

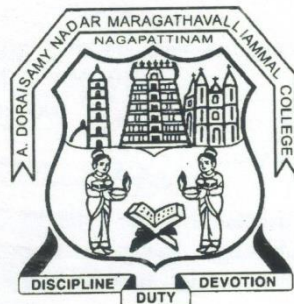
**A.D.M COLLEGE FOR WOMEN (AUTONOMOUS),**

**NAGAPATTINAM-611 001**

**(Nationally Re-accredited with 'A' Grade by NAAC- 3<sup>rd</sup> Cycle)**

**PG DEPARTMENT OF COMPUTER SCIENCE**

**(for the candidates admitted from the academic year 2019-2020)**



**B.Sc., INFORMATION TECHNOLOGY**

**SYLLABUS**

# A.D.M. COLLEGE FOR WOMEN (AUTONOMOUS), NAGAPATTINAM

## B.Sc., Information Technology Degree Programme

(for the candidates admitted from the academic year 2019-2020)

### PROGRAMME OBJECTIVES

- The programme aims to produce graduates who have been exposed to experiences that will prepare them to address the information processing requirements of organizations.
- The curriculum has been carefully designed in collaboration with our course experts and in consultation with our industrial partners.
- Students will learn about the concepts of information technology and management of information in organizations by understanding systems concepts, communications and information technologies.

### B.Sc., Information Technology 2018 – 2021

#### STRUCTURE OF THE PROGRAMME

Part	Title of the Part	No. of Papers	Hours	Credit
I	Language - Tamil	4	24	12
II	English	4	24	12
III	Core Course	15	70	66
	Allied	6	27	18
	Major Based Elective	3	18	14
IV	Skill Based Elective	3	6	6
	Non-Major Elective	2	4	4
V	Extension Activities	0	0	1
	Value Education	1	2	2
	Environmental Studies	1	2	2
	Soft-Skill Development	1	2	2
	Gender Studies	1	1	1
	<b>Total</b>	<b>41</b>	<b>180</b>	<b>140</b>

### Passing Minimum

A candidate shall be declared to have passed in each course if she secures not less than 40% marks out of 75 marks (i.e., 30 marks) in the End Semester Examination (SE) and 40% out of 25 marks (i.e., 10 marks) in the Continuous Internal Assessment.(CIA).

**A.D.M. COLLEGE FOR WOMEN(AUTONOMOUS), NAGAPATTINAM**  
 (RE-ACCREDITED WITH “A” GRADE BY NAAC)  
**DEPARTMENT OF COMPUTER SCIENCE**  
**B.Sc., INFORMATION TECHNOLOGY**  
**CHOICE BASED CREDIT SYSTEM SUBJECTS OF STUDY**  
**AND SCHEME OF EXAMINATION 2018-2021**

SEM	COURSE	COURSE-TITLE	INST HOUR/ WEEK	CREDIT	EXAM HOURS	MARKS		TOTAL
						INT	EXT	
V	Core Course(CC) X	Computer Networks	6	6	3	25	75	100
	Core Course-(CC) XI	Operating Systems	6	6	3	25	75	100
	Core Course (CC) XII	Database Systems Lab	6	6	3	40	60	100
	Skill Based Course II	Mobile Computing	2	2	3	25	75	100
	Skill Based Course III	Smart Device Programming Lab	2	2	3	40	60	100
	Major Based Elective Course-I (MBE)	<b>1.Database Systems</b> 2. Object Oriented System Design	6	4	3	25	75	100
		Soft Skills Development	2	2	3	25	75	100
	<b>Total</b>		<b>30</b>	<b>28</b>				<b>700</b>
VI	Core Course (CC) XIII	Computer Graphics and Multimedia	6	6	3	25	75	100
	Core course(CC) – XIV	.Net Technology	6	6	3	25	75	100
	Core course(CC) – XV	Multimedia Lab	5	5	3	40	60	100
	Major Based Elective Course-II (MBE)	<b>1. Cloud Computing</b> 2. E-Commerce	6	5	3	25	75	100
	Major Based Elective Course-III (MBE)	.Net Technology Lab / <b>Software Development Lab</b>	6	5	3	40	60	100
	Extension Activities		-	1				
	Gender Studies		1	1	3	25	75	100
	<b>Total</b>		<b>30</b>	<b>29</b>				<b>6 00</b>
	<b>Grand Total</b>		<b>180</b>	<b>140</b>				<b>4100</b>

First Allied	Second Allied
I-Mathematics	II-Digital Electronics & Microprocessor III-Digital Marketing

# Department of Computer Science

## Mark Allocation for Theory Papers

CIA	-	25 Marks
External	-	<u>75 Marks</u>
		<b><u>100 Marks</u></b>

### **CIA Component**

Test	-	10 Marks
Assignment	-	2 Marks
Seminar	-	3 Marks
Quiz/Group Discussion	-	5 Marks
Attendance	-	<u>5 Marks</u>
		<b><u>25 Marks</u></b>

### **Pattern of question Paper (Theory)**

Section – A	10 x 2 = 20 Marks	(No Choice)
Section – B	5 x 5 = 25 Marks	(Either or)
Section – C	3 x 10 = <u>30 Marks</u>	(Any three out of 5)
<b>Total</b>		<b><u>75 Marks</u></b>

# Department of Computer Science

## Practical Question Pattern (for B.Sc., CS, B.Sc., IT, BCA & NME Students)

**Internal: 40**

**Total Marks: 100**

**External: 60**

**Time : 3 Hrs**

**ANSWER ALL THE QUESTIONS:**

1. -----
2. -----

Record -10 Marks

Program 1- 25 Marks

Program 2- 25 Marks

# **PG DEPARTMENT OF COMPUTER SCIENCE**

**(for the candidates admitted from the academic year 2019-2020)**

## **B.Sc., INFORMATION TECHNOLOGY**

### **PROGRAMME OUTCOMES**

**PO1:** Demonstrate professionally with social, cultural and ethical responsibility as an individual as well as in multifaceted teams with positive attitude

**PO2:** Adapt to sustain in emerging era and constantly upgrade skills towards independent and lifelong learning.

**PO3:** Communicate complex concepts with professionalism by adapting appropriate resources and modern tools.

**PO4:** Design, develop algorithms and provide software solutions to cater the industry needs and to develop the skills to take up entrepreneurship and higher studies in the field of Computer Science

**PO5:** Inculcate skills to excel in the fields of Computer Science and IT enabled services, Public and Private sectors, Teaching and Research.

### **PROGRAMME SPECIFIC OUTCOMES**

**PSO1:** Apply the knowledge gained during the course of the program to identify, formulate and solve real life problems to meet the core competency with continuous up gradation.

**PSO2:** Apply the knowledge of ethical and management principles required to work in a team with stewardship of the society.

**PSO 3:** Able to apply the knowledge gained during the course of the programme in the areas of problem solving, analysis, design & development of software and hardware to choose a career option in high degree of employability / entrepreneurship / Higher Education.

**PSO 4:** Evolve as globally competent computer professionals possessing leadership skills and domain knowledge for developing innovative solutions in multi disciplinary domains.

**PSO 5:** To acquire the knowledge on multiple programming skills to develop core software products that lays the foundation for further application development in the field of computer science and recent technology with focus on multimedia and animation.

**PSO 6:** Use and apply current technical concepts and practices in the core Information Technologies of human computer interaction, information management, programming, networking.

**PSO 7:** Effectively integrate IT-based solutions into the user environment.

**PSO 8:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**CORE COURSE X**  
**COMPUTER NETWORKS**

**Internal Marks : 25**

**Semester : V**

**External Marks : 75**

**No. of Hours/Week : 6**

**Exam Hours : 3**

**Credit : 6**

**Course Objectives:**

- Build an understanding of the fundamental concepts of computer networking.
- Familiarize the student with the basic taxonomy and terminology of the computer networking area.
- Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
- Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.
- To explain the role of protocols in networking and to analyze the services and features of the various layers in the protocol stack.

**UNIT I**

**Introduction:** Data Communications – Components-Networks - Protocol and Standards – **Basic Concept:** Line Configuration – Topology – Transmission mode – Categories of Networks – The OSI model: The model – Function of the Layers.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT II**

**Signals:** Analog and Digital – Periodic and Non Periodic signals – Composite Signals - Digital Signals – Transmission of Digital Data: Digital Data Transmission – DTE – DCE Interface – MODEMS – **Transmission Media:** Guided Media – Multiplexing: FDM, WDM, TDM – Multiplexing Applications.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT III**

**Error Detection and Correction:** Types of Errors – Types of Redundancy Check – Error Correction – Data Link Control: Line Discipline – Flow control – Error control – **Data link protocols:** Asynchronous protocols – Synchronous protocols – Character Oriented Protocol – Bit Oriented Protocol.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

## UNIT IV

**Switching:** Circuit switching – Packet switching – Message switching – **Network and Interface Devices:** Repeaters – Bridges – Routers – Gateway – other devices – Routing Algorithms – Distance Vector Algorithm – Link state Algorithms. **Transport layer:** Duties of the transport layer – Connection – OSI transport Protocol.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

## UNIT V

**LAN:** Ethernet Technologies - Wireless LAN – Applications - Requirements – Planning –Architecture-IEEE802.11 – WAP Services – Network Management – Goal of Network Management-Standards-Network Management Model - Simple Network Management Protocol.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

## TEXT BOOK

Behrouz A.Forouzan, Data Communications and Networking, Tata McGraw Hill, Second Edition.

## REFERENCES

1. Andrew S. Tanenbaum, “Computer Networks”, Pearson Education, 5<sup>th</sup> Ed., New Delhi, 2011.
2. William Stallings, “Data and Computer Communications”, Pearson Education, 10th Ed., New Delhi 2014.
3. Jochen Schiller, “Mobile Communication”, 2nd ed., Pearson Education, New Delhi, 2009.

## Web-Resources:

<https://ceng393.cankaya.edu.tr/course.php?page=Lecture%20Notes>

[https://www.tutorialspoint.com/data\\_communication\\_computer\\_network/data\\_communication\\_computer\\_network\\_tutorial.pdf](https://www.tutorialspoint.com/data_communication_computer_network/data_communication_computer_network_tutorial.pdf)

## Course Outcomes:

On completion of the Course, Students should be able to

- Independently understand basic computer network technology.
- Identify the different types of network topologies and protocols.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
- Identify the different types of network devices and their functions within a network
- Understand and building the skills of subnetting and routing mechanisms.
- Familiarity with the basic protocols of computer networks, and how they can be used to assist in network design and implementation.



**CORE COURSE XI**  
**OPERATING SYSTEMS**

**Internal Marks : 25**

**Semester : V**

**External Marks : 75**

**No. of Hours/Week : 6**

**Exam Hours : 3**

**Credit : 6**

**Course Objectives**

- To provide fundamental concepts of all managements in an operating system.
- To gain the basic knowledge about the operating systems and its various schemes and services.
- To make students able to learn different types of operating systems along with concept of file systems and CPU scheduling algorithms used in operating system.
- To provide students knowledge of memory management and deadlock handling algorithms
- At the end of the course, students will be able to implement various algorithms required for management, scheduling, allocation and communication used in operating system.

**UNIT I**

Operating System Introduction Basic Concepts and Terminology An OS Resource Manager OS process view point OS hierarchical and extended machine view Memory Management: Single Contiguous Allocation Introduction to Multiprogramming.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT II**

Memory Management: Relocatable Partitioned Memory Management Paged Memory Management Demand Memory Management Segmented Memory Management Segmented and Demand-Paged Memory Management Swapping and Overlays.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT III**

Job and Processor scheduling: Process Control Block Scheduling Policies Scheduling Algorithms : In non multiprogramming environment In multiprogramming environment.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

## UNIT IV

Process Synchronization: Race Conditions Hardware solution to mutual exclusion problem, Test and set instruction Wait and signal mechanism semaphores, Dead Lock conditions Prevention Banker s Algorithm Detection and Recovery.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

## UNIT V

Device Management: I/O Devices Device Management Functions Serial and direct access storage devices Disk Scheduling File Management: Functions file organization allocation methods.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

## TEXT BOOKS

1. Operating System by Stuart E Madnick and John Donovan, Tata McGraw Hill.
2. Fundamentals of Operating System by Prof. R Sridhar, Dynaram Pub., Bangalore.

## REFERENCE BOOK

1. Operating System (Concepts and Design) Milan Milenkovic McGraw Hill International
2. E. Andrew S. Tanenbaum, “Modern Operating Systems”, 4th ed., Prentice Hall, New Delhi, 2014.dition

## Web-Resources:

<http://www.svecw.edu.in/Docs%5CCSEOSLNotes2013.pdf>

[http://www.crectirupati.com/sites/default/files/lecture\\_notes/Operating%20Systems%20Lecture%20Notes.pdf](http://www.crectirupati.com/sites/default/files/lecture_notes/Operating%20Systems%20Lecture%20Notes.pdf)

## Course Outcomes:

On completion of the Course, Students should be able to

- Understand the basic concept of Computer System and Operating System Structure
- Gain Knowledge of the fundamental aspects of process and processor managements with deadlocks and CPU scheduling
- Introduce memory and virtual memory techniques
- Understand files, directories and its accessing methods and its structures
- Ability to know mass storage devices and its scheduling
- Understand the security on the operating system and protection mechanisms.

**CORE COURSE XII**  
**DATABASE SYSTEMS LAB**

**Internal Marks : 25**

**Semester : V**

**External Marks : 75**

**No. of Hours/Week : 6**

**Exam Hours : 3**

**Credit : 6**

**Course Objectives**

- To acquire skills in SQL statements with various constructs
- To acquire skills in PL/SQL Programming
- To practice with stored Objects, functions, procedures, triggers
- Design different views of tables for different users and to apply embedded and nested queries.
- Design and implement a database for a given problem according to well known design principles that balance data retrieval performance with data consistency.

**List of Practical'ss**

1. SQL - Data Definition Language
  - Table creation
  - Table altering
  - Drop table
2. SQL - Data Manipulation Language
  - Data insertion
  - Built-in functions
  - Set operations
  - Join operation
  - Nested Sub queries
  - Views
3. PL/SQL Procedure
  - Cursor
  - Procedure
  - Functions
  - Triggers

**Course Outcomes**

On completion of the Course, Students should be able to

- Understand, analyze and apply common SQL statements including DDL, DML and DCL statements to perform different operations.
- Design and implement a database schema for a given problem-domain
- Normalize a database
- Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS
- Programming PL/SQL including stored procedures, stored functions, cursors, packages

**SKILL BASED COURSE II**  
**MOBILE COMPUTING**

**Internal Marks : 25**

**External Marks : 75**

**Exam Hours : 3**

**Semester : V**

**No. of Hours/Week : 2**

**Credit : 2**

**Course Objectives**

- To understand the Architectures, Synchronization Process and Operating Systems in Mobile Computing.
- To understand the basic concepts and methods of mobile communication systems.
- To impart fundamental concepts in the area of mobile computing, to provide a computer systems perspective on the converging areas of wireless networking, embedded systems, and software, and to introduce selected topics of current research interest in the field.
- It will provide a complete overview of the mobile computing subject area, including the latest research
- In both broad and in-depth knowledge, and a critical understanding of mobile computing from different viewpoints: infrastructures, principles and theories, technologies, and applications in different domains.

**UNIT I**

Mobile Communications - An Overview : Mobile Computing - Mobile Computing Architecture - Mobile Devices - Mobile System Networks - Data Dissemination - Mobility Management – Security.

**(Content – 4 Hrs, Assessment - 2 Hrs)**

**(6 Hrs)**

**UNIT II**

Mobile Devices and Systems : Mobile Phones - Digital Music Players - Handheld Pocket Computers - Handheld Devices with Operating Systems - Smart Systems - Limitations of Mobile Devices - Automotive Systems.

**(Content – 4 Hrs, Assessment - 2 Hrs)**

**(6 Hrs)**

**UNIT III**

GSM and Similar Architectures : GSM Services and System Architecture - Radio Interfaces - Protocols - Localization - Calling - Handover - Security - New Data Devices - General Packet Radio Service - High Speed Circuit Switched Data.

**(Content – 4 Hrs, Assessment - 2 Hrs)**

**(6 Hrs)**

**UNIT IV**

Data Synchronization in Mobile Computing Systems : Synchronization - Synchronization Software for Mobile Devices - Synchronization Protocols - Mobile Devices

Server and Management : Mobile Agent - Application Server - Gateways - Portals - Service Discovery - Device Management - Mobile File Systems – Security.

(Content – 4 Hrs, Assessment - 2 Hrs)

(6 Hrs)

## **UNIT V**

Mobile Operating Systems :Operating System-Palm OS-Windows CE-Symbian OS-Linux for Mobile Devices.

(Content – 4 Hrs, Assessment - 2 Hrs)

(6 Hrs)

### **Text Book**

Mobile Computing, Rajkamal, Oxford University Press, 2011.

### **REFERENCE**

Mobile Computing, KumkumGarg, Pearson Education, 2010.

### **Web Resources:**

<https://cseexamhacks.files.wordpress.com/2017/01/mobile-computing.pdf>

<https://www.vidyarthiplus.com/vp/attachment.php?aid=43026>

### **Course Outcomes:**

On completion of the Course, Students should be able to

- To explore Mobile security issues.
- To integrate multimedia, camera and Location based services in Android Application
- To be familiarized with Intent, Broadcast receivers and Internet services.
- To learn activity creation and Android UI designing.
- Describe the possible future of mobile computing technologies and applications.

**SKILL BASED COURSE III**  
**SMART DEVICE PROGRAMMING LAB**

**Internal Marks : 25**

**Semester : V**

**External Marks : 75**

**No. of Hours/Week : 2**

**Exam Hours : 3**

**Credit : 2**

**Course Objectives:**

- Describe Android platform, Architecture and features.
- Understanding of the real-time embedded and mobile systems, and the techniques essential to the design and implementation of mobile applications.
- Understand the various parts of an Android Project.
- Use the Android Emulator.
- Install and run the application on a physical device.
- Create a simple User Interface.

**List of Practicals:**

1. Different Layout design including nested layout for a single biodata.
2. Arithmetic Operation for two numbers
3. Business Calculator
4. Animation: Bouncing of a ball
5. Intent
6. Database SQLite: Student Biodata
7. Fragments - Tablet Programming
8. Media Player
9. Repeated Alarm
10. Google Maps

**Course Outcomes:**

On completion of the Course, Students should be able to

- Use Intent, Broadcast receivers and Internet services in Android App.
- Design and implement Database Application and Content providers.
- Use multimedia, camera and Location based services in Android App.
- Discuss various security issues in Android platform
- Design User Interface and develop activity for Android App.

**MAJOR BASED ELECTIVE COURSE (MBE) – I  
DATABASE SYSTEMS**

**Internal Marks : 25**

**Semester : V**

**External Marks : 75**

**No. of Hours/Week : 6**

**Exam Hours : 3**

**Credit : 4**

**Course Objectives**

- To provide the basic concepts of the Database Systems including Data Models, Storage Structure, Normalization and SQL.
- Distinguish between file processing system and DBMS
- Describe Database users including data base administrator
- Describe data models, schemas and instances.
- Describe DBMS Architecture & Data Independence

**UNIT I**

Introduction: Database-System Applications- Purpose of Database Systems - View of Data --Database Languages - Relational Databases - Database Design -Object-Based and Semi structured Databases - Data Storage and Querying Transaction Management -Data Mining and Analysis - Database Architecture - Database Users and Administrators - History of Database Systems.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT II**

Relational Model: Structure of Relational Databases - Fundamental Relational-Algebra Operations Additional Relational-Algebra Operations- Extended Relational-Algebra Operations - Null Values - Modification of the Database.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT III**

SQL: Data Definition - Basic Structure of SQL Queries - Set Operations-Aggregate Functions - Null Values- Nested Subqueries - Complex Queries - Views -Modification of the Database - Joined Relations - SQL Data Types and Schemas - Integrity Constraints - Authorization - Embedded SQL.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT IV**

Relational Languages: The Tuple Relational Calculus - The Domain Relational Calculus - Query-by- Example. Database Design and the E-R Model: Overview of the Design Process - The Entity-Relationship Model - 3 Constraints - Entity-Relationship Diagrams - Entity-Relationship Design Issues - Weak Entity Sets - Database Design for Banking Enterprise.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

## UNIT V

Relational Database Design: Features of Good Relational Designs - Atomic Domains and First Normal Form - Decomposition Using Functional Dependencies - Functional-Dependency Theory - Decomposition Using Functional Dependencies - Decomposition Using Multivalued Dependencies-More Normal Forms - Database-Design Process.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

### Text Book

Database System Concepts, Sixth edition, Abraham Silberschatz , Henry F. Korth, S. Sudarshan, McGraw-Hill-2010.

### Reference Book

Database Systems: Models, Languages, Design and Application, Ramez Elmasri, Pearson Education 2014 .

### Web-Resources:

<http://www.svecw.edu.in/Docs%5CITIIBTechIISemLecDBMS.pdf>

[http://www.kciti.edu/wp-content/uploads/2017/07/dbms\\_tutorial.pdf](http://www.kciti.edu/wp-content/uploads/2017/07/dbms_tutorial.pdf)

### Course Outcomes:

On completion of the Course, Students should be able to

- Emphasize the need, role, importance and uses of databases in application development
- Design E-R modeling for a given situation and provide the foundation for development of relational database structure.
- Identify the advantages of the database approach over the file based data storage system.
- Distinguish between different models of file organizing, storing and using of data.
- Understand the relational model and relational algebra operations.
- Normalize the relational tables applying normalization rules.
- Apply PL/SQL procedural interfaces statement on relational tables as per requirements.



## MAJOR BASED ELECTIVE COURSE (MBE) - I

### OBJECT ORIENTED SYSTEM DESIGN

**Internal Marks : 25**

**Semester : V**

**External Marks : 75**

**No. of Hours/Week : 6**

**Exam Hours : 3**

**Credit : 4**

#### Course Objectives

- To introduce various phases of a Object Oriented System Design and also to develop skills in designing a UML diagram.
- Specify, analyze and design the use case driven requirements for a particular system.
- Model the event driven state of object and transform them into implementation specific layouts.
- Identify, Analyze the subsystems, various components and collaborate them interchangeably.
- To implement the object-oriented modeling and design patterns to provide solutions to the real-world software design problems.

#### UNIT I

Overview of Object-oriented systems development Need for object orientation - Overview of the unified approach -Object Basics -Object-Oriented Systems Development Life Cycle The software development process- building high-quality software- object-oriented systems development- reusability.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

#### UNIT II

Object-Oriented Methodologies Unified Modeling Language Static and dynamic models- why modeling- introduction to the unified modeling language- UML diagrams- UML class diagram- Use-case diagram- UML dynamic modeling- model management- UML extensibility- UML meta-model.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

#### UNIT III

Object-Oriented Analysis Process- identifying Use Cases Use-case driven object-oriented analysis- business process modeling- Use-case model- Object Analysis- Classification classifications theory- approaches for identifying classes-Identifying object relationships - identifying attributes and methods- defining attributes by analyzing use cases and other UML diagrams.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

#### UNIT IV

The Object-Oriented Design Process and Design Axioms the object-oriented design process- object-oriented design axioms- corollaries- Design patterns and frameworks Describing Design patterns Façade Design pattern. Designing Classes - the object-oriented design philosophy- UML object constraint language- designing

classes- the process- class visibility- designing classes- refining attributes - designing methods and procedures-

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

## **UNIT V**

Access Layer - designing access layer classes- case study -View Layer- Designing interface objects user interface design as a creative process- designing view layer classes User satisfaction and usability testing Case Study - Analyzing the Bank ATM - Use-case model- developing effective documentation- Relationship analysis - defining attributes - object responsibility - defining methods for - refining attributes - designing methods - Designing the access layer - designing user interface.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

## **TEXT BOOKS**

1. Ali Bahrami, Object Oriented System Development, McGraw Hill International Edition, 1999.

2. Erich Gamma, Richard Helm, Ralph Johnson and John Vlissides, DESIGN PATTERNS Elements of reusable Object Oriented Software , Addison Wesley Professional Computing Series - Pearson Education -2003

## **REFERENCES**

1. Magnifying object-oriented analysis and design, **Author:** by ArpitaPatil Netra  
**Publication:** PHI
2. UML 2 and the Unified Process: Practical Object-Oriented Analysis and Design, Jim Arlow / IlaNeustadt.

## **Web-Resources:**

[https://www.iare.ac.in/sites/default/files/IARE\\_OOAD\\_Lecture%20Notes\\_All\\_Uni\\_TS.pdf](https://www.iare.ac.in/sites/default/files/IARE_OOAD_Lecture%20Notes_All_Uni_TS.pdf)

[http://www.crectirupati.com/sites/default/files/lecture\\_notes/OOAD-lecture%20notes.pdf](http://www.crectirupati.com/sites/default/files/lecture_notes/OOAD-lecture%20notes.pdf)

## **Course Outcomes:**

On completion of the Course, Students should be able to

- Become familiar with the Unified modelling Language.
- Understand the object-oriented approach to analysing and designing systems and software solutions. Employ the Unified modelling Language notations to create effective and efficient system designs.
- Understand the difference between writing programs for the software and doing analysis and design.
- Problem formulation and decomposition (analysis) and solution building (design) will be covered.

## **SOFT SKILLS DEVELOPMENT**

**Internal Marks : 25**

**Semester : V**

**External Marks : 75**

**No. of Hours/Week : 2**

**Exam Hours : 3**

**Credit : 2**

### **UNIT I**

Know thyself/Understanding Self: Introduction to soft skills-Self discovery-Developing positive attitude – Improving perceptions – Forming values.

### **UNIT II**

Interpersonal skills / Understanding others: Developing interpersonal relationships-Team building–Group dynamics-Networking-Improved work relationship.

### **UNIT III**

Communication Skills / Communication with others: Art of listening-Art of Reading- Art of Speaking-Art of Writing-Art of Writing E-Mail-E-Mail Etiquette.

### **UNIT IV**

Corporate Skills / Working with Others: Developing Body Language-Practising Etiquette and Memorism –Time Management-Stress Management.

### **UNIT V**

Selling Self/Job Hunting: Writing Resume / CV-Interview Skills-Group Discussion-Mock Interview-Mock GD-Goal Setting-Career Planning.

### **Text Book**

A Book an Development Of Soft Skill Dr. K. Meena & Dr.V. Ayothi. Soft Skills-Dr. K. Alex & Chand Company.

### **Reference Books**

1. Developing the leader within you John C. Maxwell
2. Good to Great by Jim Collins.
3. The Seven habits of highly effective people Stephen Covey.
4. Emotional Intelligence Daniel Goleman.
5. You can win Shine Khera.
6. Principle Centered Leadership Stephen Covey.

**CORE COURSE XIII**  
**COMPUTER GRAPHICS AND MULTIMEDIA**

<b>Internal Marks</b>	<b>: 25</b>	<b>Semester</b>	<b>: VI</b>
<b>External Marks</b>	<b>: 75</b>	<b>No. of Hours/Week</b>	<b>: 6</b>
<b>Exam Hrs</b>	<b>:3</b>	<b>Credit</b>	<b>: 6</b>

**Course Objectives**

- Introduces the concepts and implementation of computer graphics
- The main objective of this module is to introduce to the students the concepts of computer graphics.
- It starts with an overview of interactive computer graphics, two dimensional system and mapping.
- It presents the most important drawing algorithm, two-dimensional transformation; Clipping, filling and an introduction to 3-D graphics.
- Learn multimedia authoring tools.

**UNIT I**

Introduction: Overview of Graphics Systems - Video Display Devices - Refresh Cathode Ray Tubes - Raster Scan and Random Scan Displays - Raster Scan and Random Scan Display Processor - Colour CRT Monitors – DVST - 3D Viewing Devices - Input Devices - Hard Copy Devices.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT II**

Output primitives: Line drawing algorithms - DDA Line drawing algorithm - Bresenham's line drawing algorithm - Circle Drawing algorithms - Bresenham's circle drawing algorithm - Mid point circle drawing Algorithms - Area filling algorithms – Scan line algorithm – boundary fill algorithm – flood fill algorithm - character generation.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT III**

Attributes of Output primitives: line attributes – Curve attributes - Area fill attributes - Character attributes - bundled attributes - Anti aliasing techniques - 2D Transformations– Basic transformation – Composite transformation – other transformation.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

## **UNIT IV**

2D viewing: windowing concepts – clipping algorithms- window to viewport transformation - Graphical User interfaces - logical classification of input devices -Interactive Input Methods - Three dimensional display techniques.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

## **UNIT V**

Multimedia hardware & software - Components of multimedia – Text – Image – Graphics – Audio – Video - Animation - Multimedia communication systems – Applications: Video conferencing - Virtual reality - Interactive video - video on demand.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

## **TEXT BOOKS**

1. Donald Hearn and M. Pauline Baker, Computer Graphics , 3rd Edition, Prentice Hall of India.
- 2.Ralf Steinmetz, Klara Steinmetz, "Multimedia Computing, Communications and Applications", Pearson Education.

## **REFERENCES**

1. Steven Harrington, Computer Graphics Programming Approach , 2nd Edition McGraw Hill.
- 2.Roy A. Plastock and Gordon Kelley, Theory and Problems of Computer Graphics, Schaum's Outline Series, McGraw Hill.

## **Web-Resources:**

<https://drive.google.com/file/d/1lxXSJWqITJ1TCHkXqvjbMcDNvRhPi4mw/view>

[https://www.vssut.ac.in/lecture\\_notes/lecture1424803788.pdf](https://www.vssut.ac.in/lecture_notes/lecture1424803788.pdf)

<https://www.dgp.toronto.edu/~hertzman/418notes.pdf>

## **Course Outcomes:**

On completion of the Course, Students should be able to

- Understand the basics of computer graphics, different graphics systems and applications of computer graphics.
- Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.
- Use of geometric transformations on graphics objects and their application in composite form.
- Extract scene with different clipping methods and its transformation to graphics display device.
- Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.
- Render projected objects to naturalize the scene in 2D view and use of illumination models for this.

**CORE COURSE XIV  
.NET TECHNOLOGY**

**Internal Marks : 25**

**Semester : VI**

**External Marks :75**

**No. of Hours/Week : 6**

**Exam Hrs :3**

**Credit : 5**

**Course Objectives**

- Demonstrate knowledge of object-oriented concepts Design user experience and functional requirements C#.NET application.
- Understand code solutions and compile C# projects within the .NET framework.
- Design and Implement database connectivity using ADO.NET in window based application.
- Identify and resolve problems (debug /trouble shoot) in C#.NET window based application
- Identify Industry defined problem and suggesting solution(s) using .NET application.

**UNIT I**

Introduction: Integrated Development Environment - IDE Components -Setting Environment Options - Building a Console application -Variable-Variable as Objects - Constants-Arrays.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT II**

Programming Fundamentals: Flow Control Statement-Writing & using procedures - Argument-Built-in Functions -The Textbox control -The List box, Checked List Box and Combo Box Controls-The Scrollbar or Track bar controls.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT III**

Working with Forms: Appearance of Forms - Loading or showing Forms - Dynamic Forms -Designing Menus - Common Dialog controls - Rich Text box Control –List view, Tree view, or Image List Controls - Handling Strings or Characters - Handling Dates or Times - Manipulating Folders or Files -Accessing Files.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT IV**

ADO .Net: The Basic Data - Access Classes-storing Data in datasets - Update Operations -Working with Typed Datasets - Data Binding - Designing Data Driven Interfaces.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

## UNIT V

Building Web Applications: Understanding HTML or DHTML- working with HTML - Cascading Style Sheets - Server Side Technologies – Controls - ASP.Net Objects - Understanding Web Services.

(Content – 15 Hrs, Assessment-3 Hrs)

(18 Hrs)

## TEXT BOOK

Evangelos Petroustos, *Mastering Microsoft Visual Basic 2008*, Wiley India Edition, Wiley Reprint, 2009.

Mathew MacDonald, “ASP.NET: The Complete Reference”, Tata McGraw Hill Ltd., New Delhi, 2017.

## REFERENCES

Dr. C. Muthu, “ASP.NET”, Shalom InfoTech Pvt. Ltd., 2011.

## Web-Resources:

<https://docs.microsoft.com/en-us/dotnet/framework/get-started/overview>

<https://ecomputernotes.com/csharp/dotnet>

[http://www.tmv.edu.in/pdf/distance\\_education/bca%20books/bca%20vi%20sem/bca-623%20asp.net.pdf](http://www.tmv.edu.in/pdf/distance_education/bca%20books/bca%20vi%20sem/bca-623%20asp.net.pdf)

## Course Outcomes:

On completion of the Course, Students should be able to

- Develop, implement and creating Applications with C#.
- develop, implement, and demonstrate Component Services, Threading, Remoting, Windows services, web
- Understand and be able to explain Security in the .NET framework and Deployment in the .NET.
- Develop Assemblies and Deployment in .NET, Mobile Application Development.

**CORE COURSE XV**  
**MULTIMEDIA LAB**

**Internal Marks : 40**

**Semester : VI**

**External Marks :60**

**No. of Hours/Week : 5**

**Exam Hrs :3**

**Credit : 5**

**Course Objectives:**

- To understand about data compression techniques, image compression techniques like JPEG, video compression techniques like MPEG, and the basic concepts about animation.
- To offer the knowledge of creating and working with digital images .
- To manipulate them and to develop a presentation package using multimedia tools.
- To give an overall view of multimedia tools.
- To understand and differentiate text, image, video & audio.

**Macromedia Flash**

1. Create an animation to represent the growing Moon.
2. Create an animation to indicate a ball bouncing on steps.
3. To Simulate Movement Of A Cloud
4. Display the background given (filename: Tulip.jpg) through your name.
5. Create an animation with the following features.
  - i. WELCOME
  - b) Letters should appear one by one
  - c) The fill color of the text should change to a different color after the
    - i. Display of the full word.
6. To simulate a ball hitting another ball.
7. To Change A Circle Into a Square Using Flash.

**Photoshop**

1. Cropping, Rotating and Feathering in image.
2. Creation of a single image from selected portions of many
3. Developing a commercial brochure with background tints
4. Applying masks and filtering on images

**Corel Draw**

1. Create a Logo for a company using Contour Tool.
2. Create an Invitation card using the appropriate tools.
3. Create an Visiting Card using the appropriate tools.
6. Applying masks and filtering on images



**Course Outcomes:**

On completion of the Course, Students should be able to

- To learn and understand technical aspect of Multimedia System
- Design and implement an animation for various themes.
- Prepare multimedia advertisement...
- Develop various Multimedia Systems applicable in real time.
- To develop multimedia application and analyze the performance of the same.

**MAJOR BASED ELECTIVE COURSE (MBE) – II**  
**CLOUD COMPUTING**

**Internal Marks : 25**

**Semester : VI**

**External Marks : 75**

**No. of Hours/Week : 6**

**Exam Hrs : 3**

**Credit : 5**

**Course Objectives**

- Understand the concepts, characteristics, delivery models and benefits of cloud computing
- Understand the key security and compliance challenges of cloud computing
- Understand the key technical and organisational challenges
- Understand the different characteristics of public, private and hybrid cloud deployment models.
- Cloud Backup and solutions

**UNIT I**

Defining Cloud Computing: Definition - Cloud Types - Characteristics of Cloud Computing - Role of Open standards - Cloud Architecture: Cloud Computing Stack: Composibility.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT II**

Infrastructure - Platforms - Virtual Appliances - Communication protocols - Applications – Connecting to the cloud - Cloud Services: Infrastructure as a Service - Platform as a Service - Software as a Service.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT III**

Identity as a Service - Compliance as a Service - Platforms: Load balancing and visualization– Understanding Hypervisors - Cloud Security: Securing the Cloud.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT IV**

Securing the data - Moving applications to the cloud - Cloud Storage: Definition – Provisioning –Cloud storage - Cloud Backup solutions - Cloud storage Interoperability.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

**UNIT V**

Moving applications to the Cloud - Case Study: Google Web Services, Amazon Web Services - Microsoft Cloud Services.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

## **TEXT BOOK**

Barrie Sosinsky, Cloud Computing Bible, Wiley India Pvt. Ltd., 2011.

## **REFERENCES**

1. Roger Jennings, Cloud Computing with Windows Azure Platform, Wiley India Pvt. Ltd, 2009.
2. Miller Michael, Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online, Que Publishing, 2008.

## **Web Resources**

<http://www.mb.net/resources/cloud-computing-resources.aspx>

<http://www.mastertheboss.com/cloud-computing/in-the-cloud-computing-a-beginners-tutorial>

<http://www.south.cattелеcom.com/technologies/cloudcomputing/indes.aspx>

## **Course Outcomes:**

On completion of the Course, Students should be able to

- Articulate the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing
- Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.
- Explain the core issues of cloud computing such as security, privacy, and interoperability.
- Choose the appropriate technologies, algorithms, and approaches for the related issues.
- Identify problems, and explain, analyze, and evaluate various cloud computing solutions.

## MAJOR BASED ELECTIVE COURSE (MBE) – II

### E-COMMERCE

<b>Internal Marks</b>	<b>: 25</b>	<b>Semester</b>	<b>: VI</b>
<b>External Marks</b>	<b>:75</b>	<b>No. of Hours/Week</b>	<b>: 6</b>
<b>Exam Hrs</b>	<b>:3</b>	<b>Credit</b>	<b>: 5</b>

#### Course Objectives

- Introduction to information systems for business and management.
- It is designed to familiarize students with organizational and managerial foundations of systems, the technical foundation for understanding information systems.
- Presents concepts and skills for the strategic use of e-commerce and related information technology from three perspectives: business to consumers, business-to-business, and intra-organizational.
- E-commerce in altering the structure of entire industries, and how it affects business processes including electronic transactions, supply chains, decision making and organizational performance.

#### UNIT I

E-commerce-Electronic Commerce – E-Commerce types – E-Commerce and world at the large-E-Commerce Case studies : Intel , Amazon.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

#### UNIT II

Electronic Mail – The X.400 Message handling system –Internet Addresses – Multipurpose Internet Mail Extension – X.500 Directory Services – E-mail user agent.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

#### UNIT III

EDI- Costs and benefits – Components of EDI Systems – EDI implementation issues – EDIFACT – EDIFACT Message Structure.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

#### UNIT IV

Cyber Security – Cyber Attacks – Hacking- SSL - Authentication and assurance of data integrity – Cryptographic based solutions – Digital Signatures – VPN.

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

#### UNIT V

Electronic Payment Systems – payment gateway – internet banking – the SET Protocol – E-cash – E-Cheque –Elements of electronic payments

**(Content – 15 Hrs, Assessment-3 Hrs)**

**(18 Hrs)**

## **TEXTBOOK**

E-Commerce The Cutting Edge Of Business, Kamallesh K Bajaj, Debjani Nag, McGraw Hill, 2011.

## **REFERENCE**

E-Commerce: Issues, Perspectives and Challenges in the Indian Context, Gupta and Gupta, Knowledge World Publishers, 2010.

## **Web Resources**

[https://mrcet.com/pdf/Lab%20Manuals/IT/IT.B.TECH%20IV%20YEAR%20II%20SEM%20E-COMMERCE%20\(R15A0571\)%20NOTES.pdf](https://mrcet.com/pdf/Lab%20Manuals/IT/IT.B.TECH%20IV%20YEAR%20II%20SEM%20E-COMMERCE%20(R15A0571)%20NOTES.pdf)

[https://www.iare.ac.in/sites/default/files/lecture\\_notes/IARE\\_E-Commerce\\_Lecture\\_Notes.pdf](https://www.iare.ac.in/sites/default/files/lecture_notes/IARE_E-Commerce_Lecture_Notes.pdf)

<http://notes4learners.blogspot.com/p/ecommerce-unit-1.html>

## **Course Outcomes:**

On completion of the Course, Students should be able to

- Demonstrate an understanding of the foundations and importance of E-commerce
- Analyze the impact of E-commerce on business models and strategy
- Describe Internet trading relationships including Business to Consumer, Business-to-Business, Intra-organizational.
- Describe the infrastructure for E-commerce
- Describe the key features of Internet, Intranets and Extranets and explain how they relate to each other.
- Assess electronic payment systems

## MAJOR BASED ELECTIVE COURSE (MBE) – III

### .NET TECHNOLOGY LAB

<b>Internal Marks</b>	<b>: 40</b>	<b>Semester</b>	<b>: VI</b>
<b>External Marks</b>	<b>:60</b>	<b>No. of Hours/Week</b>	<b>: 6</b>
<b>Exam Hrs</b>	<b>:3</b>	<b>Credit</b>	<b>: 5</b>

#### Course Objectives

- Learn about MS.NET framework developed by Microsoft.
- Introduce to .Net IDE Component Framework.
- Programming concepts in .Net Framework.
- Using XML in C#.NET specifically ADO.NET and SQL server
- Creating website using ASP.Net Controls.

#### List of Practicals

1. Placing Textboxes dealing with its properties.
2. Making use of placeholders, literals and controls.
3. Making use of list box, check box and radio button controls.
4. Setting up and using Ad Rotator control.
5. Making use of Required field Validator and Compare Validator controls.
6. Using Range Validator, Regular Expression Validator and validation summary.
7. Database connectivity through connected approach.
8. Data view with the help of grid view control.
9. Formatting data with a help of data list control.

#### Course Outcomes:

On completion of the Course, Students should be able to

- Create user interactive web pages using ASP.Net.
- Create simple data binding applications using ADO.Net connectivity.
- Performing Database operations for Windows Form and web applications.
- To develop, implement and creating Applications with C#.
- To develop, implement, and demonstrate Component Services, Threading, Remoting, Windows services, web

**MAJOR BASED ELECTIVE COURSE (MBE)– III**  
**SOFTWARE DEVELOPMENT LAB**

<b>Internal Marks</b>	<b>: 40</b>	<b>Semester</b>	<b>: VI</b>
<b>External Marks</b>	<b>:60</b>	<b>No. of Hours/Week</b>	<b>: 6</b>
<b>Exam Hrs</b>	<b>:3</b>	<b>Credit</b>	<b>: 5</b>

**Course Objectives**

- To provide basic knowledge of the real time projects of the IT industry.
- To develop mini real time software using any platforms such as C, C++, Java, Dot Net, etc.

**Course Outcomes**

On completion of this lab course the students will be able to

- Improve the team building, communication and management skills of the students.
- Build and test the mini project successfully.
- Demonstrate and build the project successfully by hardware requirements, coding, emulating and testing.
- To report and present the findings of the study conducted in the preferred domain.
- Students are provided to work on multidisciplinary Problems.
- Students should be able to work as professionals, with portfolio ranging from data management, network configuration, designing hardware, database and software design to management and administration of entire systems