



## HOLY CROSS COLLEGE (AUTONOMOUS)

Affiliated to Bharathidasan University

Nationally Accredited (3rd Cycle) with 'A' Grade by NAAC

College with Potential for Excellence.

Tiruchirapalli - 620002.

### DEPARTMENT OF COMPUTER SCIENCE

#### Programme: B.C.A

<b>PO No.</b>	<b>Programme Outcomes</b> <i>Upon completion of the B.C.A Degree Programme, the graduate will be able to</i>
PO-1	Attain excellence in the area of Computer Applications
PO-2	Utilize the practical skill to examine, plan and engineer the applications of technology using computing tools and techniques
PO-3	Design innovative methodologies/techniques/ideas for solving real time problems to cater to the need for the society.
PO-4	Create student employability and be competent enough to work in IT industry.
PO-5	Integrate ethical values in designing computer application.

<b>PSO No.</b>	<b>Programme Specific Outcomes</b> <i>Upon completion of these courses the student would</i>
PSO-1	Acquire advanced knowledge in various area of computer Applications
PSO-2	Analyze and find the best techniques for solving computational problem
PSO-3	Develop competent technical writing skills for software
PSO-4	Apply the recent technology in various domains and evaluate the methods of implementing it.
PSO-5	Design and Create innovative ideas that meet the requirements of software industry

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPALLI-620 002.**  
**DEPARTMENT OF COMPUTER SCIENCE**  
**CHOICE BASED CREDIT SYSTEM**  
**BACHELOR OF COMPUTERAPPLICATIONS**  
**(2018-2021)**

Semester	Part	Course	Title of the Course	Code	Hrs / Wk	Credits	Marks
I	I	Language	Tamil Paper I / Hindi Paper I / French Paper I	U15TL1TAM01/ U18HN1HIN01/ U16FR1FRE01	6	3	100
	II	English	English Paper I	U15EL1GEN01	6	3	100
	III	Major Core -1	Foundations of Programming	U18CA1MCT01	5	4	100
	III	Major Core - 2	Foundations of Programming Lab	U18CA1MCP02	3	2	100
	III	Allied - 1 (Compulsory)	Allied Paper I Business Information Systems	U18CA1ACT01	3	2	100
	III	Allied - 2 (Compulsory)	Allied Paper II Applied Mathematics I	U15MA1ACT05	4	4	100
	IV	Environmental Studies	Environmental Studies	U18RE1EST01	1	1	100
	IV	Value Education	Ethics I/ Bible studies I/ Catechism I	U15VE2LVE01/ U15VE2LVB01/ U15VE2LVC01	1	-	-
	VI		Service Oriented Course		1	-	-
			<b>TOTAL</b>		<b>30</b>	<b>19</b>	<b>700</b>
II	I	Language	Tamil Paper II/Hindi Paper II/ French Paper II	U15TL2TAM02/ U18HN2HIN02/ U16FR2FRE02	5	3	100
	II	English	English Paper II	U15EL2GEN02	6	3	100
	III	Major Core - 3	Data Structures and Algorithms	U18CA2MCT03	5	5	100
	III	Major Core - 4	Data Structures Lab	U18CA2MCP04	5	4	100
	III	Allied - 3 (Compulsory)	Allied Paper III Applied Mathematics II	U15MA2ACT11	4	3	100
	IV	SkillBasedElective-1	Soft Skill Development	U15RE2SBT01	2	2	100
	IV	SkillBasedElective-2	Sustainable rural Development and Students Social Responsibility	U18RE2SBT02	2	2	100
	IV	Value Education	Ethics I/ Bible Studies I/ Catechism I	U15VE2LVE01/ U15VE2LVB01/ U15VE2LVC01	1	1	100
		Internship/Field Work/Field Project 30 hours- <b>Extra Credit</b>	U18SP2ECC01			2	100
			<b>TOTAL</b>		<b>30</b>	<b>25</b>	<b>900</b>
III	I	Language	Tamil Paper III/Hindi Paper III/ French Paper III	U15TL3TAM03/ U18HN3HIN03/ U16FR3FRE03	6	3	100
	II	English	English Paper III	U15EL3GEN03	6	3	100
	III	Major Core - 5	Database Systems and Data Mining	U18CA3MCT05	5	5	100
	III	Major Core - 6	Database Systems and Data Mining Lab	U18CA3MCP06	5	5	100
	III	Allied - 4 (Optional)	Allied Optional Paper I Applied Mathematics III	U15MA3AOT13	4	3	100
	IV	SkillBasedElective - 3	MongoDB with SQL Lab	U18CA3SBP03	2	2	100
	IV	Gender Studies	Gender Studies	U15WS3GST01	1	1	100
	IV	Value Education	Ethics II/ Bible studies II/ Catechism II	U15VE4LVE02/ U15VE4LVB02/ U15VE4LVC02	1	-	-
			<b>TOTAL</b>		<b>30</b>	<b>22</b>	<b>700</b>
I	I	Language	Tamil Paper IV/Hindi Paper IV/ French Paper IV	U15TL4TAM04/ U18HN4HIN04/ U16FR4FRE04	5	3	100
	II	English	English Paper IV	U15EL4GEN04	6	3	100
	III	Major Core - 7	Java Programming	U18CA4MCT07	5	5	100

IV	III	Major Elective - 1	Web Designing and PHP Lab / Unix and Shell Programming Lab / Ruby on Rails Lab	U18CA4MEP01/ U18CA4MEP02/ U18CA4MEP03	5	5	100
	III	Allied - 5 (Optional)	Allied Optional Paper II Basics of Accounting	U18CO4AOT10	4	4	100
	III	Allied - 6 (Optional)	Allied Optional Paper III Java Programming Lab	U18CA4AOP03	4	3	100
	IV	Value Education	Ethics II/ Bible Studies II/ Catechism II	U15VE4LVE02/ U15VE4LVB02/ U15VE4LVC02	1	1	100
	VI	Extension Activity outside the class hours from Semester I -IV		Any one activity based on the Student's choice (15Activities)	-	1	100
	Internship/Field Work/Field Project 30 hours- <b>Extra Credit</b>			U18SP4ECC01	-	2	100

V	III	Major Core – 7	Computer Organization and Architecture	U17CA5MCT07	4	4	100
	III	Major Core – 8	Operating Systems	U17CA5MCT08	4	3	100
	III	Major Core – 9	Computer Networks	U17CA5MCT09	4	3	100
	III	Major Core - 10	Object-oriented Programming in C# and .Net	U17CA5MCT10	4	3	100
	III	Major Core - 11	C# and .Net Programming Lab	U17CA5MCP11	4	3	100
	III	Major Elective - 2	R Programming Lab / Python Programming Lab / UI/UX Design Lab	U18CA5MEP04/ U18CA5MEP05/ U18CA5MEP06	5	5	100
	IV	Non Major Elective - 1	Desktop Publishing Lab	U15CA5NMP01	2	2	100
	IV	Skill Based Elective - 4	Quantitative Aptitude	U15CA5SBT04	2	2	100
	IV	Value Education	Ethics III/ Bible studies III/ Catechism III	U15VE6LVE03/ U15VE6LVB03/ U15VE6LVC03	1	-	-
			<b>TOTAL</b>		<b>30</b>	<b>25</b>	<b>800</b>
VI	III	Major Core – 12	Software Engineering Concepts	U18CA6MCT12	5	4	100
	III	Major Core – 13	Computer Graphics	U18CA6MCT13	5	4	100
	III	Major Core – 14	Business Process Outsourcing	U17CA6MCT14	4	4	100
	III	Major Core - 15	Mongo DB with SQL Lab	U16CA6MCP15	4	3	100
	III	Major Elective – 3	Internet of Things/ Cloud Computing/ Big DataAnalytics	U18CA6MET07/ U18CA6MET08/ U18CA6MET09	5	5	100
	IV	Non Major Elective - 2	Multimedia Lab	U18CA6NMP02	2	2	100
	IV	Skill Based Elective - 5	Mobile Application Development Lab	U18CA6SBP05	2	2	100
	IV	Skill Based Elective - 6	Research Methodology	U15DS6SBT06	2	2	100
	IV	Value Education	Ethics III/ Bible studies III/ Catechism III	U15VE6LVE03/ U15VE6LVB03/ U15VE6LVC03	1	1	100
	Internship/Field Work/Field Project 30 hours - <b>Extra Credit</b>			U18SP6ECC01	-	2	100
			<b>TOTAL</b>		<b>30</b>	<b>29</b>	<b>1000</b>
			<b>GRAND TOTAL</b>		<b>180</b>	<b>147</b>	<b>5000</b>
			ED : Extra Credit (Compulsory) : Mini Project	U18CA6ECP01		2	100
			<b>TOTAL</b>		<b>30</b>	<b>27</b>	<b>900</b>

(For Candidates admitted from 2015 onwards)  
**HOLY CROSS COLLEGE (Autonomous), Tiruchirappalli - 620 002.**

**PG & RESEARCH DEPARTMENT OF TAMIL**

**First Year - Semester – I**

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

**General Objectives:**

தமிழ் இலக்கியப் பரப்பையும், பாரம்பரியத்தையும் அறிமுகப்படுத்துதல்.

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

**Course Objectives:**

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

**அலகு:1 செய்யுள்**

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

மநல நுழசனள (நூலவசய சுநயனபை )

1. ந. காமராசு கவிதைகள்
2. தமிழன்பன் கவிதைகள்

**அலகு:2 செய்யுள்**

8. கல்யாணஜி - பேசும்பார் என் கிளி
9. நிர்மலா சுரேஷ் - தைலச்சிமிழும் தச்சன் மகனும்
10. இரா. மீனாட்சி - ஒரு கோதை **18Hrs**

11. விஜி -குரங்கு மனிதன்
12. பா. சத்தியமோகன் -எங்கெங்கு காணினும்
13. ஹைகூ கவிதைகள்

**மநல நுழ்சனள (நுலவசய சுநயனபெ)**

1. ந.முத்துக்குமார் கவிதைகள்
2. செனடரியூ கவிதைகள்

**அலகு:3**

**18Hrs**

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

**மநல நுழ்சனள (நுலவசய சுநயனபெ)**

தமிழ் இலக்கிய வரலாறு -மு.வரதராசன்

**அலகு:4**

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

**அலகு:5**

பொதுப்பகுதி - கலைச்சொற்கள் **18Hrs**

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

**Course Outcomes:**

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	To evaluate the importance of Tamil in terms of patriotism, self- discipline and unity.	PSO 1	U
CO-2	To evaluate poems and enrich knowledge in religious faith, preserving nature, social atrocities against women and resistance.	PSO 2	E
CO-3	To enhance the creative spirit among the youth through the present Tamil literatures	PSO 2	AN
CO-4	To be aware about human rights and humanism through short stories	PSO 3	AP
CO-5	To learn the culture of different languages	PSO 4	U

**பார்வை நூல்கள்**

## பாட நூல்கள்

செய்யுள்

- தமிழாய்வுத்துறை வுத்துறை வெளியீடு

தமிழ் இலக்கிய வரலாறு

- தமிழாய்வுத்துறை வெளியீடு

சிறுகதைத் தொகுப்பு

- தமிழாய்வுத்துறை வெளியீடு

கலைச்சொற்கள்

- தமிழாய்வுத்துறை வெளியீடு

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

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

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

**Course Objectives (CO):**

**The learner will be able to:**

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

**UNIT – I** (18 Hours)

1. Aatma Nirbharatha
2. Idgah
3. Sangya

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

**UNIT- II** (18 Hours)

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

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

**UNIT- III** (18 Hours)

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

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

**UNIT- IV****(18 Hours)**

1. Bharat Ek Hai
2. Sharandhata
3. Kriya

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

**UNIT- V****(18 Hours)**

1. Mitrata
2. Vapasi
3. Ling Aur Vachan

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

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

**Course Outcomes:****The learner will be able to:**

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

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

**Reference Books :**

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



(For candidates admitted 2016 onwards)

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

**DEPARTMENT OF FRENCH**

**SEMESTER I**

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

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

**Course Objectives(CO):**

**The learner will be able to**

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

**Unit 1 Parcours d’initiation ;Vous comprenez**

**(15Hours)**

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

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

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

**Unit 2 Autravail!**

**(15Hours)**

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

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

**Unit 3 On s’étend!**

**(15Hours)**

La conjugaison des verbes irréguliers, le future proche, les pronoms après une préposition – les loisirs

– proposer, accepter, refuser, demander une explication – première approche de l’espace de France, repérages de quelques lieux de loisirs

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

**Unit 4 Racontez-moi ! ; Bonvoyage!**

**(30Hours)**

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

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

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

**Unit 5 Bonappétit!**

**(15Hours)**

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

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

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

**TEXT BOOKS :**

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

Authors: J. Girardet and J. Pécheur Publication: CLÉ

INTERNATIONAL, 2013.

**Books for Reference:**

La Conjugaison – Nathan

French made easy – Beginners level - Goodwill Publishing House Je parle

français I –Abhay Publications

Le français avec des jeux et des activités - ELI Langue et la

civilisation – I – Mauger Bleu

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

(For Candidates admitted from June 2018 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. First Year - Semester – I**

<b>Course Title</b>	<b>Major Core 1: Foundations Of Programming</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5 Hrs Wk</b>
<b>Code</b>	<b>U18CA1MCT01/ U18CS1MCT01</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**General Objectives:**

To understand the concepts of problem solving approaches and to develop programming skills using C language.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understand the concepts of Algorithms and create flowcharts for a given problem
CO-2	Apply the basic concepts of C in real-time applications
CO-3	Analyze different types of arrays and apply the concepts for solving problems in real time
CO-4	Understand the concept of memory management
CO-5	Remember the file concept and create files using C

**UNIT I**

**15Hrs**

**INTRODUCTION TO COMPUTER PROBLEM SOLVING**

Introduction – The Problem Solving aspect – Top down design – Implementation of algorithm – Program Verification – The efficiency of algorithms – The analysis of algorithms – Fundamental Algorithms.

**PROGRAMMING AND ALGORITHMS**

Programs and Programming – building blocks for simple programs -pseudo code representation – flow charts - Programming Languages - compiler – Interpreter, Loader and Linker - Program execution.

**Extra Reading /Key words:** *Develop algorithms for real time Applications*

**UNIT II**

**15Hrs**

**BASICS OF ‘C’, INPUT / OUTPUT & CONTROL STATEMENTS**

Introduction- Identifier – Keywords - Variables – Constants – I/O Statements - Operators - Initialization –Expressions – Expression Evaluation – Lvalues and Rvalues – Type Conversion in C –Formatted input and output functions - Specifying Test Condition for Selection and Iteration- Conditional Execution - and Selection – Iteration and Repetitive Execution- go to Statement – Nested Loops- Continue and break statements.

**Extra Reading /Key words:** *Basic I/O and control operations in Python*

**UNIT III**

**15Hrs**

**ARRAYS, STRINGS, FUNCTIONS AND POINTERS**

Array – One dimensional Character Arrays- Multidimensional Arrays- Arrays of Strings – Two dimensional character array – functions - parameter passing mechanism scope – storage classes – recursion - comparing iteration and recursion- pointers – pointer operators - uses of pointers- arrays and pointers – pointers and strings - pointer indirection pointers to functions - Dynamic

memory allocation.

**Extra Reading /Key words:** *Develop multidimensional array programs*

#### UNITIV

15Hrs

#### STRUCTURE AND MEMORY MANAGEMENT

Structure, declaration of structure, Union, difference between structure and union, Pointers, pointers operators, pointer arithmetic, Introduction of Static and Dynamic memory allocation, The process of Dynamic memory allocation, DMA functions malloc() function, Sizeof() operator, Function free(), Function realloc(), Preprocessor, # define, defining functions like macros, # error, #include, creating header files, include user defined header files, Conditional compilation directives.

**Extra Reading /Key words:** *Implement the debugging concepts*

#### UNITV

15Hrs

#### FILE MANAGEMENT

Introduction File handling:-File structure, File handling function, File types, Streams, Text, Binary, File system basics, The file pointer, Opening a file, Closing a file, Writing a character, Reading a character, Using fopen(), getc(), putc(), and fclose(), Using feof(), Command line arguments.

**Extra Reading /Key words:** *Implement the system and file concepts using emulator.*

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

#### Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Know the correct and efficient ways of solving problems.	PSO1, PSO2	U
CO-2	Write C program for simple applications	PSO 2	An
CO-3	Formulate algorithm for simple problems	PSO 2	U
CO-4	Analyze different data types and arrays	PSO 5	An
CO-5	Perform simple search and sort	PSO 1	Ap
CO-6	Understand memory management and write programs using structures for solving complex computational problem	PSO2, PSO3	U
CO-7	Create files and perform file operations using C	PSO 1, PSO5	R, An
CO-8	Use programming language to solve problems	PSO1, PSO5	E

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

## **References**

### **Text Books**

1. Byron S Gottfried, —"Programming with C", Schaums Outlines, Second Edition, Tata McGraw-Hill, 2006.
2. Cormen, Leiserson, Rivest, Stein, "Introduction to Algorithms", McGraw Hill, Publishers, 2002.
3. Yashavant P. Kanaetkar, "Let Us C", BPB Publications.
4. E. Balagurusamy, "Programming in ANSI C", McGraw Hill Publications.

### **Reference Books:**

1. Brian W. Kernighan and Dennis M. Ritchie, "The C programming Language", 2006, Prentice-Hall.
2. Deitel and Deitel, "C How to Program", Pearson Education. 2013, 7th Edition.
3. R.G. Dromey, "How to Solve it by Computer", Pearson education, Fifth Edition, 2007.
4. Kamthane, A.N., "Programming with ANSI and Turbo C", Pearson Education, Delhi, 2006.
5. K R Venugopal, Sudeep R Prasad, "Mastering C", McGraw Hill Education (India) Private Limited; Second edition 2015.
6. Pradip Dey, Manas Ghosh, —Computer Fundamentals and Programming in C, Second Edition, Oxford University Press, 2013.

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. First Year - Semester – I**

<b>Course Title</b>	<b>Major Core 2: Foundations of Programming Lab</b>
<b>Total Hours</b>	<b>30</b>
<b>Hours/Week</b>	<b>3 Hrs Wk</b>
<b>Code</b>	<b>U18CA1MCP02 / U18CS1MCP02</b>
<b>Course Type</b>	<b>Practical</b>
<b>Credits</b>	<b>3</b>
<b>Marks</b>	<b>100</b>

**General Objective:**

Student writes application programs using C for solving real time problems.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Recall the syntax of control structures and solve problems using C
CO-2	Remember the syntax of looping statements and solve problems using C
CO-3	Create programs for arrays and strings using C
CO-4	Develop programs for Functions, Pointers and Structures in C
CO-5	Write programs for creating a file and perform I/O operation on files

**EXERCISES**

1. Control Statements
2. Loop Statements
3. Arrays (Searching and Sorting)
4. Strings
5. Functions and Pointers
6. Structure and Union
7. Dynamic Memory Allocation
8. Macros and File Handling

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. First Year - Semester – I**

<b>Course Title</b>	<b>Allied 1 (Compulsory): Business Information Systems</b>
<b>Total Hours</b>	<b>45</b>
<b>Hours/Week</b>	<b>3 Hrs Wk</b>
<b>Code</b>	<b>U18CA1ACT01</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>2</b>
<b>Marks</b>	<b>100</b>

**General Objective**

Students explore how technology and information can be best used to achieve the organization's goals and in doing so gain strategic and sustainable competitive advantage within its business sector.

**Course Objectives**

<b>CO No.</b>	<b>Course Objective</b>
<b>CO -1</b>	Understand and remember the foundations and use of information systems.
<b>CO -2</b>	Understand and interpret the personal, social and business implications of using information systems.
<b>CO -3</b>	Observe and explain the real-world use of information systems, citing practical examples.
<b>CO -4</b>	Understand the basic principles of modeling information systems processes and outcomes.
<b>CO -5</b>	Evaluate and critically analyze problems of Information systems.

**UNIT I: AN OVERVIEW**

**9Hrs**

**An Introduction to Information Systems:**

Information Concepts – System Concepts – What is an Information System? – Business Information Systems.

**Information Systems in Organizations:** Organizations and Information Systems – Competitive Advantage – Careers in information systems.

*Extra Reading (Keywords): Data mining, Big Data.*

**UNIT II: INFORMATION TECHNOLOGY CONCEPTS**

**9Hrs**

**Hardware:** Input and Output Devices - **Software:** Systems **Software:** Operating Systems – Current Operating Systems - Application Software: Overview of Application Software – Personal Application Software – **Database Systems and Business Intelligence:** Database Management Systems – **Telecommunications and Networks:** An overview of Telecommunications: Short Range Wireless options – Networks and Distributed Processing: Network Types – **The Internet, Intranets and Extranets:** Use and Functioning of the Internet: How the Internetworks.

*Extra Reading (Keywords): OODBMS and RDBMS*

**UNIT III: BUSINESS INFORMATION SYSTEMS**

**9Hrs**

**Electronic and Mobile Commerce:** An Introduction to Electronic Commerce – An Introduction to Mobile Commerce – Electronic and Mobile Commerce Applications – **Enterprise Systems:** An Overview of Enterprise Systems: Transaction Processing Systems – Transaction Processing Activities – **Information and Decision Support Systems:** Decision Making and Problem Solving – **Knowledge Management and Specialized Information Systems:** Knowledge Management Systems.

*Extra Reading (Keywords): B2B, B2C, C2C.*

**UNIT IV:SYSTEMSDEVELOPMENT****9Hrs**

**Systems Development:** Investigation and Analysis: Systems Development Life Cycles – Systems Investigation - Systems Analysis. **Systems Development:** Design, Implementation, Maintenance and Review.

*Extra Reading (Keywords): Explore CASE Tools, SDLC.*

**UNIT V: INFORMATION SYSTEMS IN BUSINESSANDSOCIETY****9Hrs**

The Personal and Social Impact of Computers: Computer Waste and Mistakes - Preventing Computer-Related Waste and Mistakes - Computer Crime: The Computer as a Tool to Commit Crime - The Computer as the Object of Crime - Preventing Computer-Related Crime - Privacy Issues.

*Extra Reading (Keywords): Botnets, Cyberstalking, Phishing.*

**Course Outcomes:**

CO No.	Course Outcomes	PSOs addressed	Cognitive Level
CO-1	Analyze and model the flow of information through business processes.	PSO 1	R, An
CO-2	Formulate plans and architectures for the capture, storage and retrieval of data.	PSO 2	U, Ap
CO-3	Develop computer programs to support or automate business processes.	PSO 3	Ap, C
CO-4	Apply networking concepts and technologies to support business needs.	PSO 4	Ap
CO-5	Align information systems and services with business strategy and formulate plans for the retrieval and analysis of supporting data.	PSO 5	An, Ap
CO-6	Document, monitor and assess the effectiveness of IT controls.	PSO 1	R, U, E

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

**References****Text book**

1. Ralph M. Stair, George W. Reynolds, “**Principles of Information Systems, A Managerial Approach**”, Ninth Edition, Thomson Publishing.

**Reference books**

1. A.K. Gupta, S. Chand, “**Management Information System**”,2010.
2. Dr. S.P. Rajagopalan, “**Management Information System**”, Margham Publications,2012.
3. P. Mohan, “**Management Information System**”, Himalaya Publishing House,2006.
4. Elizabeth Hardcastle, “**Business Information Systems**”, Elizabeth Hardcastle & Ventus Publishing,2008.
5. PaulBocijAndrew GreasleySimonHickie,“**BusinessInformationSystems**”,Third Edition, Prentice Hall,2008.



For Candidates admitted from June 2018 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620**

002

**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. First Year - Semester – I**

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

**General Objective:**

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

**Course Objectives(CO) :**

**The learner will be able to**

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

**UNIT 1: MATHEMATICAL LOGIC**

**12Hrs**

Introduction – Notations – Negation – Conjunction – Disjunction - Conditional and bi-conditional Statements

– Statement Formulas – Truth Table

**Extra Reading/ Keywords:** Symbolic logic, Formal logical system

**UNIT II : MATHEMATICAL LOGIC (CONTINUED)**

**12Hrs**

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

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

**UNIT III: MEASURES OF CENTRAL TENDENCY**

**12Hrs**

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

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

**UNIT IV: DISPERSION, SKEWNESS&KURTOSIS****12Hrs**

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

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

**UNIT V : CORRELATIONANDREGRESSION****12Hrs**

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

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

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

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

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

**TEXT BOOKS:**

1. Treatment and content as in G.S.S. BHISHMA RAO, Discrete structure and graph theory(2006) ,Scitech Publications Pvt Ltd., Hyderabad, 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 (Relevant portions only)

UNIT IV : Chapter 10 & 11 (Relevant portions only)

UNIT V : Chapter 12 & 13 (Relevant portions only)

**REFERENCE BOOKS :**

1. J.N.Kapur&H.C..Saxena(2003), "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

**(For candidates admitted from 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2**  
**/B.Sc./B.Com/B.R.SC/B.C.A/ B.B.A DEGREE EXAMINATION**  
**SEMESTER I / V**

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

**General Objectives:**

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

**Course Objectives:**

The student will be able to

1. understand the prospects of the various naturalresources.
2. analyse the concept and need forbiodiversity
3. evaluate the effect of the different types ofpollution.
4. understand the need for disastermanagement
5. understand the Environment and SocialIssues

**Unit I – Awareness and Natural Resources**

**3hrs**

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

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

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

**Unit II – Ecosystems and Biodiversity**

**3hrs**

Ecosystem – concepts, structure and types – concept of food chains and food web – causes and effects of weakening food chains - Biodiversity – concept of genetic, species and ecological biodiversity – ecological and economic values – India, a mega diversity country, hotspots – threats to biodiversity and conservation measures

*Extra reading (Key Words): Red list (any 10 plants and animals)*

### **Unit III –Environmental Pollution**

**3hrs**

Causes, effects and control of water, and air pollution – global warming – ozone depletion – nuclear hazards. Population growth at national and global level

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

*Extra reading (Key Words): Environmental factors affecting human behaviour*

### **Unit IV –DisasterManagement**

**3hrs**

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

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

### **Unit V – Environment andSocialIssues**

**3hrs**

**Rich – poor wide – at national and global levels**

Urbanization – slums

Changing value systems – AIDS Family welfare programs

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

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

#### **Course Outcomes:**

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

## **REFERENCES:**

- Agarwal, K.C. (2001). Environmental Biology, Nidi Publication Ltd. Bikaner.
- Chairas, D.D. (1985). Environmental Science. The Benjamin Cummings Publishing company., Inc.
- Clarke George, L. (1954). Elements of Ecology. Hohn Wiley and SONS, Inc.
- Hodges, L. (1977). Environmental Pollution, II Edition. Holt, Rinehart and Winston, New York.
- Krebs, C.J. (2001). Ecology. VI Edition. Benjamin Cummings.
- Nebel, B.J. and Wright, R.T. (1996). Environmental Science, Prentice Hall, New Jersey
- Odum, E.P. (2008) Fundamentals of Ecology. Indian Edition. Brooks / Cole.
- Sharma, B.K. and Kaur (1997). Environmental Chemistry. Goel Publishing House, Meerut. Sharma, B.K. and Kaur, (1997). An Introduction to Environmental Pollution. Goel Publishing House, Meerut.
- Sinhe, A.K. Boojh, R. and Vishwanathan, P. N. (1989). Water Pollution Conservation and Management, Gyansdaya Prakashan, Nainital.

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

**HRS /WK:1**  
**CREDITS:1**

**CODE:U15VE2LVE01**  
**MARKS :100**

**OBJECTIVES:**

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

**UNIT – I: RELIGION**

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

**UNIT – II: DIFFERENT RELIGIONS**

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

**UNIT –III: UNITY OF RELIGION**

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

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

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

**UNIT – V: VALUE SYSTEMS**

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

**REFERENCES:**

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

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

**HRS / WK:1**  
**CREDIT:1**

**CODE:U15VE2LVB01**  
**MARKS :100**

**OBJECTIVE:**

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

**UNIT – I: BIBLE – THE WORD OF GOD**

- Books of the Bible – Division into Old Testament and New Testament – History of the Bible-
- Messianic Prophecies (Isaiah 9:6,40:3,53:1-12,61:1-3,Micah5:2)
- The Birth and Ministry of John the Baptist (Luke 1:1-80,Mat3:1-17,14:1-12)
- The Birth, Passion, Death and Resurrection of Jesus (Luke 1:26-80,2:1-52,John 1:18-21)

**UNIT – II: MINISTRY OF JESUS**

- Miracles (Mark 2:1-12,Luke 4:38-41,6:6-11,7:1-17,8:26-56,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 New Testament
- Martha & Maria (Luke 10: 38- 42, John 11:1-46)

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

- Early Church
- 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 present Church.

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

- Mother Mary (Mother of Jesus) (Luke 1: 27-35, John 2: 1-12, 19:35, Acts 1:13-14)
- St. Peter (Luke 22:1-7, Acts 2:1-41, 12:1-17)
- St. Andrew (Mat 4:18-20, John 1:35-42, 6:1-14)
- St. Stephen (Acts 6,7)
- St. Paul (Acts 8,9,14,17,26 and 28)
- St. Thomas (John 20:24-31)

#### **UNIT – V: ST. PAUL’S LETTERS AND THE MESSAGE**

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

#### **REFERENCES:**

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

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

**HRS / WK:1**  
**CREDIT:1**

**CODE:U15VE2LVC01**  
**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 – speciality of the Gospel – main emphasis of themessage – meaning and blessing of suffering and paschal joy in one’s life - Passion – PaschalMystery

**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. Vaazhvin Vazhiyil – St. John’s Gospel- Fr.Eronimus
4. God’s Word nourishes A catholic approach to the Scriptures Dr. Silvano Renu Rita,O.C.V. STD and Dr. Mascarenhas Fio S.J. D.mim. Catholic Bible I
5. Documents of Vatican II – St. Paul’s Publications, Bombay1966.

(For Candidates admitted from 2015 onwards)  
**HOLY CROSS COLLEGE (Autonomous), Tiruchirappalli - 620 002.**

**PG & RESEARCH DEPARTMENT OF TAMIL**

**First Year - Semester – II**

<b>Course Title</b>	jkpo;j;jhs; - II
<b>Total Hours</b>	75
<b>Hours/Week</b>	5 Hrs Wk
<b>Code</b>	U15TL2TAM02
<b>Course Type</b>	Theory
<b>Credits</b>	3
<b>Marks</b>	100

**General Objectives:**

இறைச்சிந்தனை வழி மாணவர்களை ஒருமுகப்படுத்துதல்.

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

**Course Objectives:**

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

**அலகு:1செய்யுள்**

**15 Hrs**

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

**மநல றுழசனள (நூலவசய சுநயனபெ)**

1. அற்புதத்திருவந்தாதி - காரைக்கால் அம்மையார்
2. திருவாய்மொழி - நம்மாழ்வார்

**அலகு:2செய்யுள்**

**15 Hrs**

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

மநல றுழசனள (நுஔவசய சுநயனனபெ)

1. நந்திக்கலம்பகம்
2. குற்றாலக்குறவஞ்சி –திரிகூடராசப்பக்கவிராயர்

அலகு:3

15 Hrs

தமிழ் இலக்கிய வரலாறு –

பல்லவர்காலம்

நாயக்கர்காலம்

அலகு:4

15 Hrs

படைப்பிலக்கியம் - புதினம்

கல்கி - பார்த்திபன் கனவு

மநல றுழசனள (நுஔவசய சுநயனனபெ)

வில்லோடு வா நிலவே – வைரமுத்து

அலகு:5

15 Hrs

கடிதம் எழுதுதல்

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

**Course Outcomes:**

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

**பார்வை நூல்கள்**

செய்யுள்

- தமிழாய்வுத்துறை வெளியீடு

தமிழ் இலக்கிய வரலாறு

- தமிழாய்வுத்துறை வுத்துறை வெளியீடு

நாவல்

கல்கி

- பார்த்திபன் கனவு

கடித இலக்கியம்

- பயிற்சி ஏடு

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

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

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

**Course Objectives (CO):**

**The learner will be able to:**

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

**UNIT – I** **(15 Hours)**

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

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

**UNIT- II** **(15 Hours)**

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

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

**UNIT- III** **(15 Hours)**

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

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

**UNIT- IV**

**(15 Hours)**

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

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

**UNIT- V**

**(15 Hours)**

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

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

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

**Course Outcomes:**

**The learner will be able to:**

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

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

Reference Books :

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

(For candidates admitted 2016 onwards)

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

**DEPARTMENT OF FRENCH**

**SEMESTER II**

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

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

**Course Objectives (CO):**

**The learner will be able to**

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

**Unit 1 Quelle journée!**

**(15Hours)**

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

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

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

**(12Hours)**

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

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

**Unit 3 Souvenez-vous ?**

**(12Hours)**

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

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

#### **Unit 4 On s'appelle ? (12Hours)**

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

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

#### **Unit 5 Un bon conseil ! ; Parlez-moi devous! (24Hours)**

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

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

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

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

#### **TEXT BOOKS :**

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

#### **Books for Reference:**

La Conjugaison – Nathan

French made easy – Beginners level - Goodwill Publishing House Je parle français II - Abhay Publications

Le français avec des jeux et des activités – ELI Langue et la civilisation – I – Mauger Bleu

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



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

**HOURS : 6**  
**CREDIT : 3**

**CODE : U15EL2GEN02**

**MARKS: 100**

**OBJECTIVES**

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

**UNIT I – SELF**

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

**Speaking** - Sharing expressions, dreams and expressing opinions.

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

**Writing** - Story Writing

**Grammar** - Articles and Sentence Pattern

**Vocabulary** - Meanings, Synonyms, Antonyms

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

General Essay - Courage is the key to success

**TEXTS**

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

**UNIT II – STRENGTHS**

**Listening** - Listening to a process

**Speaking** - Telephone Etiquette

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

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

**Grammar-** Subject verb agreement, Prepositions

**Vocabulary-** One word substitute in the context

**Composition-** Letter Writing - informal letters

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

**TEXTS**

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

**UNIT III - POSITIVE SHORTCOMINGS**

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

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

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

**Writing** - Filing Complaints, Travelogues

**Grammar** - Tenses, Direct and Indirect Speech

**Vocabulary** - Compound words

**Composition - Dialogue Writing**

General essay – Adversity is the seed of success.

**TEXTS**

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

**UNIT IV POTENTIALS**

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

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

**Reading** - Parallel Reading, reading for pleasure

**Writing** - Letter writing – formal letters

**Grammar** - Adjectives, Degrees of Comparisons

**Vocabulary** - Idioms and Phrases

**Composition** - Debates and Discussions

General essay – My potentials

**TEXTS**

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

**UNIT V ACHIEVEMENTS**

**Listening** - Listening to comparisons and arguments

**Speaking** - Performance

**Reading** - In-depth reading

**Writing** - Script writing of story to play

**Grammar** - Question Tags

**Vocabulary** - Homophones

**Composition** - Essay Writing

General essay - The reward of hard work.

**TEXTS**

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

(For Candidates admitted from June 2018 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. First Year - Semester – II**

<b>Course Title</b>	<b>Major Core 3: Data Structures And Algorithms</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5 Hrs Wk</b>
<b>Code</b>	<b>U18CA2MCT03 / U18CS2MCT03</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**General Objectives:**

To understand the fundamental concepts of Data Structures and learn to develop Algorithms and to impart knowledge about the application of binary trees.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Remembers and understands the basic concepts of data structures and algorithms
CO-2	Understand basic concepts of Linked List and analyze its implementation
CO-3	Evaluate basic principles of stacks and queues
CO-4	Create trees for general expressions
CO-5	Apply operations of graphs in real time applications

**UNITI: 15Hrs**

**INTRODUCTION AND OVERVIEW:** Definitions – Overview of Data Structures - Implementation of Data Structures. **ARRAYS:** Definition – Terminology – One-dimensional Array: Memory Allocation for an Array – Operations on Arrays – Application of Arrays.

**Extra Extra Reading /Key words:** *two dimensional and multi dimensional array concepts.*

**UNITII: 15Hrs**

**LINKED LISTS:** Definition – Single Linked List: Definition- Operations on a Single LinkedList

- Circular Linked List - Double Linked Lists – Operations on a Double Linked Lists.

**Extra Reading /Key words:** *real time applications of Linked Lists.*

**UNITIII 15Hrs**

**STACKS:** Introduction - Definition - Representation of Stack - Operations on Stacks.

**QUEUES:** Introduction - Definition - Representation of Queues.

**Extra Reading /Key words:** *Postfix expression, Dequeue.*

**UNITIV 15Hrs**

**TREES:** Basic Terminologies - Definition and Concepts - Representation of Binary Tree - Operations on Binary Tree - Types of Binary Trees: Expression Tree.

**Extra Reading /Key words:** *Tree Traversals, Binary Search Tree.*

**UNITV 15Hrs**

**GRAPHS:** Introduction – Graph Terminologies. Representation of Graphs: Set

Representation – Linked Representation. Operation on Graphs: Operations on Linked List Representation of Graphs. **Extra Reading /Key words:** *cyclic and acyclic graph, shortest path.*

**Course Outcomes:**

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand array concept and develop array programs in C	PSO 2	U
CO-2	Appreciate the concept of memory allocation in C	PSO 2	An
CO-3	Analyze and implement linked list concept	PSO 2	An
CO-4	Illustrate the concept of Stack and Queue	PSO 5, PSO1	An
CO-5	Appraise the concept of trees	PSO 1.PSO 3	E
CO-6	Manipulate operations on graphs	PSO 1	U

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

Reference Books

1. Samanta.D,**ClassicDataStructures**, 2005,PrenticeHallofIndiaPrivateLtd,NewDelhi.  
**UNIT I** :Chapters 1 (1.1, 1.3, 1.4), 2 (2.1 - 2.3)  
**UNIT II**: Chapter 3 (3.1, 3.2, 3.2.2, 3.3, 3.4)  
**UNIT III**:Chapters 4 (4.1 – 4.4), 5 (5.1 - 5.3)  
**UNIT IV**:Chapter 7 (7.1 – 7.4, 7.5 – 7.5.1)  
**UNIT V** :Chapter 8 (8.1 – 8.3.2, 8.4 – 8.4.1)

**Reference Books:**

1. Aho Alfred. V , Hopcroft John . E., Ullman Jeffrey. D, **Data structures and Algorithms**, 2005, Pearson Education (Singapore) Pvt. Ltd., IndianBranch.
2. Heileman Gregory .L, **Data Structures, Algorithms and Object – Oriented Programming**, 2002, Tata Mc-Graw Hill Publishing Company Ltd, NewDelhi.
3. Kruse Robert. L, **Data Structures and Program Design**, 2001, Prentice Hall of IndiaPrivate Ltd, NewDelhi.
4. Sara Baase and Allen Van Gelder, **Computer Algorithms – Introduction to Design and Analysis**, 2002, Pearson Education,Asia.
5. Seymour Lipschutz ,**Data Structures**, Schaum’s Outline Series , 2006, McGraw HillCompany.

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. First Year - Semester – II**

<b>Course Title</b>	<b>Major Core 4: Data Structures Lab</b>
<b>Total Hours</b>	<b>30</b>
<b>Hours/Week</b>	<b>5 Hrs Wk</b>
<b>Code</b>	<b>U18CA2MCP04 / U18CS2MCP04</b>
<b>Course Type</b>	<b>Lab</b>
<b>Credits</b>	<b>4</b>
<b>Marks</b>	<b>100</b>

**General Objective:**

Student learns to develop C program for implementing different kind of Data Structures.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Remember stack concepts and develop programs using C.
CO-2	Understand the concepts of Queue and develop programs using C.
CO-3	Insert and delete nodes into and from a linked list using C.
CO-4	Develop C programs for implementing different sorting techniques.
CO-5	Develop C programs for searching an element in an array.
CO-6	Find the shortest path in a graph using C.

**EXERCISES**

1. Operations on Stack and Conversion of expressions.
2. Operations on Queue.
3. Operations on LinkedList.
4. Operations on Binary tree and Traversals.
5. SORTING:
  - a. Bubble Sort.
  - b. Insertion Sort.
  - c. Selection Sort.
  - d. Heap Sort.
  - e. Quick Sort.
6. SEARCHING:
  - a. Linear Search.
  - b. Binary Search.
7. Dijkstra's Algorithm to find the Shortest Path.

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS),**  
**TIRUCHIRAPPALLI – 620 002 PG DEPARTMENT OF**  
**COMPUTER SCIENCE**  
**B.C.A. First Year - Semester – II**

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

**General Objective:**

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

**Course Objectives(CO) :**

**The learner will be able to**

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

**UNIT I:**

**LINEARPROGRAMMINGPROBLEM**

**12Hrs**

Introduction –Mathematical formulation of the Problem – Solving LPP by graphical method – General LPP - Canonical and standard forms – Simplex method.**(Simple problems only)**

**Extra Reading/ Keywords:** *Integer linear programming, Mixed integer programming Karmarkar's algorithm.*

**UNIT II:  
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)**

**Extra Reading/ Keywords:** *Modified distribution method (MODI), Russell’s approximation method*

**UNIT III:  
Assignmentproblem**

**12Hrs**

Assignment Problem – Hungarian method – Unbalanced AP – Maximization in AP.

**Extra Reading/ Keywords:** *Generalised assignment problem, Linear bottleneck assignment problem*

**UNIT IV:  
SequencingProblem**

**12Hrs**

Introduction – problem of sequencing- Basic terms - Processing n jobs through 2 machines & 3 machines.

**Extra Reading/ Keywords:***Job-shop scheduling, Flow-shop scheduling*

**UNIT V:  
Network**

**SchedulingbyPERT/CPM**

**12Hrs**

Introduction – Network Basic components – logical sequencing – Rules of network construction – Concurrent activities - Critical path analysis.

**Extra Reading/ Keywords:***Critical path analysis in project management, Graphical evaluation and review technique, Precedence diagram method.*

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

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

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO – 1	Recognize and relate LPP and solving LPP using graphical and simplex method.	PSO - 3	R,U,E
CO – 2	Explain Transportation problem and Evaluate its initial basic feasible solution	PSO -2	Ap, E
CO – 3	Discuss and solve assignment problem using Hungarian algorithm.	PSO -1	E
CO – 4	Recall and evaluate the problem of sequencing with respect to processing n jobs through 2machinesand 3 machines.	PSO -5	E
CO – 5	Describe and Construct Network and compute PERT and CPM	PSO -4	R,U,E
CO – 6	Provide an understanding of basic concepts in Operations Research Techniques for Analysis and Modeling in computer applications Skill Development	PSO – 2,5	U, Ap

**TEXT BOOK:**

**Treatment and content as in** Kanti Swarup, Gupta P.K, Man Mohan (2007),13<sup>th</sup> 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 , (2<sup>nd</sup> Reprint 2011), OPERATIONS RESEARCH , 3<sup>rd</sup> edition, Vikas Publishing House Pvt.Ltd, New Delhi.
2. Gupta P.K., Hira S.(2005) , OPERATIONS RESEARCH, S.Chand & Co.Limited , New Delhi.
3. Mariappan P.(2001), OPERATIONS RESEARCH METHODS & APPLICATIONS , New Centurion Publications, New Delhi.
4. PanneerSelvam(2003),OPERATIONSRESEARCH,PrenticeHallofIndiaPrivate Limited, NewDelhi.
- 5.Sharma J.K.(2007), OPERATION RESEARCH THEORY &APPLICATIONS, Macmillan India Limited,Chennai.

NewDelhi.

New Centu



(For the candidates admitted from 2015 onwards)

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

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

**SEMESTER- II**

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

**General Objective:**

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

**Course Outcomes:**

**The student will be able to**

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

**UNIT I:**

**6hrs**

**Individual Capacity Building**

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

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

**UNIT II:**

**6hrs**

**Interpersonal skills**

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

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

**UNITIII:****6hrs****Corporate skills**

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

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

**UNITIV:****6hrs****Management skills**

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

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

**UNITV:****6 hrs****Self Development Plan**

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

**Extra reading / Key Words:** *Case study*

**Note: Extra reading/Key words are only for internal**

**testing(Seminar/Assignment) Course Course Outcome:**

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

**REFERENCES:**

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

Francis Thamburaj S.J. (2009). Communication soft skills for Professional Excellence, 1<sup>st</sup> Ed., Grace Publishers, Rathan Reddy B.(2005). Team Development and Leadership, Jaico Publishing House, Mumbai.

(For candidates admitted from 2018 onwards)

**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 2**  
**B.A./ B.Sc./B.Com./BCA & BBA, DEGREE EXAMINATION**  
**SEMESTER II / III**

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

**General Objective:**

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

**Course Objectives:**

**The student will be able to:**

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

**Unit-I**

**6hrs**

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

**Extra reading/Key word:** *resource mapping tools*

**Unit-II**

**6hrs**

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

**Extra reading / Key word:** *Practices in India*

**Unit-III**

**6hrs**

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

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

**Unit IV-**

**6hrs**

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

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

## **Unit-V**

**6hrs**

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

**Extra reading/Key word:** *Defense recruitment modes.*

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

### **Assignments) Course Outcome:**

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

### **REFERENCES:**

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

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

**HRS /WK:1**  
**CREDITS:1**

**CODE:U15VE2LVE01**  
**MARKS :100**

**OBJECTIVES:**

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

**UNIT – I: RELIGION**

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

**UNIT – II: DIFFERENT RELIGIONS**

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

**UNIT –III: UNITY OF RELIGION**

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

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

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

**UNIT – V: VALUE SYSTEMS**

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

**REFERENCES:**

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

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

**HRS / WK:1**  
**CREDIT:1**

**CODE:U15VE2LVB01**  
**MARKS :100**

**OBJECTIVE:**

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

**UNIT – I: BIBLE – THE WORD OF GOD**

- Books of the Bible – Division into Old Testament and New Testament – History of the Bible-
- Messianic Prophecies (Isaiah 9:6,40:3,53:1-12,61:1-3,Micah5:2)
- The Birth and Ministry of John the Baptist (Luke 1:1-80,Mat3:1-17,14:1-12)
- The Birth, Passion, Death and Resurrection of Jesus (Luke 1:26-80,2:1-52,John 1:18-21)

**UNIT – II: MINISTRY OF JESUS**

- Miracles (Mark 2:1-12,Luke 4:38-41,6:6-11,7:1-17,8:26-56,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 New Testament
- Martha & Maria (Luke 10: 38- 42, John 11:1-46)

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

- Early Church
- 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 present Church.

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

- Mother Mary (Mother of Jesus) (Luke 1: 27-35, John 2: 1-12, 19:35, Acts 1:13-14)
- St. Peter (Luke 22:1-7, Acts 2:1-41, 12:1-17)
- St. Andrew (Mat 4:18-20, John 1:35-42, 6:1-14)
- St. Stephen (Acts 6,7)
- St. Paul (Acts 8,9,14,17,26 and 28)
- St. Thomas (John 20:24-31)

### **UNIT – V: ST. PAUL’S LETTERS AND THE MESSAGE**

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

### **REFERENCES:**

3. Holy Bible
4. John Stott, 1994, “**Men with a Message**”, Angus Hudson Ltd. London.

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

**HRS / WK:1**  
**CREDIT:1**

**CODE:U15VE2LVC01**  
**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 – speciality of the Gospel – main emphasis of themessage – meaning and blessing of suffering and paschal joy in one’s life - Passion – PaschalMystery

**REFERENCES:**

6. Catechism of the Catholic Church published by Theological Publications in India for the Catholic Hierarchy of India,1994
7. The Holy Bible Revised Standard Version with Old and New Testaments Catholic Edition forIndia.
8. Vaazhvin Vazhiyil – St. John’s Gospel- Fr.Eronimus
9. God’s Word nourishes A catholic approach to the Scriptures Dr. Silvano Renu Rita,O.C.V. STD and Dr. Mascarenhas Fio S.J. D.mim. Catholic Bible I
10. Documents of Vatican II – St. Paul’s Publications, Bombay1966.



(For Candidates admitted from 2015 onwards)  
**HOLY CROSS COLLEGE (Autonomous), Tiruchirappalli - 620 002.**

**PG & RESEARCH DEPARTMENT OF TAMIL**

**Second Year - Semester – III**

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

**General Objectives:**

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

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

**Course Objectives:**

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

**அலகு:1 செய்யுள்**

**18 Hrs**

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

**key Words (Extra Reading)**

சீவகசிந்தாமணி

**அலகு:2 செய்யுள்**

**18 Hrs**

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

**அலகு:3**

18 Hrs

தமிழ் இலக்கிய வரலாறு  
சோழர் காலம்  
அலகு:4

18Hrs

நாடகம்  
சத்திய வேள்வி – அய்க்கண்

**key Words (Extra Reading)**  
யாருக்கும் வெட்கமில்லை - சோ

அலகு:5

18 Hrs

கோயிற்கலை

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

**Course Outcomes:**

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

**பாட நூல்கள்**

- செய்யுள்
  - தமிழாய்வுத்துறை வுத்துறை வெளியீடு
- தமிழ் இலக்கிய வரலாறு
  - தமிழாய்வுத்துறை வுத்துறை வெளியீடு
- நாடகம்
  - சத்திய வேள்வி
- கோயிற்கலை
  - தமிழ்நாட்டிலுள்ள ஆலயங்களைக் கலை நுணுக்கத்துடன் காணுதல்

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

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

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

**Course Objectives (CO):**

**The learner will be able to**

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

**UNIT – I**

**(18 Hours)**

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

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

**UNIT- II**

**(18 Hours)**

1. Thulasi Das
2. Anal Kireet
3. BhaktiKal – Gnanashrayi Sakha

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

**UNIT- III****(18 Hours)**

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

**Extra Reading (Key Words ):***Rahim***UNIT- IV**

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

**Extra Reading (Key Words ):****UNIT- V****(18 Hours)**

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

**Extra Reading (Key Words ):** *Bihari satsai*

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

**Course Outcomes:****The learner will be able to:**

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

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

**Prescribed Books**

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

**Reference Books :**

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

(For candidates admitted 2016 onwards)

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

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

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

**Course Objectives (CO):**

**The learner will be able to**

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

**Unit 1 Vivementdemain!**

**(18 Hours)**

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

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

**Unit 2 Tu as duboulot?**

**(18 Hours)**

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

*Extra Reading (Key Words):* l'organigramme d'une entreprise.

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

**(18 Hours)**

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

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

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

**(18 Hours)**

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

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

**Unit 5 Onse retrouve**

**(18 Hours)**

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

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

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

**TEXT BOOKS :**

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

Authors: J. Girardet and J. Pécheur Publication: CLÉ

INTERNATIONAL, 2013.

**Books for Reference:**

La Conjugaison – Nathan

French made easy – Intermediate level – Goodwill Publishing House Je parle

français III – Abhay Publications

Le français avec des jeux et des activités – ELI Langue et

la civilisation – I – Mauger Bleu

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

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. First Year - Semester – III**

<b>Course Title</b>	<b>Major core 5 – Database Systems and Data Mining</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5 Hrs Wk</b>
<b>Code</b>	<b>U18CA3MCT05</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**GENERAL OBJECTIVE**

To impart the fundamental aspects of database design, database languages and database-system implementation.

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understand, analyze the database, file management and data management system.
CO-2	Apply relational algebra notation to access data from database.
CO-3	Create and relate E-R diagrams with relation and different types of normalization.
CO-4	Execute DDL and DML commands using SQL.
CO-5	Analyze and determine the types of data.

**UNIT- I: Introduction to DBMS**

**15Hrs**

Database System Applications – Purpose of Database Systems – View of Data – Database Languages – Relational Databases – Database Design – Data Storage and Querying – Transaction Management – Database Architecture - Data Mining and Information Retrieval – Specialty Databases – Database Users and Administrators – History of Database Systems.

**Extra reading/Key words:** *DB Software, Big Data*

**UNIT- II: Relational Model**

**15Hrs**

Structure of Relational Databases - Database Schema- keys- - Schema Diagrams - Relational Query Languages - Relational Operations - The Relational Algebra.

**Extra reading/Key words:** *Tuple and Domain Calculus*

**UNIT- III: Database Design and The E-R Model**

**15 Hrs**

Overview of the Design Process – The Entity-Relationship Model – Constraints – Removing Redundant Attributes in Entity Sets - Entity-Relationship Diagrams – Entity-Relationship Design Issues **Normalization:** The Purpose of Normalization – How Normalization Supports Database Design – Data Redundancy and Update Anomalies – Functional Dependencies – The Process of Normalization – First Normal Form - Second Normal Form - Third Normal Form – General Definitions of 2NF and 3NF. **Advanced Normalization:** Boyce Codd Normal Form - Fourth Normal Form – Fifth Normal Form.

**Extra reading/Key words :** *EER Model, 6NF*

**UNIT- IV: Introduction ToSQL****15Hrs**

Overview oftheSQLQuery– Language -SQLDataDefinition-BasicStructureofSQLQueries  
 - Additional Basic Operations - Set Operations - Null Values - Aggregate Functions - Nested Subqueries - Modification of the Database – **Intermediate SQL:** Join Expressions - Views – Transactions - Integrity Constraints – SQL Data Types and Schemas – Authorization - **Advanced SQL:** Functions and Procedures.

**Extra reading/Key words:** *PostgreSQL, Embedded SQL*

**UNIT- V: An Introduction ToDataMining****15 Hrs**

**An Introduction To Data Mining:** Introduction-The Data Mining Process - The Data Preprocessing Phase-The Analytical Phase - The Basic Data Types - Non-dependency Oriented Data – Quantitative Multidimensional Data - Categorical and Mixed Attribute Data -Binary and Set Data - Text Data - Dependency Oriented Data -Time-Series Data -Discrete Sequences and Strings -Spatial Data-Network and Graph Data -The Major Building Blocks: A Bird’s Eye View -Association Pattern Mining- Data Clustering Outlier Detection -Data Classification -Impact of Complex Data Types on Problem Definitions. Pattern Mining with Complex Data Types - Clustering with Complex Data Types -Outlier Detection with Complex Data Types - Classification with Complex Data Types - Scalability Issues and the Streaming Scenario - A Stroll through some Application Scenarios - Store Product Placement - Customer Recommendations - Medical Diagnosis -Web LogAnomalies.

**Extra reading/Key words:** *Data Mining Tools – Weka, Orange.*

**Course Outcomes:**

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Recall and Relate file management systems with DBMS.	PSO 1	R, U
CO-2	Design relations using Database Schema	PSO2 PSO5	A
CO-3	Relate Relational Algebra Notation with Relation Operation to access the data.	PSO 2	An
CO-4	Differentiate and Refine the relations by applying normalizationtechniques.	PSO 4	An,E
CO-5	Sketch and Relate E-R diagrams with relations.	PSO 2	An
CO-6	Apply SQL queries to access the data.	PSO 4	Ap
CO-7	Recognize the importance of Data Mining.	PSO 1	R, U
CO-8	Illustrate the classification, clustering and outlier detection of data.	PSO 2	U,E

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



## References

### TextBooks

1. Abraham Silberschatz, Henry F. Korth, S. Sudarshan, “**Database System Concepts**”, 2010, Sixth Edition, McGraw-Hill Publications.
  - UNIT I** : Chapter 1(1.1-1.13)
  - UNIT II** : Chapter 2(2.1-2.6), 6(6.1)
  - UNIT III** :Chapter 7(7.1-7.5,7.7)
  - UNIT IV** :Chapters 3(3.1-3.9),4(4.1-4.6), 5(5.2)
  - UNIT V** : Chapters 10(10.1, 10.5-10.7),14(4.1-14.7)
2. Thomas Connolly, Carolyn Begg, “**Database Systems**”, 2009, Fourth Edition, Pearson Education Ltd., New Delhi.
  - i. **UNIT III** :Chapters 13(13.1 – 13.9), 14(14.2,14.4 – 14.5)
3. Charu C. Aggarwal, “**Data Mining: The Text Book**”, 2015, Springer.
  - i. **UNIT V** : Chapter 1

### Reference Books:

1. G.K.Gupta ,”**Database Management System**”, 2011, Tata McGraw Hill Publications Company Limited, New Delhi.
2. Seema kedar, “**Database Management System**”, 2011, Technical Publications.
3. Elmasri & Navathe, “**Fundamentals of Database Systems**”, 2006, Pearson Education Publications, New Delhi.
4. P.K. Yadav,”**Database Management System**”, 2013, Tata McGraw Hill Publications Company Limited, New Delhi.
5. Jiawei Han and Micheline Kamber, “**Data Mining Concepts and Techniques**”, 2<sup>nd</sup> Edition, Morgan Kaufmann, 2006

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Second Year - Semester – III**

<b>Course Title</b>	<b>MAJOR CORE 6 : Database Systems and Data Mining Lab</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5 Hrs /Wk</b>
<b>Code</b>	<b>U18CA3MCP06</b>
<b>Course Type</b>	<b>Practical</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**General Objectives:**

To examines the database architecture and data mining technologies required for solving complex problems of data and information management, information retrieval, and knowledge discovery facing modern organizations.

**Course Objectives:**

<b>CO NO.</b>	<b>COURSE OBJECTIVES</b>
CO-1	Understand to create table,aggregate functions,set operators using queries
CO-2	Provide pratices to partition the table,usage of nested queries
CO-3	Apply pl/sql program to prepare mark sheet,pay slip,electricity bill
CO-4	Apply pl/sql program to prepare multiplication table,count the strings
CO-5	Provide the exposure on weka tools.

1. Table creation and simplequeries.
2. Queries using aggregatefunctions.
3. Queries using setOperators.
4. Table creation with variousjoins.
5. Partitioned tablecreation.
6. Nested sub queries and correlated subqueries.
7. View creation andmanipulations.
8. PL/SQL program to prepare marksheet.
9. PL/SQL program to prepare a payslip.
10. PL/SQL program to prepare the electricityBill.
11. PL/SQL program to prepare the multiplication table for a givennumber.
12. PL/SQL program to count the number of characters and digits in astring.
13. Exposure on WEGAtools.

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Second Year - Semester – III**

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

**General Objective:**

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

**Course Objectives(CO) :**

**The learner will be able to**

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

**UNIT1:MATRICES**

**12Hrs**

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

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

**UNIT II : MATRICES (CONTINUED)**

**12Hrs**

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

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

**UNIT III : SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS AND INTERPOLATION** **12 Hrs**

Solving algebraic and transcendental equations – Bisection, False position and Newton Raphson methods.

Newton Gregory forward and backward interpolation formulae

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

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

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

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

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

Trapezoidal rule and Simpsons 1/3 rule (truncation error excluded). Solving differential equations (1<sup>st</sup> order

differential equations only) – solutions by Euler’s method - Euler’s modified method (excluding improved Euler’s method) – Runge Kutta 2<sup>nd</sup> and 4<sup>th</sup> order method.

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

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

**Course Outcomes(CO):**

The learner will be able to

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO - 1	Recall matrices and its operations and Solving simultaneous linear equations	PSO - 3	R,U,E
CO - 2	Compute Eigen values ,Eigen vector using Cayley Hamilton Theorem	PSO -2	Ap, E
CO - 3	Evaluate algebraic and transcendental equation using numerical methods	PSO -1	E
CO - 4	Formulation of Polynomial using interpolation .	PSO -5	E
CO - 5	Examine direct and iterative numerical methods of simultaneous equation. Solve differential equation using Euler method, Runge Kutta method.	PSO -4	U,E
CO - 6	impart the knowledge on matrices and enable the students to know about different methods of solving numerical equations, methods of interpolation ,numerical differentiation and integration- Skill Development	PSO -2	U,E

**TEXTBOOKS:**

For Units I and II

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

UNIT I Chapter 3 : Sections 3.1-

3.3 UNIT II Chapter 3 :

Sections3.4,3.5

For Units III, IV and V

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

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

UNIT IV Chapter 4 Section 1-3,6

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

**REFERENCE BOOKS :**

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

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

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

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

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Second Year - Semester – III**

<b>Course Title</b>	<b>SKILL BASED ELECTIVE 3 - MONGODB WITH SQL LAB</b>
<b>Total Hours</b>	<b>30</b>
<b>Hours/Week</b>	<b>2 Hours / Week</b>
<b>Code</b>	<b>U18CA3SBP03</b>
<b>Course Type</b>	<b>Practical</b>
<b>Credits</b>	<b>2</b>
<b>Marks</b>	<b>100</b>

**GENERAL OBJECTIVE: To understand and experiment the querying sequences in the open source tool MongoDB.**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understand the fundamentals of MongoDB.
CO-2	Installs the MongoDB components in the Individual system and virtualizes the server concept
CO-3	Apply the basic queries of CRUD operations in MongoDB prompt
CO-4	Apply and extract the collection documents with various Queries
CO-5	Apply and experiment the query sequences with various operations in different applications

**EXERCISES**

1. Write a MongoDB query to display all the documents in the collectionrestaurants.
2. Write a MongoDB query to display the fields restaurant\_id, name, boroughand cuisine for all the documents in the collectionrestaurant.
3. Write a MongoDB query to find the restaurants who achieved a score more than90.
4. Write a MongoDB query to find the restaurants that achieved a score, more than 80 but less than100.
5. Write a MongoDB query to find the restaurants which do not prepare any cuisine of 'American' and achieved a score more than 70 and located in the longitude less than - 65.754168. Note :Do this query without using \$andoperator.
6. Write a MongoDB query to find the restaurants which do not prepare any cuisine of 'American ' and achieved a grade point 'A' not belongs to the borough Brooklyn. The document must be displayed according to the cuisine in descendingorder.
7. Write a MongoDB query to find the restaurant Id, name, borough and cuisine for those restaurants which contain 'Wil' as first three letters for itsname.
8. Write a MongoDB query to find the restaurant Id, name, borough and cuisine for those restaurants which contain 'ces' as last three letters for itsname.
9. Write a MongoDB query to find the restaurant Id, name, borough and cuisine for those restaurants which contain 'Reg' as three letters somewhere in itsname.
10. Write a MongoDB query to find the restaurants which belong to the borough Bronx and prepared either American or Chinesedish.

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

<b>Course Title</b>	<b>GENDER STUDIES</b>
<b>Total Hours</b>	<b>15</b>
<b>Hours/Week</b>	<b>1</b>
<b>Code</b>	<b>U15WS3GST01 / U15WS6GST01</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>1</b>
<b>Marks</b>	<b>100</b>

**General Objective:**

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

**Course Objectives:**

**The student will be able to**

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

**Unit I**

**3**

**hrs**

**Concepts of Gender:**

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

**Extra reading /Key Words:** *Acts on gender*

**Unit II**

**3**

**hrs**

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

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

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

### **Unit–III**

**3hrs**

#### **Areas of Gender Discrimination:**

Family – Sex Ratio – Literacy – Health – Governance – Religion Work Vs Employment – Market – Media – Politics – Law – Domestic Violence – Sexual Harassment – State Politics and Planning.

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

### **Unit–IV**

**3hrs**

#### **Women Development and Gender Empowerment:**

Initiatives – International Women’s Decade – International Women’s Year – National Policy for Empowerment of Women – Women Empowerment Year 2001 – Mainstreaming Global Policies. **Extra reading/Key Words:** *Case study*

### **Unit–V**

**3hrs**

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

**Extra reading / Key Words:** *Laws on gender equality*

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

#### **Course Outcomes:**

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

#### **REFERENCES:**

- Manimekalai.N & Suba. S (2011), Gender Studies, Publication Division, Bharathidasan University, Tiruchirappalli
- Jane, P. & Imelda, W. (2004), 50 Key Concepts in Gender Studies.



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

**HRS / WK:1**  
**CREDIT:1**

**CODE:U15VE4LVE02**  
**MARKS :100**

**OBJECTIVES:**

- To make the learners aware of various gender and social issues and CyberCrimes.
- To make the learners understand and appreciate the role of media, in facing the challenges on various lifeissues.
- To enable the learners to understand the ways of empowering women and cybercrime againstwomen

**UNIT – I: GENDER ISSUES**

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

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

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

**UNIT – III: WOMEN AND MEDIA**

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

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

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

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

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

**REFERENCES:**

1. Dr.M.Arumairaj et al., 1999, “Marching towards the Milleniumahead”.
2. Thomas Anjugandam, 1999, “Grow Free Live Free” SalesianPublicaiton.
3. H.C Pretti Nandhini Upreti, jaipur 2000 “Women and problems of GenderDiscrimination”.
4. Thomas B.Jayaseelan, 2002, “Women: Rights and law” Indian Social Institute, NewDelhi.
5. Reni Jacob vol I & II, April- June 2004, ”Vikasimi – The journal ofWomen’s Empowerment,Ed,”

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

**HRS /WK:1**

**CODE:U15VE4LVB02**

**CREDIT:1**

**MARKS :100**

**OBJECTIVE:**

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

**UNIT – I: PURPOSE OF LIFE**

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

- Noah (Gen 6-9); Abraham (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 Kings1-11)

**UNIT – III: MINOR PROPHETS**

Brief Life History and teachings of

- Amos
- Jonah
- Micah
- Nahum
- Habakkuk

**UNIT – IV: MAJOR PROPHETS**

Brief Life History and teachings of

- Isaiah (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 (Daniell-6)

**UNIT – V: WOMEN IN THE BIBLE**

Women in the Old Testament

- Eve (Gen3)
- Ruth (Ruth1-4)
- Hannah (I Sam1:1-28)
- Esther (Esther1-6)

**REFERENCES:**

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

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

**HRS / WK:1**

**CODE : U15VE4LVC02**

**CREDIT:1**

**MARKS :100**

**OBJECTIVES:**

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

**UNIT – I: MISSION OF THE CHURCH**

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

**UNIT – II: PARTICIPATORY CHURCH**

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

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

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

**UNIT – IV: SACRAMENTS**

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

**UNIT – V: MARY AND SAINTS**

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

**REFERENCES:**

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

(For Candidates admitted from 2015 onwards)  
**HOLY CROSS COLLEGE (Autonomous), Tiruchirappalli - 620 002.**

**PG & RESEARCH DEPARTMENT OF TAMIL**

**Second Year - Semester – IV**

<b>Course Title</b>	தமிழ்த்தாள் - IV
<b>Total Hours</b>	75
<b>Hours/Week</b>	5 Hrs Wk
<b>Code</b>	U15TL4TAM04
<b>Course Type</b>	Theory
<b>Credits</b>	3
<b>Marks</b>	100

**General Objectives:**

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

- Make the student to understand the cultural and tradition of Tamilians.
- Student will learn to understand the different religions
- Understand the depth of Tamil Literature & Culture.
- Know about the structure of the family, manners and discipline.
- Know about the rights of equality.

**Course Objectives:**

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

அலகு:1 செய்யுள்

15 Hrs

**1. குறுந்தொகை**

1. கொங்கு தேர் வாழ்க்கை அஞ்சிறைத் தும்பி - இறையனார்
2. யாரும் இல்லை தானே கள்வன் - கபிலர்
3. வேம்பின் பைங்காய்என் தோழி தரினே - மிளைக்கந்தன்
4. உள்ளது சிதைப்போர் உளரெனப் படாஅர் - பாலை பாடிய பெருங்கடுங்கோ
5. நோற்றோர் மன்ற தோழி - குறுங்குடி மருதன்

**2. நற்றிணை**

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

**3. கலித்தொகை**

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

அலகு:2

15 Hrs

அகநானூறு

- 1.வானம் வாய்ப்பக் கவினிக் கானம் - சீத்தலைச் சாத்தனார்
2. எம்வெங் காம மியைவதாயின் - மாமூலனார்

5.புறநானூறு

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

6. பதிற்றுப்பத்து - ஐந்தாம் பத்து

1. கடர் வீ வேங்கை
2. தசம்பு துளங்கு இருக்கை
3. ஊன்துவை அடிசில்

7. திருக்குறள்

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

அலகு:3

15 Hrs

தமிழ் இலக்கிய வரலாறு

சங்ககாலம் - சங்கம் மருவியகாலம்

எட்டுத்தொகை, பத்துப்பாட்டு, பதினெண்கீழ்க்கணக்கு நூல்கள்

அலகு:4

15 Hrs

வாழ்க்கை வரலாறு

அன்னை தெரசா - பா. தீனதயாளன்

மநல நுழ்சனள (நூலவசய சுநயனபை)

அக்னி சிறகுகள் - அப்துல் கலாம்

அலகு:5

15 Hrs

பொது- மொழிப்பெயர்ப்பு

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

**Course Outcomes:**

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	To develop an attitude to consider other living beings as equals	PSO 1	U
CO-2	To learn about the life style of traditional Tamil literature	PSO 2	AN
CO-3	to be inspired by the traditional culture and values	PSO 2	R
CO-4	To study about the dedicated service of mother Theresa and to practice the same	PSO 3	U
CO-5	to enhance skills in translation	PSO 4	C

1. செய்யுள் - தமிழாய்வுத்துறை வெளியீடு
2. தமிழ் இலக்கிய வரலாறு - தமிழாய்வுத்துறை வெளியீடு
3. வாழ்க்கை வரலாறு  
பா.தீனதயாளன் - அன்னை தெரசா
4. மொழிப்பெயர்ப்பு - தமிழாய்வுத்துறை வெளியீடு

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

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

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

**Course Objectives (CO):**

**The learner will be able to**

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

**UNIT – I** **(15 Hours)**

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

**UNIT- II** **(15 Hours)**

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

**Extra Reading (Key Words) :** *Vyavasayikata*

**UNIT- III** **(15 Hours)**

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

**Extra Reading (Key Words) :** *Kisan*

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

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

**Extra Reading (Key Words ):** *Hamara Bharat*

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

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

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

**Course Outcomes:****The learner will be able to:**

Course Outcomes	Cognitive Level
Utilize technical terms in translating a text.	Ap
Mark the global brands and their countries.	U, E
Develop an essay on any social issue.	E, C
Formulate an office order for the university	Ap, C
Make use of translation techniques in a text.	Ap

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

**Prescribed Books**

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

**Reference Books :**

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



(For candidates admitted 2016 onwards)

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPPALLI – 2**  
**DEPARTMENT OF FRENCH**  
**SEMESTER IV**

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

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

**Course Objectives (CO):**

**The learner will be able to**

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

**Unit 1 C'est la fête!**

**(18 Hours)**

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

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

**Unit 2 Vous plaisez!**

**(18 Hours)**

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

*Extra Reading (Key Words):* Histoire du monde au début du 20<sup>e</sup> siècle.

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

**(18 Hours)**

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

*Extra Reading (Key Words):* les taboos

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

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

*Extra Reading (Key Words ):* les sportifs français

**Unit 5 La vie est dure****(18 Hours)**

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

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

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

**TEXT BOOKS :**

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

Authors: J. Girardet and J. Pécheur Publication: CLÉ

INTERNATIONAL, 2013.

**Books for Reference:**

La Conjugaison – Nathan

French made easy – Intermediate level - Goodwill Publishing House Je parle

français III – Abhay Publications

Le français avec des jeux et des activités - ELI Langue et la

civilisation – I – Mauger Bleu

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

(For candidates admitted from June 2017 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), Tiruchirapalli – 620002**  
**PG AND RESEARCH DEPARTMENT OF ENGLISH**  
**I YEAR UG – SEMESTER I**  
**PART II – ENGLISH 4 - GENERAL ENGLISH IV**

**HOURS : 6**  
**CREDIT : 3**

**CODE : U15EL4GEN04**  
**MARKS: 100**

**EMPLOYABILITY SKILLS**

**OBJECTIVES:**

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

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

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

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

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

**Writing** recommendations.

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

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

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

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

**TEXTS**

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

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

**Listening** to differentiate duty from obligation.

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

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

**Writing** paragraphs with cause and reason, analyzing motives behind people's actions and behavior.

**Grammar** – use of cohesive devices

**Vocabulary** – figures of speech– simile, metaphor.

**Composition** –

1. Excellence is not a destination, it is a continuous journey that never ends – Brian Tracy
2. To be perfect is to change often – Winston Churchill

**TEXTS**

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

**UNIT III – Team skills**

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

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

**Reading** for comprehension – absorbing the attitude of the people.

**Writing** – personal essays and report writing

**Grammar** – use of inverted structures

**Vocabulary** –New words in current usage.

**Composition –1.**“Talent wins games, but teamwork and intelligence wins championships.”  
**2.** “It takes two flints to make a fire.”

#### **TEXTS**

1. “The Little Black Boy” by William Blake
2. How to get cooperation by Dale Carnegie.

#### **UNIT IV – Communication skills for interpersonal relationship**

**Listening** to specific information and guessing.

**Speaking** –Facing interview and situational speeches (Master of ceremony, felicitation and the like).

**Reading** for comprehension to identify the methods of persuasion.

**Writing** formal letters and invitations.

**Grammar** – Transformation of sentences.

**Vocabulary** – Words related to technical registers.

**Composition –1.**“Communication is an art form that is crafted throughout our lives.”

- 2.** Birds of same feather flock together.

#### **TEXTS**

1. The Refund by Fritz Karinthy

#### **UNIT V –Presentation skills**

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

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

**Reading** for comprehension.

**Writing** agenda, minutes, memo, notice, circular, project proposal.

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

**Vocabulary** – Business terms.

**Composition** – writing a project.

#### **TEXTS**

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

(For Candidates admitted from June 2018 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Second Year - Semester – IV**

<b>Course Title</b>	<b>Major core 7 – Java Programming</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5 Hrs Wk</b>
<b>Code</b>	<b>U18CA4MCT07</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**GENERAL OBJECTIVE**

To enable the students to learn the syntax, concepts of the language to write the solution for real world problems.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understand & analyze the Java features and Program Structure.
CO-2	Apply the concepts of encapsulation in classes and objects.
CO-3	Classify and implement the types of Inheritance & Packages.
CO-4	Differentiate and demonstrate the types in Thread creation and Exception Handling.
CO-5	Create the Applet Program and apply the Collection Framework.

**UNIT- I Introductionto Java**

**15Hrs**

JAVA EVOLUTION : Java History – Java Features – How Java Differs from C and C++ -- Java and Internet – Java and World Wide Web – Web Browsers – Hardware and Software Requirements – Java Support Systems – Java Environment.

OVERVIEW OF JAVA LANGAGE : Introduction – Simple Java Program – More of Java – An Application with Two Classes – Java Program Structure – Java Tokens – Java Statements – Implementing a Java Program – Java Virtual Machine – Command Line Arguments – Programming Style - TYPE CONVERSION IN EXPRESSION-DECISION MAKING AND

BRANCHING : Introduction – Decision Making with If Statement – Simple If Statement – The If ..Else Statement – Nesting of If..Else Statements – The Else If Ladder – The Switch Statement – The ? : Operator.

**Extra reading/Key words:** *Netbean, Eclipse*

**UNIT- II ClassesandObject**

**15Hrs**

DECISION MAKING AND LOOPING: Introduction – The While Statement – The doStatement – The for Statement – Jumps in Loops – Labeled Loops. CLASSES, OBJECTS AND METHODS: Introduction – Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing Class Members – Constructors – Methods Overloading – Static Members – Nesting of Methods – Inheritance: Extending a Class – Overriding Methods – Final Variables and Methods – Final Classes – Finalizer Methods – Abstract Methods and Classes – Methods with Varargs – VisibilityControl.

**Extra reading/Key words:** *Generalization, Specialization*

**UNIT- III InterfacesandPackages****15Hrs**

INTERFACES: MULTIPLE INHERITANCE: Introduction – Defining Interfaces – Extending Interfaces – Implementing Interfaces – Accessing Interface Variables.

PACKAGES : PUTTING CLASSES TOGETHER : Introduction – Java API Packages – Using System Packages – Naming Conventions – Creating Packages – Accessing a Package – Using a Package – Adding a Class to a Package – Hiding Classes – Static Import.

Extra reading/Key words: *Proxy, JAR Files*

**UNIT - IV Multithreading andExceptionHandling****15 Hrs**

MULTITHREADED PROGRAMMING : Introduction – Creating Threads – Extending the Thread Class – Stopping and Blocking a Thread – Life Cycle of a Thread – Using Thread Methods – Thread Exceptions – Thread Priority – Synchronization – Implementing the ‘Runnable’ Interface-Inter threadcommunication.

MANAGING ERRORS AND EXCEPTIONS : Introduction – Types of Errors – Exceptions – Syntax of Exception Handling Code – Multiple Catch Statements – Using Finally Statement – Throwing Our Own Exceptions – Using Exceptions for Debugging.

Extra reading/Key words: *Deadlock, Synchronization*

**UNIT - VAppletProgramming****15Hrs**

Introduction – How Applets Differ from Applications – Preparing to Write Applets – Building Applet Code – Applet Life Cycle – Creating an Executable Applet – Designing a Web Page – Applet Tag – Adding Applet to Html File – Running the Applet – More About Applet Tag – Passing Parameters to Applets – Aligning the Display – More About Html Tags – Displaying Numerical Values – Getting Input from the User-Event Handling-Introduction to AWT package-Introduction to Swings - **JAVA COLLECTIONS:** Overview of Interfaces-Overview of Classes-Overview of Algorithms.

Extra reading/Key words: *HTML5, Servlet*

**Course Outcomes:**

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	State OOPS and Relate java syntax with C and C++.	PSO 1	R, U
CO-2	Categorize OOPS such as encapsulation, abstraction, polymorphism.	PSO 2	An
CO-3	Applying encapsulation concepts in developing the programs with classes andobjects.	PSO 4	Ap
CO-4	Identify different types of inheritance and apply them for reusability of code.	PSO 1, PSO 4	R, Ap
CO-5	Construct the packages by arranging the classes with visibility control.	PSO 2, PSO 5	C, An
CO-6	Develop program using different methods of thread creation and exception handling.	PSO 5	C, Ap
CO-7	Create Internet program using applets.	PSO 5	C,Ap
CO-8	Evaluate java collection with other implementation methods of data structure.	PSO 4	E

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

**An – Analyse; E- Evaluate; C – Create**

## References

### Text Book:

1. E.Balagurusamy, **“Programming with JAVA”**, 5<sup>th</sup> Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi.

**UNIT I** : CHAPTERS 2, 3, 5.13 &6

**UNIT II** : CHAPTERS 7, 8

**UNIT III**: CHAPTERS

10,11

**UNIT IV**: CHAPTERS 12, 13

**UNIT V**: CHAPTERS 14,17

### Reference Books:

1. Herbert Schildt, **“Java The Complete Reference”**, 7<sup>th</sup> edition, Tata McGraw-Hill Publications Pvt. Ltd., New Delhi
2. Y.Daniel Liang, **“Introduction to Java Programming”**, 10<sup>th</sup> edition, Pearson Education Ltd
3. David J.Eck, **“Programming :Introduction to programming using Java”**, 6<sup>th</sup> edition, Createspace Publications
4. Joshua Bloch, **“Effective Java”**, Second Edition, Addison Wesley Publications.
5. Kathy Sierra, Bert Bates, **“Head First Java”**, d edition, O’Reilly Publications.

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Second Year - Semester – IV**

<b>Course Title</b>	<b>MAJOR ELECTIVE 1: Web Designing &amp; PHP Lab</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5 Hrs /Wk</b>
<b>Code</b>	<b>U18CA4MEP01</b>
<b>Course Type</b>	<b>Practical</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**General Objectives:**

To discuss and develop websites using script type, style sheets, jquery, html and php languages.

**Course Objectives:**

<b>CO NO.</b>	<b>COURSE OBJECTIVES</b>
CO-1	Understand the basic concepts of html and stylesheets.
CO-2	Perform basic operations using CSS
CO-3	Learn how to use jquery for effective website creation
CO-4	Learn various functions of MySQL
CO-5	Understand the Scripting language of website creation

**HTML5 & CSS:**

1. Create a HTML page that will have the following: Headers, Linking and Images.
2. Create a HTML page that will have the following: Frames, Unordered Lists, Nested and Ordered Lists
3. Create a HTML page that will have the following: Tables and Formatting
4. Create a HTML page that will have the following: Forms, Creating and Using Image Maps, Tags

**JAVA SCRIPT:**

1. Write a script to generate Random Numbers within 1 to 10 and display the numbers in a Table.
2. Write a script to create an Arithmetic Calculator using Function.
3. Write a script to check the given String is Palindrome or not.

**JQUERY:**

1. Write a program to display the WeekDays.
2. Write a program to generate Date and Time in different format.
3. Write a program to Validate Age and Numeric Value.

**PHP & MySQL:**

1. Creating a simple PHP program using the concepts: Flow Control, Strings and Arrays, creating Functions.
2. FORM processing using PHP.
3. Connecting to MySQL from PHP, PHP MySQL Connectivity, Creating Databases and Tables with PHP Programs: Storing data and Retrieving data.



For Candidates admitted from June 2018 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Second Year - Semester – IV**

<b>Course Title</b>	<b>MAJOR ELECTIVE 2: Unix and Shell Programming Lab</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5 Hrs /Wk</b>
<b>Code</b>	<b>U18CA4MEP02</b>
<b>Course Type</b>	<b>Practical</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**General Objectives:**

To get knowledge and practical skill to create dynamic web applications

**Course Objectives:**

<b>CO NO.</b>	<b>Course objectives</b>
CO-1	Understand the usage of Unix Shell Command
CO-2	Understand the usage of commands related to inode, I/O redirection and piping, process control commands, mails
CO-3	Develop small shell scripts for conditions and looping
CO-4	Develop small shell scripts for file handling
CO-5	Develop small shell scripts for Logging.

**EXERCISES**

1. Use of Basic UNIX Shell Commands: ls, mkdir, rmdir, cd, cat, touch, file, wc, sort, cut, grep, dd, dfspace, du, ulimit
2. Commands related to inode, I/O redirection and piping, process control commands, mails.
3. Shell Programming: Shell script exercises based on following:
  - (i) Interactive shell scripts (ii) Positional parameters (iii) Arithmetic (iv) if-then-fi, if-then- else-fi, nested if-else (v) Logical operators (vi) else + if equals elif, case structure (vii) while, until, for loops, use of break
4. Write a shell script to create a file. Follow the instructions
  - (i) Input a page profile to yourself, copy it into other existing file;
  - (ii) Start printing file at certain line
  - (iii) Print all the difference between two file, copy the two files.
  - (iv) Print lines matching certain word pattern.
5. Write shell script for-
  - (i) Showing the count of users logged in,
  - (ii) Printing Column list of files in your home directory
  - (iii) Listing your job with below normal priority
  - (IV) Continue running your job after logging out.
6. Write a shell script to change data format. Show the time taken in execution of this script.
7. Write a shell script to print file names in a directory showing date of creation & serial number of the file.
8. Write a shell script to count lines, words and characters in its input (do not use wc).
9. Write a shell script to print end of a Glossary file in reverse order using Array. (Use awk tail)
10. Write a shell script to compute gcd lcm & of two numbers. Use the basic function to find gcd & LCM of N numbers.

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Second Year - Semester – IV**

<b>Course Title</b>	<b>Major Elective 1 : Ruby On Rails Lab</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5 Hrs Wk</b>
<b>Code</b>	<b>U18CA4MEP03</b>
<b>Course Type</b>	<b>Practical</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**General Objectives:**

To understand and learn the concepts of object oriented programming with developing programming skills in Ruby and develop web applications using Ruby on Rails.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understand the basics of Ruby and control statements.
CO-2	Apply the concepts of arrays.
CO-3	Understand the User defined functions and files types.
CO-4	Understand and analyze the computing capabilities in Ruby.
CO-5	Analyze and design algorithms for various applications

**EXERCISES**

1. Write a program to explain the Class and Object concept inRuby.
2. Write a program for the various operators inRuby.
3. Write a program to read the content in the File using File concepts inRuby.
4. Write a program to create a user defined Function and how to call theFunction.
5. Write a programto
  - 1) Fetch the values from TextBox and RadioButton
  - 2) Explain the Session and Cookies inRails.
6. Write a program to retrieve Data from theDatabase
7. Write a program for create Rails Controllers and RailsViews
8. Write a program to explain the concept of uploadingFiles

**HOLY CROSS COLLEGE (AUTONOMOUS) TIRUCHIRAPALLI – 620 002.**  
**B.Com Regular / Computer Applications (For Candidates admitted from June 2018 onwards)**  
**Second Year - Semester – IV**

<b>Course Title</b>	<b>ALLIED 5 - BASICS OF ACCOUNTING (For BCA)</b>
<b>Total Hours</b>	<b>60</b>
<b>Hours/Week</b>	<b>4 Hrs / Wk</b>
<b>Code</b>	<b>U18CO4AOT10</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>4</b>
<b>Marks</b>	<b>100</b>

**General Objective:**

To enable the students to understand the basic principles of Double entry system of Accounting and to provide basic knowledge of accounting procedure for Subsidiary Books Final A/CS, depreciation accounting, Rectification of Errors and Computerized Accounting.

**Course Objectives:**

**The learner will be able to**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Remember and understand the accounting concepts and conventions and the basic principles of Double Entry system of Book-keeping and Accounting.
CO-2	Understand and apply the provisions relating to the preparation of Subsidiary Books and Final Accounts of Companies. Acquire knowledge on single entry system of book keeping
CO-3	Understand the basic methods of providing depreciation
CO-4	Recall the accounting procedures related to Rectification of Errors.
CO-5	Understand the concept of computerized accounting.

**UNIT-I-INTRODUCTION**

**12Hrs**

Accounting Concepts – Conventions – Rules of Double Entry – Journal – Ledger – Trial Balance.

**Extra reading /Key words :***Chronology, Financial Statement*

**UNIT- IIACCOUNTING CYCLE**

**12Hrs**

Trading Account, Profit and Loss Account, Balance Sheet, Subsidiary Books – Purchases Book, Sales Book, Three column Cash Book,

**Extra reading /Key words :***Final Accounts, Journal Proper*

**UNIT- IIIDEPRECIATIONACCOUNTING**

**12Hrs**

Depreciation Accounting Straight Line Method, Written Down Value Method and Annuity Method.

**Extra Reading / Key words :***Devaluation, Emolument, Superannuation.*

**UNIT- IV RECTIFICATIONOFERRORS**

**12Hrs**

Rectification of Errors, Basic Principles for Rectification of Errors, Suspense Account, Errors Disclosed by Trial Balance, Guidelines to Locate Errors in the Trial Balance.

**Extra Reading / Key words:** *Erroneous, Suspense Account*

**UNIT- VCOMPUTERACCOUNTING**

**12Hrs**

Computer Accounting and Algorithm – Areas of Application of Computer in Accounting, Features and Advantages of Computers and Computer Accounting – Algorithm, Requisites of an Effective Algorithm – Features of Algorithm.**Extra Reading / Key words:** *Data Processing, Dactylogy*

**Theory 40% & Problems 60%**

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

**Course Outcomes:**

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Examine the fundamentals of accounting concepts and its implications.	1	U
CO-2	Develop nomenclatures of accounting cycle	1	U
CO-3	Perceive knowledge on depreciation and its various methods.	1	Ap
CO-4	Identify and disclose the errors involved in accounting process	1	Ap
CO-5	Adapt with the global changing competitive era.	1	U
CO-6	Develop accounting skills and employable in business organizations	1	Ap

**PRESCRIBED TEXT:**

1. T.S. Reddy and A. Murthy, "*Financial Accounting*", 2014, Margham Publications.

**BOOKS FOR REFERENCE:**

1. M.c. Shukla T.S. Grewal & SC Gupta, "*Advanced Accountancy*", 2007, S. Chand and Co.
2. Volume I Pillai and Bagavathy, "*Fundamentals of Advanced Accounting*", 2004, S. Chand & Co.
3. T.S. Reddy and Y. Hari Prasad Reddy, "*Financial and Management Accounting*", 2012
4. Margam Publications.
5. Financial Accounting, "B. Charumathy and L. Vinayagam", 2012, S. Chand & Company

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Second Year - Semester – IV**

<b>Course Title</b>	<b>Allied 6 (Optional) Paper III Java Programming Lab</b>
<b>Total Hours</b>	<b>60</b>
<b>Hours/Week</b>	<b>4 Hrs Wk</b>
<b>Code</b>	<b>U18CA4AOP03</b>
<b>Course Type</b>	<b>Practical</b>
<b>Credits</b>	<b>3</b>
<b>Marks</b>	<b>100</b>

**GENERAL OBJECTIVE:**

To enable the students to learn the syntax, concepts of the language and apply them to write the solution for real world problems.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understand & analyze the Java features and Program Structure.
CO-2	Understand the OOPs concepts and apply them in programs.
CO-3	Classify and implement the types of Inheritance & Package concept.
CO-4	Differentiate and apply the types of Thread creation and Debug the programs using Exception Handling.
CO-5	Create the Applet Programs and apply the Collection Framework.

**EXERCISES**

1. Create a Simple javaprograms.
2. Create a java program using Controlstructures
3. Develop a program using Classes & objects andmethods
4. Apply Arrays inprograms.
5. Implement a program usingInterface
6. Develop a program usingInheritance
7. Apply different visibility control inpackages.
8. create a Multithreadedprogram.
9. Debug the program using Exceptionhandling.
10. Design user interface with Applets
11. Apply Collections in javaprogram.

**Course Outcomes:**

<b>CO No.</b>	<b>Course Outcomes</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO-1	Develop simple java programs.	PSO 1,3	R, U
CO-2	Categorize OOPS such as encapsulation, abstraction, and polymorphism and apply them in programs.	PSO 2,3	An
CO-3	Applying encapsulation concepts in developing the programs with classes and objects.	PSO 4,3	Ap
CO-4	Identify different types of inheritance and apply them in programs for reusability of code.	PSO 2, PSO 4,3	An, Ap
CO-5	Construct the packages by arranging the classes with visibility control.	PSO 5,3	C, An
CO-6	Develop programs using different methods of thread creation for implementing concurrency.	PSO 5,3	C, Ap
CO-7	Execute the programs without interruption by handling exception.	PSO 4,3	An, Ap
CO-8	Create Internet program using applets.	PSO 5,3	C,Ap
CO-9	Evaluate java collection with other implementation methods of data structure.	PSO 4,3	E

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

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

**HRS / WK:1**  
**CREDIT:1**

**CODE:U15VE4LVE02**  
**MARKS :100**

**OBJECTIVES:**

- To make the learners aware of various gender and social issues and CyberCrimes.
- To make the learners understand and appreciate the role of media, in facing the challenges on various lifeissues.
- To enable the learners to understand the ways of empowering women and cybercrime againstwomen

**UNIT – I: GENDER ISSUES**

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

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

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

**UNIT – III: WOMEN AND MEDIA**

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

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

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

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

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

**REFERENCES:**

6. Dr.M.Arumairaj et al., 1999, “Marching towards the Milleniumahead”.
7. Thomas Anjugandam, 1999, “Grow Free Live Free” SalesianPublicaiton.
8. H.C Prett Nandhini Upreti, jaipur 2000 “Women and problems of GenderDiscrimination”.
9. Thomas B.Jayaseelan, 2002, “Women: Rights and law” Indian Social Institute, NewDelhi.
10. Reni Jacob vol I & II, April- June 2004, ”Vikasimi – The journal ofWomen’s Empowerment,Ed,”

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

**HRS /WK:1**

**CODE:U15VE4LVB02**

**CREDIT:1**

**MARKS :100**

**OBJECTIVE:**

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

**UNIT – I: PURPOSE OF LIFE**

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

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

**UNIT – II: JUDGES AND KINGS**

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

**UNIT – III: MINOR PROPHETS**

Brief Life History and teachings of

- Amos
- Jonah
- Micah
- Nahum
- Habakkuk

**UNIT – IV: MAJOR PROPHETS**

Brief Life History and teachings of

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

**UNIT – V: WOMEN IN THE BIBLE**

Women in the Old Testament

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

**REFERENCES:**

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



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

**HRS / WK:1**

**CODE : U15VE4LVC02**

**CREDIT:1**

**MARKS :100**

**OBJECTIVES:**

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

**UNIT – I: MISSION OF THE CHURCH**

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

**UNIT – II: PARTICIPATORY CHURCH**

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

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

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

**UNIT – IV: SACRAMENTS**

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

**UNIT – V: MARY AND SAINTS**

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

**REFERENCES:**

4. “Vatican II Revised” Archbishop Angelo Fernandes Published by X.Diax de RioS.J. Gujarat Sahitya Prakash, P.O.Box. 70, Gujarat, 388001, India.
5. “The Sacraments The Word of God at the Mercy of the Body” Claretian Publications, Malleswaram, Bangalore 560055.
6. Documents of Vatican II – St. Paul's Publications, Bombay 1966.

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – V**

<b>Course Title</b>	<b>Major Core 7 – Computer Organization and Architecture</b>
<b>Total Hours</b>	<b>60</b>
<b>Hours/Week</b>	<b>4 Hrs Wk</b>
<b>Code</b>	<b>U17CA5MCT07</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>4</b>
<b>Marks</b>	<b>100</b>

**General Objectives:**

To give Basic Knowledge on Various Building Blocks of a Digital Computer and Architecture.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understand and learn the types of computer Instructions.
CO-2	Learn and understand the Machine language and Assembly languages.
CO-3	Know and understand the categories of the peripheral devices and its data transfer.
CO-4	Learn and understand the instruction formats, addressing, modern pipelining and vector processing techniques.
CO-5	Know and understand the main memory, auxiliary memory, associative, cache and virtual memory.

**UNIT I**

**12Hrs**

**BASIC COMPUTER ORGANIZATION AND DESIGN:** Computer Instructions: Instruction Set Completeness-Timing And Control-Instruction Cycle: Fetch And Decode- Determine The Type Of Instruction-Register-Reference Instructions-Memory-Reference Instructions-Input-Output And Interrupt: Input-Output Configuration-Input-Output Instructions-Program Interrupt-Interrupt Cycle.

*Extra Reading (Key words): Computer Instructions about various Processors.*

**UNIT II**

**12Hrs**

**PROGRAMMING THE BASIC COMPUTER:** Introduction –Machine Language-Assembly Language: Rules Of The Language-An Example-Translation To Binary-The Assembler: Representation Of Symbolic Program In Memory-First Pass-Second Pass-Program Loops. Micro programmed Control: Control Memory-Addressing Sequencing: Conditional Branching-Mapping Of Instruction-Subroutines.

*Extra Reading(Key words): Other translators for program translation.*

**UNIT III**

**12Hrs**

**INPUT – OUTPUT ORGANIZATION:** Peripheral Devices -- Input Output Interface – Asynchronous Data Transfer – Modes of Transfer – Priority Interrupt – Direct Memory Access.

*Key terms: INTEL 8085 & 8086 Instructions.*

**UNITIV** **12Hrs**

**CENTRAL PROCESSING UNIT:** General Register Organization – Stack Organization – Instruction Formats – Addressing Modes – Data Transfer and Manipulation.

**PIPELINE AND VECTOR PROCESSING:** Parallel Processing – Pipelining – Arithmetic Pipeline – Instruction Pipeline – RISC Pipeline – Vector Processing.

**Key terms:** Compare and process the real time data with Stack, Pipeline and vector processing.

**UNITV** **12Hrs**

**MEMORY ORGANIZATION:** Memory Hierarchy – Main Memory – RAM and ROM Chips – Memory Address Map – Memory Connection to CPU – Auxiliary Memory – Magnetic Tape – Associative Memory -- Cache Memory – Virtual Memory – Memory Management Hardware.

**Key terms:** Acquire knowledge about Memory Organization.

### Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Describe the Computer Instructions	PSO 1	R, U
CO-2	Explain the Instruction Cycle.	PSO 2	U
CO-3	Illustrate the concept of Micro programmed Control	PSO 2	U
CO-4	Illustrate the concepts of transfer of data.	PSO 3	U
CO-5	Differentiate different types of addressing modes and explain pipeline and vector processing.	PSO 4	An
CO-6	Analyze the various types of Memory and the purpose of Memory Management.	PSO 4	An

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

### References

#### Text Books:

1. M.Morris Mono, **Computer System Architecture**, Third Edition,2011,Prentice – Pearson, New Delhi.

**UNIT I** : Chapters 5.3 -5.7  
**UNIT II** : Chapters 6.1 – 6.5, 7.1,7.2  
**UNIT III** : Chapters 11  
**UNIT IV** : Chapters 8.1 – 8.6, 9.1 –9.6  
**UNIT V** : Chapters12

#### Reference Books

1. Thomas C.Bartee, **Digital Computer Fundamental**, 1991,Tata McGraw – Hill Publishing Company, NewDelhi.
2. Albert Paul Malvino and Jerald A.Brown, **Digital Computer Electronics** ,1999 ,Tata McGraw – Hill Publishing Company, NewDelhi.
3. M.MorrisMano,**DigitalLogicandComputerDesign**,1998,PrenticeHallofIndiaPrivateLtd, NewDelhi.
4. Kai Hwang, Faye A. Briggs, **Computer Architecture and Parallel Processing** , 1985,McGraw – Hill Book Company, NewDelhi.

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – V**

<b>Course Title</b>	<b>Major Core 8 –Operating Systems</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>4HrsWk</b>
<b>Code</b>	<b>U17CA5MCT08</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>3</b>
<b>Marks</b>	<b>100</b>

**GENERAL OBJECTIVE**

To enable the students learn the concepts of operating systems, CPU and disk scheduling, Memory management, paging, Demand paging, Page replacement algorithms and concluded with file system concepts.

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Remember the basic concepts and structures of operating systems.
CO-2	Understand the concept of process and various CPU scheduling algorithms.
CO-3	Remember the basics of deadlocks, process synchronization.
CO-4	Understand the memory management techniques and procedures.
CO-5	Understand the concept of file systems.

**UNIT I**

**12Hrs**

**INTRODUCTION:** What is an Operating System? – Mainframe Systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems - Real-Time Systems – Handheld Systems – Feature Migration – Computing Environments.

**COMPUTER-SYSTEM STRUCTURES:** Computer-System Operation – I/O Structure – Storage Structure – Storage Hierarchy – Hardware Protection –Network Structure.

**OPERATING-SYSTEM STRUCTURES:** System Components – Operating-System Services – System Calls – System Programs – System Structure – Virtual Machines.

*Extra Reading: Finding the evolution of computer system.*

**UNIT II**

**12Hrs**

**PROCESSES:** Process Concept – Process Scheduling – Operation on Processes – Cooperating Processes – Interprocess Communication. **THREADS:** Overview – Multithreading Models – Threading Issues. **CPU SCHEDULING:** Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple-Processor Scheduling – Real-Time Scheduling – Algorithm Evaluation.

*Extra Reading: Calculating waiting time, turn around time and response time for all the scheduling Algorithms.*

**UNITIII****12Hrs**

**PROCESS SYNCHRONIZATION:** Background - The Critical-Section Problem – Synchronization Hardware – Semaphores – Classic Problems of Synchronization.

**DEADLOCKS:** System Model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlock.

*Extra Reading: Finding the real time examples in deadlock.*

**UNITIV****12Hrs**

**MEMORY MANAGEMENT:** Background – Swapping – Contiguous Memory Allocation – Paging - Segmentation – Segmentation with Paging.

**VIRTUAL MEMORY:** Background - Demand Paging – Process Creation - Page Replacement – Allocation of Frames – Thrashing – Other Considerations.

*Extra Reading: Calculating page fault and comparing which page replacement algorithm is the best one.*

**UNITV****12Hrs**

**FILE-SYSTEM INTERFACE:** File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection.

**FILE-SYSTEM IMPLEMENTATION:** File-System Structure – File System Implementation - Directory Implementation – Allocation Methods – Free-Space Management – Efficiency and Performance – Recovery.

*Extra Reading: Comparing the allocation methods.*

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Recall the different structures of operating systems.	PSO 1	R, U
CO-2	Discuss theory and implementation of processes, resource control, physical and virtual memory, scheduling, I/O and files	PSO 2	R
CO-3	Calculate waiting time, response time, turnaround time and disk seek time in disk scheduling	PSO 2	U
CO-4	Compare the memory allocation methods and differentiate the page replacement algorithms	PSO 3	An
CO-5	Conclude with a detailed understanding of Linux kernel	PSO 4	An

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

## **References**

### **Text Books:**

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, **“Operating System Concepts”**, 2006, Sixth Edition, John Wiley & Sons Publications Inc.,Singapore.

### **Reference Books**

1. DeitelHarvay M.,**“Operating Systems”**, 2003, Pearson Education Publications,Singapore.
2. GodboleAchyut S.,**“Operating Systems”**, 2002, Tata McGraw Hill PublishingCompany Limited, NewDelhi.
3. Milan Milankovic, **“Operating System-Concepts and Design”**, 2005, Tata McGraw Hill Publishing Company Limited, NewDelhi.
4. Tanenbaum Andrew S. & Woodhull Albert S., **“Operating Systems – Design and Implementation”**, 2002, Pearson Education Publications,Singapore.
5. William Stallings, **“Operating Systems – Internals and Design Principles”**, 2006, Pearson Education Publications,Singapore.

For Candidates admitted from June 2018 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – V**

Course Title	<b>MAJOR CORE 9 COMPUTER NETWORKS</b>
Total Hours	<b>60</b>
Hours/Week	<b>4 Hrs Wk</b>
Code	<b>U17CA5MCT09</b>
Course Type	<b>Theory</b>
Credits	<b>3</b>
Marks	<b>100</b>

**General Objectives:**

To impart deep knowledge on different layers of Computer Networks.

**Course Objectives:**

CO No.	Course Objectives
CO-1	Remembers and understands the basic concept of computer hardware and software
CO-2	Understand the types of Transmission Media and remembers the working principles of Public Switched Telephone Network.
CO-3	Understand the general techniques of Error control, Flow control in Data Link Protocols.
CO-4	Analyse the Routing and Congestion Control Algorithms in Network Layer; remember the underlying protocol in Transport Layer.
CO-5	Remember the various services of Application Layer; analyze the various techniques in cryptography.

**UNIT I**

**12Hrs**

**INTRODUCTION:** Uses of Computer Networks - Network Hardware - Network Software - Reference models OSI reference Model (TCP/IP reference Model, A comparison of the OSI and TCP/IP Reference Models).

*Extra Reading (Keywords): IoT interoperation across the OSI model.*

**UNIT II**

**12Hrs**

**THE PHYSICAL LAYER:** Guided Transmission Media - Wireless Transmission - The Public Switched Telephone Network: Structure of the Telephone System – Trunks and Multiplexing - Switching.

*Extra Reading (Keywords): Mobile Telephone System.*

**UNIT III**

**12Hrs**

**THE DATA LINK LAYER:** Data Link Layer Design issues - Error Detection and Correction - Elementary Data Link Protocols - Sliding Window Protocols.

*Extra Reading (Keywords): Orthogonal frequency division multiplexing (OFDM) Technique*

**UNIT IV**

**12Hrs**

**THE NETWORK LAYER:** Network Layer Design Issues - Routing Algorithms - Congestion Control Algorithms. **THE TRANSPORT LAYER:** The Transport Service (Services Provided to the Upper Layers, Transport Service Primitives) – Elements of Transport Protocols.

*Extra Reading (Keywords): Quality of Service (QoS)*

**UNITV****12Hrs**

**THE APPLICATION LAYER:** DNS - Domain Name System - Electronic Mail - The World Wide Web. **NETWORK SECURITY:** Cryptography - Symmetric Key Algorithms - Public Key Algorithms.

*Extra Reading (Keywords): Communication Security and Web Security*

**Course Outcomes:**

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the fundamental knowledge in Network Hardware and Software; summarize OSI reference Model.	PSO 2	R, U
CO-2	Describe about the types of Transmission Media and understands the working of Public Switched Telephone Network.	PSO 2,6	R, An
CO-3	Relate and illustrate the techniques of Error Detection and Correction.	PSO 2	U, A
CO-4	Express the Elementary Data Link Protocols.	PSO 3	R
CO-5	Illustrate and analyse the Routing and Congestion Control Algorithms in Network Layer; explain the underlying protocol in Transport Layer.	PSO 4	R, An
CO-6	Identify the functionality of Application Layer services.	PSO 4	U
CO-7	Analyze and interpret the network security algorithms.	PSO 1,6	R, An

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

**References****Text Book:**

1. Tanenbaum Andrew .S, Computer Networks, 2006, Fourth Edition, Prentice-Hall India of India Pvt. Ltd., New Delhi.

<b>UNITI</b>	:	Chapter 1 (1.1, 1.2, 1.3,1.4.1,1.4.2,1.4.3)
<b>UNITII</b>	:	Chapter 2 (2.2, 2.3, 2.5(2.5.1, 2.5.4,2.5.5))
<b>UNITIII</b>	:	Chapter 3 (3.1 -3.4)
<b>UNITIV</b>	:	Chapter 5 (5.1, 5.2(5.2.1-5.2.8),5.3) Chapter 6 (6.1.1, 6.1.2), 6.2),
<b>UNITV</b>	:	Chapter 7 (7.1, 7.2,7.3) Chapter 8.1, 8.2, 8.3

**Reference Books:**

1. BlackUylessD.,“**DataCommunicationandDistributedNetworks**”,2000,PrenticeHall of India Pvt. Ltd., NewDelhi.
2. Forouzan Behrouz A., “**Local Area Networks**”, 2003, Tata McGraw Hill Publishing Limited, NewDelhi.
3. Godbole Achyut S., “**Data Communication and Networks**”, 2002, Tata McGraw Hill Publishing Limited, NewDelhi.
4. Mansfield Kenneth C., Antonakos James L., “**An Introduction to Computer Networking**”, 2002, Prentice Hall of India, NewDelhi.
5. Tanenbaum Andrew S., “**Computer Networks**”, 2003, PearsonEducation, Asia.



For Candidates admitted from June 2018 onwards)  
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**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – V**

<b>Course Title</b>	<b>MAJOR CORE 10 - OBJECT ORIENTED PROGRAMMING IN C# AND .NET</b>
<b>Total Hours</b>	<b>60</b>
<b>Hours/Week</b>	<b>4 Hours / Week</b>
<b>Code</b>	<b>U17CA5MCT10</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>3</b>
<b>Marks</b>	<b>100</b>

**GENERAL OBJECTIVE:** Learn the web based technologies of the .NET framework and know the object oriented aspects of C#

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understand the .NET FRAMEWORK fundamentals
CO-2	Comprehend the Windows controls used with C# Programming aspects
CO-3	Explain & depict the Windows application development in .NET with C# programming
CO-4	Apply and analyze the web application development with web services
CO-5	Comprehend the .NET Framework components related with database objects

**UNIT I:** **12Hrs**

**Overview of .NET Framework:** .NET Framework Architecture - .NET Features – The Common Language Runtime – The .NET Framework Class Library – The Common Type System – Visual Studio .NET IDE 2005 – Windows Programming Fundamentals.

**Windows Controls – Category 1:** Control Class – Text Boxes – Rich Text Boxes – Labels - Link Labels – Buttons.

*Extra Reading: Microsoft Visual Studio Environment*

**UNIT II:** **12Hrs**

**Windows Controls – Category 2:** Check Boxes – Radio Buttons – Panels – Group Boxes – List Boxes – Checked List Boxes – Combo Boxes.

*Extra Reading: Win GUI Controls used with multiple applications*

**UNIT III:** **12Hrs**

**Windows Controls – Category 3:** Picture Boxes – Scroll Bars – Splitters – Track Bars –Pickers – Notify Icons – Tool Tips – Timers.

*Extra Reading: GUI applications with Windows control categories*

**UNIT IV:** **12Hrs**

**Windows Controls – Category 4:** MenuStrip – Dialog Boxes – Image Lists – Tree Views – List Views – Tool Bars – Status Bars – Progress Bars.

*Extra Reading: Multiple Integrated Web page applications*

**UNITV:****12Hrs****Data Access with ADO.NET:** ADO.NET Architecture – Advantages – ADO.NET Objects.**Handling Databases in Code:** Connection Class – Command Class – DataAdapter – The DataSet Class – Data Reader Class – DataTable Class – DataRow Class – DataColumn Class – DataRelation Class**Extra Reading: Case Studies with Front and Back ends in Microsoft Visual Studio setting**

CO No.	COURSE OUTCOMES	PSOs Addressed	Cognitive Level
CO-1	Realizes the .NET FRAMEWORK fundamentals	PSO - 1	R
CO-2	Comprehends the Windows controls used with C# Programming aspects	PSO - 2	U
CO-3	Explicates the Windows application development in .NET with C# programming	PSO - 3	R, U
CO-4	Applies and analyzes the GUI application development	PSO - 4	R, U
CO-5	Exemplifies the windows controls related with database objects	PSO - 5	Ap, An

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

**References****TextBook:**

ProgrammingwithC#.NET,J.G.R.Sathiaseelan,N.Sasikaladevi,PHILearningPrivateLimited, NewDelhi

<b>UNITI:</b>	Chapter 1,3
<b>UNITII:</b>	Chapter 4
<b>UNIT III:</b>	Chapter 5
<b>UNITIV:</b>	Chapter 6
<b>UNITV:</b>	Chapter 8,9

**Reference Books:**

1. Herbert Schildt, “The Complete Reference: C# 4.0”, Tata McGraw Hill,2012
2. Christian Nagel et al. “Professional C# 2012 with .NET 4.5”, Wiley India,2012
3. Dan Clark, “Beginning C# Object Oriented Programming”, 1<sup>st</sup> Edition, APRESS,2011
4. AndrewTroelsen,“ProC# 2010andthe.NET4Platform,Fifthedition,APress,2010
5. Ian Griffiths, et. al, “Programming C# 4.0”, Sixth Edition, O“Reilly,2010

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – V**

<b>Course Title</b>	<b>MAJOR CORE 11 - C# AND .NET PROGRAMMING LAB</b>
<b>Total Hours</b>	<b>60</b>
<b>Hours/Week</b>	<b>4 Hours / Week</b>
<b>Code</b>	<b>U17CA5MCP11</b>
<b>Course Type</b>	<b>Practical</b>
<b>Credits</b>	<b>3</b>
<b>Marks</b>	<b>100</b>

**GENERAL OBJECTIVE:** Learn the web based technologies of the .NET framework and know the object oriented aspects of C#

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Depict the various programming structures with relevant OOP in C#
CO-2	Demonstrate the OOPs concepts with C# programs
CO-3	Explain & depict the Windows application development in .NET with C# programming
CO-4	Apply and analyze the applications with back end connectivity through ADO.NET structures
CO-5	Develop C# application programs with components related with database objects through ADO.NET connectivity

**EXERCISES in C#:**

1. Simple Computations
2. Windows User Interface creation with Windowtools
3. Classes and Objects
4. Applications with OOPs concepts
5. Multiple Form creation using GUI tool box controls with Data base connectivity

**DOTNET APPLICATIONS:**

1. Simple User Interface Programs using Windows tools and Properties
2. Windows Application with Database Connectivity using C# and ADO.NET
3. GUI Application with Database Connectivity using C# and ADO.NET
4. Using MDI and SDI components
5. Creating multiple form applications using Windowstools, structures, properties and Back end tools.

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**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – V**

<b>Course Title</b>	<b>MAJOR ELECTIVE 2 - R PROGRAMMING LAB</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5 Hours / Week</b>
<b>Code</b>	<b>U18CA5MEP04</b>
<b>Course Type</b>	<b>Practical</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**GENERAL OBJECTIVE:** Learn the R programming basic concepts and implement the statements to develop applications.

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Depict the various programming structures with R programming
CO-2	Demonstrate the R concepts by comparing with other programming languages
CO-3	Explain & depict the chart preparation in R programming
CO-4	Apply and analyze the applications using R
CO-5	Develop R programs and compare with C programs

### **EXERCISES**

- 1 Introduction R Nults and Bolts (I)
- 2 R Nults and Bolts (II)
- 3 Getting Data In and Out of R
- 4 Control Structures and Functions
- 5 Loop Functions
- 6 Data Manipulation (dplyr, reshape2 packages)
- 7 String Operations (stringr package)
- 8 Packaging, Debugging and Object Oriented Programming

(For Candidates admitted from June 2018 onwards)  
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**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – V**

<b>Course Title</b>	<b>Major Elective -2 : Python Programming Lab</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5 Hrs Wk</b>
<b>Code</b>	<b>U18CA5MEP05</b>
<b>Course Type</b>	<b>Practical</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**General Objectives:**

To understand and learn the concepts of object oriented programming with developing programming skills in Python.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understand the basics of Python programming and control statements.
CO-2	Apply the concepts of arrays.
CO-3	Understand the User defined functions and files types.
CO-4	Understand and analyze the computing capabilities in Python.
CO-5	Analyze and design algorithms for various applications

**EXERCISES**

1. Compute the GCD of two numbers.
2. Find the square root of a number (Newton's method)
3. Exponentiation (power of a number)
4. Find the maximum of a list of numbers
5. Linear search and Binary Search
6. Selection sort, Insertion Sort
7. Merge Sort
8. First n Prime Numbers
9. Multiply Matrices
10. Programs that take Command Line Arguments (wordcount)
11. Find the most frequent words in a text read from a file
12. Simulate Elliptical Orbits in Pygame
13. Simulate Bouncing Ball using Pygame

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**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – V**

<b>Course Title</b>	<b>MAJOR ELECTIVE 2: UI /UX DESIGN LAB</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5 Hrs /Wk</b>
<b>Code</b>	<b>U18CA5MEP06</b>
<b>Course Type</b>	<b>Practical</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**General Objectives:** To make the students familiar with the use of user interface applications to create objects, logos, icons, text, edit image and design page layouts.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Remembers and understands a working with files, layers and viewing artwork
CO-2	Understands and create a basic shapes and working with types
CO-3	Remembers and understands a placing images and working with objects
CO-4	Understands to draw graphs and create and manage imported artwork

**Adobe Illustrator**

1. Working withfiles
2. Working inlayers
3. Viewingartwork
4. MakingSelections
5. Creating BasicShapes
6. Working withtype
7. PlacingImages
8. Working withObjects
9. Drawinggraphs
10. Working with importedartwork

**Invision**

1. Create a rapid prototype in Invisionstudio
2. Advanced animation using Motion Invisionstudio
3. Edit animations with the Timeline in Invisionstudio
4. Component override and resizing in Invisionstudio

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**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – V**

<b>Course Title</b>	<b>Non Major Elective 1: Desktop Publishing Lab</b>
<b>Total Hours</b>	<b>26</b>
<b>Hours/Week</b>	<b>2 Hrs Wk</b>
<b>Code</b>	<b>U15CA5NMP01</b>
<b>Course Type</b>	<b>Lab</b>
<b>Credits</b>	<b>2</b>
<b>Marks</b>	<b>100</b>

**General Objectives:**

To learn use the basic tools found in Adobe Photoshop to create and edit images.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Demonstrate the techniques of photo editing.
CO-2	Apply layer masks, filters and blending modes , share and save your images in various formats.
CO-3	Learn various retouching and repairing techniques to correct images.
CO-4	Demonstrate the techniques for resize and crop images.
CO-5	Demonstrate how to Remove or repair unwanted image areas.

1. Using various selection tools.
2. Using image adjustment tools to enhance an image.
3. Create scenery using Photoshop brushes.
4. Demonstrate the use of layer effects.
5. Create a text with picture inside.
6. Demonstrate the use of ripple effect and lens flare.
7. Create a snapshot inside a photo.
8. Photo retouching.
9. Coloring a BW photo.
10. Create slide mount template.
11. Create Photo mount template.
12. Create photo frame effect.
13. Create photo film effect.
14. Create a 3D Photo effect.
15. Create 2D and 3D logos.
16. Animate text using ImageReady.
17. Create three frames with Lens flare effect and different background colors and animate using ImageReady
18. Create a Christmas Tree with Blinking Lights.
19. Animate a candle flame using Liquify filter.
20. Design an attractive Greeting Card, Invitation, Wallpaper

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**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – V**

<b>Course Title</b>	<b>SKILL BASED ELECTIVE 4 QUANTITATIVE APTITUDE</b>
<b>Total Hours</b>	<b>30</b>
<b>Hours/Week</b>	<b>2 Hrs Wk</b>
<b>Code</b>	<b>U15CA5SBT04</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>2</b>
<b>Marks</b>	<b>100</b>

**General Objectives:**

To impart the basic knowledge on English, Mathematics, Verbal and Non-Verbal reasoning.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understand and remember vocabulary usage and grammatical structure in everyday life
CO-2	Understands and applies the arithmetic and mathematical aptitude
CO-3	Remember and analyze the problem solving skills and reasoning ability
CO-4	Remember and understand the different kinds of non-verbal reasoning
CO-5	Understands and applies the puzzles and logical reasoning

**UNIT I**

**6Hrs**

Vocabulary: Prefixes and Suffixes - Jumbled Words and Sentences – Jumbled Words – Jumbled Sentence.

Grammar and Usage: The Sentence – Active and Passive voice – Tenses an overview – Reported Speech / Indirect Speech – Errors in use of Articles.

*Extra Reading (Keywords): Advanced grammar for competitive exam .*

**UNIT II**

**6Hrs**

Arithmetic Ability: Numbers – H.C.F and L.C.M of Numbers – Problems on Numbers – Problems on Ages – Profit and Loss – Simple Interest.

*Extra Reading (Keywords): Understand the arithmetic problems to solve the sums by applying shortcut methods with time management.*

**UNIT III**

**6Hrs**

Verbal Reasoning: Coding – Decoding Test – Series Test – Inserting the Missing Character.

Logical Deduction: Logic - Statement – Conclusion.

*Extra Reading (Keywords): Reasoning tricks and shortcut concepts for competitive exam.*

**UNIT IV**

**6Hrs**

Non-Verbal Reasoning: Series – Analogy – Similar Figure Test.

*Extra Reading (Keywords): Non-Verbal Reasoning tricks and shortcut concepts for competitive exam.*

**UNIT V**

**6Hrs**

Brain Twisters: Date, Calendar and Clock - Puzzle Test.

*Extra Reading (Keywords): How to solve the Brain Twisters problems asked in competitive exam.*



**Course Outcomes:**

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Recall the body of rules surrounding English grammar in every day context including the use of noun, tense and articles.	PSO 1, 3	R, U
CO-2	Demonstrate various principles involves in solving mathematical problem and thereby reducing the time taken for solving role.	PSO 2, 4	R, An, Ap
CO-3	Define and describe several examples of verbal reasoning problem.	PSO 2, 4, 5	U, An, Ap
CO-4	Illustrate the use series of techniques and analogies.	PSO 3,4	R, Ap
CO-5	Solve the various problem and solution in puzzles concepts	PSO 4, 5	R, An, Ap

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

**TEXT BOOKS**

1. J.K. Gangal, “Competitive English for Professional Courses”, S.Chand & Company Ltd.,New Delhi.2010.

**UNIT I** : Vocabulary : Units 5,8  
Grammar&usage : Units 2,5,6,7

2. Dr. R.S. Aggarwal, “Quantitative Aptitude”, S.Chand & Company Ltd.,NewDelhi.2011.

**UNIT II** : Chapters 1,2,7,8,11,21

3. Dr.Lal, Mishra & Kumar, “Multi- dimensional Reasoning (Verbal & Non-Verbal)”, Upkar Prakashan Private Company Ltd., NewDelhi.

**UNIT III** : VerbalReasoning : Chapters 2,10,20

**UNIT IV** : Non-VerbalReasoning: Chapters 1,2,15

**UNIT V** : VerbalReasoning : Chapters 7,22

4. Dr. R.S. Aggarwal, “A Modern Approach to Verbal Reasoning”, S.Chand & CompanyLtd.,

**UNIT III** : Series Testing

**Reference Books:**

1. Wren&Martin, “High School Grammar & Composition”, 2006, S.Chand & Company Pvt.Ltd., NewDelhi.

2. J.K.Gangal, “Competitive English for Professional Courses”, S. Chand & Company Ltd., New Delhi,2010.

3. R.S.Aggrawal, “Quantitative Aptitude”, S. Chand & Company Pvt. Ltd., New Delhi.

4.R.S.Aggrawal, ”Verbal & Non-Verbal Reasoning”, 2007, S.Chand&Company Pvt.Ltd.,New Delhi.

5. Dr.Lal, Mishra & Kumar, “Multi- dimensional Reasoning (Verbal & Non-Verbal)”, Upkar Prakashan Private Company Ltd., New Delhi.

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

**HRS / WK:1**  
**CREDIT:1**

**CODE:U15VE6LVE03**  
**MARKS :100**

**OBJECTIVES:**

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

**UNIT – I: PERSONAL COMPETENCE**

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

**UNIT – II: MARRIAGE AND FAMILY**

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

**UNIT – III: PARENTHOOD**

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

**UNIT – IV: PERSONALITY DEVELOPMENT**

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

**UNIT – V: CAREER CHOICE**

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

**REFERENCES:**

1. Tony B and Barry Buzan(2003), The mind map book, BBC world wide limited,London.
2. Susan Nash(2005), Turning team performance inside out, Jai CO. publishing House,New Delhi.
3. Fr. Ignacimuthu (1999) “Values for Life”, 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.C.A – DEGREE COURSES  
LIFE ORIENTED EDUCATION  
BIBLE STUDIES – III: ESSENCE OF CHRISTIAN LIVING**

**HRS / WK:1**

**CODE:U15VE6LVB03**

**CREDIT:1**

**MARKS :100**

**OBJECTIVE:**

- To prepare the students to practice Christian principles in family, church and society as 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: MARRIAGE AND FAMILY LIFE**

- Finding the God’s Will - Issac (Gen24)
- Man and woman as Partners – Abraham and Sarah (Gen 16-18,22), Aquila and Priscilla (Acts 18:1-3,26)
- Evils to be avoided – Premarital Sex, Extramarital Sex, Homosexuality, Abortion(Heb13: 4, Psalm 127 :4)
- Ideal Wife – Sarah (I Peter 3: 1-6), Ruth,(Eph 5)

**UNIT – III: CHRISTIAN HOME**

- Parental Responsibilities and bringing up children – Abraham (Gen 22), Eli (I Sam 2: 24-36,3: 11- 18), Mary, Mother of Jesus (Luke 2:51,52)
- Caring for the Aged (I Sam 2:31,32)

**UNIT – IV: CHRISTIAN ETHICS**

- Holiness – Joseph (Gen 39:9) Levi 11: 45, Ecc12
- Obedience to God - Abraham (Gen 12) ; St.Paul (Acts9)
- Freedom and Accountability
- Justice and Love
- 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 of wealth

## **UNIT – V: MISSIONARIES DOWN THE LANE**

- William Carrié(Calcutta)
- Pandithar Rama Bai(Karnataka)
- Amy Carcheal(Dohnavur)
- Dr. Ida Scudder(Vellore)
- Devasagayam(Nagercoil)
- St. John De Britto(Oriyur)
- Graham Staines & Family(Odisha)
- St. Mother Teresa(Calcutta)

### **REFERENCES:**

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

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

**HRS / WK:1**

**CODE:U15VE6LVC03**

**CREDIT:1**

**MARKS :100**

**OBJECTIVES:**

- To prepare the students to participate meaningfully in the liturgical celebration and experience GOD in their day todaylife.
- To enable the students to become living witnesses 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. – The Creed – Act of contrition – Discernment of spirits – Counseling – Spiritual direction.

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

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

**UNIT – IV: CHRISTIAN FAMILY**

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

**UNIT – V: CONSECRATED LIFE**

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

**REFERENCES:**

2. Compendium – Catechism of the Catholic Church Published by Vaigarai Publishing House for the Catholic Church of India.
3. 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.
4. Documents of Vatican II – St. Paul’s Publications, Bombay1966.

(For Candidates admitted from June 2018 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – VI**

<b>Course Title</b>	<b>MAJOR CORE 12 – SOFTWARE ENGINEERING CONCEPTS</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5 Hrs Wk</b>
<b>Code</b>	<b>U18CA6MCT12</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>4</b>
<b>Marks</b>	<b>100</b>

**General Objectives:**

To prepare students to be successful professionals in the IT field with solid fundamental knowledge of Software Engineering.

**Course Objectives:**

CO No.	Course Objectives
CO-1	Remembers and understand software the nature of software , software process and software engineering practice and Analyse & Evaluate the various models.
CO-2	Understand the requirements, analyze and apply the various requirement models.
CO-3	Understand the design concepts, analyze and apply the concepts to design architectural, component level & User interface models. Remember and understand the golden rules.
CO-4	Understand the quality concepts, Software Quality Assurance tasks, discuss the strategies of testing, explain the types of testing.
CO-5	Understand the Product, process & project metrics, Analyse the estimation modeling, understand the emerging trends, Apply the software concepts to do project.

**UNIT I**

**15Hrs**

**INTRODUCTION TO SOFTWARE ENGINEERING:** Evolving role of software –Software – The changing nature of software.

**SOFTWARE ENGINEERING:** A layered technology – A process framework – CMMI- Process Pattern – Process Assessment – Personal and Team Process Models.

**PROCESS MODELS:** Prescriptive models-The waterfall model - Incremental Process Models - Evolutionary Process Models.

*Extra Reading (Key words): Additional Process Models.*

**UNIT II**

**15Hrs**

**REQUIREMENTS ENGINEERING:** Abridge to Design and Construction- Requirements Engineering task – Initiating the requirement engineering process – Eliciting requirements

**.BUILDING THE ANALYSIS MODEL:** Requirement analysis – Analysis Modeling approaches - Data Modeling concepts - Object Oriented Analysis - Flow Oriented Modeling

*Extra Reading (Key words): XML Modeling.*

**UNIT III**

**15Hrs**

**DESIGN ENGINEERING:** Design within the context of software engineering - Design process and Design quality - Design Concepts - Design Model.

**CREATING AN ARCHITECTURAL DESIGN:** Architectural styles and patterns - Mapping data flow into a software architecture.

*Extra Reading (Key words): Other architectural designs.*

**UNITIV**

**15Hrs**

**MODELING COMPONENT LEVEL DESIGN :**What is a component - Designing Class Based components – Conducting Component level design.

**PERFORMING USER INTERFACE DESIGN:** The golden rules – User-Interface analysis and Design-Interface analysis - Interface Design steps.

*Extra Reading (Key words): Latest User Interface designs.*

**UNITY**

**15Hrs**

**TESTING STRATEGIES:** Test strategies for Conventional Software - Validation testing – System testing - The art of debugging.

**TESTING TACTICS:** Software testing fundamentals - Black Box and White Box testing-Basis path testing- Control Structure testing - Black Box testing.

**QUALITY MANAGEMENT:** Quality concepts - Software Quality Assurance - Software Reviews -Formal Technical Reviews.

*Extra Reading (Key words): Overview of Testing Tools.*

**Course Outcomes:**

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Define software, explain the nature of software , software process and software engineering practice, explain and compare the various models.	PSO 2	R, U
CO-2	Discuss the requirements, analyze and design the various requirement models.	PSO 2,6	R, U
CO-3	Explain the design concepts, analyze and apply the concepts to design architectural, component level & User interface models, list the golden rules.	PSO 2	U
CO-4	Explain the quality concepts, SoftwareQuality Assurance tasks, discuss the strategies of testing, explain the types of testing.	PSO 3	Ap
CO-5	Explain the Product, process & project metrics, discuss the estimation modeling, understand the emerging trends, Prepare a Product.	PSO 4	U

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

## References

### Text Book:

1. Pressman Roger .S, “Software Engineering-A Practitioner’s Approach”, 2005, Tata McGraw Hill Publishing Company Ltd., NewDelhi.

#### **UNIT I:**

Chapter1 (1.1 to 1.3), Chapter2 (2.1 to 2.6), Chapter3 (3.1 to 3.4)

#### **UNIT II**

Chapter7 (7.1 to 7.4), Chapter8 (8.1 to 8.4, 8.6)

#### **UNIT III:**

Chapter9 (9.1 to 9.4), Chapter10 (10.3 and 10.6)

#### **UNIT IV:**

Chapter11 (11.1 to 11.3), Chapter12 (12.1 to 12.4)

#### **UNIT V:**

Chapter13 (13.3,13.5 to 13.7), Chapter14 (14.1 to 14.6), Chapter26 (26.1 to 26.4, 26.7)

#### **Reference Books:**

1. Carlo Ghezzi, Mehdi Jazayeri and Dimo Mandrioli, “Fundamentals of Software Engineering”, 2001, Prentice-Hall of India Private Ltd., NewDelhi.
2. Ian Sommarvilla, “Software Engineering”, 2004, Pearson Education Publishing Ltd.,New Delhi.
3. Jawadekar Waman.S, “Software Engineering Principles and Practice”, 2004,Tata McGraw Hill Publishing Company Ltd., NewDelhi.
4. RichardFairley, “SoftwareEngineeringConcepts”,2000,TataMcGrawHillInternational Publishing Company Ltd., NewDelhi.
5. Shari Lawrence Pfleeger, “Software Engineering Theory and Practice”, 2001,Pearson Education Publishing Ltd., NewDelhi.



(For Candidates admitted from June 2018 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – VI**

<b>Course Title</b>	<b>MAJOR CORE 13 – COMPUTER GRAPHICS</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5 Hours / Week</b>
<b>Code</b>	<b>U18CA6MCT13</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>4</b>
<b>Marks</b>	<b>100</b>

**GENERAL OBJECTIVE:**

To introduce students with fundamental concepts and theory of Computer Graphics

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Demonstrate the working principle of various video display devices such as CRT, LCD and LED systems and categorize the input and output devices used in graphics systems.
CO-2	Examine the specification of basic geometric structures such as Points, Lines, Circles & curves.
CO-3	Apply the various attributes that control the appearance of the displayed Primitives.
CO-4	Apply two dimensional transformations and clipping techniques in 2D scenes.
CO-5	Recognize the three dimensional display methods and compare parallel and perspective projections.

**UNIT I**

**15Hrs**

**OVERVIEW OF GRAPHICS SYSTEMS:** Video display devices: Refresh cathode-ray tubes - Raster-Scan Displays - Random-Scan Displays - Color CRT Monitors - Direct-View Storage Tubes - Flat-Panel Displays - Three-Dimensional Viewing Devices - Stereoscopic and Virtual-Reality Systems - Raster-Scan Systems: Video Controller - Raster-Scan Display Processor - Random-Scan Systems - Graphics Monitors and Workstations - Input Devices: Keyboards-Mouse - Trackball and space ball - Joysticks - Data Glove - Digitizers - Image Scanners - Touch Panels - Light Pens - Voice Systems- Hard Copy Devices.

*Extra Reading (Keywords): CRT, LCD, LED.*

**UNIT II**

**15Hrs**

**OUTPUT PRIMITIVES:** Points and Lines - Line-Drawing Algorithms: DDA Algorithm- Bresenham's Line Algorithm - Loading the Frame Buffer - Line Function - Circle-Generating Algorithms: Properties of Circles - Midpoint Circle Algorithm - Curve Functions – Fill-Area Functions – Character Generation.

*Extra Reading (Keywords): Ellipse Algorithm, Spline Curves.*

**UNIT III**

**15Hrs**

**ATTRIBUTES OF OUTPUT PRIMITIVES:** Line Attributes: Line Type - Line width - Pen and Brush Options - Line color - Curve Attributes - Color and Grayscale Levels: Color Tables- Grayscale - Area-Fill Attributes: Fill Styles - Pattern Fill - Soft Fill - Character Attributes: Text Attributes - Marker Attributes - Bundled Attributes: Bundled Line Attributes - Bundled Area-Fill Attributes - Bundled Text Attributes - Bundled Marker Attributes - Inquiry Functions.

*Extra Reading (Keywords): Color table, Fill Styles.*

**UNITIV****15Hrs**

**TWO - DIMENSIONAL GEOMETRIC TRANSFORMATIONS:** Basic Transformations: Translation – Rotation – Scaling – Matrix Representations and Homogeneous Coordinates - Composite Transformations: Translations – Rotations -- Scaling. Other Transformations: Reflection -- Shear - Transformations between Coordinate systems - Affine Transformations - Transformation functions - Raster Methods for transformations.

**TWO – DIMENSIONAL VIEWING:** Window to View port Coordinate Transformations - Clipping Operations - Point Clipping - Line Clipping: Cohen Sutherland Line Clipping – Polygon Clipping: Sutherland-Hodgeman PolygonClipping.

*Extra Reading (Keywords): Shear, Window, Viewport.*

**UNITV****15Hrs**

**THREE DIMENSIONAL CONCEPTS:** Three - Dimensional Display Methods: Parallel projection -- Perspective Projection -- Depth Cueing -- Visible Line and Surface –Identification- - Surface Rendering -- Exploded and Cutaway Views -- Three-dimensional and Stereoscopic views -- Three-Dimensional Graphics Packages.

**THREE – DIMENSIONAL VIEWING:** Viewing Coordinates: Specifying the View Plane-- Transformation from World to Viewing Coordinates -- Projections: Parallel projection -- Perspective Projection.

*Extra Reading (Keywords): Depth Cue, Convergence.*

<b>CO No.</b>	<b>COURSE OUTCOMES</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO-1	Acquire the concept of Raster Scan & Random Scan System Architectures with relevant equations of computer graphics	PSO - 1	<b>R</b>
CO-2	Understood and analyze the basic graphics algorithms for drawing and clipping the geometric objects.	PSO - 2	<b>U</b>
CO-3	Able to recognize the coordinate elements to display graphic images to given specifications	PSO - 3	<b>R, U</b>
CO-4	Describes the standard graphic projections of lines, planes and solids	PSO - 4	<b>R, U</b>
CO-5	Obtain development of surfaces and filling attributes with geometric object with various projections	PSO - 5	<b>Ap, An</b>
CO-6	Classifies the 2D and 3D views and coordinate systems with graphical techniques	PSO - 5	<b>An, Ev</b>

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

**Ap – Apply; An – Analyse; E- Evaluate; C – Create**

## References

### Text Books:

Donald Hearn & M.Pauline Baker **“Computer Graphics”** , 2006,Prentice Hall of India, New Delhi.

<b>UNIT I</b>	: Chapter-2(2.1-2.6)
<b>UNIT II</b>	: Chapter-3 (3.1-3.5, 3.9, 3.12,3.14)
<b>UNIT III</b>	: Chapter-4 (4.1-4.7)
<b>UNIT IV</b>	: Chapters 5(5.1 - 5.8), 6(6.3, 6.5-6.7,6.8)
<b>UNIT V</b>	: Chapters 9(9.1 – 9.2), 12(12.2 -12.3)

### Reference books:

1. Asthana R.G.S , Sinha .N.K, **“Computer Graphics”**,2002, New Age International Publishers, NewDelhi.
2. Foley, Van Dam, Feiner Hugher, **“Computer Graphics – Principles & Practice”**, 2004, Pearson Education, NewDelhi.
3. Krishnamurthy N., **“Introduction to Computer Graphics”**,2002,TataMcGraw Hill Publishing Company Limited, NewDelhi.
4. David Hillman, **“Multimedia Technology and Applications”** ,2003,Galgotia Publications Private Ltd, New Delhi.
5. JudithJeffcoale,**“Multimedia in Practice Technology and Applications”**,2003,Prentice Hall of India Private Ltd, NewDelhi.

(For Candidates admitted from June 2018 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – VI**

<b>Course Title</b>	<b>Major Core 14 – Business Process Outsourcing</b>
<b>Total Hours</b>	<b>60</b>
<b>Hours/Week</b>	<b>4 Hrs Wk</b>
<b>Code</b>	<b>U17CA6MCT14</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>4</b>
<b>Marks</b>	<b>100</b>

**GENERAL OBJECTIVE:**

To understand the various activities engaged in BPO domains.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understand the concept of outsourcing and identify different types of outsourcing.
CO-2	Aware of BPO Companies in India and world-wide.
CO-3	Classify call centers and appreciate the use of BPOs in Healthcare systems.
CO-4	Understand Healthcare BPO and the technologies required
CO-5	Understand the Career Opportunities in the BPO Industry

**UNIT – I Introduction to Business Process** **12 Hrs**

Nature and Types of Business Organization-Organization Structure - Definition - Complexity - Formalization-Outcomes for Individuals. **Explanation:** Size - Technology - Environment - Natural Cultures.

**Extra reading/Key words:** *call center, e-support.*

**UNIT - II Introduction To Business Process Outsourcing And Offshore BPO** **12 Hrs**

Benefits of BPO – Growth Drivers - BPO Models and Types of Vendors. **Offshore BPO:** Evolution-Global ITES/BPO Scenario-Offshore BPO Destinations- Challenges of Offshoring - BPO Companies in India.

**Extra reading/Key words:** *Customer Attrition, Back office support.*

**UNIT - III Contact Center And Healthcare BPO** **12 Hrs**

Types of Call Centers - Technology - Components and Working Principles of a Call Center - Issues and Problems. Structure of American Healthcare Sector - Activity Profile - Future Trends and Threats.

**Extra reading/Key words:** *Cloud Computing, BPaaS.*

**UNIT - IV Transaction Processing BPO And Human Resource BPO** **12 Hrs**

Elements of Back Office Services - Financial Services - Insurance. Reasons for Outsourcing HR - Activities Involved in HR BPO - HR Outsourcing Trends.

**Extra reading/Key words:** *KPO, VOC.*

**UNIT - V Career Opportunities in the BPO Industry** **12 Hrs**

Employment Opportunities - Employee Structure - Skill Set Required - Compensation Levels. Case study: Intelnet Global, CBay System, Datamatrix.

**Extra reading/Key words:** *Hypergrowth, virtual agent.*

**Course Outcomes:**

<b>CO No.</b>	<b>Course Outcomes</b>	<b>PSOs Addressed</b>	<b>Cognitive Level</b>
CO-1	Recall and relate the concept of outsourcing and identify different types of outsourcing.	PSO 1	R, U
CO-2	Identify BPO Companies in India and world-wide.	PSO 2	R
CO-3	Evaluate the call centers and appreciate the use of BPOs in Healthcare systems.	PSO 5	Ap
CO-4	Examine Transaction Processing BPO and Human Resource BPO	PSO 4	E
CO-5	Plan for Career Opportunities in the BPO Industry.	PSO 3	An
CO-6	Evaluate the Offshore BPO	PSO 4	E

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

**References****Text Books**

1. Richard H.Hall, “**Organization, Structure, Processes and Outcomes**”, PearsonEducation, 7th Edition.

**UNIT: I**

2. Sarika Kulkarni, “**Business Process Outsourcing**”, Jaico Publishing House,2005

**UNIT: II, III, IV & V****Reference Books**

1. Dr. S. Nakkiran, “**Business Process Outsourcing**”, Deep & Deep Publishers,2004.
2. Ed. Gopal. R, Manjrekar, Pradip, “**BPO/KPO Management – An Industry Perspective**”, ExcellBooks.
3. AkshayaBhargava, “**RandomNotesonIndianBPO**”,theICFAIUniversityPress.2006.
4. Kulkarni, Sarika, “**Business Process Outsourcing**”, Jaico Publishing House, Delhi,2005.

(For Candidates admitted from June 2018 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Second Year - Semester – III**

<b>Course Title</b>	<b>Major Core 15 - MONGODB WITH SQL LAB</b>
<b>Total Hours</b>	<b>30</b>
<b>Hours/Week</b>	<b>4 Hours / Week</b>
<b>Code</b>	<b>U16CA6MCP15</b>
<b>Course Type</b>	<b>Practical</b>
<b>Credits</b>	<b>3</b>
<b>Marks</b>	<b>100</b>

**GENERAL OBJECTIVE: To understand and experiment the querying sequences in the open source tool MongoDB.**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understand the fundamentals of MongoDB.
CO-2	Installs the MongoDB components in the Individual system and virtualizes the server concept
CO-3	Apply the basic queries of CRUD operations in MongoDB prompt
CO-4	Apply and extract the collection documents with various Queries
CO-5	Apply and experiment the query sequences with various operations in different applications

**EXERCISES**

11. Write a MongoDB query to display all the documents in the collectionrestaurants.
12. Write a MongoDB query to display the fields restaurant\_id, name, boroughand cuisine for all the documents in the collectionrestaurant.
13. Write a MongoDB query to find the restaurants who achieved a score more than90.
14. Write a MongoDB query to find the restaurants that achieved a score, more than 80 but less than100.
15. Write a MongoDB query to find the restaurants which do notprepare any cuisine of 'American' and achieved a score more than 70 and located in the longitude less than - 65.754168. Note :Do this query without using \$andoperator.
16. Write a MongoDB query to find the restaurants which do not prepare any cuisine of 'American ' and achieved a grade point 'A' not belongs to the borough Brooklyn. The document must be displayed according to the cuisine in descendingorder.
17. Write a MongoDB query to find the restaurant Id, name, borough and cuisine for those restaurants which contain 'Wil' as first three letters for itsname.
18. Write a MongoDB query to find the restaurant Id, name, borough and cuisine for those restaurants which contain 'ces' as last three letters for itsname.
19. Write a MongoDB query to find the restaurant Id, name, borough and cuisine for those restaurants which contain 'Reg' as three letters somewhere in itsname.
20. Write a MongoDB query to find the restaurants which belong to the borough Bronx and prepared either American or Chinesedish.

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**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – VI**

<b>Course Title</b>	<b>Major Elective 3– Internet of Things</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5 Hrs Wk</b>
<b>Code</b>	<b>U18CA6MET07</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**General Objective:**

To understand the Fundamentals, Architecture and Protocols of Internet of Things and its application in various domain

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understand the Internet of computer and Internet of things.
CO-2	Compare M2M and IoT communication.
CO-3	Understand and analyze the architecture in various IoT Layer
CO-4	Analyze various protocols and its usage in communication.
CO-5	Create Program to implement IoT applications

**UNIT- I IntroductionToIoT**

**15Hrs**

Introduction to Internet of Things –Definition and Characteristics of IoT, Physical Design of IoT – IoT Protocols, IoT communication models, IoT Communication APIs, IoT enabled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems. Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle.

**Extra Reading/Keywords:** *Bio sensors, Nano sensors*

**UNIT- II IoTandM2M**

**15Hrs**

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT -Basics of IoT System Management with NETCOZF, YANG-NETCONF, YANG, and SNMP NETOPEER

**Extra Reading/Keywords:** *5G technology, Ambient intelligence*

**UNIT- IIIIoTArchitecture**

**15Hrs**

Architecture Reference Model- Introduction-Reference model and architecture-IoT reference model-IoT Reference Architecture-Introduction-Functional View-Information view-Deployment and operational view-Other relevant architectural views

**Extra Reading/Keywords:** *Security and Context Aware architecture*

**UNIT- IV IoT Protocols****15Hrs**

Protocol Standardization for IoT – M2M Area Network Physical layer: IEEE 802.15.4 – M2M Protocols for legacy Systems: BACNet Protocol – Modbus – Zigbee Architecture – IP based Protocol – 6LoWPAN – RPL

**Extra Reading/Keywords:** *Physical Web, mDNS*

**UNIT-V Building IoT With Raspberry Pi & Arduino****15Hrs**

Building IOT with RASPBERRY PI- IoT Systems - Logical Design using Python – IoT Physical Devices & Endpoints - IoT Device - Building blocks - Raspberry Pi - Board - Linux on Raspberry Pi – Raspberry Pi Interfaces - Programming Raspberry Pi with Python - Other IoT Platforms - Arduino.

**Extra Reading/Keywords:** *Simulator-Proteus*

**Course Outcomes:**

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Recognize and describe the Internet of computer and Internet of Things	PSO 1	R, U
CO-2	Classify IoT architecture based on their applicability.	PSO 2	An
CO-3	Identify the different protocols used in different layer.	PSO 2	R
CO-4	Classify models in IoT Architecture and relate it with real time implementation	PSO2, PSO3	An
CO-5	Implement Python Program in Raspberry PI board using python.	PSO4 PSO5	Ap
CO-6	Express the IoT application in various real time problems	PSO 4	U

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



## **References**

### **Text Books:**

Arshdeep Bahga, Vijay Madiseti, "Internet of Things – A hands-on approach", Universities Press, 2015.

**UNIT I: CHAPTER 1**

**UNIT II: CHAPTER 5**

**UNIT V: CHAPTER 6**

Jan Holler, Vlasios Tsiatsis , Catherine Mulligan, Stamatis , Karnouskos, Stefan Avesand. David Boyle, "From Machine-to-Machine to the Internet of Things - Introduction to a New Age of Intelligence", Elsevier, 2014

**UNIT III: CHAPTER 7,8**

Olivier Hersent, David Boswarthick, Omar Elloumi , "The Internet of Things – Key applications and Protocols", Wiley, 2012

**UNIT IV: CHAPTERS 1,3,5,7,12**

### **Reference Books:**

1. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), "Architecting the " InternetofThings", Springer,2011.
2. PethuruRajandAnupamaC. Raman, "TheInternetof ThingsEnablingTechnologies, Platforms and Use Cases", Taylor & Francis, CRC Press,2017.
3. Honbo Zhou, "The Internet of Things in the Cloud: A Middleware Perspective", CRC Press, 2012.
4. Ovidiu Vermesan,PeterFriess, "Internet of Things-From Research and Innovation toMarket deployment",Riverspublisher.
5. Adrian McEWen and Hakim Cassimally, "Designing the Internet of Things", John Wielyand Sons private Ltd,2014.

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**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – VI**

<b>Course Title</b>	<b>Major Elective 3 – Cloud Computing</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5HrsWk</b>
<b>Code</b>	<b>U18CA6MET08</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**GENERAL OBJECTIVES**

This course covers a series of current cloud computing technologies, including technologies for Infrastructure as a Service, Platform as a Service, and Software as a Service. Different layers of the cloud technologies, virtualization mechanisms, data security and scientific applications of cloud are included.

**COURSE OBJECTIVES (CO)**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	remember the deployment and service models
CO-2	understand the various technologies
CO-3	analyze virtualization mechanisms
CO-4	explain the various platforms of cloud in industry
CO-5	evaluate pricing models for cloud based services

**UNIT I**

**15Hrs**

**UNDERSTANDING CLOUD COMPUTING:**Origins and Influences - Basic Concepts and Terminology - Goals and Benefits - Risks and Challenges.

**FUNDAMENTAL CONCEPTS AND MODELS:**Roles and Boundaries - Cloud Characteristics - Cloud Delivery Models - Cloud Deployment Models.

*Extra Reading (Keyword): Real time applications.*

**UNIT II**

**15Hrs**

**CLOUD-ENABLING TECHNOLOGY:** Broadband Networks and Internet Architecture – Data Centre Technology – Virtualization Technology-Web Technology – Multitenant Technology – Service Technology.

**FUNDAMENTAL CLOUD SECURITY:** Basic Terms and concepts –threat agents – cloud Security Threats – Additional Considerations.

*Extra Reading (Keyword): Current Technologies, Security Challenges.*

**UNIT III**

**15Hrs**

**VIRTUAL MACHINES PROVISIONING AND MIGRATION SERVICES :**Introduction and Inspiration –Background and related work – Virtual Machines Provisioning and Manageability – Virtual Machine Migration Services – Provisioning in the Cloud Context.

*Extra Reading (Keyword): Virtual Machine Migration in Action.*

**UNITIV** **15Hrs**  
**HrsSECURE DISTRIBUTED DATA STORAGE IN CLOUD COMPUTING** :Introduction – Cloud Storage:From LANs To WANs – Technologies for Data Security in Cloud Computing – Open Questions and Challenges.

*Extra Reading (Keywords) :Mongo DB, Cosmos DB*

**UNITV** **15Hrs**  
**CLOUD APPLICATIONS** :Scientific Applications : Healthcare – Biology – Geoscience – Business and Consumer Applications : CRM and ERP – Productivity – Social Networking – Media Applications – Multiplayer Online Gaming.

*Extra Reading (Keywords) :Green Computing Concepts.*

**Course Outcomes**

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Discuss the fundamental concepts in cloud.	PSO 1	R, U
CO-2	Analyse the cloud enabling technologies.	PSO 4	U
CO-3	Knowand explain the Virtualization mechanisms.	PSO 4	U
CO-4	Comprehend the Cloud Data Security concepts.	PSO 2	R
CO-5	Know and distinguish the various applications Cloud.	PSO 2	An

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

**References**

**Text Books :**

1. Thomas Erl, ZaighamMahmood, and Ricardo Puttini, “**Cloud Computing: Concepts, Technology and Architecture**”, Prentice Hall, U.S.A.,2013.

**UNITI** : Chapters 3 &4  
**UNITII** : Chapters 5 &6

2. RajkumarBuyya,JamesBroberg,AndrzejGoscinski,“**CloudComputing:Principlesand Paradigms**”, John Wiley & Sons, U.S.A. ,2013.

**UNITIII** : Chapter 5 (5.1to 5.4 ,5.6)  
**UNITIV** : Chapter 8 (8.1 –8.4)

3. RajkumarBuyya, Christian Vecchiola, S. ThamaraiSelvi, “**Mastering Cloud Computing**”, Elsevier Inc.,2013.

**UNITV** : Chapters10

**Reference Books:**

1. MichaelJ.Kavis,“**ArchitectingtheCloud:DesignDecisionsforCloudComputing ServiceModels (SaaS, PaaS, and IaaS)**”, John Wiley & Sons Inc., Jan2014.
2. Michael Miller, “**Cloud Computing Web Based Applications That Change The Way You Work And Collaborate Online**”, Pearson Education,2009.
3. Kris Jamsa, “**Cloud Computing**”, Jones and Bartlett Learning,2013.
4. Swarup K. Das, “**Cloud Computing**”,Dominant Publishers,2015.
5. PrasantaPattnaik, ManasKabat“**Fundamentals of Cloud Computing**”, S.Chand (G/L) & Company Ltd; First edition(2014).

(For Candidates admitted from June 2018 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – VI**

<b>Course Title</b>	<b>MAJOR ELECTIVE 3 – BIG DATA ANALYTICS</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5 Hours / Week</b>
<b>Code</b>	<b>U18CA6MET09</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**GENERAL OBJECTIVE:**

To impart knowledge in Fundamental of Big Data Analytics and Map Reduce Fundamentals and to recognize the key concepts of Hadoop framework, MapReduce

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understand the fundamental concepts of Big data
CO-2	Analyze the usage and extraction techniques of Big data Analytical framework
CO-3	Specify the importance of distributed computing and Cloud environment for Big Data
CO-4	Determines the Operational Data bases and the HADOOP & MapReduce techniques
CO-5	Apply and analyze the analytical platforms of data distribution sources

**UNIT I**

**15Hrs**

**GRASPING THE FUNDAMENTALS OF BIG DATA:** The Evolution of Data Management – Understanding the Waves of Managing Data – Defining Big Data – Building a successful Big Data Management Architecture – The Big Data Journey

**EXAMINING BIG DATA TYPES:** Defining Structured Data – Defining Unstructured Data – Looking at Real time and Non-Real time Requirements – Putting Big Data together.

*Extra Reading: Big data & Importance, examples of Real and non-real time requirements*

**UNIT II**

**15 Hrs**

**OLD MEETS NEW: DISTRIBUTED COMPUTING:** Distributed Computing – Understanding the Basics of Distributed Computing – Getting Performance Right.

**DIGGING INTO BIG DATA TECHNOLOGY COMPONENTS:** Exploring the Big Data Stack – Layer 0: Redundant Physical Infrastructure – Layer 1: Security Infrastructure – Interfaces and Feeds to and from Applications and the Internet – Layer 2: Operational Databases – Layer 3: Organizing Data Services and Tools – Layer 4: Analytical Data Warehouses – Big Data Analytics – Big Data Applications.

*Extra Reading: Importance of Distributed system in Big Data and its components*

**UNIT III**

**15Hrs**

**VIRTUALIZATION AND ITS SUPPORT TO DISTRIBUTED COMPUTING:**

Understanding the Basics of Virtualization – Managing Virtualization with the Hypervisor – Abstraction and Virtualization Implementing Virtualization to work with Big Data.

**EXAMINING THE CLOUD AND BIG DATA:** Defining the cloud in the context of Big Data – Understanding Cloud Deployment and Delivery Models – The Cloud as an Imperative for Big Data – Making use of the Cloud for Big Data Providers in the Big Data Cloud Market

*Extra Reading: Usage of cloud for Big Data Cloud Market*

**UNITIV****15Hrs**

**OPERATIONAL DATABASES:** RDBMSs are Important in a Big Data Environment – Non-relational databases – Key Value Pair Databases – Document Databases – Columnar Databases – Graph Databases – Spatial Databases – Polyglot Persistence.

**MAPREDUCE FUNDAMENTALS:** Tracing the origins of MapReduce – Understanding the Map Function – Adding the Reduce Function – Putting Map and Reduce Together – Optimizing Map Reduce Tasks.

**EXPLORING THE WORLD OF HADOOP:** Explaining Hadoop – Understanding the Hadoop Distributed File System (HDFS) – Hadoop MapReduce

*Extra Reading: Analyzing the examples of Big Data Operational Databases with Apps.*

**UNITV****15Hrs**

**DEFINING BIG DATA ANALYTICS:** Using Big Data for Results – Modifying Business Intelligence Products to Handle Big Data – Studying Big Data Analytics Examples.

**UNDERSTANDING TEXT ANALYTICS & BIG DATA:** Exploring Unstructured Data – Understanding Text Analytics – Analysis and Extraction Techniques – Putting your results together with Structured Data – Putting Big Data to use – Text Analytics Tools for Big Data.

**CUSTOMIZED APPROACHES FOR ANALYSIS OF BIG DATA:** Building New Models and Approaches to support Big Data – Understanding Different Approaches to Big Data Analysis – Characteristics of a Big Data Analysis Framework – Big to Small – Big Data Paradox

*Extra Reading: Future enhancements of Big Data Analytics*

CO No.	COURSE OUTCOMES	PSOs Addressed	Cognitive Level
CO-1	Explains the fundamentals of Big Data and categorizes Big Data and its importance	PSO - 1	R
CO-2	Identifies the distributed Computing with Big Data and the various layers of the Stack	PSO - 2	U
CO-3	Describes the virtualization approaches and models with cloud environment in big data	PSO - 3	R, U
CO-4	Explores the various operational databases and technologies like Hadoop & MapReduce	PSO - 4	R, U
CO-5	Summarizes the big data analytics in various environments	PSO - 5	Ap, An
CO-6	Integrates the Text data analytics with Customized approaches	PSO - 5	Ap, An

## References

### Text book

Judith Hurwitz, Alan Nugent, Dr. Fern Halper and Marcia Kaufman, “**Big Data for Dummies**”, A Wiley Brand - Wiley Publications, 2013.

<b>UNITI:</b>	Chapters 1,2
<b>UNITII:</b>	Chapters 3,4
<b>UNITIII:</b>	Chapters 5,6
<b>UNITIV:</b>	Chapters 7, 8,9
<b>UNITV:</b>	Chapters 12, 13, 14

### Reference books

1. Bill Franks, “**Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics**”, 1st Edition, Wiley and SAS Business Series, 2012.
2. DT Editorial Services, “**Big Data Black Book**”, DreamTech Press, 2015.
3. Seema Acharya, Subhashini Chellappan, “**Big Data and Analytics**”, Wiley Publication, First Edition, Reprint in 2016.
4. O’Reilly Media, “**Big Data Now: Current Perspective**” O’Reilly Media, 2013 Edition.
5. Mike Barlow, “**Real-Time Big Data Analytics: Emerging Architecture**”, O’Reilly Media Inc., 2013.

(For Candidates admitted from June 2018 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – VI**

<b>Course Title</b>	<b>Non Major Elective 2: Multimedia Lab</b>
<b>Total Hours</b>	<b>26</b>
<b>Hours/Week</b>	<b>2 Hrs Wk</b>
<b>Code</b>	<b>U18CA6NMP02</b>
<b>Course Type</b>	<b>Lab</b>
<b>Credits</b>	<b>2</b>
<b>Marks</b>	<b>100</b>

**General Objectives:**

To learn use the basic tools found in Adobe Photoshop to create and edit images.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Demonstrate the techniques of photo editing.
CO-2	Apply layer masks, filters and blending modes , share and save your images in various formats.
CO-3	Learn various retouching and repairing techniques to correct images.
CO-4	Demonstrate the techniques for resize and crop images.
CO-5	Demonstrate how to Remove or repair unwanted image areas.

1. Using various selectiontools.
2. Using image adjustment tools to enhance animage.
3. Create scenery using Photoshopbrushes.
4. Demonstrate the use of layereffects.
5. Create a text with pictureinside.
6. Demonstrate the use of ripple effect and lensflare.
7. Create a snapshot inside aphoto.
8. Photoretouching.
9. Coloring a BW photo.

1. Create slide mounttemplate.
2. Create Photo mounttemplate.
3. Create photo frameeffect.
4. Create photo filmeffect.
5. Create a 3D Photoeffect.
6. Create 2D and 3Dlogos.
7. Animate text using ImageReady.
8. Create three frames with Lens flare effect and different background colors and animateusing ImageReady
9. Create a Christmas Tree with BlinkingLights.
10. Animate a candle flame using Liquifyfilter.
11. Design an attractive Greeting Card, Invitation,Wallpaper



(For Candidates admitted from June 2018 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.C.A. Third Year - Semester – VI**

<b>Course Title</b>	<b>Skill Based Elective 5</b> <b>Mobile Application Development Lab</b>
<b>Total Hours</b>	<b>30</b>
<b>Hours/Week</b>	<b>2 Hrs Wk</b>
<b>Code</b>	<b>U18CA6SBP05</b>
<b>Course Type</b>	<b>Practical</b>
<b>Credits</b>	<b>2</b>
<b>Marks</b>	<b>100</b>

**EXERCISES**

1. Creating “Hello world” Application.
2. Creating an Application that displays message based on the screenorientation.
3. Create an application that displays custom designed OpeningScreen.
4. Play an audio, based on the usevent.
5. Create an UI with allviews.
6. Create menu inApplication.
7. Read/ write the Localdata.
8. Create / Read / Write data with database(SQLite).
9. Create an application to sendSMS.
10. Create an application to send ane-mail.
11. Display Map based on the Current/givenlocation.
12. Learn to deploy androidApplications.

(For candidates admitted from 2015 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI-2**  
**SEMESTER VI**

<b>Course Title</b>	<b>SKILL BASED ELECTIVE 6 : RESEARCH METHODOLOGY</b>
<b>Total Hours</b>	<b>30</b>
<b>Hours/Week</b>	<b>2</b>
<b>Code</b>	<b>U15DS6SBT06</b>
<b>Course Type</b>	(Theory cum Project)
<b>Credits</b>	<b>2</b>
<b>Marks</b>	<b>100</b>

**General Objective:**

Students get introduced to concept of research and to carry out research projects.

**Course Objective:**

The student will be able to

1. understand the different types of research.
2. analyze the research objectives and frames the hypothesis
3. understand the structure of dissertation.
4. evaluate their research work.

**Unit I**

**6Hrs**

**Introduction to research:** Concept of research – types of research – introduction to research literature base – collection of research information from different sources; maintenance of information.

**Extra reading / Key Words:** *Primary data, Secondary data collection*

**Unit II**

**6Hrs**

**Research focusing:** identifying research area – drawing objectives \ hypothesis – designing the work – data collection – analysis.

**Extra reading / Key Words:** *Test of Hypothesis and Levels of significance.*

**Unit III**

**6Hrs**

**Preparation of dissertation:** Structure of dissertation – editing – bibliography.

**Extra reading / Key Words:** *Summarizing any Two research article.*

**Unit IV Project work**

**12Hrs**

**Note: 1.Extra reading/Key words are only for internal testing(Seminar/Assignment)**

**The students will be evaluated internally by a test for 50 marks. The Project will be evaluated by an external evaluator and a viva- voce will be conducted for 50 marks. The students can carry out their projects individually or in groups.**

**REFERENCES:**

Blaxter, L., Hughes, C. and Tight (1999) How to research? Viva Book private Limited

Kothari, C.R. (2004) research Methodology- Methods and Technioques, New Age International Publishers, India

Lal, B.(2002) Research Methodology, ABD Publishers. India

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

**HRS / WK:1  
CREDIT:1**

**CODE:U15VE6LVE03  
MARKS :100**

**OBJECTIVES:**

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

**UNIT – I: PERSONAL COMPETENCE**

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

**UNIT – II: MARRIAGE AND FAMILY**

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

**UNIT – III: PARENTHOOD**

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

**UNIT – IV: PERSONALITY DEVELOPMENT**

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

**UNIT – V: CAREER CHOICE**

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

**REFERENCES:**

5. Tony B and Barry Buzan(2003), The mind map book, BBC world wide limited,London.
6. Susan Nash(2005), Turning team performance inside out, Jai CO. publishing House,New Delhi.
7. Fr. Ignacimuthu (1999) “Values for Life”, VaigaraiPathipagam.
8. Grose. D.N. (2000), “A text book on Value Education”, DominantPublishers.

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

**HRS / WK:1**

**CODE:U15VE6LVB03**

**CREDIT:1**

**MARKS :100**

**OBJECTIVE:**

- To prepare the students to practice Christian principles in family, church and society as 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: MARRIAGE AND FAMILY LIFE**

- Finding the God’s Will - Issac (Gen24)
- Man and woman as Partners – Abraham and Sarah (Gen 16-18,22), Aquila and Priscilla (Acts 18:1-3,26)
- Evils to be avoided – Premarital Sex, Extramarital Sex, Homosexuality, Abortion(Heb13: 4, Psalm 127 :4)
- Ideal Wife – Sarah (I Peter 3: 1-6), Ruth,(Eph 5)

**UNIT – III: CHRISTIAN HOME**

- Parental Responsibilities and bringing up children – Abraham (Gen 22), Eli (I Sam 2: 24-36,3: 11- 18), Mary, Mother of Jesus (Luke 2:51,52)
- Caring for the Aged (I Sam 2:31,32)

**UNIT – IV: CHRISTIAN ETHICS**

- Holiness – Joseph (Gen 39:9) Levi 11: 45, Ecc12
- Obedience to God - Abraham (Gen 12) ; St.Paul (Acts9)
- Freedom and Accountability
- Justice and Love
- 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 of wealth

## **UNIT – V: MISSIONARIES DOWN THE LANE**

- William Carrié(Calcutta)
- Pandithar Rama Bai(Karnataka)
- Amy Carcheal(Dohnavur)
- Dr. Ida Scudder(Vellore)
- Devasagayam(Nagercoil)
- St. John De Britto(Oriyur)
- Graham Staines & Family(Odisha)
- St. Mother Teresa(Calcutta)

### **REFERENCES:**

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

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

**HRS / WK:1**

**CODE:U15VE6LVC03**

**CREDIT:1**

**MARKS :100**

**OBJECTIVES:**

- To prepare the students to participate meaningfully in the liturgical celebration and experience GOD in their day todaylife.
- To enable the students to become living witnesses 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. – The Creed – Act of contrition – Discernment of spirits – Counseling – Spiritual direction.

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

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

**UNIT – IV: CHRISTIAN FAMILY**

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

**UNIT – V: CONSECRATED LIFE**

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

**REFERENCES:**

5. Compendium – Catechism of the Catholic Church Published by Vaigarai Publishing House for the Catholic Church of India.
6. 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.
7. Documents of Vatican II – St. Paul’s Publications, Bombay1966.

(For Candidates admitted from June 2018 onwards)  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.Com. First Year - Semester – II**

**B.COM WITH SPECIALISATION IN COMPUTER APPLICATIONS**

<b>Course Title</b>	<b>ALLIED OPTIONAL 3 COMPUTER APPLICATION IN BUSINESS</b>
<b>Total Hours</b>	<b>60</b>
<b>Hours/Week</b>	<b>4 Hrs Wk</b>
<b>Code</b>	<b>U18CA2AOT03</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>3</b>
<b>Marks</b>	<b>100</b>

**General Objectives:**

To make the students familiar with the use of IT and the various facets of IT and to equip the students with practical skills to use computers.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	understands the components, different applications and issues of information technology
CO-2	remembers and understands the terminologies of operating system and features of Microsoft Word
CO-3	explain the features of Excel environment
CO-4	create power point presentation with multimedia effects
CO-5	solve ecommerce framework with real-time applications.

**UNIT I**

**12Hrs**

**INFORMATION TECHNOLOGY: Introduction:** Meaning – Need – Components. **Role of IT:** It in Business, IT in Manufacturing, IT in Mobile Computing, IT in Public Sector, IT in Defense, IT in Media, IT in Publication, IT and Internet. **Emerging Trends in IT:** E-Commerce, IT And Supply Chain Management, IT And SIS, Electronic Data Interchange(EDI) and Mobile Communication. **IT and Ethical Issues:** Privacy, Accuracy, Property and Accessibility Issues.

*Extra Reading (Key Words): Cyber Law Security and Practices*

**UNIT II**

**12Hrs**

**BASICS OF OPERATING SYSTEMS:** Meaning, Definition and Functions of OS. **Microsoft Window 2007:** Task Bar, Desktop and Customizing, My Computer-Setting, Control Panel Components, Windows Explorer, Using Help and Search Features. **Word Processing Using MS Word 2007:** Basics - Working with Word documents – Working with Text. *Checking Spelling and Grammar:* Using Spelling and Grammar Dialog Box - Using Auto Correct- Using

Synonyms and Thesaurus. Adding Graphics and Drawing Objects – MailMerge.

**Extra Reading (Key Words): Distributed Operating System**

### UNITIII

12Hrs

**MS-EXCEL :** Spread Sheet Using Microsoft Excel 2007: Excel Environment – *Working With Worksheet:* Entering Data – Navigating Through Cells – Naming And Renaming Cells – Editing A Worksheet – Cut-Copy, Paste Functions - Find And Replace Features. *Formulas and Functions:* Functions and Formulas - Using Auto Sum, Auto Fill and Command. Creating and Inserting a Chart and Transporting to Word and PowerPointDocuments.

**Extra Reading (Key Words): Import Excel to analysis tools**

### UNITIV

12Hrs

**MS-POWER POINT:** *Making Presentation Using Microsoft Power Point 2007.* PowerPoint Environment – *Working with PowerPoint:* Creating a Presentation using Design Templates and Blank Presentation - Working with Different Views. *Designing Presentation:* Working with Slides – Working with Text – Formatting the Text - Graphics and Adding Multimedia Animation - Inserting Pictures and Tables From Other Office Products – Running Slides.

**Extra Reading (Key Words): Presentation with Hyperlink and Animation**

### UNITV

12Hrs

**APPLICATIONS OF E-COMMERCE:** *Introduction to E-Commerce:* Meaning, Need, Advantages, E-Commerce Framework, Types of E-Commerce. *The Anatomy of E-Commerce Applications:* Electric Consumer Application - Electronic Commerce Organization Application. *Electronic Payment System:* Introduction to EPS, EFT and SET - Types of Payment System. *Technology and Cyber Law:* Basics Concepts and Importance of Cyber Law - Cyber Laws in India (Information Technology Act 2000).

**Extra Reading (Key Words): Usage of E-purchase Websites**

#### Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Describe the Components, different Applications and issues of Information Technology.	PSO 1	R, U
CO-2	Discuss the terminologies of Operating System and features of Microsoft Word.	PSO 1, 2	R, Ap
CO-3	Explain the features of Excel Environment.	PSO 1, 4, 5	U, Ap, E
CO-4	Create Power Point Presentation with Multimedia Effects.	PSO 3, 5	R, Ap
CO-5	Relate Ecommerce Framework with Real-Time Applications.	PSO 4,5	R, Ap

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



## **References**

### **Text Books**

1. Alexis Leon, Mathews Leon, Leena Leon, “**Introduction to Information Technology**”, Vijay Nicole, imprints Private Ltd, Chennai.
2. R. Parameswaran, “**Computer Applications in Business**”, S.Chand & Company Ltd. New Delhi.

### **Reference Books:**

1. V. Rajaraman, “**Introduction to Information Technology**”, PHI Learning Pvt Ltd, New Delhi.
2. Dr. Ch. Seetha ram, “**Information Technology For Management**”, Deep & Deep Publications Pvt Ltd, New Delhi.
3. Leon, “**Introduction to Computers**”, Vikas Publishing House Pvt Ltd.
4. Srinivasa vallaban SV, “**Computer In Business**”, Sultan Chand and Sons, New Delhi.
5. “**Introduction to Computers with Ms Office**”, New Delhi.

## **PRACTICALS**

1. Typing and formatting a page in MS Word
2. Typing all kinds of letters
3. Typing a Resume
4. Creation of tables in MS Word and entering text and numeric data
5. Use of Mailmerge
6. Preparing a graph for a given data
7. Creating power point file using templates and master slide
8. Importing data from word and excel to power point slides
9. Inserting picture files and audio files
10. Using animation and slide transition schemes in slides
11. Opening net banking account
12. Case study on Cyber Laws

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**B.Com. First Year - Semester – II**

<b>Course Title</b>	<b>Major Core 13 – Digital Marketing</b>
<b>Total Hours</b>	<b>90</b>
<b>Hours/Week</b>	<b>6 Hrs /Wk</b>
<b>Code</b>	<b>U19CO6MCT16</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**General Objective**

To help the students to have an overall understanding of various digital marketing platforms.

**Course Objectives:**

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understands and analyze the basics of digital marketing and its process
CO-2	Understands and compare various pay per clicks and Digital Display Ads
CO-3	Discuss about Email Marketing and Mobile Marketing
CO-4	Describe about Social Media Marketing
CO-5	Understands and create Strategy and Planning of Digital Marketing

**UNIT I**

**18Hrs**

**INTRODUCTION AND SEO :** An introduction to Digital Marketing - Search Engine Optimization: An Introduction – Search Engine Result Pages - Search Behavior – Goals – On Page Optimization - Off Page Optimization – Analyze.

*Extra Reading (Key Words): Online Marketing*

**UNIT II**

**18Hrs**

**PAY PER CLICK AND DIGITAL DISPLAY ADVERTISING :** An Introduction –goals - Setup – Manage – Analyze. Digital Display Advertising: An Introduction - Display Advertising – Define.

*Extra Reading (Key Words): CTR, CPA, CPC*

**UNIT III**

**18Hrs**

**EMAIL MARKETING AND MOBILE MARKETING:** An Introduction – Data and Email Marketing process – Design and content – Delivery – Discovery: Report and analysis. Mobile Marketing: An Introduction – Opportunity – Optimize.

*Extra Reading (Key Words): Marketing Mix*

**UNIT IV**

**18Hrs**

**SOCIAL MEDIA MARKETING:** An Introduction – Goals – Channels: Facebook – Twitter – LinkedIn - Google+ - YouTube – Blogs – Overview of Instagram - Implementation.

*Extra Reading (Key Words ): Network Marketing*

**UNIT V**

**18Hrs**

**ANALYTICS, STRATEGY AND PLANNING:** An Introduction – Goals - Strategy And Planning: Approach - Digital Marketing Plan: Structure - Situation Analysis - Audience – Activities - Analysis.

*Extra Reading (Key Words): B2B, Marketing*

## Course Outcomes:

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the basics of digital marketing and its process.	PSO 1	R, U
CO-2	Distinguish various pay per clicks and digital display ads.	PSO 2	R
CO-3	Discuss about email marketing and mobile marketing.	PSO 2	U
CO-4	Discuss about social media marketing.	PSO 3	R
CO-5	Illustrate strategy and planning of digital marketing.	PSO 4	An

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

## References

### Text Books:

1. Dodson Ian, “**The Art of Digital Marketing**”, New Delhi: Wiley India, 2016.

**Unit I:** Chapter-1, 2

**Unit II:** Chapter-3, 4

**Unit III:** Chapter-5, 8

**Unit IV:** Chapters 6, 7

**Unit V:** Chapters 10

### Reference Books:

1. Ahuja Vandana, “**Digital marketing**”, New Delhi: Oxford University Press,2016.

2. RyanDamian,“**UnderstandingDigitalMarketing:MarketingStrategiesforEngagingthe Digital Generation**”, 4/e; New Delhi: Kogan Page Limited,2016.

3. Shah, Kruti and D’Souza, Alan “**Advertisement and Promotion – An IMC Perspective**”, 1/e; New Delhi: McGraw Hill Education,2014.

4. Baack,E.DonaldandClow,E.Kenneth,“**IntegratedAdvertising,PromotionandMarketing Communications**”, 6/e; New Delhi: Pearson Education,2014.

5. Nag, A. , “**Sales and Distribution Management**”, New Delhi: McGraw-Hill Education,2013..

## PRACTICALS

1. BusinessCard
2. Web Site Creation ForRestaurant
3. Web Site Creation For OnlineShopping
4. Online WebpageCreation
5. Online BlogCreation
6. OnlineAdvertisement
7. BrochureCreation
8. FlyerCreation
9. ID CardCreation
10. Login PageCreation

**For Candidates admitted from June 2018 onwards)**  
**HOLY CROSS COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI – 620 002**  
**PG DEPARTMENT OF COMPUTER SCIENCE**  
**B.Com. Third year- semester -V**

<b>Course Title</b>	<b>Major Elective 3 – Fundamentals of E-Commerce</b>
<b>Total Hours</b>	<b>75</b>
<b>Hours/Week</b>	<b>5HrsWk</b>
<b>Code</b>	<b>U19CO6MET07</b>
<b>Course Type</b>	<b>Theory</b>
<b>Credits</b>	<b>5</b>
<b>Marks</b>	<b>100</b>

**GENERAL OBJECTIVE**

To provide an understanding of E-commerce practices and applications in business and Marketing areas.

<b>CO No.</b>	<b>Course Objectives</b>
CO-1	Understands and criticize the e-commerce, advantage disadvantage of E-commerce and traditional commerce v/s E-commerce
CO-2	Describe and understands different type of models and activities of E-commerce.
CO-3	Discuss the different type techniques and software used in E-commerce.
CO-4	Illustrate the strategies for marketing sales and promotion.
CO-5	Analyze and show the different type of e-commerce application and supply chain diagram.

**UNIT I**

**15Hrs**

**INTRODUCTION TO E-COMMERCE** : Electronic Commerce: Meaning – Definition – Scope – Goals – Functions – Significance – Benefits – Electronic Commerce Evolution – Advantages and disadvantages – Pre-requisites – Traditional commerce and electroniccommerce – Role of E-commerce.

*Extra Reading (Key Words):The Internet And World Wide Web.*

**UNIT II**

**15Hrs**

**DRIVING THE E-COMMERCE REVOLUTION** : E-commerce activities – Major modes – Models: B2B, B2C, B2G, C2G, C2C – Development of e-commerce activities – Elements – Stages – Solutions – Targeting Strategy – E-commerce and internet – Brick & Mortar to Click and Mortar – Electronic markets in India – Pull & Push Marketing – Web Personalization *Extra Reading (Key Words):Business Strategy And Implementation ofIT*

**UNIT III**

**15Hrs**

**E-COMMERCE SOFTWARE**: E-commerce requirements – Web Hosting – Basic Packages – Security threats – CERT – four C's – EDI – E-commerce implementation – Evaluation – Issues of e-commerce – Call centre: Types of e-payment systems – Steps for e-payment: Traditional payment models – Problems – Electronic Cash – Electronic Wallets – Small cards and Charge cards.

*Extra Reading (Key Words):Micropayments*

**UNITIV****15Hrs**

**STRATEGIES FOR MARKETING SALES & PROMOTION** : Identifying and reaching customers – Creating and maintaining brands on the web – Banner ads – Business models for selling on the web – CRM Definition – Components – Need – Goal – Architecting – E-commerce and the future.

*Extra Reading (Key Words): Micromark Technology And Tools*

UNITV 15Hrs

**PROSPECTS OF E-COMMERCE**: E-business – Internet bookshops – Grocery supplies – Software supplies & support – Electronic newspapers – Online share dealing – Online shopping – Virtual Auctions – E-diversity – E-security.

*Extra Reading (Key Words): Create Any Business Application Website*

CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Describe and criticize the e-commerce, advantage disadvantage of E-commerce and traditional Commerce v/s E-Commerce .	PSO 1	R, U
CO-2	Explain different type of models and activities of E-Commerce.	PSO 2	U
CO-3	Describe the different type techniques and software used in E-Commerce.	PSO 2	U
CO-4	Identify the strategies for marketing sales and promotion.	PSO 3	An
CO-5	Describe and show the different type of E-Commerce application and Supply Chain diagram.	PSO 4	U

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

**References****Text Books:**

1. Murthy C.S.V., “**E-Commerce Concepts, Models, Strategies**” Himalaya Publishing House, New Delhi, 2003.

**Reference Books:**

1. David Whiteley , “**E-commerce Strategy, Technologies And Applications**”, Tata McGraw Hill Publishing Company, New Delhi, 2001.
2. Gary P. Schneides, James. T Perry : “**Electronic Commerce**”, Course technology, Cambridge, 2001.
3. Kalakota Whinston, “**Frontiers of Electronic Commerce**”, Pearson Education, Singapore, 2005.
4. Vaitheeshwaran. K, “**Failing to Succeed : The Story of India’s First E-Commerce Company**”, Replika Press, 2017.
5. Joseph. P. T. (SJ), “**E-Commerce: An Indian Perspective**”, Fifth Edition, Prentice Hall India, 2015.

