits:2   **Marks:100**

Objective:

Motivating the students to take interest in understanding the matrix representation of a graph and algorithmic approach for various aspects of graph theory.

MATRIX REPRESENTATION

UnitI: **(6HRS)**

Incidence matrix – Reduced incidence matrix – Circuit matrix – Fundamental circuit matrix (Proof of the theorem excluded)

UnitII: **(6HRS)**

Cut set matrix – Fundamental cut set matrix – Relationship between matrices – Adjacency matrix – Path matrix(Proof of the theorem excluded)

UnitIII: **(6HRS)**

ALGORITHMIC APPROACH

Introduction – Computer representation of a graph –Kruskal algorithm and R.C Prim's algorithm for finding minimal spanning tree.

UnitIV: **(6HRS)**

All fundamental circuits algorithm – Dijikstras algorithm - Dijikstras algorithm for weighted graphs.

UnitV: **(6HRS)**

Travelling salesman problem algorithm – Algorithm for finding all spanning trees – David Huffman algorithm .

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 and2:   Chapter8(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 , NewDelhi.

2. Harary , "GRAPH THEORY" , Narosa Publishing House New Delhi,Bombay.

3. NarsinghDeo , "GRAPH THEORY WITH APPLICATIONS TO ENGINEEERINGAND COMPUTER SCIENCE", Prentice Hall of India, NewDelhi.

HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI 620 002.
B.SC.,MATHEMATICS
(For the candidates admitted from2015 onwards)
SEMESTER VI
SKILL BASED ELECTIVE - 6: RESEARCH METHODOLOGY

Total Hours: 30
Hours/Week: 2   **Code:U15DS6SBT06**
Credits:2   **Marks:100**

General Objective:
Students get introduced to concept of research and to carryout research projects.

Unit I Introduction to research:

Definition - Types – Nature and Scope of Research – Research Design – Plagiarism

Unit II – Data Collection

Types – Primary and Secondary data collection – Data processing –Hypothesis Testing

Unit III – Plan and Execution

Methodology – Work Plan and Execution – Analysis –Interpretation - Documentation

Unit IV - Format and Presentation of Project Report

Art of writing and Structure of Project report – Viva Voce

Unit – V Project –

Project Work (Applying Real Expertise in the Project Work)

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 50marks.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. / B.R.Sc./ B.C.A. DEGREE COURSE
LIFE ORIENTED EDUCATION
ETHICS – III: FAMILY AND CAREER DEVELOPMENT

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

OBJECTIVES:
      1. To help the students learn skills, knowledge, talent to lead a meaningfullife.
      2. To help the students understand marriagelife.
      3. To make the students learn skills of nurturing family andchildren.
      4.To make them aware of emotional intelligence and choose theircarrier.

UNIT – I: PERSONAL COMPETENCE

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

UNIT – II: MARRIAGE AND FAMILY

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

UNIT – III: MOTHERHOOD

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

UNIT – IV: PERSONALITY DEVELOPMENT

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

UNIT – V: CAREER CHOICE

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

REFERENCES:
1. Tony B and Barry Buzan(2003), The mind map book, BBC world wide limited,London.
2. Susan Nash(2005), Turning team performance inside out, Jai CO. publishing House,New Delhi.
3. Fr. Ignacimuthu (1999) "Values for Life",VaigaraiPathipagam.
4. Grose. D.N. (2000), "A text book on Value Education", DominantPublishers.

HOLY CROSS COLLEGE (AUTONOMOUS), TRICHIRAPALLI-2.
B.A/B.SC/B.COM/B.R.SC/B.C.A – DEGREE COURSES
LIFE ORIENTED EDUCATION
BIBLE STUDIES – III: ESSENCE OF CHRISTIAN FAITH

HRS / Wk:1   **CODE:U12VE6LVBO3**
                                                    CREDIT :1
                                                    MARKS : 100

Objective:

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

UNIT – I: ESSENTIALS OF CHRISTIAN FAITH

- Salvation   – Deliverance from sin (Is 53),Assurance of salvation and New life (II Cor5:17)
- Sacraments – Baptism (Luke 3: 6-14), Lord's Supper (I Cor 10: 16,17; 11:23-29)
- Trinity   – One in three and three in one. Illustrations from the Bible. (John 14:16,17)
- Heaven and Eternal life (John 14: 13, 3:13-21)

UNIT – II: MAARIAGE AND FAMILY LIFE

- Finding the God's Will - Issac (Gen 24)
- Man and woman as Partners – Abraham and Sarah (Gen16-18,22)

     Aquila and Priscilla (Acts 18:1-3,26)

- Evils to be avoided – Premarital Sex, ExtramaritalSex,

     Homosexuality, Abortion(Heb 13: 4, Psalm 127 : 4)

- Ideal Wife – Sarah (I Peter 3: 1-6), Ruth, Eph5

UNIT – III: CHRISTIAN HOME

- Parental Responsibilities and bringing up children – Abraham (Gen22),

     Eli (I Sam 2: 24-36,3: 11- 18), Mary Mother of Jesus (Luke 2:51,52

- Caring for the Aged (I Sam 2:31,32)
- Entertainments (I Cor 10:23)

UNIT – IV: CHRISTIAN ETHICS

- Holiness – Joseph (Gen 39:9)Levi 11: 45, Ecc12
- Obedience to God - Abraham (Gen 12) ; St. Paul (Acts9)
- Freedom andAccountability
- Justice andLove
- Choices in Life – Making Decisions(Studies, job, lifePartner)

- Model to follow – Who is your model? (John 15:1-17)
- Social Evils – Dowry, Caste discrimination, Accumulation ofwealth
- Freedom of Options, Time Management, Work Ethics (I Peter 2:11-25)

UNIT – V: ROLE IN CHURCH AND SOCIETY

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

REFERENCES:

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

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

HRS /WK:1   **CODE:U12VE6LVC03**
                                                          CREDIT :1
                                                          MARKS : 100

OBJECTIVES:
- To prepare the students to participate meaningfully in the liturgical celebrationand experience GOD in their day todaylife.
- To become a living witness to Jesus Christ in their personal, family and sociallife.

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

UNIT – II: HOLY SACRIFICE OF THE MASS
Significance – meaning and need for spiritual growth – mass prayers – part of the mass – liturgical year, its division and its significance. –Creed – Act of contrition – Discernment of spirits
– Counseling – Spiritual direction.

UNIT – III: CHRISTIAN VOCATION AS DISCIPLE FOR THE KINGDOM OF GOD
Who am I as a Christian? – Christian dignity and others – The values of the Kingdom opposing to the values of the World – Christian social conscience – Christian in the reformation of the world – a call to be salt and light in today's context.

UNIT – IV: CHRISTIAN FAMILY
Holy family- characteristic of good family – Bible centered, Prayer centered, Christian centered–Responsibilities of parents, and children in the family – church – laws towards marriage- Pro life (Abortion, Euthanasia) – Lay Vocation – Lay Participation – Lay associates.

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

REFERENCES:

1. Compendium – Catechism for the Catholic Church Published by Vaigarai PublishingHouse for the Catholic Church ofIndia.
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– 620002.