

ARULMIGU PALANIANDAVAR ARTS COLLEGE FOR WOMEN**(AUTONOMOUS)****Re-accredited with B⁺⁺ by NAAC in 3rd cycle****(Run by Hindu Religious and Charitable Board under the Aegis of****Arulmigu Dhandayuthapani Swamy Thirukovil, Palani)****(Affiliated to Mother Teresa Women's University, Kodaikanal)****Chinnakalayamputhur(PO), Palani 624 615.****Curriculum Framework and Syllabus for Outcome Based Education in****Bachelor of Computer Applications****PROGRAMME CODE: UGBCAS****Degree Programme for the students admitted from the Academic year****2019-2020 Onwards****PG DEPARTMENT OF COMPUTER SCIENCE**

INSTITUTIONAL VISION AND MISSION

VISION

- Enlightenment and Empowerment of Rural Women

MISSION

- To imbibe research activity and collaborative programs with our local communities.
- High quality teaching, providing learning environment with practical exposure.
- Encouragement of a questioning spirit and self-reliance.
- Strong and support education for the student's employability.

DEPARTMENT VISION AND MISSION

VISION

- To provide the atmosphere for students so they can create employment opportunities for themselves as well as for others.
- To prepare the students for technical training with revolutionary vision who can compete globally.

MISSION

- To provide technical education to the students through well equipped- labs.
- Giving personal attention to weaker students consequently, allowing them to cope up with others scholars.
- To provide a student – friendly environment that is amicable for practical knowledge.
- To implement the professional and communication skills of the students, working deliberately.

B.C.A

REGULATIONS

1.Preamble:

Computer Science department was established in 1998 as self supporting department with the curriculum specifically designed to reflect the depth and breadth of computer science. To encourage young rural women students to adopt higher education, M.Sc Computer Science Programme is added in the department in 2005. To bridge the gap between the studies of computers and its applications, BCA programme is introduced in the year 2008. Expert members from Academia and Industry provide inputs in introducing specialized courses in the curriculum to suit industry needs. To further enhance the quality of the program, the department adheres Outcome Based Education (OBE) 2019-2020 onwards.

2. Eligibility for Admission

- Candidate should have passed the Higher Secondary Examination conducted by the board of syndicate as equivalent there to with Mathematics .

3. Duration of the course

- The students will undergo the prescribed course of study for a period of not less than three academic years (Six semesters).

4. Medium of Instruction:

- English

5. General Framework :

- Course Study : Part I,II,III,IV,V subjects.

6. Eligibility of the degree:

- Candidates will be eligible, if they complete the course with the required credits and pass in the prescribed examinations.
- The candidate requires 75% of attendance to attend the end semester examination.
- Two internal tests will be conducted and the average of two tests will be considered for the internal mark consolidation.
- To get Graduation , the students should gain minimum 140 credits.

7. Evaluation

Pattern of Evaluation

	Int.	Ext.	Total
Theory	25	75	100
Practical	40	60	100
Project	40	60	100

Internal Assessment Components

Theory(25 Marks)

Test - 15

Assignment - 5

Seminar - 5

25

8.Content Delivery Methods

1. Lecture method
2. Group Discussion
3. ICT

9.Passing Rules

- 75% of marks are allotted for external evaluation and 25% of the marks are allotted for internal evaluation in each of the theory subjects
- 60% of marks are allotted for external evaluation and 40% of the marks are allotted for internal evaluation in each of the practical subjects.
- For each courses there will be Continuous Internal Assessment (CIA) and Final Semester Examination.
- For each paper, passing minimum is 40% in both internal and external

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Chinnakalayamputhur(PO), Palani 624 615.

Curriculum Framework and Syllabus for Outcome Based Education in
Bachelor of Computer Applications (2019-20 and onwards)

BOARD OF STUDIES MEETING HELD ON 26.04.2019

UNIVERSITY NOMINEE

Dr.(Mrs).M.P.Indra Gandhi,

Assistant Professor (SG),

Department of Computer Science,

Mother Teresa Women's University,

Kodaikanal.

Contact No: 9442094960

M.P. Indragandhi
26/4/2019

SUBJECT EXPERTS

Dr.(Mr).K.Haridas,

Head & Associate Professor,

Department of Computer Applications,

NGM College,

Pollachi.

Contact No: 9863274250

Haridas
26/4/19

Dr.(Mr.) C.Thirumoorthi,

Associate Professor,

PG and Research Department of Computer Science,

Hindusthan College of Arts and Science (Autonomous),

Coimbatore – 28.

Contact No: 9942651892

C.Thirumoorthi
26/4/2019

HOD

S. Subbanayagi
DRAN

A. Pur
PRINCIPAL

10. Pattern of the Question Paper (External)**BLOOM'S TAXONOMY BASED ASSESSMENT PATTERN****K1**-Knowledge; **K2**- Comprehend; **K3**- Applications; **K4**-Analysis;**K5**- Synthesis; **K6**-Evaluation;**1.PART I,II,III****External Question Pattern : Theory – 75 Marks (3 Hours)**

Knowledge Level	Section	Marks	Course Outcomes	Description	Total
K1	A (Answer All) Two Questions from each unit	10*1=10	CO1&CO2	One word/ Short Answers	75
K2 & K3	B (Either or Choice) One Questions from each unit	5x 5 = 25	CO2 & CO3	Descriptive / Detailed	
K3&K4	C (Answer 5 out of 8)	5*8 = 40	CO3,CO4 &CO5	Descriptive / Detailed	

Internal Question Pattern (30 Marks – 2 Hours Test)

Knowledge Level	Section	Marks
K1	A (Answer All)	6*1=6
K2,K3	B (Answer 2 out of 4)	2x 4 = 8
K4,K5	C (Answer 2 out of 4)	2*8 = 16

PART IV (SBC & NME) – External (75 Marks – 3 Hours)

Knowledge Level	Section	Marks	Description	Total
K1,K2	A(Answer 5 out of 8)	5*3=15	Short Answers	75
K2	B(Answer 5 out of 8)	5*6=30	Descriptive	
K4	C(Answer 3 out of 5)	3*10=30	Detailed	

**SEMESTER-WISE DISTRIBUTION OF COURSES WITH
SCHEME OF VALUATION
UNDER CBCS PATTERN
OUTCOME BASED EDUCATION (OBE)**

Part	Sub. Code	Title of Paper	Hours	Marks			Credits	Exam (H)
				INT	EXT	TOT		
Semester – I								
PART I	MUGT1	Tamil	6	25	75	100	3	3
PART II	MUGE1	English	6	25	75	100	3	3
PART III	MUBCC1	Core I– Digital Electronics	5	25	75	100	5	3
	MUBCL1	Core II Practical:I – Multimedia and Animation	5	40	60	100	3	3
	MUBCA1	Allied I- Principles of Management	5	25	75	100	5	3
PART IV	MUBCHL1	Skill Based Course-I Lab	2	40	60	100	2	3
	MUVE	Value Education – Yoga	1	25	75	100	2	3
		Total	30			700	23	
Semester – II								
PART I	MUGT2	Tamil	6	25	75	100	3	3
PART II	MUGE2	English	6	25	75	100	3	3
PART III	MUBCC2	Core III : Programming in ‘C’	6	25	75	100	5	3
	MUBCL2	Core IV: Practical II– Programming in ‘C’	5	40	60	100	3	3
	MUBCA2	Allied II: Mathematics-I	5	25	75	100	5	3
PART IV	MUBCEC2	Skill Based Course –II	2	25	75	100	2	3
		Total	30			600	21	
Semester – III								
PART III	MUBCC3	Core V – Object Oriented Programming with C++	5	25	75	100	4	3
	MUBCC4	Core VI – Data Structures	6	25	75	100	4	3
	MUBCL3	Core VII – Practical III Object Oriented Programming with C++	5	40	60	100	4	3
	MUBCL4	Core VIII – Practical IV: Office Automation and Tally	5	40	60	100	3	3
	MUBCA3	Allied III- Business Accounting	5	25	75	100	5	3
PART IV	MUBCHR3	Skill Based Course – III	2	25	75	100	2	3
	MUBCN1	Non Major Elective – I	2	25	75	100	2	3
		Total	30			700	24	

Semester – IV								
PART III	MUBCC5	Core IX – Java Programming	6	25	75	100	5	3
	MUBCC6	Core X – Operating System	6	25	75	100	5	3
	MUBCL5	Core XI– Practical V: Web Technology	5	40	60	100	3	3
	MUBCL6	Core XII – Practical VI: Java Programming	5	40	60	100	3	3
	MUBCA4	Allied IV: Mathematics II	6	25	75	100	5	3
PART IV	MUBCNA4	Skill Based Course – IV	2	25	75	100	2	3
PART V	MUEXA4	Extension Activities	-	-	-	100	1	
		Total	30			700	24	
<i>*Internship Training(15 Days)</i>								
Semester – V								
PART III	MUBCC7	Core XIII – Relational Database Management System	5	25	75	100	5	3
	MUBCL7	Core XIV Practical VII– Dot Net Programming	6	40	60	100	3	3
	MUBCL8	Core XV– Practical VIII: Relational Database Management System	5	40	60	100	3	3
	MUBCE1	Elective - I	6	25	75	100	5	3
	MUBCE2	Elective - II	6	25	75	100	5	3
	MUBCIT	Internship Training	-	-	100	100	1	3
PART IV	MUBCOS5	Skill Based Course – V	2	25	75	100	2	3
		Total	30			700	24	
Semester – VI								
PART III	MUBCC8	Core XVI –Data Communication and Networks	6	25	75	100	5	3
	MUBCC9	Core XVII – Computer Graphics	5	25	75	100	4	3
	MUBCPR	Core XVIII – Project Work	7	40	60	100	4	3
	MUBCE3	Elective – III	6	25	75	100	5	3
PART IV	MUBCSS6	Skill Based Course – VI (Oral Practical)	2	25	75	100	2	3
	MUES6	Environmental Studies	2	25	75	100	2	3
	MUBCN2	Non Major Elective –II	2	25	75	100	2	3
		Total	30			700	24	

Extra Credit Papers:

S.No.	Name of the Papers	Sub.Code	Semester	Marks	Credits
1.	Green computing	UGEGC	I	100	2
2.	IPR,Plagiarism,Copyrights and Patents	UGEICP	III	100	2
3.	MOOC Online Courses	UGEMOC	V	100	2

LIST OF NME PAPERS

1. **Semester III** – Internet and its Applications.
2. **Semester VI** – Web Designing

LIST OF SKILL BASED COURSES

1. **Semester I** : HTML Programming
2. **Semester II** : E-Commerce
3. **Semester III** : Human Rights
4. **Semester IV** : Numerical Aptitude
5. **Semester V** : Open Source Technology
6. **Semester VI** : Soft Skills (Oral Practical)

LIST OF ELECTIVE PAPERS

SEMESTER V:

Elective I :

1. Software Engineering (or)
2. Cloud Computing(or)
3. PC Maintenance and Trouble Shooting

Elective II :

1. Organizational Behaviour (or)
2. Information Security (or)
3. Big Data Analytics

SEMESTER VI

Elective III :

1. Data Mining and Warehousing (or)
2. Digital Image Processing (or)
3. Software Testing.

LIST OF ALLIED PAPERS

Semester I	Allied 1	- Principles of Management
Semester II	Allied 2	- Mathematics I – Discrete Mathematics
Semester III	Allied 3	- Business Accounting
Semester IV	Allied 4	- Mathematics II - Resource Management Techniques

CORE PAPERS

❖ Theory Papers

1. **CORE I** – Digital Electronics
2. **Core III** : Programming in ‘C’
3. **Core V** – Object oriented programming with C++
4. **Core VI** – Data Structures
5. **Core IX** –Java Programming
6. **Core X** – Operating System
7. **Core XIII** – Relational Database Management system
8. **Core XVI** – Data communication and Networks
9. **Core XVII** – Computer Graphics

❖ Practical papers

1. **Core II** : **Practical -I**-Multimedia and Animation
2. **Core IV** : **Practical -II**– Programming in ‘C’
3. **Core VII** : **Practical –III**: Object Oriented Programming With C++
4. **Core VIII** : **Practical - IV** :Office Automation and Tally
5. **Core XI** : **Practical V** : Web Technology
6. **Core XII** : **Practical –VI**: .Java Programming
7. **Core XIV** : **Practical –VII**: Dot Net Programming
8. **Core XV** : **Practical VIII**: Relational Database Management system

❖ Project

1. **Core XVIII** : **Project Work**

❖ Internship Training

Summary of Courses and Credit Distribution in Choice Based Credit System

PART I	Curriculum Structure	No. Of Courses	Credits
I	Languages	02	06
II	English	02	06
III	Core Papers	18 (9 Theory + 8 Lab + 1 Project)	71
	Allied Courses	04	20
	Core Elective	03	15
	Internship Training	01	01
IV	Non-Major Elective	02	04
	Value Based Course	02	04
	Skill Based Course	06	12
V	Extension Activities	01	01
Total		41	140

TOTAL MARKS : 4100

INTERNSHIP TRAINING

Students will undergo internship training in the fourth semester holidays from first week of May to second week of June for a period of 4 weeks in a related organization approved by the staff coordinator / HOD. It will be evaluated during V semester for 100 marks.

OUTCOME BASED EDUCATION

“Outcome-Based Education” (OBE) is considered as a student-centered instruction model that focuses on measuring student performance through outcomes. Outcomes include knowledge, skills and attitudes. In the OBE model, the required knowledge and skill sets for a particular degree is predetermined and the students are evaluated for all the required parameters (Outcomes) during the course of the program.

Part – I : Languages: Part – 1 comprises of category namely Tamil

Part – II : English: Part – 2 comprises of the category namely English

Part – III : Core Courses: A set of *major papers* that include Theory, Practical, Allied, Core Electives, Project and Internship in the major field of study selected by the student. Core courses are mandatory in nature.

Part – IV : Non - Major Electives (NME): A set of non – major elective courses are offered as choices of the students, outside of their major discipline. The courses other than the core and allied shall be opted by the students as Non – Major Elective.

Value Based Courses (VBC): Courses of cross-cutting issues relevant to the current pressing concerns both nationally and internationally such as environment and human values .

Skill Based Courses (SBC): The courses offered as skill - based courses under Part IV of the programme is aimed at imparting Advanced Skill of the programme. This comprises of six courses from 1st to 6th semesters.

Part – V: Extension Activities: Students shall be actively participated in the extension activities .

PROGRAM EDUCATIONAL OBJECTIVES

After few years from the completion of BCA programme, the students will be able to

PEO1 : To equip the students to meet the requirement of Corporate world and Industry standard.

PEO2 : To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications

PEO3 : Involve in lifelong learning to adapt the technological advancements in the emerging areas of computer applications.

PROGRAMME OUTCOMES

Upon successful completion of the programme, the student will able to

PO1 : Understand the Concepts of key areas of Computer Science.

PO2 : Analyze and apply latest technologies to solve problems in the areas of Computer Applications.

PO3 : Develop various real-time applications using latest technologies and programming languages.

PO4 : Possess Strong foundation for their higher studies.

PO5 : Become employable in various IT companies and Government jobs.

PO6 : Develop practical skills to provide solutions to industry, society and business.

PROGRAMME SPECIFIC OUTCOMES

Graduate with a BCA will have the ability to

PSO1 : Able to work as software programmer, system and network administrator, web designer faculty for computer science and computer applications .

PSO2 : Able to design and develop computer applications for Business problems

PSO3 : Able to create platforms to become an entrepreneur and a relish for higher studies such as M.C.A.,M.Sc.,etc.,

MAPPING INSTITUTION MISSION WITH PROGRAMME EDUCATIONAL OBJECTIVES

	IO1	IO2	IO3	IO4
PEO1		*		*
PEO2	*	*		*
PEO3			*	

CORE I**MUBCC1 - DIGITAL ELECTRONICS****Hours: 5****Credits : 5****Semester: I****Preamble**

This course facilitate the students to acquire knowledge on Digital Computers and also it enables the students to understand the working principles of computer.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course outcomes	Cognitive Level
CO1.	Gain the knowledge of input and output devices, Number System, Simplification Techniques, Combinational and Sequential Circuits.	Knowledge (Level K1) Comprehension (Level K2)
CO2.	Understand the fundamental concepts and techniques used in digital electronics	Knowledge (Level K1) Comprehension (Level K2)
CO3.	Apply the concepts of Boolean Algebra, Logic gates, Logic Variables and Truth tables to simplify equations.	Applications (Level K3)
CO4.	Analyze combinational logic in terms of Adder, Subtractor and Multiplexer circuits.	Applications (Level K3) Analysis (Level K4)
CO5.	Comprehend the combinational logic in terms of Adder, Subtractor and Multiplexer circuits	Comprehension (Level K3)

COURSE CONTENT**Unit - I:**

Number Systems: Introduction – conversion – Floating point representation of Numbers – Binary Arithmetic Operations - 1's & 2's Complement – 9's & 10's complement – Binary Coded Decimal.

Codes: Weighted Binary Codes – Non-weighted Codes – Error detecting codes – Error Correcting codes – Alpha numeric codes.

Unit - II:

Boolean algebra and Minimization Techniques: Introduction – Boolean Logic Operations – Basic Laws of Boolean Algebra – Demorgan's Theorems– Sum of Products and Product of Sums – Karnaugh Map.

Unit - III:

Logic Gates: Introduction – Positive and Negative Logic Designation – Logic Gates.

Arithmetic: Half Adder – Full Adder –Half Subtractor- Full Subtractor.

Unit - IV:

Combinational Circuits: Multiplexer: Basic Four – Input Multiplexer – 8 to 1 Multiplexer – 16 to 1 Multiplexer.

De-Multiplexer: 1 to 4 De-Multiplexer – 1 to 8 De-Multiplexer – 1 to 16 De- Multiplexer.

Unit - V:

Flip – Flops: Introduction - S-R Flip-Flops - D Flip- Flops - J-K Flip-Flops - T Flip- Flops.

TEXT BOOK

- Digital Circuits and Design, by S.Salivahanan and S.Arivazhagan , Third Edition, Vikas Publishing House Pvt. Ltd. New Delhi, 2007

REFERENCE BOOK

- Digital Electronics Principles, Devices, Applications by Anil K.Maini,, Wiley Publications, 2007

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	M	M	H
CO2	M	M	M	M	M
CO3	H	M	M	M	M
CO4	H	M	M	M	M
CO5	H	H	M	H	H

***H-High;**

M-Medium;

L-Low;

CORE II
MUBCL1 - PRACTICAL I - MULTIMEDIA AND ANIMATION

Hours: 5**Credits 3**
Semester: I**Preamble**

This course helps the students to learn Corel draw, Photoshop and Macromedia Flash and create a simple animation effectively.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Comprehend the knowledge on designing the image in corel draw.	Comprehension (Level K2)
CO2.	Describe and designing the image in Corel draw.	Synthesis (Level K5)
CO3.	Evaluate the appropriate tools used for designing the image in Photoshop.	Synthesis (Level K5)
CO4.	Design animated movies using Macromedia flash.	Analysis (Level K4)
CO5.	Apply various tools available in Macromedia flash and create simple animation.	Applications (Level K3)

PROGRAM LIST**Corel Draw**

1. Design letter head with logo
2. Wedding card design
3. Design a brochure
4. Design a book cover
5. Design a newspaper advertising.

PHOTOSHOP

1. Scenery Creation.
2. Banner Design.
3. Greeting Card Design.
4. Identification Card Design.
5. Visiting Card Design.

MACROMEDIA FLASH

1. Motion Tweening.
2. Shape Tweening.
3. Animation Using Mask Layer.
4. Animation Using Guide Layer.
5. Transforming Object Using Buttons.
6. Screen Creation.
7. Greeting Design & Star Blinking.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	M
CO2	M	M	M	M	H
CO3	M	M	M	M	M
CO4	M	M	M	M	H
CO5	M	H	H	H	H

H-High;*M-Medium;****L-Low;**

ALLIED PAPER I
MUBCA1 - PRINCIPLES OF MANAGEMENT

Hours : 5

Credits : 5
Semester : I**Preamble**

This course imparts the fundamental knowledge and exposure the concepts, theories and practices in the field of management.

Course Outcome

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Understand the concept of levels of management, objectives of management, process of planning, types of Organization and leadership quality.	Knowledge (Level K1)
CO2.	Describe the concept of levels of management, objectives of management, process of planning, types of Organization and leadership quality.	Comprehension (Level K2)
CO3.	Summarize the characteristics and situational theories of leadership.	Knowledge (Level K1) Comprehension (Level K2)
CO4.	Discuss the important factor for types of organization and responsibility of authorities.	Comprehension (Level K2) Applications (Level K3)
CO5.	Acquire the knowledge on efficient communication in management	Analysis (Level K4)

COURSE CONTENT**Unit - I:**

Management: Meaning & Definition – Principles of Management – Management Vs Administration – Functions of Management – Levels of Management – Contribution of F.W Taylor and Henry Fayol

Unit - II:

Planning: Meaning and Definition – Objectives – Importance – Advantages – Limitations – Kinds – Process of Planning – Methods of Planning

Management by Objectives (M.B.O): Definition of M.B.O – Principles of M.B.O – Benefits of M.B.O – Weaknesses of M.B.O.

Unit - III:

Organization: Meaning and Definition – Features – Principles – Process – Merits of Organization – Consequence of Poor Organization – Types of Organization.

Delegation of Authority: Authority and Responsibility– Accountability –Process of Delegation – Principles of Delegation – Obstacles to Delegation –Centralization and Decentralization of Authority

Unit - IV:

Motivation: Meaning and Definition – Characteristics – Theories of Motivation – Maslow's Need Hierarchy Theory.

Leadership: Meaning and Definition – Characteristics– Functions of Leader – Leadership Styles –Theories of Leadership.

Unit - V:

Communication: Meaning and Definition – Nature – Principles – Benefits – Elements – Importance of communication in management – channels or types – barriers to communication – guidelines for ensuring effective communication.

Control:Definition – characteristics of control – benefits of control – steps in controlling – effective control.

TEXT BOOK

- S.Kathiresan and Dr.V.Radha , Principles of Management

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	L	M	M
CO2	M	M	M	M	H
CO3	M	M	L	M	M
CO4	M	M	M	M	H
CO5	H	M	H	M	H

***H-High;**

M-Medium;

L-Low;

SKILL BASED COURSE -I
MUBCHL1 - HTML PROGRAMMING

Hours: 2

Credits 2
Semester: I

Preamble

This course obtains the students to acquire the knowledge on design webpage and websites using HTML tags.

Course Outcome

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
C01.	Classify various HTML tags.	Comprehension (Level K2) Applications (Level K3)
C02.	Illustrate HTML tags in simple programs.	Analysis (Level K4)
C03.	Apply HTML tags in simple programs.	Applications (Level K3) Analysis (Level K4)
C04.	Design static webpage using Basic HTML tag.	Synthesis (Level K5)
C05.	Create website by applying all the available HTML tags.	Evaluation (Level K6)

Program List

1. Design a webpage using basic HTML tags
2. Create a webpage using formatting tags
3. Develop a webpage using list tags
4. Create a webpage using physical and logical tags
5. Prepare class timetable using table tags.
6. Link the webpages internally and externally using anchor tag.
7. Split the webpage using frame tag
8. Design a webpage by applying various attributes of form tag.
9. Create a website for your college
10. Design a webpage for your Department

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	H	M	H
CO2	M	M	H	M	M
CO3	M	H	H	H	H
CO4	H	H	H	H	H
CO5	M	H	M	H	M

***H-High;**

M-Medium;

L-Low;

CORE III**MUBCC2 - PROGRAMMING IN 'C'****Hours: 6****Credits 5****Semester: II****Preamble**

This course helps the students to learn C Programming language and develop programming skills in writing simple programs.

Course Outcomes

On successful completion of the course, the students are able to

CO	Course Outcomes	Cognitive Level
CO1.	Recall and understand the fundamentals of C programming to acquire the programming logic, use of program instruction, Syntax and programming structure.	Knowledge (Level K1) Comprehension (Level K2)
CO2.	Describe the concepts of decision making branching and looping.	Knowledge (Level K1)
CO3.	Understand the concepts of decision making branching and looping.	Knowledge (Level K1) Comprehension (Level K2)
CO4.	Implement different operations on arrays and functions to solve the problem.	Applications (Level K3)
CO5.	Execute file operations to preserve data in physical disk.	Applications (Level K3)

COURSE CONTENT**Unit - I:**

History of C – Basic Structure of C Programs – Character Set –C Tokens – Keywords and Identifiers – Constants and Variables – Data Types – Storage Class - Operators and Expressions.

Unit - II:

Managing Input and Output Operations - Decision Making and Branching: IF statement –Simple IF Statement-The IF....ELSE Statements - Nesting of IF.....ELSE Statements – The Switch Statement – The? : Operator - The GOTO Statement – **Decision Making and Looping** – The WHILE Statement – The DO Statement – The FOR Statement-Jumps in LOOPS.

Unit - III:

Arrays: One-dimensional Arrays – Two-dimensional Arrays – Multi-dimensional Arrays – Character Arrays and Strings.

User - defined Function– Elements of user defined functions – definition of functions – function calls – Functions declaration – category of functions - Nesting of functions – Passing arrays to functions – Scope, visibility and life time of variables.

Unit - IV:

Structures: Defining a Structure – Declaring structure variables – Accessing structure members – structure initialization – copying and comparing structure variables- Arrays of structure – Arrays within structure – Structure within structure.

Union: introduction- size of structure – Bit fields.

Pointers: Accessing the address of a variable – declaration – initialization – accessing a variable through its pointer – pointer expression – pointers & characters string – Array of pointers – Pointers as functions arguments – Pointers and Structures.

Unit - V:

File Management : Introduction – Defining and Opening a File – Closing a File – Input / Output Operations on Files - Error Handling During I/O Operation – Random Access to Files – Command Line Arguments.

TEXT BOOK

- Programming in ANSI 'C', E.Balagurusamy Eighth Edition, Tata McGraw – Hill Publishing Company, 2009.

REFERENCE BOOK

- “Let us C” Yashwanth Kanetkar - BPB Publication

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	H	H
CO2	H	H	H	H	H
CO3	H	H	H	H	H
CO4	H	H	H	H	H
CO5	H	H	M	H	M

***H-High;**

M-Medium;

L-Low;

CORE IV**MUBCL2 - PRACTICAL II - PROGRAMMING IN 'C'****Hours: 5****Credits : 3****Semester : II****Preamble**

This course provide exposure to problem-solving through programming and train the students to the basic concepts of the C-Programming Languages

Course Outcomes

On successful completion of the course, the students are able to

CO	Course Outcomes	Cognitive Level
CO1.	Read and understand the execution of programs written in C language.	Knowledge (Level K1)
CO2.	Trace the execution of programs written in C language.	Comprehension (Level K2)
CO3.	Implement various concepts in C.	Application(Level K3)
CO4.	Implement programs with pointers and arrays, perform pointer arithmetic and use the pre-processor.	Application(Level K3)
CO5.	Write the C code for a given algorithm.	Analysis(Level K4) Synthesis (Level K5)

Program List:

1. To find the Sum of individual Digits.
2. To reverse a given Digit.
3. Prime Number Series.
4. Armstrong Number Series.
5. Matrix Manipulation and Transpose of a Matrix.
6. Palindrome using String.
7. String Concatenation, Comparison and Length.
8. Count number of words, character and lines in a sentence.
9. Standard deviation ,Mean
10. Fibonacci using Recursion.
11. Swapping of numbers using Pointers.
12. To prepare student Mark List using Structures.

13. To prepare Electricity Bill using Files.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	H	H
CO2	H	H	H	H	H
CO3	H	H	H	H	H
CO4	H	M	H	M	H
CO5	H	H	M	H	H

***H-High;**

M-Medium;

L-Low;

ALLIED II

MUBCA2 - MATHEMATICS I - DISCRETE MATHEMATICS

Hours: 5

Credits: 5
Semester: II

Preamble

This course helps the students to obtain the knowledge on Matrices, Polynomial equations, set theory, Relations and Graph Theory

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Recall the basic concepts of Mathematics.	Knowledge (Level K1)
CO2.	Impart different kinds of Matrices, Equations, Sets, Relations and Graphs.	Knowledge (Level K1)
CO3.	Comprehend different kinds of Matrices, Equations, Sets, Relations and Graphs.	Comprehension (Level K2)
CO4.	Solve the equations to find the roots.	Comprehension (Level K2) Applications (Level K3)
CO5.	Analyze the real world problems using Graph Theory.	Analysis (Level K4)

COURSE CONTENT

Unit - I:

Matrices: Definition- Types of Matrices- Addition of Matrices-Subtraction of Matrices – Product of Matrices-Transpose of a matrix - Inverse of a matrix –Reciprocal Matrix – Rank of a Matrix.

Unit - II:

Theory of Equations: Nature of roots –Relation between the coefficients and the roots of an algebraic equation-Transformation of equations-Horner's Method-Newton's Method.

Unit - III:

Set Theory: Introduction-Basic concepts and Notations-Ordered pairs and Cartesian product-set operations

Unit - IV:

Relations: Introductions –Definition-Types of Relations-Some operations on relations – Composition of Relations –Properties of Relations-Equivalence classes-Partition of a set –Matrix representation of a relation.

Unit - V:

Graph Theory: Introduction- Definitions-Degree of a Vertex-Some special simple graphs-Matrix representation of graphs - Paths, Cycles and connectivity.

TEXT BOOKS

- Ancillary Mathematics – Volume I by S.Narayanan ,R.Hanumantha Rao and T.K .Manickavasagam Pillay Reprint 2015.(UNIT I,II)
- Discrete Mathematics by T.Veerarajan Reprint 2015 (**Rest of Units**).

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	M	M	H	H
CO2	M	M	M	M	M
CO3	M	M	M	H	M
CO4	H	M	H	H	H
CO5	M	H	M	H	H

*H-High;

M-Medium;

L-Low;

SKILL BASED COURSE- II**MUBCEC2 - E-COMMERCE****Hours: 2****Credits: 2
Semester: II****Preamble**

This course helps the students to get the knowledge on electronic data interchange in E-commerce and protect the networks through Information Technology Act.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Recollect the concepts of e-commerce and its types, EDI and e-security protection.	Knowledge (Level K1) Comprehension (Level K2)
CO2.	Comprehend the role of EDI in current scenario.	Comprehension (Level K2)
CO3.	Deploy the types of firewalls for security in network.	Applications (Level K3)
CO4.	Applications in different e-commerce technologies.	Analysis (Level K4)
CO5.	Categorize the e-commerce and apply in different e-commerce technologies.	Analysis (Level K4)

COURSE CONTENT**Unit - I:**

An overview of E-Commerce- Definition of E-Commerce-Objects if E-Commerce-Factors promoting E-commerce-Advantages and Disadvantages of E-Commerce.

Unit - II:

Classification of E-Commerce-Business-to-Business E-Commerce:B2B, B2C,C2C,C2B,B2B-Impact of E-Commerce.

Unit - III:

Framework and Application of E-Commerce-Anatomy of E-Commerce-Supply Chain Management - Applications of E-Commerce Technologies.

Unit - IV:

Electronic Data Interchange(EDI)-Process of EDI-EDI components-Benefits of EDI-Value Added Networks-Internet based EDI.

Unit - V:

E-Security protection-Protecting the network –Firewalls-Types of Firewall-Cyber law-Cyber crime- The Information Technology Act 2000

TEXT BOOK

- E-Commerce Abirami Devi and Alagammai , Margham Publications, Chennai.

REFERENCE BOOKS

- E-Commerce Vijayalakshmi Sundaram, S.Madhubala and Company, Chennai.
- E-Commerce C.S.Rayadu Himalaya Publishing House, New Delhi.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	H	M	M
CO2	M	M	M	M	M
CO3	H	H	M	M	M
CO4	M	H	M	M	M
CO5	M	H	M	H	M

***H-High;**

M-Medium;

L-Low;

CORE V**MUBCC3 - OBJECT ORIENTED PROGRAMMING WITH C++****Hours: 5****Credits : 4****Semester: III****Preamble**

This course discuss OOPS concepts, it deals with I/O facilities, control structures and help the students to develop programming skills in writing simple programs.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Get an idea about object oriented paradigm with concepts of streams, classes, functions, data and objects and also recollect the concepts of files.	Knowledge (Level K1)
CO2.	Classify difference between object oriented programming and procedural oriented language and data types in C++.	Knowledge (Level K1) Comprehension (Level K2)
CO3.	Apply dynamic memory management techniques using pointers, constructors, destructors, etc.	Knowledge (Level K1) Applications (Level K3)
CO4.	Acquire the concept of polymorphism and apply inheritance with the understanding of early and late binding.	Applications (Level K3) Analysis (Level K4)
CO5.	Validate the use of various OOPs concepts with the help of programs.	Analysis (Level K4) Synthesis (Level K5)

COURSE CONTENT**Unit - I:**

Principles of OOP: OOP Paradigm – Basic Concepts of OOP – Benefits of OOP – Object Oriented Languages – Applications of OOP.

Token, Expressions and Control Structures: Introduction – Tokens - Keywords, - Identifiers and Constants – Data Types – Variables – Operators – Manipulators - Expressions - Control Structures in C++.

Unit - II:

Functions in C++: Introduction - Main Function – Function Prototyping – Call by Reference –Return by Reference - Inline Functions - Function Overloading – Friend and Virtual Functions.

Unit - III:

Classes and Objects - Constructors and Destructors - Operator Overloading and Type Conversions.

Unit - IV:

Inheritance: Introduction - Single Inheritance – Multilevel Inheritance –Multiple Inheritance- Hierarchical Inheritance – Hybrid Inheritance – Virtual Base Classes – Abstract Classes.

Pointers, Virtual Functions and Polymorphism - Managing Console I/O Operations

Unit - V:

Working with Files – Classes for File Stream Operations – Opening and Closing a File – Detecting end-of-file – File Pointers – Updating a File – Error handling During File Operations – Command Line Arguments.

TEXT BOOK

- Object Oriented Programming with C++, E.Balagurusamy Seventh Edition, Tata McGraw – Hill, New Delhi 2009.

REFERENCE BOOK

- “C++: The Complete Reference”, Herbert schildt Fourth Edition, McGraw – Hill Publications 2003.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	H	H
CO2	M	M	H	M	M
CO3	H	M	H	H	H
CO4	H	H	H	H	H
CO5	H	M	H	H	M

***H-High;**

M-Medium;

L-Low;

CORE VI
MUBCC4 - DATA STRUCTURES

Hours: 6**Credits: 4****Semester: III****Preamble**

This course gives knowledge on data, files, Arrays, Records and Pointers. It helps to understand Stack, Queue, Linked list and Trees

Course Outcomes

On successful completion of the course, the students are able to

CO	Course Outcomes	Cognitive Level
CO1.	Recognize fundamental concepts of Data structures, space complexity and time complexity.	Knowledge(Level K1)
CO2.	Understand linear data structures such as stacks, queues, linked list and non linear data structures such as trees and Graphs.	Knowledge(Level K1) Comprehension (Level K2)
CO3.	Apply appropriate data structure for a given application.	Applications(Level K3)
CO4.	Implement different searching and sorting techniques.	Applications(Level K3)
CO5.	Analyze efficient algorithms by acquiring knowledge about time and space complexities of the algorithms.	Analysis(Level K4)

COURSE CONTENT

Unit - I:

Introduction and Overview: Introduction – Basic Terminology; Elementary Data organization – Data Structures-Data Structure Operations. Algorithms: Complexity - Time-space Tradeoff.

Unit - II:

Arrays, Records and Pointers: Introduction – Linear Arrays – Representation of Linear Arrays in Memory – Traversing Linear Arrays – Inserting and deleting .Sorting :Bubble Sort – Searching : Linear Search – Binary Search.

Unit - III:

Linked Lists: Introduction - Linked Lists –Representation of Linked List in Memory – Traversing a Linked Lists – searching a Linked List. Memory allocation: Garbage Collection – Insertion into a Linked List –Deletion from a Linked List – Header Linked List –Two way Lists.

Unit - IV:

Stacks, Queues: Stacks – Array Representation of Stacks – Linked Representation of Stacks - Arithmetic expressions: Polish Notation – Queues – Linked Representation of Queues.

Unit - V:

Trees: Introduction – Binary Trees – Representing Binary Trees in Memory – Traversing Binary Trees – Traversal Algorithms using Stacks – Header Nodes: Threads – Binary Search Trees – Searching and Inserting in Binary Search Trees – Deleting in a Binary Search Tree.

TEXT BOOK

- Data Structures Revised First Edition by Seymour Lipschutz – McGraw Hill Education Private Limited,2006.

REFERENCE BOOK

- Fundamentals of Data Structures by Ellis Horowitz, Sartaj Sahini – Galgotia Publications, 1998.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	M	H	M	M	H
CO2	H	M	M	M	M
CO3	H	M	M	H	H
CO4	M	H	H	M	M
CO5	M	M	H	M	H

*H-High;

M-Medium;

L-Low;

CORE VII**MUBCL3 - PRACTICAL III - OBJECT ORIENTED PROGRAMMING WITH C++****Hours: 5****Credits : 4****Semester: III****Preamble**

This course provide understanding of classes, objects, constructors, destructors, and control structures.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Understand Object oriented features and C++ concepts.	Comprehension (Level K2)
CO2.	Apply Object oriented features and C++ concepts.	Application (Level K3)
CO3.	Practice to solve the real world problems.	Application (Level K3)
CO4.	Apply to solve the real world problems.	Application (Level K3)
CO5.	Experiment various data structure concepts using C++.	Analysis (Level K4)

Program List

1. Print the Student Name, Register Number, Marks, Total and Average using Array Of Objects.
2. Sum of the given numbers using Function Overloading
 1. Two Integer Values
 2. Three Integer Values
 3. Two double Values
3. Banking Operations using Constructors.
4. Sum of the two values using '+' operator overloading using
 1. Two integer values b. Two floating values
5. Find the Arithmetic operations using Inline function.
6. Write a C++ program to apply single inheritance and assume the fields by your own.

7. Write a C++ program to apply multiple inheritances and assume the fields by your own.
8. Write a C++ program to apply the 'this' pointer to greatest age among them.
9. Write a C++ program to apply run time polymorphism to display the book details.
10. Create a sequential file with fields with student name, register number C++ Mark, Maths mark, Science mark and write another program to access the file and calculate total mark, average and result.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	H	H
CO2	H	M	H	H	M
CO3	H	H	H	H	H
CO4	H	M	H	M	H
CO5	H	M	H	M	H

***H-High;**

M-Medium;

L-Low;

CORE VIII PRACTICAL IV
MUBCL4 - OFFICE AUTOMATION AND TALLY

Hours: 5**Credits: 3**
Semester: III**Preamble**

This course trains the students to acquire knowledge on Ms-Office and helps to create, alter and account entries in tally

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Practice MS-Office package and do the documentation, calculation, presentation and manipulating the tables.	Applications(Level K3)
CO2.	Describe MS-Office package and do the documentation, calculation, presentation and manipulating the tables.	Applications(Level K3)
CO3.	Get idea about creation and alteration of company profile and Balance sheet.	Comprehension (Level K2)
CO4.	Apply various accounting voucher entries.	Applications(Level K3)
CO5.	Acquire the knowledge in bank reconciliation statement preparation and stock summary	Analysis(Level K4)

COURSE CONTENT

Office Automation
Program List**1 Format the document using**

- i. Bulleted & Numbered List
- ii. Adding Headers and Footers
- iii. Find and Replace the word.

2 Create a Business Letter using Mail Merge concept.**3 Create a document News Paper format in MS- word.****4 Create a worksheet to**

- i. Find, delete and add records,
- ii. Formatting columns, row height, merging, splitting columns.
- iii. Sort the contents in ascending and descending order

- 5 **Create the worksheet in MS-EXCEL to store the following information:
Reg. no, Name, Mark1 , Mark2, Mark3 , Total, Average**
 - a) Using formula and function find the total, average, maximum, minimum and total marks
 - b) Create the bar chart for average mark with proper title for axes, legend and gridlines.
- 6 **Create, display and interact with data using Pivot Tables and Pivot Charts of excel feature.**
- 7 **Create 3 slides for a Seminar Lecture on introduction to computer and do the following**
 - (a) Numbering the Slides
 - (b) Moving the Frames and Inserting Clipart
 - (c) Inserting New Slide
 - (d) Deleting Slide
 - (e) Copying a Slide.
- 8 **Create 5 Slide presentation of your own and do the following**
 - (a) Inserting Pictures
 - (b) Copying picture form previous slide
 - (c) Copying text from previous slide

TALLY**UNIT - I:**

Creation of Company-Alteration of company-Creation of ledger account-Group of accounting

UNIT - II:

Voucher entries – Purchase – Sales – Expenses – cash – journal.

UNIT - III:

Preparation of Balance Sheet-Profit and Loss Account - Trading account-Various accounting statements – Alteration - Adjustment

UNIT - IV:

Stock maintenance - Stock entries-Stock registers - Purchase registers-Sales registers-Godown registers-Reorder level registers

Program List

1. Company Creation & Accounts master creation
2. Voucher Entry (2 Programs)
3. Day Book preparation
4. Preparation of Trial Balance
5. Preparation of Final Accounts (Profit & Loss A/c & Balance Sheet)
6. Stock Group & Stock item creation
7. Making voucher entries with Inventory details (3 programs)

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	H
CO2	H	M	M	H	H
CO3	M	H	H	H	H
CO4	M	H	H	H	H
CO5	H	M	M	H	H

H-High;*M-Medium;****L-Low;**

ALLIED III

MUBCA3 - BUSINESS ACCOUNTING

Hours : 5

Credits : 5

Semester: III

Preamble

This course provide the knowledge on basic Accounting Frame work and to understand the concepts and conventions of Accounting.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Understand the accounting concept, conversion, methods and its rules.	Knowledge(Level K1)
CO2.	Acquire knowledge for preparation of journal and Ledger.	Analysis(Level K4)
CO3.	Summarize the ledger balance and check the arithmetical accuracy of books of accounts.	Applications(Level K3)
CO4.	Applications of ledger balance and check the arithmetical accuracy of books of accounts.	Applications(Level K3)
CO5.	Prepare Financial statement of sole trading concern with accounting principles.	Synthesis(Level K5)

COURSE CONTENT

Unit - I:

Accounting –Definition and functions-Accounting Conventions Concepts- System of Accounting – Rules of double – Entry System of Book Keeping- Preparation of Journal and Ledger Accounting

Unit - II:

Subsidiary books - Purchase book - sales book - Purchase return book - Sales return book – Bills payable, Bills receivable.

Unit - III:

Cash book – Single, Double, Triple column cash book.

Unit - IV:

Preparation of trial balance - Final accounting – trading, profit & Loss accounting of balance sheet with simple adjustments.

Unit - V:

Budget preparation of Cash Budget - Flexible budget.

TEXT BOOK

- K.L.Nagarajan,N.Vinayakam,P.L.Mani, Principles of Accountancy,
Eurasia PublicationHouse(Pvt)Ltd.,New Delhi.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	M
CO2	M	H	M	H	H
CO3	M	M	M	H	H
CO4	M	M	H	H	M
CO5	H	M	M	H	H

***H-High;**

M-Medium;

L-Low;

SKILL BASED COURSE III
MUBCHR3 - HUMAN RIGHTS

Hours:2

Credits :2
Semester: III

Preamble

This course provides an introduction to basic human rights philosophy, principles and also an overview of current issues.

Course Outcome

On successful completion of the course, the students are able to

CO	Course Outcomes	Cognitive Level
CO1.	Know the basic rights and freedoms, regardless of their political, economical and cultural systems.	Knowledge (Level K1)
CO2.	Understand the importance and historical growth of the Human Rights.	Knowledge (Level K1)
CO3.	Describe historical growth of the Human Rights.	Comprehension (Level K2)
CO4.	Demonstrate the awareness of international context of human rights.	Comprehension (Level K2) Application (Level K3)
CO5.	Categorize the modern issues regarding child and women.	Analysis (Level K4)

COURSE CONTENT

Unit - I:

Definition of Human Rights - Nature, Content, Legitimacy and Priority - Theories on Human Rights- Historical Development of Human Rights.

Unit - II:

International Human Rights - Prescription and Enforcement up to World War II - Human Rights and the U.N.O. - Universal Declaration of Human Rights - International Covenant on Civil and Political Rights - International Covenant on Economic, Social and Cultural Rights and Optional Protocol.

Unit - III:

Human Rights Declarations - U.N. Human Rights Declarations - U.N. Human Commissioner.

Unit - IV:

Amnesty International - Human Rights and Helsinki Process - Regional Developments - European Human Rights System - African Human Rights System - International Human Rights in Domestic courts.

Unit – V:

Contemporary Issues on Human Rights: Children's Rights - Women's Rights -Dalit's Rights - Bonded Labour and Wages - Refugees - Capital Punishment. Fundamental Rights in the Indian Constitution - Directive Principles of State Policy -Fundamental Duties - National Human Rights Commission.

TEXT BOOK

- International Bill of Human Rights, Amnesty International Publication, 1988.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	M	H	M	M
CO2	M	M	M	H	H
CO3	M	M	M	H	H
CO4	M	M	H	H	M
CO5	H	M	H	M	H

***H-High;**

M-Medium;

L-Low;

Non Major Elective - I**MUBCN1 - Internet and its Applications****(Offered to Other Department Students)****Hours: 2****Credits : 2
Semester: III****Preamble**

This course helps the students to use Internet and its applications.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Classify the types of networks and function of computers.	Comprehension (Level K2)
CO2.	Describe the types of networks and function of computers.	Comprehension (Level K2)
CO3.	Practice mailing in internet.	Applications(Level K3)
CO4.	Describe the applications of internet.	Applications(Level K3)
CO5.	Criticize the applications of internet.	Applications(Level K3)

COURSE CONTENT**Unit - I:**

Introduction to Computers: Introduction – Types of Computer – Characteristics of Computers – Generation of Computers – Anatomy of a Digital Computer: Functions and Components of a Computer.

Unit - II:

Computer Networks : Introduction – Types of Networks – Internet and World Wide Web: Introduction – What's special about internet – Web browsers – Searching the Web: Search Engine – Meta Search Engines.

Unit - III:

E-Mail : Introduction – E-Mail Names and Address – Mailing Basics: Address Book – Signature – File Attachments – Setting Priority – Replaying and Forwarding E-Mail Messages – Spamming – E-Mail advantages.

Unit - IV:

Internet Applications : Computers in Business and Industry – Office Automation – People-Ergonomics – Office Automation Technologies – Office Automation Systems.

Unit - V:

Computer In Education and Training – Computers in Entertainment, Science, Medicine and Engineering.

TEXT BOOK

- Alexis Leon and Mathews Leon, *Fundamentals of Information Technology* .

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	M	H	H	M	M
CO2	H	M	M	M	M
CO3	M	M	M	H	M
CO4	H	M	H	M	H
CO5	M	H	M	H	M

***H-High;**

M-Medium;

L-Low;

CORE IX**MUBCC5 - JAVA PROGRAMMING****Hours: 6****Credit: 5****Semester: IV****Preamble**

This course helps the students to inculcate knowledge on Concepts of Java Programming and to create wide range of Applications and Applets using Java.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Recollect the OOPs concepts such as Class, Inheritance, Encapsulation and Polymorphism.	Knowledge(Level K1) Comprehension (Level K2)
CO2.	Understand fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.	Knowledge(Level K1) Comprehension (Level K2)
CO3.	Implement programs using more advanced features such as Interface, Packages and Multithreading	Applications(Level K3)
CO4.	Analyze differences between application program and applets, applet lifecycle and graphics programming	Analysis(Level K4)
CO5.	Validate Java Programs using Stream Classes and files	Synthesis(Level K5)

COURSE CONTENT**Unit - I:**

Fundamentals of Object Oriented Programming: Introduction – Object Oriented Paradigm – Basic concepts of OOP – Benefits of OOP – Applications of OOP. Java Evolution.

Overview of Java Language: Introduction-Simple Java Program – Java Program Structure - Java Tokens - Java Statements - Implementing a Java Program - Java Virtual Machine - Command Line Arguments - Constants, Variables and Data Types.

Unit - II:

Classes, Objects and Methods: Introduction-Defining a Class- Static Members-Overriding Methods-Final Variables and Methods-Final Classes- Finalizer Methods-Abstract Methods and Classes –Visibility Control.

Interfaces: Introduction-Defining Interfaces-Extending Interfaces - Implementing Interfaces-Accessing Interface Variables.

Unit - III:

Packages: Java API Packages-Using System Packages-Creating Packages-Accessing a Package-Using a Package-Adding a Class to Package-Hiding Classes.

Multithreading Programming: Creating Threads - Extending the Thread Class-Stopping and Blocking a Thread - Life Cycle of a Thread-Thread Exceptions-Thread Priority-Synchronization-Implementing the 'Runnable' Interface - Managing Error and Exceptions.

Unit - IV:

Applet Programming: Introduction-Preparing to Write Applets-Applet Life Cycle-Designing a web page-Passing Parameters to Applets. Event Handling.

Graphics Programming: The Graphics Class-Lines and Rectangles-Circle and Ellipses-Drawing Arcs-Drawing Polygons-Line Graphs-Using Control Loops in Applets.

Unit - V:

Managing Input/Output Files in Java: Introduction - Concept of Streams - Stream Classes - Byte Stream Classes - Character Stream Classes - Input/Output Exceptions - Creation of Files - Reading/Writing Characters - Reading/Writing Bytes - Random Access Files.

TEXT BOOK

- Programming with JAVA – E.Balagurusamy sixth Edition. Tata McGraw – Hill, New Delhi 2010.

REFERENCE BOOK

- “Java 2: The Complete Reference” BY Herbert Schildt , Fifth Edition, Tata McGraw – Hill 2002.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	M	H	M
CO2	H	H	H	M	H
CO3	H	H	H	H	M
CO4	H	H	M	H	M
CO5	H	H	H	H	M

***H-High;**

M-Medium;

L-Low;

CORE PAPER X
MUBCC6 - OPERATING SYSTEM

Hours: 6**Credits : 5****Semester: IV****Preamble**

This course learns the fundamental aspect of operating system and give sufficient knowledge on various system Resources.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Recollect the concept of fundamental aspect of operating system	Knowledge(Level K1)
CO2.	Understand the concept of scheduling algorithms, Deadlock, process management and memory management.	Knowledge(Level K1)
CO3.	Describe the concept of scheduling algorithms, Deadlock, process management and memory management.	Comprehension (Level K2)
CO4.	Sketch the Threats, Memory management and production policies.	Applications(Level K3)
CO5.	Acquire the knowledge about file management.	Analysis(Level K4)

COURSE CONTENT

Unit - I:

Introduction: What is an Operating System – Mainframe Systems – Distributed Systems

Processes: Process Concept – Process Scheduling – Interprocess Communication.

Unit - II:

Threads: Overview – Multithreading Models. **CPU Scheduling:** Basic Concepts – Scheduling Criteria – Scheduling Algorithms.

Unit - III:

Process Synchronization: Background – The Critical Section Problem – Synchronization Hardware – Semaphores.

Deadlock: System Model – Deadlock Characterization – Methods For Handling Deadlocks – Deadlock Prevention – Deadlock avoidance – Deadlock detection – Recovery from deadlock

Unit - IV:

Memory Management: Swapping – Contiguous Memory allocation – Paging – Segmentation – Segmentation with Paging – Virtual Memory: Demand Paging

Unit - V:

Security: User Authentication – Cryptography

File System Interface: File Concept – File Access Methods – Directory Structure.

TEXT BOOK

- Operating Systems Concepts – Silberschatz , Galvin, Gagne, Sixth Edition, John Wiley & Sons, Inc.

REFERENCE BOOK

- Milenkovic Operating Systems (Concepts and Design), Milan Second Edition, Tata McGraw –Hill

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	M	M	H	M
CO2	H	H	H	M	H
CO3	M	M	M	H	M
CO4	H	M	M	M	M
CO5	M	H	M	H	M

***H-High;**

M-Medium;

L-Low;

CORE XI-PRACTICAL V
MUBCL5 - WEB TECHNOLOGY

Hours:5**Credits :3****Semester: IV****Preamble**

This course helps the students to learn JSP, PHP and Java script and to create a dynamic webpage.

Course Outcomes

On successful completion of the course, the student will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Discuss the core concepts of web programming such as Java script, JSP and PHP.	Comprehension (Level K2)
CO2.	Describe the core concepts of web programming such as Java script, JSP and PHP.	Comprehension (Level K2)
CO3.	Apply interactive web pages using JavaScript.	Applications(Level K3)
CO4.	Design interactive web pages using JavaScript.	Applications(Level K3)
CO5.	Validate server side scripting using JSP and PHP.	Synthesis(Level K5)

Program List:

1. Design a web page using CSS
2. Prepare a resume using forms
3. Website Design for a Department (or) College (or) Company etc.
4. Java Script for a Mathematical Calculator
5. Java Script – Number Puzzle
6. Java script-Games using Random number generation
7. Validation of name, mobile number, date of birth, email id using Java Script
8. Online Quiz using JSP
9. Perform Arithmetic operations using JSP
10. Generate Fibonacci series using PHP
11. PHP program to check whether the given number is prime or not
12. Online ticket booking using PHP

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	H	H
CO2	H	H	H	H	H
CO3	H	H	H	H	H
CO4	H	H	H	H	H
CO5	H	H	H	H	H

***H-High;**

M-Medium;

L-Low;

CORE XII-PRACTICAL VI
MUBCL6 - JAVA PROGRAMMING

Hours: 5

Credits : 3

Semester : IV

Preamble

This course helps the students to inculcate knowledge on Concepts of Java Programming and to create wide range of Applications and Applets using Java.

Course Outcomes

On successful completion of the course, the student will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Sketch the Oops concepts and gain the knowledge of Java and Applet.	Applications(Level K3)
CO2.	Describe the Oops concepts and gain the knowledge of Java and Applet.	Applications(Level K3)
CO3.	Implement core java concepts.	Analysis(Level K4)
CO4.	Create simple stand alone application using Core Java and remote applications using Applet.	Synthesis(Level K5)
CO5.	Evaluate simple stand alone application using Core Java and remote applications using Applet.	Synthesis(Level K5)

COURSE CONTENT

PROGRAMMING LIST

1. To perform addition of complex numbers using class and objects.
2. To perform multiplication of matrices using class and objects.
3. To perform volume calculation using method overloading.
4. Using command line arguments, test if the given string is palindrome or not.
5. Using multilevel inheritance process student marks.
6. Implement multiple inheritance for payroll processing.
7. Package illustration.
8. To illustrate built-in exceptions (any four).
9. To create multiple threads
 1. Using Thread class
 2. Using Runnable interface
10. String manipulation using string methods.

11. Applet – Graphical methods.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	H	H
CO2	H	H	H	H	H
CO3	H	H	H	H	H
CO4	H	H	H	H	H
CO5	H	H	H	H	H

*H-High;

M-Medium;

L-Low;

ALLIED IV - MATHEMATICS II
MUBCA4 - RESOURCE MANAGEMENT TECHNIQUES

Hours: 6**Credits : 5****Semester: IV****Preamble**

This course gives basic ideas about operation Research and solve the LPPs using various methods of operation Research.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Recall and describe the concept of Operation Research.	Comprehension (Level K2)
CO2.	Apply transportation and assignment problem to allocate resources.	Applications(Level K3)
CO3.	Acquire the knowledge about game theory.	Analysis(Level K4)
CO4.	Validate network scheduling by PERT and CPM.	Synthesis(Level K5)
CO5.	Evaluate network scheduling by PERT and CPM.	Synthesis(Level K5)

COURSE CONTENT

Unit - I:

Operation Research: Introduction – Origin and development – Nature and features – Modeling – Advantages and Limitations of Models – Applications of Operation Research.

Unit - II:

Linear Programming Problem: Mathematical Formulation - Graphical Solution Method: Exceptional Cases – Canonical and Standard forms of LPP. Simplex methods (Excluding Non standard LPPs)optimal solutions.

Unit - III:

Transportation problem : Introduction – LP Formulation of the Transportation Problem- Solution of a TP – Finding an I.B.F.S – Test for Optimality - Degeneracy in TP – MODI Method .

Assignment Problem: Mathematical Formulation of the problem – Solution methods of AP – Special cases in AP – Travelling Salesman Problem.

Unit - IV:

Game Theory –Maximin and Minimax principles –Mixed strategy – Dominance property- Graphical method – Simplex method..

Unit - V:

Network Scheduling by PERT / CPM : Introduction – Network – Logical Sequencing – Rules of Network Construction - Critical Path Analysis – Probability considerations in PERT – Distinction between PERT and CPM.

TEXT BOOK

- “Operations Research”, kanti swarup P.K Gupta, Manmohan sultan chand & sons Newdelhi

REFERENCE BOOKS

- Introduction to operations research , P.K. Gupta & D.S. Hira, chand & sons Newdelhi
- Resource management techniques, Ganapathy .
- Linear Programming, Arumugam , New Gamma Publishing House, Palayamkottai

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	M
CO2	H	M	H	M	M
CO3	H	M	M	M	H
CO4	H	M	H	H	H
CO5	M	H	M	H	H

*H-High;

M-Medium;

L-Low;

SKILLED BASED COURSE IV**MUBCNA4 - NUMERICAL APTITUDE****Hours: 2****Credits : 2****Semester : IV****Preamble**

This course helps the students to improve their employability skills.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Recollect and describe the basic concepts of logical reasoning	Knowledge(Level K1) Comprehension (Level K2)
CO2.	Discuss problem solving and reasoning ability	Comprehension (Level K2)
CO3.	Demonstrate various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.	Applications(Level K3)
CO4.	Apply various principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.	Applications(Level K3)
CO5.	Critically evaluate various real life situations by resorting to analysis of key issues and factors.	Analysis(Level K4)

COURSE CONTENT**Unit - I:**

Operations on Numbers – H.C.F & L.C.M of Numbers (Solved Examples).

Unit - II:

Problems on Numbers- Problems on Ages — Problems on Trains(Solved Examples)

Unit - III:

Percentage – Profit & Loss – Ratio & Proposition(Solved Examples).

Unit - IV:

Time & Work –Time & Distance(Solved Examples)

Unit - V:

Simple Interest-Compound Interest-Permutations & Combinations

TEXT BOOK

- Quantitative Aptitude for Competitive Examination, by R.S.AGGARWAL Revised Edition

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	M	H
CO2	H	M	M	H	H
CO3	M	H	M	H	H
CO4	M	M	M	M	H
CO5	H	M	H	M	H

H-High;*M-Medium;****L-Low;**

CORE XIII**MUBCC7 - RELATIONAL DATABASE MANAGEMENT SYSTEM****Hours: 5****Credits :5****Semester :V****Preamble**

This course facilitates the students to know the Core concepts of RDBMS and helps the students to create and connect the multiple tables and to have knowledge on Normalization Techniques.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Remember the basic concepts and applications of database system	Knowledge(Level K1)
CO2.	Understand the basic concepts and applications of database system	Comprehension (Level K2)
CO3.	Get the idea about various data models which describes the structure of database	Comprehension (Level K2)
CO4.	Design principles using ER models and Normalization approach	Comprehension (Level K2) Applications(Level K3)
CO5.	Interpret SQL interface of a RDBMS package to create, secure, maintain and query a database and PL/SQL programming using Triggers and Cursors	Analysis(Level K4)

COURSE CONTENT**Unit - I:**

Introduction: Database System Applications – Purpose of Database Systems – View of Data – Database Languages – Transaction Management – Database users and Administrators – Overall System Structure.

Unit - II:

Relational Model: Entity – Relationship Model: Basic Concepts – Design Issues – Mapping cardinalities – Keys – E – R Diagrams – Weak entity sets – Extended E – R feature

Unit - III:

Data Normalization: Pitfalls in Relational Database Design- Entity – Decomposition – Functional Dependencies – Normalization – First Normal Form – Second Normal Form – Third Normal Form – Boyce – Codd Normal Form – Fourth Normal Form – Fifth Normal Form – Denormalization

Unit - IV:

PL/SQL: A Programming Language: History – Fundamentals – Block Structure – Comments – Data Types – Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators.

Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control statements.

Unit - V:

PL/SQL Cursors and Exceptions: Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT...FOR UPDATE – WHERE CURRENT OF clause – Cursor with Parameters – Cursor Variables – Exceptions – Types of Exceptions (Predefined Oracle Server Exceptions, User Defined Exceptions).

PL/SQL Composite Data Types: Records – Tables – Varrays . **Named Blocks:** Triggers

TEXT BOOKS

1. Database System Concepts, Abraham Silberschatz, Henry F.Korth, S.Sudarshan TMH 5th Edition (UNIT s – I, II,III- Chapter – 7(7.1,7.2,7.3)
2. Database Management Systems, Alexis Leon, Mathews Leon , Lieon Vikas (UNIT – III – Chapter -11)
3. Database Systems Using Oracle, Nilesh Shah 2nd edition, PHI.
(UNIT – IV: Chapters 10 & 11 UNIT – V: Chapters 12, 13 & 14)

REFERENCE BOOK

1. Database Management Systems, Gerald V. Post 3rd Edition, TMH.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	M	M
CO2	M	M	M	H	M
CO3	H	M	H	H	M
CO4	H	M	H	H	M
CO5	H	H	M	H	M

*H-High;

M-Medium;

L-Low;

CORE XIV PRACTICAL VII

MUBCL7 - DOT NET PROGRAMMING

Hours: 6**Credits: 3**
Semester: V**Preamble**

This course helps the students to acquire the knowledge on .NET framework and to develop web based and application based software.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Understand the database connectivity with application programming.	Analysis (Level K4)
CO2.	Demonstrate the database connectivity with application programming.	Analysis (Level K4)
CO3.	Design and execute different kinds of tasks in real time application.	Applications(Level K3)
CO4.	Apply different kinds of tasks in real time application.	Analysis (Level K4)
CO5.	Validate the results for the given input data.	Synthesis (Level K5)

COURSE CONTENT

Program List:

1. Write a program to find a grade of students.
2. Write a program to find factorial of given number using functions.
3. Write a program to arrange names in alphabetical order.
4. Write a program to display the user information.(personal details)
5. Calculator.
6. Notepad
7. Employee Details.
8. Hospital Management system.
9. Sales Transaction System.

10. News Paper Vendor Details

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	H	M
CO2	H	H	H	H	M
CO3	H	H	H	H	M
CO4	H	H	M	H	M
CO5	M	M	H	M	H

*H-High;

M-Medium;

L-Low;

CORE PAPER XV-PRACTICAL VIII**MUBCL8 - RELATIONAL DATABASE MANAGEMENT SYSTEM****Hours: 5****Credits : 3****Semester: V****Preamble**

This course facilitates the students to know the Core concepts of RDBMS and helps the students to create and connect the multiple tables and to have knowledge on Normalization Techniques.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Apply constraints in tables.	Analysis (Level K4)
CO2.	Figure out the need and use of database in application development.	Application (Level K3)
CO3.	Apply the uses of database in application development.	Application (Level K3)
CO4.	Describe the concepts of triggers and cursors.	Synthesis(Level K5)
CO5.	Evaluate the concepts of triggers and cursors.	Synthesis(Level K5)

COURSE CONTENT**Program List**

1. DDL, DML, DCL Commands
2. Logical, Comparison, Conjunctive & Arithmetic Operators.
3. **Retrieving rows with Characters functions:**
 1. CONCAT (Concatenation)
 2. REPLACE
 3. SUBSTR (Substring)
 4. LENGTH
4. **Retrieving rows with Aggregate functions:**
 1. GROUP BY
 2. HAVING
5. **Retrieving rows with date functions & number function:**
 1. SYSDATE
 2. ABS, FLOOR, CEIL, ROUND, POWER
 - 3.

6. JOINS:

1. Union, Intersection & Union all
2. Simple Join
3. Self-Join
4. Outer Join

7. CONSTRAINTS:

1. Domain Integrity (Not Null, Check)
2. Entity Integrity (Unique & Primary Key)
3. Referential Integrity (Foreign Key)

8. VIEW: PL/SQL

9. PL/SQL Programs with Control Structures
10. PL/SQL Programs with Exception Handling
11. PL/SQL Programs with Cursors
12. Creating & Calling Procedures

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	H	M
CO2	H	H	H	H	M
CO3	M	M	M	H	M
CO4	H	M	H	M	M
CO5	M	H	M		HM

H-High;*M-Medium;****L-Low;**

ELECTIVE 1.1
MUBCE1-SOFTWARE ENGINEERING

Hours:6**Credits : 5****Semester : V****Preamble**

This course imparts the skills of developing software for various applications and systems. It discusses the various software development life cycle models and testing methodologies.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Remember the stages of software development life cycle.	Knowledge(Level K1)
CO2.	Understand the stages of software development life cycle.	Comprehension (Level K2)
CO3.	Examine various Software development life cycle models.	Applications(Level K3) Analysis(Level K4)
CO4.	Analyze the role of project management including requirement gathering, planning, designing and maintenance.	Analysis(Level K4)
CO5.	Evaluate various testing principles on software project for risk management.	Synthesis(Level K5)

COURSE CONTENT

Unit - I:

The Evolving Role of Software – Definition of Software Engineering – The Changing Nature of Software – Software Myths – Terminologies – Software Life Cycle Models: Build and Fix Model – Evolutionary Process Models – Selection of a Life Cycle Model.

Unit - II:

Requirements: Analysis and Specifications: Type of Requirements – Feasibility Studies – Requirement Elicitation: interviews, brain storming sessions, FAST – Requirement analysis: Data flow diagram, Data Dictionaries - Requirements Validation

Unit - III:

Project Planning: Size Estimation – The Constructive Cost Model (COCOMO) – The Putnam Resource Allocation Model.

Unit - IV:

Software Design: Design: Conceptual and Technical designs, Objectives of design – Modularity - Function Oriented Design – Software reliability: Basic concepts, software reliability, maturity levels - **Software Testing:** A Strategic Approach to Software Testing – Testing – Functional Testing – Structural Testing – Levels of Testing – Validation Testing.

Unit - V:

Software Maintenance: Categories of Maintenance – Problems during Maintenance – Maintenance is Manageable – Potential Solutions to maintenance problems – Maintenance process – Estimation of maintenance cost

TEXT BOOK

- “Software Engineering”, K.K.Agarwal, Third Edition 2008

REFERENCE BOOK

- “Software Engineering Concepts”, Richard e.Fairley, McGrawHill,

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	M	M
CO2	H	H	H	H	M
CO3	H	H	M	M	M
CO4	H	H	H	H	M
CO5	M	H	M	H	M

***H-High;**

M-Medium;

L-Low;

ELECTIVE 1.2

MUBCE1-CLOUD COMPUTING

Hours:6**Credits:5**
Semester:V**Preamble**

This course enables the students to learn and understand the fundamental concepts of Cloud and its services, and helps the students to understand the service oriented architecture in cloud database.

Course Outcomes

On successful completion of the course, the student will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Define cloud computing and get the idea about cloud architecture	Knowledge(Level K1)
CO2.	Understand different cloud services	Comprehension (Level K2)
CO3.	Interpret Cloud Services ,security, and architecture	Analysis(Level K4)
CO4.	Examine cloud mail services	Evaluate (Level K6)
CO5.	Apply Cloud Services in real time	Applications(Level K3)

COURSE CONTENT**Unit - I:**

Introduction – Definition of Cloud – Cloud types – Characteristics of Cloud – Cloud standards – Measuring cloud's value – Early adopters and new applications - Laws of cloudonomics – Cloud obstacles – Cloud adoption – Cloud computing costs – Service level agreements – Licensing model - Cloud architecture: Cloud computing stack – Composability – Infrastructure – Platforms – Virtual appliances – Communication protocol – Applications – Connecting to cloud.

Unit - II:

Cloud Services: IaaS – PaaS – SaaS – IdaaS – CaaS - Abstraction and Virtualization: Virtualization technologies – Load balancing – Hypervisors – Machine imaging – Porting applications – Capacity planning: Baseline and Metrics – Measurements – System metrics – Load testing – Resource ceilings – Servers and Instance types – Network Capacity – Scaling

Unit - III:

Exploring Platform as a Service (PaaS) : Service model – Development – Sites and tools – Application features - Exploring Cloud Infrastructures: Administrating the clouds – Management responsibilities – Life cycle management - Cloud management products – Cloud management standards – Cloud Security: Securing the Cloud – Securing the Data – Establishing identity and presence

Unit - IV:

Service oriented architecture – Introduction – SOA communications – Managing and Monitoring SOA – Relating SOA and Cloud - Applications to the cloud : Functionality mapping – Applications attributes – Cloud service attributes – System abstraction – Cloud bursting – Applications and Cloud APIs – Cloud Storage: Measuring digital universe – Provisioning cloud storage – Cloud backup solutions – Cloud storage interoperability.

Unit - V:

Exploring cloud mail service – Syndicate services – Instant messaging – Collaboration technologies using social networking – Audio and Video streaming – VoIP applications – Mobile market – Smart phones with the cloud - Mobile Web service : Service types – Service discovery – SMS – Protocols – Synchronization

TEXT BOOK

- Barrie Sosinsky, Cloud Computing Bible, Wiley Publications, 2011 (Unit I to V)

REFERENCE BOOKS

- Rountree, Castrillo, The Basics of Cloud Computing - Understanding the Fundamentals of Cloud Computing in Theory and Practice, First Edition, Syngress Publication, 2013
- Michael Miller, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, 2008
- Srinivasan. S, Cloud Computing Basics, Springer, 2013

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	M	M	H	M
CO2	H	H	M	H	M
CO3	H	M	M	M	H
CO4	H	M	M	H	M
CO5	H	M	H	M	M

***H-High; M-Medium; L-Low;**

ELECTIVE 1.3

MUBCE1-PC MAINTENANCE AND TROUBLE SHOOTING

Hours:6**Credits:5**
Semester : V**Preamble**

This course Facilitate the students to know the peripheral of computer and helps to do simple trouble shooting techniques.

Course Outcomes

On successful completion of the course, the student will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Keep in mind the peripherals, processors, configuration and trouble shoot the problem to the system.	Knowledge(Level K1)
CO2.	Get an idea of installation, working principle and maintenance of secondary storage device.	Comprehension (Level K2)
CO3.	Deploy the different kinds of equipment for diagnose the problem and trouble shoot it.	Analysis(Level K4)
CO4.	Acquire the knowledge on servicing the switches, cables and connectors.	Applications(Level K3)
CO5.	To Apply Trouble shooting techniques in real time	Applications(Level K3) Analysis(Level K4)

COURSE CONTENT**Unit - I:**

The Basic Microcomputer System – Processor subsystem – 8086 processor – clock generator 8284 - Bus subsystem Bus controller 8288 – Latch 74LS373 – Transceiver 74LS245 – Memory subsystems – Decoder 74LS138 – DMA Controller 8237 – I/O subsystem – PPI 8255 – PIC 8259 – PIT 8253 – Tips and Trouble Shootings.

Unit - II:

Inside the IBM PC system unit - power supply - cabling and connectors - system board functions – system configuration.

Unit - III:

Peripherals – Memory peripherals - Floppy disk drive – working principle – Removal and Installation – Cleaning and preventive maintenance – Floppy disk format – Winchester disk - CRT working principle – IBM PC display adapter – printers – interface standards – Modems and Acoustic couplers – Trouble shooting keyboards.

Unit - IV:

Servicing – Switch Settings – Cables and connectors – Operation – post – preventive maintenance.

Unit - V:

Diagnostics and Trouble shooting – Test equipment – Login problem – oscilloscope.

TEXT BOOK

- “Microcomputer servicing practical system and Trouble Shooting”, Stuart M. Asser. Vincent J. Stigliano, Richard F. Bahrenburg, A Bell & Howell Information Company Columbus, 1990.

REFERENCE BOOK

- IBM PC & CLONES, B. Govindrajalu, Tata McGrawhill Publishers, IBM PC & CLONES

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	H	M
CO2	M	M	M	H	M
CO3	M	M	M	H	M
CO4	H	M	M	H	M
CO5	H	M	H	M	H

***H-High; M-Medium; L-Low;**

ELECTIVE 2.1**MUBCE2-ORGANIZATIONAL BEHAVIOUR****Hours:6****Credits:5****Semester: V****Preamble**

This course provides the students to develop the personalities, attitudes and resolve the conflicts in organization.

Course Outcomes

On the successful completion of the course, the students able to

CO	COURSE OUTCOMES	COGNITIVE LEVEL
CO1.	Remember the organizational behaviours like attitudes, personality and communication	Knowledge(Level K1)
CO2.	Understand the learning principles, motivation theories and organizational conflicts	Comprehension (Level K2)
CO3.	Deploy the stress management by avoiding job frustration.	Applications(Level K3)
CO4.	Acquire the knowledge on resolve the conflicts by efficient communication	Analysis(Level K4)
CO5.	To develop creative and innovative ideas that could positively shape the organizations	Evaluate (Level K6)

COURSE CONTENT**Unit - I:**

Introduction: Elements of OB – Nature and Scope of OB - Contributing Disciplines to OB.

Organisational Behaviour in Historical Perspective - Foundations of Individual Behaviour:

Introduction – The Individual and Individual Differences – Human Behaviour and its Causation.

Unit - II:

Personality – Perception - Attitudes: Concept of Attitudes – Formation of Attitudes – Types of Attitudes – Measurement of Attitude – Change of Attitude. Values: Concept of Value – Types of Values – Formation of Values – Values and Behaviour Job Satisfaction.

Unit - III:

Learning: Meaning and Definition – Determinants of Learning – Learning Theories – Learning Principles – Reinforcement – Punishment – Learning and Behaviour. Motivation: Concepts – Meaning of Motivation – Nature of Motivation – Motivation Cycle or Process – Need for Motivation – Theories of Motivation – Motivation and morale. Group Behaviour.

Unit - IV:

Organisational Conflicts: Definition of Conflict – Organisational Sources of Conflict – Types of Conflicts – Aspects of Conflicts – Functional Conflict – Dysfunctional Conflict – Conflict Process – Conflict Management. Job Frustration - Stress Management.

Unit - V:

Communication Channel–Communication Networks – Communication Barriers – Effective Communication. Leadership - Organisational Structure – Organisational culture

TEXT BOOK

- S.S Khanka, “Organizational Behaviour”, S.Chand & Company Ltd, 2002 (Unit 1 to 5).

REFERENCE BOOKS

- John W Newstorm and Keith Davis – “Organizational Behaviour” – TMH, 2001.
- Hugh J Arnold and Daniel C Fieldman – “Organizational Behaviour” MC Graw Hill, 1996.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	H	H
CO2	M	M	M	H	H
CO3	M	M	M	M	M
CO4	M	M	M	H	M
CO5	H	M	H	M	H

***H-High;**

M-Medium;

L-Low;

ELECTIVE 2.2

INFORMATION SECURITY

Hours:6**Credits:5**
Semester: V

Preamble

This Course enables the student to understand various methodology available for securing information and to learn about various Security Models.

Course Outcomes

On successful completion of the course, the student will be able to

CO	COURSE OUTCOMES	COGNITIVE LEVEL
CO1.	Get an idea about information Security basis, Security Investigation, Security Analysis, Security models and Security Physical Design	Knowledge (Level K1)
CO2.	Understand Security Investigation and Security Analysis,	Knowledge (Level K1) Comprehension (Level K2)
CO3.	Analyse Security models.	Application (Level K3) Analysis (Level K4)
CO4.	Figure out the Physical design of the Security	Analysis (Level K4)
CO5.	Evaluate the Security and Analysis process.	Synthesis(Level K5)

COURSE CONTENT

Unit - I:

Information Security Basics: INTRODUCTION -History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

Unit - II:

Security Investigation :SECURITY INVESTIGATION - Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues.

Unit - III:

Security Analysis :SECURITY ANALYSIS-Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk.

Unit - IV:

Security Models :LOGICAL DESIGN-Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity.

Unit - V:

Security Physical Design :PHYSICAL DESIGN-Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel.

TEXT BOOK

- Michael E Whitman and Herbert J Mattord, “Principles of Information Security”, Vikas Publishing House, New Delhi, 2003

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	M	M	M	H
CO2	H	M	M	H	M
CO3	H	M	M	H	M
CO4	H	M	M	H	H
CO5	M	H	M	H	M

***H-High;**

M-Medium;

L-Low;

ELECTIVE 2.3

BIG DATA ANALYTICS

Hours: 6**Credits : 5****Semester: V****Preamble**

This course offers knowledge about concepts and challenge of big data. It also the helps students to acquire knowledge about Hadoop, MapReduce, Pig and Hive technology.

Course Outcomes

On successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Recall the concepts of Open Source, Linux, Java Script and PHP.	Knowledge (Level K1)
CO2.	Describe the concepts of Open Source, Linux, Java Script and PHP.	Comprehension (Level K2)
CO3.	Demonstrate the basics of Open Source Software.	Application (Level K3)
CO4.	Examine and design various applications using Open Source Software.	Analysis(Level K4) Synthesis(Level K5)
CO5.	Examine and design various applications using Open Source Software.	Analysis(Level K4) Synthesis(Level K5)

COURSE CONTENT**Unit - I:**

INTRODUCTION TO BIG DATA: Introduction to Big Data Platform – Challenges of Conventional Systems - Intelligent data analysis Nature of Data - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools

Unit - II:

STATISTICAL DATA ANALYSIS: Parameter and Statistic- Sampling Distribution- Meaning-Standard Error and its uses - Tests of Significance- Null and Alternative Hypotheses - Type-I and Type-II Error- Critical Region and Level of Significance - One tailed and Two tailed Tests. Critical values or Significant values - Tests of Significance for Large Samples - Test of Significance for Single Proportion - Test of Significance for Difference of Proportions-Test of

Significance for Single Mean- Test of Significance for Difference of Means - Chi-Square Distribution – Definition- Applications of Chi-Square Distribution -To test the goodness of fit.- To test the independence of Attributes - Student's "t" - Distribution-Definition- Applications of Student's "t" –Distribution- To test for Single Mean- To test for Difference of Means- Paired t-test for Difference of Means F-Distribution- Definition- To Test for Equality of Two Population variances - Meaning of Resampling and its uses. Basic ideas of Randomization, Exact Test, Cross Validation Jackknife and Bootstrap. Prediction Error and its uses.

Unit - III:

HADOOP: History of Hadoop- The Hadoop Distributed File System – Components of Hadoop-Analyzing the Data with Hadoop- Scaling Out- Hadoop Streaming- Design of HDFS-Java interfaces to HDFS- How MapReduce Works-Anatomy of a MapReduce Job run-Failures-Job Scheduling-Shuffle and Sort – Task execution – MapReduce Features

Unit - IV:

HADOOP ENVIRONMENT: Setting up a Hadoop Cluster - Cluster specification - Cluster Setup and Installation - Hadoop Configuration-Security in Hadoop - Administering Hadoop – HDFS - Monitoring-Maintenance

Unit - V:

FRAMEWORKS: Applications on Big Data Using Pig and Hive – Data processing operators in Pig – Hive services – HiveQL – Querying Data in Hive - fundamentals of HBase and ZooKeeper.

TEXT BOOKS

- Michael Berthold, David J. Hand, (2007), "Intelligent Data Analysis", Springer.
(For Unit I to III)
- Tom White (2012), "Hadoop:The Definitive Guide" Third Edition, O'reilly
Media (For Unit IV to V)

REFERENCE BOOKS

- Anand Rajaraman and Jeffrey David Ullman, (2012), "Mining of Massive Datasets", Cambridge University Press.
- Viktor Mayer, Schonberger, Kenneth Cukier,(2013), "BIg Data : A Revolution That Will Transform How We Live, Work and Think", Houghton Mifflin Harcourt publishing company.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	M	M	H	H
CO2	H	M	M	H	M
CO3	H	H	H	H	M
CO4	M	M	M	H	M
CO5	H	H	M	H	M

***H-High;**

M-Medium;

L-Low;

SKILL BASED COURSE V**MUBCOS5 - OPEN SOURCE TECHNOLOGY****Hours : 2****Credits : 2**
Semester: V**Preamble**

This course helps the students to acquire knowledge on open source software and to create interactive web platform applications.

Course Outcomes

On successful completion of the course, the student will be able to

CO	COURSE OUTCOMES	COGNITIVE LEVEL
CO1.	Recall the networking concepts, Transmission media and OSI layers of Network.	Knowledge(Level K1)
CO2.	Describe the networking concepts, Transmission media and OSI layers of Network.	Comprehension(Level K2)
CO3.	Compare OSI & TCP/IP models.	Knowledge(Level K1) Comprehension (Level K2)
CO4.	Deploy the elementary Data link protocols.	Applications(Level K3)
CO5.	Review transport service and Transmission control protocol like DNS, Email.	Synthesis(Level K5)

COURSE CONTENT**Unit - I:**

OPEN SOURCE: Introduction - Open Source – Open Source vs. Commercial Software .

Unit - II:

LINUX: What is Linux? - Free Software – Where I can use Linux? Linux Kernel – Linux Distributions - Linux Essential Commands – File system Concept – Standard Files –The Linux Security Model – Vi Editor – Partitions Creation.

Unit - III:

Shell Introduction – String Processing –Investigation and Managing Processes – Network Clients – Installing Application

Unit - IV:

Web Browsers : Mozilla Firefox – Introduction - Browsing with Tab - Create, close, and select tabs - Customization - Multiple home pages - Bookmark Groups - Searching and finding

within documents - Quick searches and keywords - Find Toolbar-Plug-ins -What is a Plugin?- Available Plugins .- Uninstalling Plugins .

Unit - V:

Apache Web Server : : Introduction - Starting, Stopping, and Restarting Apache - Configuration - Securing Apache - Create the Web Site - Apache Log Files

TEXT BOOKS

- “Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP”, James Lee and Brent Ware, Dorling Kindersley(India) Pvt. Ltd, 2008
- https://upload.wikimedia.org/wikipedia/commons/5/5c/Using_Firefox.pdf-Unit-IV

REFERENCE BOOKS

- “Setting Up LAMP: Getting Linux, Apache, MySQL, and PHP and Working Together”, Eric Resebrook, Eric Filson, Published by John Wiley and Sons, 2004.
- J. Jaworski, Mastering Javascript, BPB Publications, 1999 5. T. A. Powell, Complete Reference HTML (Third Edition), TMH, 2002
- “Teach yourself Web Technologies”, Ivon Bayross , BPB publications.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	M	M	H	H
CO2	H	H	H	H	H
CO3	H	H	H	H	M
CO4	M	H	M	H	M
CO5	H	M	M	H	M

***H-High;**

M-Medium;

L-Low;

CORE XVI
MUBCC8 - DATA COMMUNICATION AND NETWORKS

Hours: 6**Credits:5****Semester: VI****Preamble**

This Course imparts knowledge on network concepts like layers wireless concepts, transmission and security .It gives knowledge on networking technologies like broadband and Bluetooth.

Course Outcomes

On successful completion of the course, the student will be able to

CO	Course Outcomes	Cognitive Level
CO1.	Recall the networking concepts, Transmission media and OSI layers of Network.	Knowledge(Level K1)
CO2.	Describe the networking concepts, Transmission media and OSI layers of Network.	Comprehension(Level K2)
CO3.	Compare OSI & TCP/IP models.	Knowledge(Level K1) Comprehension (Level K2)
CO4.	Deploy the elementary Data link protocols.	Applications(Level K3)
CO5.	Review transport service and Transmission control protocol like DNS, Email.	Synthesis(Level K5)

COURSE CONTENT**Unit - I:**

Introduction to Data Communications and Networking: Data Communications- Protocols - Analog and Digital Signals. Analog and Digital Transmission Methods – Modes of Data Transmission and Multiplexing.

Unit - II:

Transmission Errors: Detection and Correction. **Transmission Media:** Guided Media, Unguided Media. **Network Topologies:** Mesh, Star, Tree, Ring, Bus. Switching Basics- Circuit switching - Packet switching - Message switching - Router and Routing.

Unit - III:

Network Protocols and OSI Model: OSI layer Functions. Local Area Networks (LAN), Metropolitan Area Networks (MAN) and Wide Area Networks (WAN) – Integrated Services Digital Network (ISDN) – Frame Relay.

Unit - IV:**Internetworking Concepts, Devices, Internet Basics, History and Architecture:**

Internetworking Devices, Repeaters, Bridges, Routers and Gateways.

An Introduction to TCP / IP, IP: TCP/IP Basics, TCP/IP Example, The concept of IP Address.

Unit - V:

TCP/IP Part II: User Datagram Protocol (UDP) - UDP Packet, Difference between UDP and TCP – Domain Name System (DNS) – Electronic Mail (Email) – Introduction – E-Mail Transfer protocols – MIME

TEXT BOOK

- Achyut S.Godbole, (2010), “Data Communications and Networks”, Tata McGraw-Hill Publishing Company Limited, ISBN-13: 978-0-07-047297.

REFERENCE BOOKS

- Behrouz A. Forouzan, (2007), “Data Communications and Networking”, 2nd Edition TataMcGraw-Hill Publishing Company Limited, ISBN-13: 9780070499355.
- Andrew S. Tanenbaum, (2002), “Computer Networks”, 4thEdition, Prentice Hall, ISBN-13:978817781652.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	M	M	H	H
CO2	H	M	M	H	M
CO3	H	M	M	H	M
CO4	H	M	M	H	M
CO5	M	H	M	H	M

***H-High;**

M-Medium;

L-Low;

CORE XVII
MUBCC9 - COMPUTER GRAPHICS

Hours: 5**Credits : 4****Semester: VI****Preamble**

This course offers Concepts on basic Graphical Techniques and learn 2D and 3D Transformations.

Course Outcomes

On the successful completion of the course, the students will be able to

CO	Course Outcomes	Cognitive Level
CO1.	List the display devices and recognize the Viewing and clipping algorithms.	Knowledge(Level K1)
CO2.	Comprehend the attributes of output primitives and geometric Transformation.	Comprehend(Level K2)
CO3.	Describe the attributes of output primitives and geometric Transformation.	Comprehend(Level K2)
CO4.	Demonstrate the algorithms for drawing lines & circle.	Applications(Level K3)
CO5.	Analyze the 2D and 3D viewing and clipping algorithms.	Analysis(Level K4)

COURSE CONTENT

Unit - I:

Video Display Devices: Refresh Cathode Ray tubes – Raster Scan Displays – Random Scan displays – Color CRT Monitors – Raster Scan System – Random Scan System.

Unit - II:

Output Primitives: Points and Lines – Line –Drawing Algorithms – Loading frame Buffer – Line function – Circle – Generating Algorithms.

Unit - III:

Attributes of Output Primitives: Line Attributes – Curve Attributes – Color and Grayscale Levels – Area – Fill Attributes – Character Attributes.

Unit - IV:

Geometric Transformations: Basic Transformations – Matrix Representations – Composite Transformations – Other Transformations

Unit - V:

Viewing: The Viewing Pipeline – Viewing Co – ordinate Reference Frame – Window – to – Viewport Co – ordinate Transformation – 2D Viewing Functions – **Clipping Operations** :Point Clipping – Line Clipping : Cohen – Sutherland Line Clipping ,Liang – Barsky Line Clipping – Curve Clipping – Text Clipping.

TEXT BOOK

- M.Pauline Baker , *Computer Graphics* – Donald Hearn, 2nd Edition

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	M	M
CO2	H	M	M	H	M
CO3	H	M	H	H	M
CO4	H	M	M	H	H
CO5	M	H	M	H	M

***H-High; M-Medium; L-Low;**

CORE XVIII**MUBCPR - PROJECT WORK****Hours:7****Credits :5****Semester: VI****Preamble**

This course motivates the students to work in emerging/latest technologies, help the students to develop ability, to apply theoretical and practical tools/techniques to solve real life problems related to industry, academic institutions and research laboratories.

Course Outcomes

On successful completion of the course the students will be able

CO	COURSE OUTCOMES	COGNITIVE LEVEL
CO1.	Understand the problem.	Comprehension (Level K2)
CO2.	Implement & execute the real time application.	Application(Level K3)
CO3.	Apply& execute the real time application.	Application(Level K3)
CO4.	Analyze various testing methods.	Analysis (Level K4)
CO5.	Verify the expected results in real time applications.	Synthesis (Level K5)

COURSE CONTENT

The project is of 7 hours/week for one (semester VI) semester duration and a student is expected to do planning, analyzing, designing, coding, and implementing the project. The initiation of project should be with the project proposal. The synopsis approval will be given by the project guides.

The project proposal should include the following:

- 1. Title***
- 2. Objectives***
- 3. Details of modules and process logic***
- 4. Limitations of the project***
- 5. Tools/Platforms, Languages to be used***
- 6. Sample Coding and Screenshots***
- 7. Conclusion***

For the project work, the guide (internal) evaluate the work for 40 marks based on the performance of the candidates during the development of the project and the external examiner will evaluate the project work for 60 marks.

The Project work should be either an individual one or group of not more than two members

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	H	M
CO2	H	H	H	H	M
CO3	H	H	H	M	M
CO4	H	H	H	H	H
CO5	H	H	H	H	H

***H-High;**

M-Medium;

L-Low;

ELECTIVE 3.1**MUBCE3-DATA MINING AND WAREHOUSING****Hours: 6****Credits : 5****Semester: VI****Preamble**

This course provides the fundamentals of data warehousing, Data mining Concepts and Data Mining Techniques.

Course Outcomes

On successful completion of the course the students will be able to

CO	COURSE OUTCOMES	COGNITIVE LEVEL
CO1.	Understand the basic concepts of Data mining and Data warehousing	Knowledge(Level K1)
CO2.	Analyse various Data mining techniques like Classifications, Clustering, Association Rule Mining, Prediction and related algorithm.	Analysis(Level K4)
CO3.	Choose appropriate Data mining techniques to carry out simple data mining task.	Application(Level K3) Analysis(Level K4)
CO4.	Develop Data mining algorithm to store heterogeneous data.	Synthesis(Level K5)
CO5.	To implement Data mining algorithm.	Application(Level K3)

COURSE CONTENT**Unit - I:**

Data Warehousing: Introduction – Definition – Multidimensional Data Model - OLAP Operations – Warehouse Schema – Data warehousing Architecture – Metadata – OLAP Engine - Data Warehouse Backend Process.

Unit - II:

Data Mining: Definition – Comparison with other fields – DM Techniques – Issues Application Areas.

Unit - III:

Association Rules: Methods – A Priori algorithm – Partition Algorithm – Pincer-Search Algorithm – Border Algorithm – Generalized Association Rules with Item constraints.

Unit - IV:

Clustering Techniques: Clustering Paradigms – Partitioning Algorithms – CLARA – CLARANS- Hierarchical Clustering – DBSCAN – Categorical Clustering Algorithms – STIRR.

Decision Trees: Tree Construction Principle – Best Split – Splitting Indices – Splitting Criteria
CART – ID3.

Unit - V:

Web Mining: Introduction – Web Content Mining – Web Structure Mining – Web Usage Mining – Text Mining – Hierarchy of Categories – Text Clustering.

TEXT BOOK:

- Data Mining Techniques – Arun K. Pujari , Universities Press – 2001.

REFERENCE BOOKS:

- Jewie Han, Michelins Kamber, “Data Mining :Concepts and Techniques”
- Pang-Ning Tan, Michael Steinbach, Vipin Kumar, “Introduction to Data Mining” 2007.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	M	M	H	M
CO2	H	M	M	H	M
CO3	H	M	H	M	M
CO4	H	H	H	H	H
CO5	H	M	H	M	M

***H-High;**

M-Medium;

L-Low;

ELECTIVE 3.2**DIGITAL IMAGE PROCESSING****Hours:6****Credits: 5****Semester: VI****Preamble**

This course understand the fundamentals steps in Digital image processing, image compression and image segmentation.

Course Outcomes:

On successful completion of the course the students will be able to

CO	COURSE OUTCOMES	COGNITIVE LEVEL
CO1.	Recognize the fundamental elements of DIP and representation of an image in multi dimensional aspects	Comprehension (Level K2)
CO2.	Apply arithmetic and logical operations on image enhancement process	Application(Level K3)
CO3.	Interpret the knowledge on compression techniques for security of an image	Analysis(Level K4)
CO4.	Verify various deduction mechanisms in image segmentation	Synthesis(Level K5)
CO5.	Categorize various compression techniques.	Analysis(Level K4) Synthesis(Level K5)

COURSE CONTENT**Unit - I:**

Digital Image Processing: Definition – The Origin of Digital Image Processing – Elements of digital image processing – Steps involved in DIP – Fundamental Steps in DIP – Structure of the Human Eye – Brightness Adaptation and Discrimination – Image Acquisition using a single sensor – Image Acquisition using sensor arrays.

Unit - II:

Basic concepts in image sampling and Quantization – Representing Digital Images – Spatial and Gray level resolution – Zooming and shrinking digital images – Neighbors of a pixel –

Adjacency, Connectivity – Regions and Boundaries – Distance Measures, Image Operations on a pixel basis.

Unit - III:

Image Enhancement in Spatial Domain – Gray level transformation – Image Negatives – Log Transformations – Enhancements using arithmetic/logical operations – Image Subtraction – Image Averaging.

Unit - IV:

Image Compression: Coding Redundancy – Inter pixel redundancy – Psycho visual redundancy – Image compression models – The source encoder and decoder – The channel Encoder and Decoder.

Unit - V:

Image Segmentation: Detection of discontinuous – Point detection – Line Detection – Edge Detection – Representation of Images: Chain Codes – Polygonal approximation – Signatures – Boundary segments – Skeletons.

TEXT BOOK:

1. Rafael C. Gonzalez & Richard. E. Woods , Digital Image Processing– Addison Wesley publishing Company Inc.(Third Indian Reprint, 2000).

REFERENCE BOOKS:

2. Anil K.Jain, "Fundamentals Digital Image Processing", Pearson Education.
3. B.Chandra and D.Dutta Majundar,"Digital Image Processing and Analysis", Prentice Hall of India private Ltd., New Delhi.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	M	M	H	M
CO2	H	M	M	M	H
CO3	H	M	M	H	H
CO4	H	M	H	M	H
CO5	M	H	M	H	M

*H-High;

M-Medium;

L-Low;

ELECTIVE 3.3

SOFTWARE TESTING

Hours:6**Credits: 5****Semester: VI****Preamble**

This course impart the Knowledge on software development Life Cycle Models and various testing Concepts.

Course Outcomes

On successful completion of the course the students will be able to

CO	COURSE OUTCOMES	COGNITIVE LEVEL
CO1.	Recollect the concept various testing methods	Knowledge(Level K1)
CO2.	Get the idea of White box testing, Black box testing and Integration testing	Comprehension (Level K2)
CO3.	Figure out testing process by Test Planning, Management, execution and Reporting	Analysis(Level K4)
CO4.	Validate the project by using test metrics and measurements	Evaluation (Level K6)
CO5.	To apply the testing procedure in software development process	Application(Level K3)

.COURSE CONTENT

Unit - I:

Software Development Life Cycle Models: Phases of Software Project – Quality, Quality Assurance and Quality Control – Testing, Verification and Validation-Process Model to Represent Different Phases – Life cycle Models

White Box Testing: What is White Box Testing – Static Testing – Structural Testing – Challenges in White Box Testing.

Unit - II:

Black Box Testing: What is Black Box Testing? – Why Black Box Testing? – When to do Black Box Testing? – How to do Black Box Testing?

Integration Testing: What is Integration Testing? – Integration Testing as a Type of Testing – Integration Testing as a Phase of Testing – Scenario Testing – Defect Bash.

Unit - III:

System and Acceptance Testing: System Testing Overview – Why is System Testing Done? – Functional versus Non-Functional Testing – Functional Testing – Non-Functional Testing – Acceptance Testing – Summary of Test Phases.

Unit - IV:

Performance Testing: Introduction – Factors Governing Performance Testing – Methodology for Performance Testing – Tools for Performance Testing – Process for Performance Testing – Challenges.

Regression Testing: What is Regression Testing? Types of Regression Testing – When to do Regression Testing? – How to do Regression Testing? – Best Practices in Regression Testing.

Unit - V:

Test Planning, Management, Execution and Reporting: Introduction – Test Planning – Test Management – Test Process – Test Reporting – Best Practices.

Test Metrics and Measurements: Project Metrics – Progress Metrics – Productivity Metrics-Release Metrics.

TEXT BOOK:

- Software Testing Principles and Practices, Srinivasan Desikan, Gopalaswamy Ramesh.

REFERENCE BOOK:

- Lessons Learned in Software Testing, C.Kaner, J.Bach and Pettichord, 2001.

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	H	H
CO2	H	M	M	M	H
CO3	H	H	H	H	H
CO4	H	H	H	M	H
CO5	M	H	M	H	M

*H-High;

M-Medium;

L-Low;

SKILL BASED COURSE VI**MUBCSS6 - SOFT SKILLS****Hours:2****Credits: 2****Semester: VI****Preamble**

This course offers the students to develop the reading, writing, understanding and communication skills for employment.

Course Outcomes

On successful completion of the course the students will be able to

CO	COURSE OUTCOMES	COGNITIVE LEVEL
CO1.	Describe the reading, writing, listening and communication skills.	Knowledge (Level K1)
CO2.	Discuss the reading, writing, listening and communication skills.	Comprehension (Level K2)
CO3.	Dramatize the day today activities with the help of soft skills.	Application (Level K3)
CO4.	Analyze and improve the skills for employability.	Analysis (Level K4)
CO5.	Analyze and improve the skills for employability.	Analysis (Level K4)

COURSE CONTENT**Unit - I:**

- 1.1. Skills in Listening and Writing
- 1.2. Skills in Reading and Understanding

Unit - II:

- 2.1. Skills to Read and Respond to Instructions
- 2.2. Skills of Interpretation and Transcoding Information

Unit - III:

- 3.1. Skills in Seeking and Responding to Information
- 3.2. Skills of Day-to-Day communication

Unit - IV:

- 4.1. Grammatical skills and Spelling rules
- 4.2. Career skills

Unit - V:

5.1. Skills of formal and in-formal expressions

5.2. Skills of non-verbal communication

TEXT BOOK

- Soft Skills for Linguistic Communication by Trinity Publication in Thiruvalluvar University

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	M	M	M	H	H
CO2	M	M	M	H	H
CO3	M	M	M	H	H
CO4	H	H	H	M	H
CO5	M	M	M	H	M

H-High;*M-Medium;****L-Low;**

NON MAJOR ELECTIVE -II
MUBCN2 - WEB DESIGNING
(Offered to other department Students)

Hours: 2

Credits : 2

Semester: VI

Preamble

This course obtain the students to acquire the knowledge on design webpage and websites using HTML tags.

Course Outcomes

On successful completion of the course, the students will be able to

CO	COURSE OUTCOMES	COGNITIVE LEVEL
CO1.	Classify various HTML tags.	Comprehension (Level K2)
CO2.	Apply various HTML tags.	Applications(Level K3)
CO3.	Illustrate HTML tags in simple programs.	Applications(Level K3)
CO4.	Describe HTML tags in simple programs.	Analysis(Level K4)
CO5.	Design websites using HTML tag.	Synthesis(Level K5)

COURSE CONTENT

Unit - I:

Basics of Internet and World Wide Web : Network – History of internet – E-mail – WWW – Browser – Search Engines.

Unit - II:

Introduction to HTML: Introduction to HTML – Homepage – HTML documents – Anchor tag – Hyperlinks.

Unit - III:

Web Page Design: **Header Section:** Prologue – Links – Colorful webpage – Comment lines – Sample HTML.

Unit - IV:

Body Section: Heading printing – Aligning Heading – Horizontal rule – Paragraph – Formatting Tags – Logical style – Physical style – Images and Pictures

Unit - V:

Ordered And Unordered List: List – Unordered list – Heading Inner List – Type attribute – Nested List – **Table Handling:** Table – Table Creation – Width – Cells spanning – Cell alignment – Coloring Cells – Column specifications – Sample Tables

TEXT BOOK:

- World wide web design with HTML, C.Xavier , Tata McGraw- Hill Publishing , New Delhi.

.Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	H	H
CO2	H	H	H	H	H
CO3	M	M	M	H	H
CO4	H	M	H	H	H
CO5	M	H	M	H	M

***H-High;**

M-Medium;

L-Low;

Extra Credit Paper

UGEGC-Green Computing

Preamble

This course obtain the students to acquire the knowledge on green computing in IT.

Course Outcomes

On successful completion of the course, the students will be able to

CO	COURSE OUTCOMES	COGNITIVE LEVEL
CO1.	Describe basic concepts of green computing	Knowledge(Level K1)
CO2.	Analyze the role of Electric Utilities	Analysis(Level K4)
CO3.	Understand the application areas of Green Computing	Comprehension (Level K2)
CO4.	Implement interfacing of various Green Computing aspects	Analysis(Level K4)
CO5.	Evaluate the various state of the art methodologies	Synthesis(Level K5)

COURSE CONTENT

Unit - I:

The Importance of Green IT: The Growing Significance of Green IT and Green Data Centers - All Companies Can Take Basic Steps-Toward Green IT. The Basics of Green IT: Important Steps for Green IT - Tools for IT Energy Measurement, Monitoring, and Management.

Unit - II:

Collaboration Is Key for Green IT : IT Technology Vendors – Data Center Design and Build Businesses - Collaboration of Building Energy Management and IT Energy Management - IT Vendors and Collaboration - Energy Manager Software - Global Significance of Energy - Efficiency Certificate Program- Al Gore and Green Collaboration.

Unit - III:

The Role of Electric Utilities: The Significant Role of Electric Utilities and IT Energy Ratings in Green IT- Energy Utility Rate Case Incentives - Using Utility Rebates to Minimize Energy Costs in the Data Center- Power Company Incentives for Companies to Go Green - Energy - Efficiency Ratings for IT - IT Vendors Help Lead the Charge Virtualization.

Unit - IV:

Chillers, Cooling Tower Fans and Cooling Equipments: Starting with the Data Center Cooling Basics -Data Center Stored Energy Including Stored Cooling - Back to the Future - Water-Cooled Servers - Strategies for Increasing Data Center Cooling Efficiency - Fuel Cells for Data Center Electricity - Other Emerging Technologies for Data Centers.

Unit - V:

Case Study Green IT Energy Utilities - Universities and a Large Company - Worldwide Green IT.

TEXT BOOK :

- John Lamb, “The Greening of IT: How Companies Can Make a Difference for the Environment”

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	H	M
CO2	M	M	M	M	M
CO3	H	H	H	M	M
CO4	M	M	M	M	H
CO5	H	M	H	H	M

***H-High;**

M-Medium;

L-Low;

Extra Credit Paper

UGEICP-IPR, Plagiarism, Copyrights and Patents

Preamble

The course provides the fundamental aspects of Intellectual property Rights and to play a major role in development and management of innovative projects in industries.

Course Outcomes

On successful completion of the course, the students will be able to

CO	COURSE OUTCOMES	COGNITIVE LEVEL
CO1.	Understand and use the basic concepts of Intellectual property Rights	Knowledge(Level K1)
CO2.	Examine the Concepts of Intellectual property Rights such as Plagiarism, Copyrights, Infringement, Patents and Licensing	Knowledge(Level K1)
CO3.	To identify the significance of practice and procedure of Patents.	Comprehension (Level K2)
CO4.	Understand and use the basic concepts of Intellectual property Rights	Comprehension (Level K2) Applications(Level K3)
CO5.	Examine the Concepts of Intellectual property Rights such as Plagiarism, Copyrights, Infringement, Patents and Licensing	Analysis(Level K4)

Unit - I

Introduction to IPR, Overview, Importance, IPR in India and IPR abroad

Unit – II

Plagiarism, Etymology, Legal aspects, Academic plagiarism, Journalism, Self plagiarism

Unit - III

Copyrights, Infringement: Searching, Filing, Distinction between related and copy rights, Trademarks, Role in commerce, Importance, Protection, Registration, Domain names, Trademark Protection Vs. Domain Name Protection, Protection of Domain Names in India

Unit -IV

Patents, Granting, Industrial Designs, Design Patents, Scope, Protection, Filing infringement, Difference between Designs, Patents, International Treaties - Geographical Indications, International protection

Unit - V

Licensing, Commercialization, Advantages and Disadvantages of a Licensing Agreement, Criminal laws, Case studies in IPR

TEXT BOOKS

- T. M Murray and M.J. Mehlman, Encyclopedia of Ethical, Legal and Policy issues in Biotechnology, John Wiley Sons 2000
- S.Sasikala, Inculcating Ethics on “IPR, Plagiarism, Copyrights and Patents”, Teachers Publishing House, 2018

REFERENCE BOOKS

- Ajit Parulekar and Sarita D’ Souza, Indian Patents Law – Legal; Business Implications; Macmillan India ltd , 2006
- B.L.Wadehra; Law Relating to Patents, Trade Marks, Copyright, Designs; Geographical Indications; Universal law Publishing Pvt. Ltd., India 2000

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	M	M	H
CO2	M	H	H	H	H
CO3	H	H	M	H	H
CO4	H	H	M	H	M
CO5	H	M	M	H	M

H-High;*M-Medium;****L-Low;**

EXTRA CREDIT PAPER
UGEMOC-3.MOOC

Preamble

This course motivate the students to learn online course

Course Outcomes

At the end of the course ,the students will able to gain the knowledge in the specific area and get a online certificate

CO	COURSE OUTCOMES	COGNITIVE LEVEL
CO1.	Understand and use the web services available in Internet	Knowledge (Level K1) Comprehension (Level K2)
CO2.	Know the web resources in Internet.	Analysis (Level K4)
CO3.	Interpret usage of Online courses.	Synthesis (Level K5)
CO4.	Know the available course content of the new technologies.	Analysis (Level K4)
CO5.	Get an idea of New technologies.	Application(Level K3)

VALUE ADDED COURSE
HARDWARE AND TROUBLE SHOOTING

Programme: UG

Subject : All Subjects

Course Type: Value Added Course – I

Contact Hours: 30

Course: Hardware and Troubleshooting

CIA: 100

Course Outcomes:

CO	COURSE OUTCOMES	COGNITIVE LEVEL
CO1.	Obtaining knowledge of troubleshoot the hardware components of a computer.	Knowledge (Level K1)
CO2.	Comprehending the troubleshooting techniques for storage devices, input and output devices.	Comprehension (Level K2)
CO3.	Applying the troubleshooting techniques for hardware failures.	Application (Level K3)
CO4.	Examining the troubleshooting techniques in Network, Printers and Mother board.	Analysis (Level K4)
CO5.	Assembling a new system with standard hardware component	Synthesis (Level K5)

COURSE CONTENT

Unit - I: Introduction:

Mother boards & its types-ports, slots, connectors, add on cards, power supply units and cabinet types.

Unit - II: Storage Devices.

Primary & Secondary storage medium-magnetic disc, RAM, ROM, PROM, EPROM, Floppy, CD-ROM,CD-R/W, DVD.

Unit - III: Hardware Troubleshooting:

Printers, Floppy drive, Microphone.

Unit - IV: Hardware Troubleshooting:

Scanner, Network, Hardware failure, Testing,CMOS, CDROM, Hard disk drive

Unit - V: Hardware Troubleshooting:

Monitor, Mother Board, Sound Card, Video Card.

Text Book:

- Stephen J. Bigelow, —Trouble Shooting, maintaining and Repairing PCs, Tata McGraw-Hill, New Delhi, 2001.

Reference Books:

- Craig Zacker & John Rourke, —The Complete Reference: PC Hardware, Tata McGraw-Hill, New Delhi, 2001.
- Mike Meyers, —Introduction to PC Hardware and Trouble Shooting, Tata McGraw-Hill, New Delhi, 2003.
- B. Govindarajulu, —IBM PC and Clones Hardware Trouble Shooting and Maintenance, Tata McGraw-Hill, New Delhi, 2002.

Question Pattern**Section – A:**

Seven questions are to be given. Five questions are to be answered. 5 x 20 = 100 marks

Total marks = 100

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	H	H	M	H
CO2	M	H	H	M	H
CO3	H	H	H	H	H
CO4	H	H	M	H	H
CO5	H	M	H	H	H

***H-High;**

M-Medium;

L-Low;

VALUE ADDED COURSE**APPLICATION DEVELOPMENT IN PROGRAMMING LANGUAGES****Programme:** UG**Course Type:** Value Added Course – II**Course:** Application Development in Programming Languages**Course Outcomes:****Subject :** All Subjects**Contact Hours:** 30**CIA:** 100

CO	COURSE OUTCOMES	COGNITIVE LEVEL
CO1.	Acquiring the knowledge of Application Development in Programming Languages	Knowledge (Level K1)
CO2.	Understanding the concept of interpreter and Compiler	Comprehension (Level K2)
CO3.	Illustrating categories of programming languages	Application (Level K3)
CO4.	Correlating various programming languages used in popular website	Analysis (Level K4)
CO5.	Developing simple applications in structured and object oriented Programming Languages.	Synthesis (Level K5)

COURSE CONTENT**Unit - I:**

Introduction- Categories of Programming Languages

Interpreted Programming Languages: Introduction – Examples- Advantages and disadvantages.

Compiled Programming Languages: Introduction – Advantages and Disadvantages – Examples.

Unit - II:

Functional Programming Languages: Introduction – Categories –Examples.

Scripting Languages: Introduction- Advantages – Disadvantages- Examples.

Markup Languages : Introduction –Examples.

Unit - III :

Application Development in Structured Programming

Unit - IV:

Application Development in Object Oriented Programming

Unit - V:

Programming Languages used in most popular websites: Google.com – Facebook.com-
YouTube.com –Yahoo-Amazon.Com – Wikipedia.org- Twitter.com – LinkedIn.com.

Web links:

- <https://www.typesnuses.com/types-of-programming-languages-with-differences/>
- [https://en.wikipedia.org/wiki/C_\(programming_language\)](https://en.wikipedia.org/wiki/C_(programming_language))
- https://en.wikipedia.org/wiki/Object-oriented_programming
- https://en.wikipedia.org/wiki/Programming_languages_used_in_most_popular_websites

Question Pattern**Section – A:**

Seven questions are to be given. Five questions are to be answered. 5 x 20 = 100 marks

Total marks = 100

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	M	H	M	H
CO2	H	H	H	H	H
CO3	H	H	H	M	H
CO4	M	M	H	H	H
CO5	H	M	H	M	H

***H-High;**

M-Medium;

L-Low;

VALUE ADDED COURSE
ICT TOOLS AND TECHNOLOGIES LAB

Programme: UG

Subject: All Subjects

Course Type: Value Added Course – III

Contact Hours: 30

Course: ICT Tools and Technologies Lab

CIA: 100

Course Outcomes:

CO	COURSE OUTCOMES	COGNITIVE LEVEL
CO1.	Acquiring knowledge about video making and editing techniques	Knowledge (Level K1)
CO2.	Applying different ICT tools for entrepreneurship development	Application (Level K3)
CO3.	Enhancing the digital skill-set required in workplace	Synthesis (Level K5)
CO4.	Appreciation of Technology in everyday life	Analysis (Level K4)
CO5.	Helps them to adjust to the inevitable future changes	Evaluation (Level K6)

COURSE CONTENT

PROGRAM LIST

Unit - I: ICT in Assessment:

- Online Quiz Creation
- Survey and Feedback creation

Unit - II: Professional Development through ICT:

- Video making tools
- Video editing
- Video publishing in You tube

Unit - III: Website Creation:

- Web node and blog creation

Unit - IV: Role of ICT in Administration:

- Record Keeping
- Event scheduling
- Budget calculation

Unit - V: Application Software and its educational applications:

- Word Processing using Google doc
- Presentations using Google slides

Websites:

Forms.google.com

Question Pattern

Practical Examination: 100 marks

Mapping					
COs & POs	PO1	PO2	PO3	PO4	PO5
CO1	H	M	H	M	H
CO2	H	M	H	H	H
CO3	H	H	H	H	H
CO4	H	M	H	M	H
CO5	M	H	H	H	M

***H-High;**

M-Medium;

L-Low;