

COURSE ID: 34

Course Name : PROJECT - I
Course Code : ITE501
Course Abbreviation : EPRO

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : NIL

Teaching Scheme: MPECS 2013

Scheme component	Hours / week	Credits
Theory	0	2
Tutorial	2	

Evaluation Scheme:

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Termwork	Oral Examination (Internal)	
Details of Evaluation	--	i. 25 marks for each practical ii. One PST of 25 marks	--	As per Proforma- VI	As per Proforma- V	
Marks	--	--	NIL	50	50	100

RATIONALE :

In the field of Information Technology various technologies (hardware and Software) needs to be integrated and proper paradigms needs to be implemented to develop any kind of computer applications . Hence it becomes essential to get hands on experience for developing industrial applications. This subject is essential to understand the implementation of the system development process i.e. analysis, design, coding, debugging and testing.

The project work should be undertaken by group of 4-5 students who will jointly work and implement the project with the approval of guide. The student should decide the area of proposal work as per requirement of Industry / community or environment and work together for hardware / software solution for that work.

The project work is divided into two phases. In the first phase the group is expected to submit a synopsis upon choosing a project work. The synopsis report should include following points:

- Title of project
- Introduction
- Study of existing system
- Need of proposed work / Choice of topic with reasoning
- Literature review / Related work
- Hardware and software requirements
- Outline of proposed work
- Block diagram
- Expected schedule

Student should work on detailed system design, data flow design, data structure layout, file designs and complete 30 to 40 percent of work out of complete project work as a part of term work submission in the form of joint report.

The term work assignment should be carried out under the guidance of appointed project guide by Head of Dept. A seminar should be delivered by student on latest trends in IT as part of termwork. The oral examination will be conducted by internal examiner as appointed by the Institute.

Objectives:

The students will be able to:

- (1) Work in Groups, Plan the work, and Coordinate the work.
- (2) Develop leadership qualities.
- (3) Develop Innovative ideas.
- (4) Practically implement the acquired knowledge.
- (5) Develop basic technical Skills by hands on experience.
- (6) Write project report.
- (7) Develop skills to use latest technology in Computer/Information Technology field.

Criteria for Continuous Assessment of Practical work and Progressive Skill Test:

Sr. no	Criteria	Marks allotted
1	Attendance at regular practical	10
2	Requirement Analysis	10
3	Design – Algorithm, DFD	10
4	Logical Thinking and Approach	10
5	Progressive Project Demonstration	10
	Total	50

Criteria for assessment at semester end oral exam:

Sr. no	Criteria	Marks allotted
1	Seminar	25
2	Requirement Analysis	05
3	Design – Algorithm, DFD	05
4	Logical Thinking and Approach	05
5	Project Report	05
6	Project Demonstration	05
	Total	50

Assessment at semester end oral exam as per Pro-forma V and VI

COURSE ID: 35

Course Name : PROJECT - II
Course Code : ITE502
Course Abbreviation : EPRT

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : ITE501

Teaching Scheme: MPECS 2013

Scheme component	Hours / week	Credits
Theory	0	4
Tutorial	4	

Evaluation Scheme:

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Termwork	Practical Examination (External)	
Details of Evaluation	--	i.25 marks for each practical ii.One PST of 25 marks	--	As per Proforma-VI	As per Proforma- IV	
Marks	--	--	NIL	50	50	100

RATIONALE :

In the field of Information Technology various technologies (hardware and Software) needs to be integrated and proper paradigms needs to be implemented to develop any kind of computer applications . Hence it becomes essential to get hands on experience for developing industrial applications. This subject is essential to understand the implementation of the system development process i.e. analyse, design, coding , debugging and testing .

The project work should be undertaken by group of 4-5 students who will jointly work and implement the project with the approval of guide. The student should decide the area of proposal work as per requirement of Industry / community or environment and work together for hardware / software solution for that work.

The project work is divided into two phases. In the second phase student should work on detailed system design, data flow design, data structure layout, file designs and complete project work as a part of term work submission in the form of joint report.

The term work assignment should be carried out under the guidance of appointed project guide by Head of Dept.

The group is expected to submit a report of a project work at the end of semester. The report should include following points:

- Title of project
- Introduction
- Study of existing system
- Need of proposed work / Choice of topic with reasoning
- Literature review / Related work
- Requirement Analysis / SRS
- Hardware and software requirements
- System design that includes details of modules of system along with Data Flow Diagrams, ER diagram and Block diagram etc.
- Implementation details with snapshots
- Applications
- Conclusion and Future work
- Bibliography

These points are guidelines to the students. Students shall prepare a report containing these and additional points if any depending on the project as guided by the appointed project guide. The oral examination will be conducted by internal and external examiner as appointed by the Institute.

Objectives:

The students will be able to:

- (1) Work in Groups, Plan the work, and Coordinate the work.
- (2) Develop leadership qualities.
- (3) Develop Innovative ideas.
- (4) Practically implement the acquired knowledge.
- (5) Develop basic technical Skills by hands on experience.
- (6) Write project report.
- (7) Develop skills to use latest technology in Computer/Information Technology field.

Criteria for Continuous Assessment of Practical work and Progressive Skill Test:

Sr. no	Criteria	Marks allotted
1	Attendance at regular practical	10
2	Requirement Analysis	10
3	Design – Algorithm, DFD	10
4	Logical Thinking and Approach	10
5	Progressive Project Demonstration	10
	Total	50

Criteria for assessment at semester end oral exam:

Sr. no	Criteria	Marks allotted
1	Requirement Analysis	10
2	Design – Algorithm, DFD	10
3	Logical Thinking and Approach	10
4	Project Report	10
5	Project Demonstration	10
	Total	50

Assessment at semester end oral exam as per Pro-forma IV and VI

COURSE ID: 36

Course Name : MANAGEMENT INFORMATION SYSTEM
Course Code : ITE503
Course Abbreviation : EMIS

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : NIL
Teaching Scheme: MPECS 2013

Scheme component	Hours / week	Credits
Theory	3	3
Practical	--	

Evaluation Scheme:

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Practical Examination	
Details of Evaluation	Average of two tests of 20 marks each	--	Term End Theory Exam (03 hours)	--	--	
Marks	20	--	80	--	--	100

RATIONALE:

Information Systems plays major role in IT, and management of Information System for become major issue. We introduced this subject to our curriculum so that our students will able to deal with management of information system.

Management Information System facilitates the decision makers to extend their planning horizons & introduce even greater levels of uncertainty in business plans & budgeted allocations. Management Information System facilitates higher degree of accountability in business process.

Objectives:

Students should be able to understand

1. Necessity of Management Information System
2. Different challenges of Information System
3. Decision Making and Implementing with MIS
4. State the important role of Management Information System in modern organization.

5. Describe the function of Business Process Outsourcing, processes in Customer Relationship Management & types of E-commerce.
6. State the use of data warehouse, data mining for decision support system.

CONTENT:

SECTION -I

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory evaluation Marks
1	INTRODUCTION TO MANAGEMENT 1.1 MIS : Concept 1.2 MIS: Definition 1.2 Role of MIS 1.3 Impact of management information system 1.4 MIS the User	04	06
2	STRATEGIC MANAGEMENT 2.1 The concept of Corporate Planning 2.2 Essentiality of Strategic Planning 2.3 Development of the Business strategies 2.4 Types of strategies 2.5 Short Range Planning 2.6 Tools of Planning 2.7 MIS: Strategic Business Planning	07	12
3	DECISION MAKING & INFORMATION 3.1 Decision making concepts 3.2 Decision making process 3.3 Decision Analysis by Analytical Modeling 3.4 Behavioral Concepts in Decision Making 3.5 Organizational Decision making 3.6 MIS & Decision making 3.7 Information concept 3.8 Information: A Quality Product 3.9 Classification of the Information	07	12
4	SYSTEM ENGINEERING : ANALYSIS & DESIGN 4.1 System Concepts 4.2 System Control 4.3 Types of System 4.4 Classes of System 4.5 General model of MIS 4.6 The need for System Analysis	06	10

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory evaluation Marks
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SECTION – II

5	DEVELOPMENT PROCESS OF MIS 5.1 Development of Long Range Plans of the MIS 5.2 Ascertaining the Class of Information 5.3 Determining the Class of Information 5.4 Development the Information Requirement 5.5 MIS : Development Process Model	04	08
6	BUSINESS PROCESS RE-ENGINEERING 6.1 Introduction 6.2 Business Process 6.3 Process Model of the Organization 6.4 Value Stream Model of the Organization 6.5 What Delays the Business Process? 6.6 Relevance of Information Technology (IT) 6.7 MIS &BPR	08	12
7	TECHNOLOGY OF INFORMATION SYSTEM 7.1 Introduction 7.2 Data Processing 7.3 Transaction Processing 7.4 Application Processing 7.5 Information System Processing 7.6 TQM of Information System 7.7 Human Factors and User Interface	08	12
8	APPLICATIONS OF MIS 8.1 Applications in manufacturing sector (Personal Management, Financial Management, Production Management, Materials Management, and Marketing Management) 8.2 Applications in Service sector (Airlines, Hotels, Hospitals, Banking, Insurance, Utilities, and Finance.)	04	08

Specification table for setting question paper for semester end theory examination

Section / Topic no.	Name of topic	Distribution of marks (level wise)			Total marks
		Knowledge	Comprehension	Application	
I / 1	Introduction to MIS	3	2	1	06
I / 2	Function of management	4	4	4	12
I / 3	Organization Structure	4	4	4	12
I / 4	Personnel and Finance Management	5	3	2	10
I / 5	Decision Making	3	2	3	08
II / 6	Decision Support System	4	4	4	12
II / 7	Technology of information system	3	5	4	12
II/8	Application of MIS	2	2	4	08

Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.

Instructional strategies:

- 1) Lectures and discussions.
- 2) Laboratory experiences and laboratory interactive sessions.
- 3) Time bound assignments.

Teaching and Learning resources, including references:

- 1) Chalk-board.
- 2) Transparencies
- 3) Presentation Slides
- 4) Demonstrative video files

Books:

Sr .No.	Author	Book Title	Publication
01	Jawadekar	Management Information System	Tata Mcgraw Hill
02	O'Brien	Management Information System	Tata Mcgraw Hill
03	Kenneth laudon	Management Information System	Eastern Eco. Edition

Websites

- ✓ www.en.wikipedia.org
- ✓ www.dwinfocenter.org
- ✓ www.ousourceking.com/bpo

COURSE ID: 37 (A)

Course Name : MULTIMEDIA TECHNIQUES
Course Code : ITE504
Course Abbreviation : EMMT

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : NIL
Teaching Scheme: MPECS 2013

Scheme component	Hours / week	Credits
Theory	3	5
Practical	2	

Evaluation Scheme:

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Practical Examination (Internal)	
Details of Evaluation	Average of two tests of 20 marks each	i.25 marks for each practical ii.One PST of 25 marks	Term End Theory Exam (03 hours)	--	As per Proforma-II	
Marks	20	--	80	--	50	150

RATIONALE:

One picture speaks thousand words. Animation has given a boost to various areas like film production, Advertisement, e-learning & animated web-site etc. This subject will enable the students to implement their creative imagination to produce animated text & images, audio and video.

It is a practical oriented subject which deals with various fonts, audio & video formats, bitmap images, animation.

Objectives:

Students will be able to:

1. Import, Export Images.
2. Edit Images.
3. Create Animation.
4. Build Flash Movie.
5. Integrate Audio & Video.

6. Play Movie, Integrate Multimedia In Web Page.

CONTENT:

SECTION - I

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory evaluation Marks
1	Introduction To Multimedia 1.1 Definitions -Where to use Multimedia 1.2 Uses of multimedia :Multimedia in Business, Multimedia in Schools, Multimedia in Home, Multimedia in Public Places 1.3 Virtual Reality 1.4 Introduction to voicemails, messaging, chatting, & video conferencing	04	06
2	SOUND 2.1 The power of sound 2.2 Multimedia system sounds. 2.3 MIDI V/S digital audio 2.4 Digital audio 2.5 Audio file format 2.6 Adding sound to multimedia project	04	08
3	IMAGES 3.1 Image file formats – gif, bmp, jpg, pix etc 3.2 Making still images 3.2.1 Bitmap 3.2.2 ClipArt 3.2.3 Bitmap software 3.3 Capturing & Editing images 3.4 Scanning images 3.5 Vector drawing 3.6 Color 3.6.1 Computerized color 3.6.2 Color palettes	04	08
4	Animation & Video 4.1 The Power of motion, Principles of Animation, Making Animation that Work, A Rolling Ball, A Bouncing Ball, Creating an Animated Scene. 4.2 Using video, Obtaining Video Clips, How Video Works, Broadcast Video Standards. 4.3 Digital video, Shooting and Editing Video.	06	10
5	MULTIMEDIA BASIC SOFTWARE TOOLS 5.1 Text editing & word processing tools 5.2 OCR software 5.3 Painting & drawing tools 5.4 3-D modeling and animation tools 5.5 Image editing tools 5.6 Sound editing tools 5.7 Animation, video and digital Movie tools	06	08

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory evaluation Marks
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SECTION – II

6	Developing multimedia applications 6.1 Applications 6.1.1 Multimedia and the single user 6.1.2 Multimedia on networks 6.1.3 Multimedia in the office 6.1.4 Multimedia in training 6.2 Methodology 6.2.1 Analysis and design 6.2.2 Content creation 6.2.3 Maintenance 6.3 Design 6.3.1 Kiosks 6.3.2 Human factors	10	16
7	Multimedia objects 7.1 Different kind of object 7.2 Object technology 7.2.1 Definitions 7.2.2 Tools for multimedia objects 7.3 Multimedia data management 7.3.1 Using a relational DBMS 7.3.2 Using an extended DBMS 7.3.3 Using an object-oriented database 7.4 The object management group	08	14
8	Multimedia and the law 8.1 Intellectual property rights 8.1.1 Copyright 8.1.2 Patents 8.2 Errors and inaccuracies 8.3 Electronic trading	06	10

Specification table for setting question paper for semester end theory examination

Section / Topic no.	Name of topic	Distribution of marks (level wise)			Total marks
		Knowledge	Comprehension	Application	
I / 1	Introduction To Multimedia	02	2	02	06
I / 2	Sound	02	4	02	08
I / 3	Images	04	02	02	08
I / 4	Animation & Video	04	04	02	10
I / 5	Multimedia Basic Software Tools	04	06	4	14
I / 6	Developing multimedia applications	06	06	04	16
I / 7	Multimedia objects	04	06	04	14

I / 8	Multimedia and the law	02	04	04	10
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Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.

Laboratory experiences and related skills developed.

Sr. no	Laboratory experience	Skills developed
1	Introduction to Multimedia	Create a cycle & name each part of cycle using different styles & format & animate text
2	Image Editing	Draw seed & create small plant with use of at least 4 frames.
3	Image Mixing	Create a forest of tree with flowers & fruits from a small plant using different layers & frame transition time.
4	Sound Recording	Create a forest of trees using the object created earlier. Also add lighting and rain effect.
5	Sound Editing	Insert audio to relevant frames that has lighting & rain effect.
6	Animation	1) Studying principle of animation and various animation techniques 2) Animation using Macromedia Flash 3) Tweened animation
7	Video	1) Cutting a part of Video file using VCD Cutter
8	Multimedia on Web	1) Adding images to an HTML page 2) Applying various effects to text on a web page 3) Using .wav files on web
9	Multimedia in Office	1) Using various multimedia features offered by Office Suites like using a scanned image on a document, applying sound to a presentation etc. 2) Interfacing digital-web-cam, capturing live image & editing using web-cam software
10	Creating multimedia database	1) Study of ways to create multimedia database.
11	Miniproject	Miniproject which implements any animation technique like morphing etc. or using Flash or using 3D-Max or using Maya

Criteria for Continuous Assessment of Practical work and Progressive Skill Test:

Sr. no	Criteria	Marks allotted
1	Attendance at regular practical	05
2	Preparedness for practical	05
3	Correct figures / diagrams	05
4	Logical Thinking and Approach	05
5	Application	05
	Total	25

Criteria for assessment at semester end practical exam:

Sr. no	Criteria	Marks allotted
1	Technical Ability	15
2	Logical Approach	10
3	Presentation	15
4	Applications	10
	Total	50

Assessment at semester end practical exam as per Pro-forma II.

Instructional strategies:

1. Lectures and discussions.
2. Laboratory experiences and laboratory interactive sessions.
3. Time bound assignments.

Teaching and Learning resources, including references:

1. Chalk-board.
2. Transparencies
3. Presentation Slides
4. Demonstrative video files

Books:

Sr.No	AUTHOR	TITLE	PUBLICATION
1	Tay Vaughan	Multimedia – Making it work	TMH
2	Judith Jeffcoate	Multimedia in practice	PHI
3	Prabhat K. Andheigh, Kiran Thakrar, John F	Multimedia Systems Design	Prentice Hall of India
4	Koegel Buford	Multimedia Systems	Pearson Education
5	Katherine Ulrich	Micromedia Flash for Windows and Macintosh	Pearson Education

b) Websites

- ✓ www.tutorialspoint.com/listtutorials/multimedia/1
- ✓ www.w3schools.com/html/html_media.asp
- ✓ multimedia.journalism.berkeley.edu/tutorials/

COURSE ID: 37(B)

Course Name : INFORMATION SECURITY
Course Code : ITE505
Course Abbreviation : ECST

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : NIL

Teaching Scheme: MPECS 2013

Scheme component	Hours / week	Credits
Theory	3	5
Tutorial	2	

Evaluation Scheme:

Mode of Evaluation	Progressive Assessment		Term End Examination		Total
	Theory	Practical	Theory Examination	Practical Examination (Internal)	
Details of Evaluation	Average of two tests of 20 marks each	i. 25 marks for each practical ii. One PST of 25 marks	Term End Theory Exam (03 hours)	As per Proforma- II	
Marks	20	--	80	50	150

RATIONALE :

Information security is becoming one of the most important areas of computing today. It is essential to understand various threats to secure computing and the basic security design principles and techniques developed to address these threats. The student will be able to recognize potential threats to confidentiality, integrity and availability. This course will introduce basic cryptography, web security, basic authentication mechanism, email security. It will develop knowledge for security of information and information systems within organizations.

Objectives:

The students will be able to:

1. Understand the risks faced by Computer Systems and the nature of common Information hazards.
2. Identify the potential threats to confidentiality, integrity and availability of Computer Systems.

3. Use cryptography algorithms and protocols
4. Build systems that can withstand attacks.

CONTENT:

A. THEORY :

Section I

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
1	INTRODUCTION TO INFORMATION SECURITY 1.1 Security trends 1.2 OSI security architecture 1.3 Security attacks 1.4 Security services 1.5 Security mechanisms 1.6 A model for network security	04	08
2	ENCRYPTION TECHNIQUES AND BLOCK CIPHERS 2.1 Symmetric cipher model 2.2 Substitution techniques 2.2.1 Caesar cipher 2.2.2 Mono-alphabetic cipher 2.2.3 Homophonic substitution cipher 2.2.4 Playfair cipher 2.2.5 Hill cipher 2.3 Transposition techniques 2.3.1 Rail fence technique 2.3.2 Simple columnar technique 2.3.3 Vernam cipher	10	12

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
3	<p>SYMMETRIC KEY ALGORITHMS</p> <p>3.1 Block cipher</p> <p style="padding-left: 20px;">3.1.1 Algorithm types – stream cipher and block cipher</p> <p style="padding-left: 20px;">3.1.2 Algorithm modes</p> <ul style="list-style-type: none"> • ECB • CBC • CFB • OFB <p>3.2 Overview of symmetric key cryptography</p> <p>3.3 Simplified Data Encryption Standard</p> <p style="padding-left: 20px;">3.3.1 Conceptual working</p> <p style="padding-left: 20px;">3.3.2 Strength of SDES</p>	08	10
4	<p>ASYMMETRIC KEY ALGORITHMS</p> <p>4.1 overview of asymmetric key cryptography</p> <p>4.2 public key cryptosystem</p> <p>4.3 RSA algorithm - encryption and decryption techniques</p> <p>4.4 Key Management</p> <p style="padding-left: 20px;">4.4.1 Distribution of public keys</p> <p style="padding-left: 20px;">4.4.2 Diffi-Hellman key exchange</p> <ul style="list-style-type: none"> • Algorithm • Man-in-middle attack 	08	10

SECTION II

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
5	MESSAGE AUTHENTICATION AND HASH FUNCTIONS 5.1 Authentication requirements 5.2 Message encryption 5.2.1 Symmetric encryption 5.2.2 Public-key encryption 5.3 Digital signature 5.4 Message Authentication Code 5.5 SHA – 1 Algorithm	08	14
6	INTERNET SECURITY 6.1 Secure Socket Layer 6.1.1 Handshake protocol 6.1.2 Record protocol 6.1.3 Alert protocol 6.2 Secure HTTP 6.3 Electronic money – types of electronic money 6.4 E-mail security 6.4.1 Pretty Good Privacy 6.4.2 S/MIME	10	14
7	INFORMATION SYSTEM SECURITY 7.1 Intruders 7.1.1 Intrusion techniques 7.1.2 Intrusion detection techniques 7.2 Password management 7.2.1 Password protection 7.2.1 Password selection strategies	06	12
Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.			

Specification table for setting question paper for semester end theory examination

Section / Topic no.	Name of topic	Distribution of marks (level wise)			Total marks
		Knowledge	Comprehension	Application	
I / 1	Introduction to Information Security	4	4	-	08
I / 2	Encryption Technique & block Cipher	4	4	4	12
I / 3	Symmetric Key algorithm	2	4	4	10
II / 4	Asymmetric Key algorithm	2	4	4	10
II / 5	Message Authentication	6	4	4	14
II / 6	Internet Security	6	4	4	14
II / 7	Information System Security	4	4	4	12

Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.

Laboratory experiences and related skills developed.

Sr. no	Laboratory experience	Skills developed
1	Study of information security threats	1. Study of security attacks
2	Implementation of Substitution cipher technique	1. Understanding the concept and Implementation of Caesar cipher 2. Understanding the concept and Implementation of Mono-alphabetic cipher
3	Implementation of Substitution cipher technique	1. Understanding the concept of Playfair cipher 2. Example
4	Implementation of Substitution cipher technique	1. Understanding the concept and Implementation of Homophonic substitution cipher 2. Understanding the concept and Implementation of Hill cipher
5	Implementation of	1. Understanding the concept and Implementation of

	Transposition cipher technique	Rail fence technique
6	Implementation of Transposition cipher technique	1. Understanding the concept and Implementation of Simple columnar technique
7	Implementation of Transposition cipher technique	1. Understanding the concept and Implementation of Vernam cipher
8	Study of SDES	1. Understanding the concept of SDES 2. Solving example step by step
9	Study of RSA	1. Understanding the concept of RSA 2. Solving example step by step
10	Study of Diffi-Hellman key exchange algorithm	1. Understanding Diffi-Hellman key exchange algorithm Solving example step by step
11	Password management	1. Understanding requirements of authentication 2. Understanding features of strong password 3. Implementation of a program to check strength of a text password
12	User authentication	1. Implementation of a program to authenticate a user based on registered password
13	Case Study	A study report on recent security attacks on information system e.g. social networking website, email system, e-commerce websites etc.

Criteria for assessment at semester end practical exam:

Sr. no	Criteria	Marks allotted
1	Technical Ability	15
2	Logical Approach	10

3	Presentation	15
4	Applications	10
	Total	50

Assessment at semester end practical exam as per Pro-forma II.

INSTRUCTIONAL STRATEGIES :

1. Lectures and discussions.
2. Laboratory experiences and laboratory interactive sessions.
3. Time bound assignments.

Teaching and Learning resources, including references:

1. Chalk-board.
2. Transparencies
3. Presentation Slides

REFERENCE MATERIAL:

a) Books / Codes

Sr. No.	Author	Title	Publisher
1.	Atul Kahate	Cryptography and network security	McGraw Hill
2.	William Stallings	Cryptography and network security Principles and practices	Pearson

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COURSE ID: 37(C)

Course Name : OBJECT ORIENTED MODELLING & DESIGN
Course Code : ITE506
Course Abbreviation : EOOM

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : NIL
Teaching Scheme:

Scheme component	Hours / week	Credits
Theory	3	5
Practical	2	

Evaluation Scheme:

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Practical Examination (Internal)	
Details of Evaluation	Average of two tests of 20 marks each	i.25 marks for each practical ii.One PST of 25 marks	Term End Theory Exam (03 hours)	--	As per Proforma-II	
Marks	20	--	80	--	50	150

RATIONALE:

Object oriented modeling and design presents an Object Oriented approach to software development. It is based on modeling objects from the real world and then using the model to build a language-independent design. This subject shows how to use Object Oriented concepts throughout the entire software life cycle, from analysis through design implementation by using different models. The graphical notation i.e. described in subjects helps the software developer to visualize a problem before going for implementation.

This subject will be useful for the student to understand the concepts of Object Oriented Programming System and to model these concepts using Unified Modeling Language (UML) for any application, before actually going for coding part

OBJECTIVES:

The students will be able to:

- 1) Interpret / give the meaning of object-oriented concepts.
- 2) Understand different Modeling Methodology.
- 3) Prepare an object model for a given problem statement.
- 4) Prepare dynamic for a given problem statement.
- 5) Describe and Design the concepts of class diagram, object diagram, interaction diagram, Sequence diagram collaboration, use case diagram, state diagram, activity.
- 4) Usage of anyone design

CONTENT:

B. THEORY :

Section I

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
1	INTRODUCTION 1.1 Object Oriented development & themes 1.2 Evidence for usefulness, modeling as a Design Technique.	02	06
2	OBJECT MODELLING 2.1 Objects and Classes (Object Diagrams, Attributes, Operations and Methods), Links, Associations and Advanced Concepts (General Concepts, Multiplicity, Link Attributes, Association as a Class, Roll names, Ordering, Qualification, Aggregation).	06	10
3	CONCEPTS OF OOP 3.1 Generalizations and Inheritance, Grouping Constructs. 3.2 Aggregation verses Association And Generalization, Recursive Aggregates, and Propagation of Operations. 3.3 Abstract Classes, Multiple Inheritance, Metadata, Candidate Keys, Constraints	08	12
4	DYNAMIC & FUNCTIONAL MODELING 4.1 Events, states, operations, concurrency, nested state diagrams, advanced dynamic	08	12

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
	4.2 Modeling concepts, relation of object and dynamic models 4.3 DFD, relation of functional to object and dynamic models		
Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.			

Section II

Sr. No.	Topics / Subtopics	Lectures (Hours)	Theory Evaluation (Marks)
5	OVERVIEW OF UML 5.1 Efforts of standardization / Integration, OMG approval for UML, Scope of UML, Conceptual model of UML, Architectural –Meta model, Unified Software Development Lifecycle. 5.2 Introduction to UML Diagrams	06	10
6	UML – STRUCTURAL MODELLING 6.1 Advanced Class Diagrams: - Advanced Classes and Relationships, Interfaces, Types and Roles, Packages, Instances. Object Diagrams. 6.2 Component Diagrams: Terms and Concepts, Common modeling techniques. Deployment Diagrams: Terms and Concepts, Common modeling techniques.	06	12
7	UML—BEHAVIORAL MODELLING 7.1 Use case diagram: Terms and Concepts, Modeling techniques. 7.2 Interaction diagram (Sequence and collaboration diagram): Terms and Concepts, Modeling techniques. 7.3 State chart diagram: Terms and Concepts, Modeling techniques. 7.4 Activity diagram: Terms and Concepts, Modeling techniques.	12	18
Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.			

Specification table for setting question paper for semester end theory examination:

Section / Topic no.	Name of topic	Distribution of marks			Total marks
		Knowledge	Comprehension	Application	
I / 1	Introduction	02	02	02	06
I / 2	Object modeling	02	02	06	10
I / 3	Concept of OOP	02	04	06	12
I / 4	Dynamic & Functional modeling	02	04	06	12
II / 5	Overview of UML	02	02	06	10
II / 6	UML Structural Modelling	02	04	06	12
II / 7	UML Behavioral Modelling	04	06	08	18

Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.

C. TERM WORK

Term work shall consist of the following:

i) Laboratory experiments and related skills to be developed :

Sr. No.	Title of Experiment	Skills to be developed
1	Introduction	1. Analyze and Design the UML diagrams for ATM System Railway Reservation System Library Management System.
2	Implementation	1. To be able to apply different logics to solve given problem.
3	Implementation	1. To be able to write program using different implementations for the same problem
4	Development	1. Understanding different steps to develop program such as Problem definition, Analysis, Design of logic Coding & Testing
5	Maintenance of program	1. Study of Maintenance (Modifications, error corrections, making changes etc.)

ii) Progressive Skills Test :

Criteria for Continuous Assessment of Practical work and Progressive skill Test :

Sr. No.	Criteria	Marks allotted
1	Attendance at regular practical	10
2	Technical preparation	10
3	Logical Thinking and Approach	20
4	Application	10
	TOTAL	50

Criteria for assessment at semester end practical exam:

Sr. no	Criteria	Marks allotted
1	Technical ability	20
2	Communication skill	10
3	Logical approach	20
	TOTAL.	50

Assessment at semester end practical exam as per Pro-forma II.

INSTRUCTIONAL STRATEGIES:

Instructional Methods:

- 1) Lectures and discussions.
- 2) Laboratory experiences and laboratory interactive sessions.
- 3) Time bound assignments.
- 4) Group tasks

Teaching and Learning resources:

1. Books
2. Transparencies
3. Power Point Presentation
4. Self-learning

REFERENCE MATERIAL:

a) Books / Codes

Sr. No.	Author	Title	Publisher
1	Rumbaugh, Blaha	Object Oriented Modelling and Designing (Refer for 1,2,3,4 Chapter)	Pearson Prentice Hall
2	Booch, Jacobson, Rumbaugh	The UML User Guide(Addison Wesley)	Pearson Education India
3	Mark Paiestly	Practical OOD with UML– .(Refer for 5, 6 and 7 Chapter)	Tata McGraw Hill
4	Kahate (TMH)	Object oriented Analysis & design	Tata McGraw Hill

b) References:

1. <http://uml.tutorials.tireme.com/>
2. http://pigseye.kennesaw.edu/~dbraun/csis4650/A&D/UML_tutorial/
3. <http://www.smartdraw.com/tutorials/software-uml/uml.htm>
4. <http://www-db.stanford.edu/~burbach/watersluice/node55.html>

COURSE ID: 38 (A)

Course Name : MOBILE COMMUNICATION
Course Code : ITE507
Course Abbreviation : EMOC

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : NIL
Teaching Scheme: MPECS 2013

Scheme component	Hours / week	Credits
Theory	3	3
Practical	--	

Evaluation Scheme:

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Practical Examination	
Details of Evaluation	Average of two tests of 20 marks each	--	Term End Theory Exam (03 hours)	--	--	
Marks	20	--	80	--	--	100

RATIONALE:

Today's world is full of Mobile or wireless Communication, So it is very essential to our students to have conceptual knowledge of Mobile Communication. This subject gives the information about some concepts and applications of Mobile Communication.

Objectives:

Students should able to Understand:

- 1) Mobile Communication System.
- 2) Mobile Network /Transport layer.
- 3) Concept of wireless application.
- 4) Use of Bluetooth Technology
- 5) Understanding of 3G Networks.
- 6) Security issues in mobility

CONTENT:

SECTION -I

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory evaluation Marks
1	INTRODUCTION 1.1 Need & Applications of Wireless 1.2 Wireless Data Technologies 1.3 Market for Mobile Communication 1.4 Mobile & Wireless Devices	04	06
2	WIRELESS TRANSMISSION 2.1 Frequencies for Radio Transmission 2.2 Signals 2.3 Antennas 2.4 Signal Propagation- Path loss, Additional signal propagation effect, Multipath propagation 2.5 Multiplexing – SDM, FDM, TDM 2.6 Modulation- ASK, FSK, PSK, AFSK, APSK 2.7 Spread Spectrum- DHSS, FHSS 2.8 Cellular Systems	08	12
3	MEDIUM ACCESS CONTROL 3.1 Specialized MAC 3.1.1 Hidden and Exposed terminals 3.1.2 Near and Far Terminals 3.2 SDMA 3.3 FDMA 3.4 TDMA- Fixed TDM, Classical & Slotted Aloha, CSMA 3.5 CDMA 3.6 Comparison between SDMA/FDMA/TDMA/CDMA	06	10
4	TELECOMMUNICATION SYSTEMS 4.1 GSM 4.1.1 Mobile Services 4.2.2 System Architecture	08	12

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory evaluation Marks
	4.2 3G Networks 4.2.1 System Architecture 4.2.2 Protocol Architecture		

SECTION – II

5	WIRELESS LAN 5.1 Introduction 5.2 Infrared v/s Radio Transmission 5.3 Infrastructure & Ad-hoc Network 5.4 IEEE 802.11 –System & protocol architecture (without detailed protocol description) 5.5 Bluetooth – User scenarios, architecture ,scatternet & piconet	08	12
6	MOBILE NETWORK LAYER 6.1 Mobile IP 6.2 Entities & terminology 6.3 IP packet Delivery- Agent discovery, Registration 6.4 DHCP	04	08
7	MOBILE TRANSPORT LAYER 7.1 Traditional TCP 7.2 Indirect TCP 7.3 Snooping TCP 7.4 Mobile TCP	06	10
8	SUPPORT FOR MOBILITY 8.1 File System - consistency, coda 8.2 WAP – architecture 8.3 Wireless datagram protocol (concept) 8.3 Security issues in mobile computing	06	10

Specification table for setting question paper for semester end theory examination

Section / Topic no.	Name of topic	Distribution of marks (level wise)			Total marks
		Knowledge	Comprehension	Application	
I / 1	Introduction	03	02	01	06
I / 2	Wireless Transmission	05	05	02	12
I / 3	Medium Access Control	04	04	02	10
I / 4	Telecommunication Systems	04	04	04	12
II / 5	Wireless LAN	04	04	04	12
II / 6	Mobile Network Layer	03	03	02	08
II/ 7	Mobile Transport Layer	04	04	02	10
II/8	Mobile Application Layer	04	04	02	10

Instructional strategies:

- 5) Lectures and discussions.
- 6) Laboratory experiences and laboratory interactive sessions.
- 7) Time bound assignments.

Teaching and Learning resources, including references:

- 5) Chalk-board.
- 6) Transparencies
- 7) Presentation Slides
- 8) Demonstrative video files

Books:

Sr .No.	Author	Book Title	Publication
01	Lacher Schiller	Mobile Communication	Pearson
02	Peter Davis,Craig & McGulfin	Wireless LAN	EMG
03	Sandip Singh	The Wireless Application Protocol	Wiely
04	Charies Archart & Grays	Professional WAP	Wiely

Websites :

- ✓ www.tutorialspoint.com/mobile.../mobile_computing_overview.htm
- ✓ www.tutorialspoint.com/wimax/wireless_introduction.htm
- ✓ www.radio-electronics.com/info/.../gsm.../gsm_introduction.php

COURSE ID: 38(B)

Course Name : DISTRIBUTED SYSTEM
Course Code : ITE508
Course Abbreviation : EDIS

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : NIL
Teaching Scheme: MPECS 2013

Scheme component	Hours / week	Credits
Theory	3	3
Tutorial	0	

Evaluation Scheme:

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Oral Examination (Internal)	
Details of Evaluation	Average of two tests of 20 marks each	--	Term End Theory Exam (03 hours)	--	--	
Marks	20	--	80	--	--	100

RATIONALE:

Distributed computing is a field of computer science that studies distributed systems. A distributed system is a software system in which components located on networked computers communicate and coordinate their actions by passing messages. The components interact with each other in order to achieve a common goal. The result of these technologies make it easy to put together computing systems composed of large number of computers connected by high speed networks and called as distributed systems. So it is essential to study distributed system for a computer or IT student.

Objectives:

The students will be able to:

1. Understand the Hardware and software concepts of Distributed systems
2. Understand process management in distributed systems
3. Understand Synchronization in distributed system processes

4. Understand Security need and Concepts in distributed system processes

CONTENT:

D. THEORY :

SECTION I

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
1	INTRODUCTION TO DISTRIBUTED SYSTEM 1.1 Definition of a distributed system 1.2 Goals 1.2.1 Making Resource accessible 1.2.2 Distribution Transparency 1.2.3 Openness 1.2.4 scalability 1.3 Types of distributed Systems 1.3.1 Distributed Computing Systems 1.3.2 Distribute Information Systems 1.3.3 Distributed Pervasive	06	12
2	ARCHITECTURES OF DISTRIBUTED SYSTEM 2.1 Architectural Styles 2.2 System Architectures 2.2.1 Centralized Architectures 2.2.2 Decentralized Architecture-Structured peer to peer, Unstructured peer to peer 2.2.3 Hybrid Architecture 2.3 Architecture V/s Middleware –Interceptors	09	14
3	COMMUNICATION 3.1 Layered Protocols – 1) Lower Level 2) Transport Level 3) Higher Level 3.2 Types of Communication 3.3 Remote Procedure Call 3.3.1 Basic RPC operation 3.3.2 Parameter passing 3.4 Asynchronous RPC 3.5 Message oriented communication 3.5.1 Message oriented Transient communication 3.5.2 Message oriented Persistent communication	09	14

SECTION II

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
4	PROCESSES 4.1 Threads 4.1.1 Introduction to threads 4.1.2 Threads in distributed systems 4.2 Clients 4.2.1 User interfaces 4.2.2 Client side software for distribution transparency 4.3 Servers 4.3.1 General design issues 4.4 Code migration 4.4.1 Approaches to code migration 4.4.2 Migration and local resources 4.4.3 Migration in heterogeneous systems	08	14
5	SYNCHRONIZATION 5.1 Clock synchronization 5.1.1 Physical clocks 5.1.2 Clock synchronization algorithms 5.2 Logical clocks 5.2.1 Lamport's Logical Clock 5.2.2 Vector Clock 5.3 Election algorithms 5.3.1 The Bully algorithm 5.3.2 A Ring algorithm 5.4 Mutual exclusion 5.4.1 A centralized algorithm 5.4.2 A distributed algorithm 5.4.3 A Token Ring algorithm	10	14
6	SECURITY 6.1 Introduction to Security 6.1.1 Security Threats, Policies and Mechanisms 6.2 Secure Channels 6.2.1 Authentication 1) Based on shares Secret key 2) Based on Public key cryptography 6.2.2 Message Integrity and Confidentiality 1) Digital Signatures 2) Session Key 6.3 Secure Group communication –Confidential group Communication	06	12
Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.			

Specification table for setting question paper for semester end theory examination

Section / Topic no.	Name of topic	Distribution of marks (level wise)			Total marks
		Knowledge	Comprehension	Application	
I / 1	Introduction	6	6	-	12
I / 2	Architectures of Distributed System	6	4	4	14
I / 3	Communication	6	4	4	14
II / 4	Processes	6	6	2	14
II / 5	Synchronization	6	4	4	14
II / 6	Security	4	6	2	12

Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.

INSTRUCTIONAL STRATEGIES :

- 8) Lectures and discussions.
- 9) Laboratory experiences and laboratory interactive sessions.
- 10) Time bound assignments.

Teaching and Learning resources, including references:

- 9) Chalk-board.
- 10) Transparencies
- 11) Presentation Slides

REFERENCE MATERIAL:

a) Books / Codes

Sr. No.	Author	Title	Publisher
1.	A.S. Tanenbaum, Maarten van Steen	Distributed Systems : Principles and Paradigms (2 nd Edition)	PHI
2.	P. K. Sinha	Distributed Systems:	PHI

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COURSE ID: 38 (C)

Course Name : E-Commerce
Course Code : ITE509
Course Abbreviation : EECO

TEACHING AND EVALUATION SCHEME:

Pre-requisite Course(s) : NIL
Teaching Scheme:

Scheme component	Hours / week	Credits
Theory	3	3
Practical	0	

Evaluation Scheme:

Mode of Evaluation	Progressive Assessment		Term End Examination			Total
	Theory	Practical	Theory Examination	Term Work	Practical Examination (External)	
Details of Evaluation	Average of two tests of 20 marks each	--	Term End Theory Exam (03 hours)	--	--	
Marks	20	--	80	--	--	100

RATIONALE:

E-commerce is revolutionizing the way business and consumers transact across the globe. Online e-commerce is becoming a reality as the number of online users is increasing day by day. E-commerce is doing the business over interconnected networks using web based technology. This subject deals with concepts, major activities, ways of doing e-commerce, types of e-commerce and e-security.

OBJECTIVES:

The students will be able to:

1. Explain activities, functions, strategies and applications of e-commerce
2. Explain e-commerce models
3. Explain functions and features of portals and portal technologies
4. Explain functions , types, design and benefits of data warehouse

5. Explain e-security
6. Explain online shopping and online purchase

CONTENT:

E. THEORY :

Section I

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
1	OVERVIEW OF E – COMMERCE 1.1 Introduction and definition 1.2 Main activities of e – commerce 1.3 Broad goals of e-commerce 1.4 Technical components of e- commerce 1.5 Functions of e-commerce 1.6 Prospects of e-commerce 1.7 Significance of e-commerce 1.8 Advantages of e-commerce 1.9 Disadvantages of e-commerce 1.10 Pre-requisites of e-commerce 1.11 Meaning of e-commerce 1.12 scope of e-commerce 1.13 Users of e-commerce 1.14 Electronic commerce systems 1.15 Technologies used 1.16 Electronic commerce applications	08	12
2	DRIVING THE E-COMMERCE REVOLUTION 2.1 E-commerce activities 2.2 Major modes founds in e-commerce 2.2.1 Revenue generating modes 2.2.2 Product delivery modes 2.2.3 payment collection modes 2.2.4 operating modes 2.3 Matrix of e-commerce models 2.4 Business to business (B2B) 2.5 Business to consumer (B2C) 2.6 Opportunity development for e-commerce 2.7 E-commerce opportunity framework 2.8 Factors in decision making strategy 2.9 Development of the e-commerce business case 2.10 Components and factors for the development of the business case 2.11 Network practices and business processes	08	12

Sr. No.	Topics / Sub-topics	Lectures (Hours)	Theory Evaluation (Marks)
3	PORTALS 3.1 Introduction to Portals 3.2 Calendaring and scheduling 3.3 Functions of portals 3.4 Definition of portals 3.5 Enterprise portals 3.6 Portal technologies 3.7 Business benefits 3.8 Features of portals 3.9 Advantages of portals 3.10 Market place for e-commerce 3.11 E-commerce portal	04	06
4	DATA WAREHOUSING 4.1 Introduction to data warehousing 4.2 Definition of data warehousing 4.3 Data marts and operational Data stores 4.4 Storage area network 4.5 Data mining 4.6 Building a data warehouse 4.7 Data visualization 4.8 Types of data warehouses	04	10
Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.			

Section II

Sr. No.	Topics / Subtopics	Lectures (Hours)	Theory Evaluation (Marks)
5.	ELECTRONIC COMMERCE AND INTERNET 5.1 Transactions ready websites 5.2 Wholesales e-commerce transaction on WWW 5.3 Traditional marketing strategies 5.3 Web personalization 5.5 Web resources 5.6 E-commerce technical components	04	06
6	ELECTRONIC MARKET 6.1 Online shopping 6.2 Online purchasing 6.3 Electronic market	06	10

	6.3 Three models of electronic market 6.5 Electronic market dimensions 6.6 Markets category 6.7 Interactive marketing 6.8 One to one marketing		
7	ELECTRONIC BUSINESS 7.1 Introduction 7.2 Definition of e- business 7.3 E-business applications 7.3 E-business architecture 7.5 AMR model for e-business 7.6 E-business initiatives 7.7 .com companies	04	08
8	ELECTRONIC DATA INTERCHANGE 8.1 Introduction 8.2 Definition 8.3 Applications 8.3 Advantages 8.5 Limitations 8.6 Disadvantages 8.7 EDI model	04	06
9	ELECTRONIC PAYMENT SYSTEMS 9.1 Introduction 9.2 Types of electronic payment system 9.3 Payment types 9.3 The traditional payment system 9.5 Modern payment system 9.6 Electronic cash 9.7 Steps for Electronic payment	06	10
Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.			

Specification table for setting question paper for semester end theory examination:

Section / Topic no.	Name of topic	Distribution of marks			Total marks
		Knowledg e	Comprehen sion	Applicatio n	
I / 1	Overview Of E –Commerce	6	4	2	12
I / 2	Driving The E-Commerce Revolution	4	4	4	12
I / 3	Portals	2	-	4	6
I / 4	Data Warehousing	2	2	6	10
II / 5	Electronic Commerce And Internet	2	2	2	6

II / 6	Electronic Market	2	4	4	10
II / 7	Electronic Business	2	4	2	8
II / 8	Electronic Data Interchange	2	2	2	6
II / 9	Electronic Payment Systems	2	4	4	10

Semester end exam question paper should be such that total marks of questions on each topic is one and half times the marks allotted above but the candidates are able to attempt questions of the above allotted marks only.

INSTRUCTIONAL STRATEGIES:

Instructional Methods:

- 1) Lectures and discussions.
- 2) Laboratory experiences and laboratory interactive sessions.
- 3) Time bound assignments.

Teaching and Learning resources:

5. Books
6. Transparencies
7. Power Point Presentation
8. Self-learning

REFERENCE MATERIAL:

c) Books / Codes

Sr. No.	Author	Title	Publisher
1.	C.S.V.Murthy	E-Commerce (Concepts, models, strategies)	Himalaya Publishing House

d) Websites for reference :

- www.3dcart.com/e-commerce_software
