University of Mumbai
B.E Information Technology
Scheme of Instruction and Evaluation

Third Year -Semester VI

		Scheme of Instructions			Scheme of Examinations					
Sr. No	Subjects	Lect/ Week	Pract/ Week	Tut/ Week	Theory Hours	Marks	T/W Marks	Practical Marks	Oral Marks	Total Marks
1	Information and Network Security	4	2	--	3	100	25	--	25	150
2	Middleware and Enterprise Integration Technologies	4	2	--	3	100	25	--	25	150
3	Software Engineering	4	2	--	3	100	25	--	25	150
4	Data Base Technologies	4	2	--	3	100	25	--	25	150
5	Programming for Mobile and Remote Computers	4	2	--	3	100	25	25	--	150
6	Information Technology for Management of Enterprise	4	-	1	3	100	25	--	25	150
	TOTAL	24	10	1	--	600	150	25	125	900

INFORMATION AND NETWORK SECURITY				
CLASS T.E. (INFORMATION TECHNOLOGY)			SEMESTER VI	
HOURS PER WEEK	LECTURES	:	04	
	TUTORIALS	:	--	
	PRACTICALS	:	02	
			HOURS	MARKS
EVALUATION SYSTEM:	THEORY		3	100
	PRACTICAL		--	-
	ORAL		--	25
	TERM WORK		--	25

1. **Introduction**
What is Information Security? Security Goals.

2. **Cryptography**
Crypto Basic, Classic Cryptography, Symmetric Key Cryptography: Stream Ciphers, A5/1, RC4, Block Ciphers, Feistel Cipher, DES, Triple DES, AES, Public Key Cryptography: Kanpsack, RSA, Defiie-Hellman, use of public key crypto- Signature and Non-repudiation, Confidentiality and Non-repudiation, Public Key Infrastructure, Hash Function: The Birthday Problem, MD5, SHA-1, Tiger Hash, Use of Hash Function.

3. **Access control - Authentication and Authorization**
Authentication Methods, Passwords, Biometric, Single – sign on, Authentication Protocol, Kerberos, Access control Matrix, ACLs, Multiple level security model, Multilateral security, Covert channel, CAPTCHA.

4. **Software Security**
Software Flaws, Buffer Overflow, Incomplete Mediation, Race conditions, Malware, Salami attack, Linearization Attacks, Trusting Software, Software reverse engineering, Digital Rights management, Operating System and Security

5. **Network Security**
Network security basics, TCP/IP Model and Port No., Protocol flaws, Enterprise wide network Design and Vulnerabilities, Reconnaissance of network, Packet sniffing, Session Hijacking, ARP Spoofing, Web site and web server vulnerabilities, Denial of Service, SSL and IPSec protocol, Firewall. Intrusion Detection System, and Honey pots, Email Security.

6. **Administered Security**
Planning, Risk Analysis, Organizational Policies, Physical Security

Text Books
1. Mark Stamp, "Information security Principles and Practice" Wiley
2. Charles P. Pfleeger, "Security in Computing", Pearson Education

References

1. Behrouz A. Forouzan, "Cryptography and Network Security", Tata McGraw Hill
2. William Stalling, "Cryptography and Network Security", Prentice Hall
3. Nina Godbole, "Information Systems Security", Wiley
4. Matt Bishop, "Computer Security: Art and Science", Pearson Education
5. Kaufman, Perlman, Speciner, "Network Security"
6. Mark Merkow, Jim Breithaupt, "IS Principles and Practices", Person Education

Term Work

Term work shall consist of at least 10 assignments/programming assignments and one written test.

Marks

1. Laboratory work (Exprriments & journa)

1. Laboratory work (Experiments and Journal)   15 Marks
2. Test (at least one)   10 Marks

The final certification and acceptance of Term Work ensures the satisfactory performance of laboratory Work and Minimum Passing in the term work.

Suggested Experiment List
1. Block Cipher such as Feistel, DES or AES
2. Public Key Cryptography (RSA)
3. Conventional Cryptography
4. Authentication Methods such as password or Kerberos.
5. Software Flaw Frauding tools such as flaw finders, ITS, PScan, RATS
6. Analysis of Network port scanner tool such as NMAP
7. Analysis of Sniffer program such as Ethernet
8. Transport Security using firewall
9. Application level security such as email by using PHP
10. Implementation of IDS

MIDDLEWARE AND ENTERPRISE INTEGRATION TECHNOLOGIES				
CLASS T.E. (INFORMATION TECHNOLOGY)			SEMESTER VI	
HOURS PER WEEK	LECTURES	:	04	
	TUTORIALS	:	--	
	PRACTICALS	:	02	
			HOURS	**MARKS**
EVALUATION SYSTEM:	THEORY		3	100
	PRACTICAL		-	-
	ORAL		-	25
	TERM WORK		-	25

Objectives of the Course:

3. IT systems are more and more integrated with other software systems.
4. The knowledge of integrating these systems by using middleware technologies can be a key competence for IT engineers. Middleware is commonly understood as an intermediary software layer between the application and the operating system, which encapsulates the heterogeneity of the underlying communication network, operating system or hardware platform.
5. This course provides details about the modern component platforms. Based on practical examples, details about modern middleware technologies are studied. Students get the chance to gain in-depth knowledge popular middleware platforms.

7. **Introduction to Object Oriented Systems**
   Preview of Object-orientation, Concept of distributed object systems, Reasons to distribute for centralized objects. Client-server system architecture, Multi tier system architectures. File Server, Database Server, Group Server, Object Server, Web Server.

8. **Introduction to Middleware Technologies**
   General Middleware, Service Specific Middleware, Client/Server Building blocks – RPC - Messaging – Peer – to – Peer, Java RMI.

9. **Introduction to Distributed Objects**
   Computing standards, OMG, Overview of CORBA, Overview of COM/DCOM, and Overview of EJB.

10. **EJB Architecture**
    Overview of EJB software architecture, View of EJB Conversation, Building and Deploying EJBs, Roles in EJB.

11. **EJB Applications**
    EJB Session Beans, EJB entity beans, Lifecycle of Beans, EJB clients, Steps in developing an application with EJB, EJB Deployment.

12. **CORBA**
    Introduction and concepts, distributed objects in CORBA, CORBA components, architectural features, method invocations, static and dynamic: IDL (Interface Definition Language) models and interfaces. Structure of CORBA IDL, CORBA's self-describing data; CORBA interface repository. Building an application using CORBA.

11. CORBA Services and CORBA Component Model
Overview of CORBA Services, Object location Services, Messaging Services, CORBA Component Model.

12. COM and .NET
Evolution of DCOM, Introduction to COM, COM clients and servers, COM IDL, COM Interfaces, COM Threading Models, Marshalling, Custom and standard marshalling, Comparison COM and CORBA, Introduction to **.**NET, Overview of **.**NET architecture, Remoting.

13. Service Oriented architecture(SAO) Fundamentals
Defining SOA, Business value of SOA, SOA characteristics, Concept of a service, Basic SOA , Enterprise Service Bus (ESB), SOA enterprise Software Models.

14. Web Services Technologies
XML Technologies - XML, DTD, XSD, XSLT< XQUERY, XPATH, Web Services and SOA, WSDL, SOAP, UDDI, WS Standards (WS-*), Web Services and Service Oriented Enterprise (SOE), WS _ Coordination and Transaction, Business Process Execution Language for Web Services (BPEL4WS)

Text Books
1. G. Sudha Sadasivam "Distributed Component Architecture", Wiley India edition.
2. Thomas Erl "Service Oriented Architecture: Concepts , Technology & Design", Prentice Hall
3. G. Brose, A Vogel and K. Duddy, "Java programming with CORBA", 3rd Edition, Wiley-dreamtech, India John Wiley and sons

References
1. Robert Orfali, Dan Harkey, "Client/server Programming with Java & Corba W/cd", Wiley India Pvt. Ltd.
2. Clemens Szyperski, "Component Software: Beyond Object-Oriented Programming", Pearson Education.
3. A. Tanenbaum, M. Van Steen: Distributed Systems (II Edition), Pearson Education, 2007
4. Bill Burke, "Enterprise JavaBeans 3.0", 5th Edition, O'Reilly Publications.
5. Sudha Sadasivam "Component Based technology" , Wiley India
6. Ed Roman, "Mastering Enterprise Java Beans", John Wiley & Sons Inc.,
7. Mowbray, "Inside CORBA", Pearson Education.
8. Jason Pritchard, "COM and CORBA side by side", Pearson Education
9. Introduction to C# Using .NET Pearson Education
10. C# How to program, Pearson Education
11. Andrew Troelsen, "C# and the .NET Platform", Apress Wiley-dreamtech, India Pvt. Ltd.
12. Don Box, "Essential COM", Pearson Education.
13. Tom, Valesky, "Enterprise Java Beans", Pearson Education

Term Work
Term work shall consist of at least 10 assignments/programming assignments and one written test.

Marks

1. Laboratory work (Experiments and Journal)	15 Marks
3. Test (at least one)	10 Marks

The final certification and acceptance of TW ensures the satisfactory performance of laboratory Work and Minimum Passing in the term work.

Suggested Topics for Experiment

1. RPC Messaging
2. Creating a distributed Object Application using RMI (DNS, distributed game, some business application etc)
3. Concept addressing COM/DCOM
4. Component framework
5. Mini projects, one business application each to be programmed using CORBA, EJB, COM, .NET
6. One mini project for creating a web service

SOFTWARE ENGINEERING				
CLASS T.E. (INFORMATION TECHNOLOGY)			SEMESTER VI	
HOURS PER WEEK	LECTURES	:	04	
	TUTORIALS	:	--	
	PRACTICALS	:	02	
			HOURS	MARKS
EVALUATION SYSTEM:	THEORY		3	100
	PRACTICAL		--	--
	ORAL		--	25
	TERM WORK		--	25

1. Introduction
Software Engineering Process Paradigms – Process Models – Incremental and Evolutionary models, Agile methodology – Process and Project Metrics – Software estimation – Empirical estimation models – Cost/Effort estimation – Planning – Risk analysis – Software project scheduling, Control & Monitoring.

2. Requirements Analysis and Engineering
Prototyping – Specification – Analysis Modeling – Various Techniques in Software requirement analysis and system specification

3. Software Design
Software Design – Abstraction – Modularity – Software Architecture – Effective modular design – Cohesion and Coupling – Architectural design - Distributed system Architectures and Application Architectures, Procedural design – Data flow/Control flow oriented design – Reuse based design – case studies from different domains.
User Interface Design – Human Factors – Interface standards – Design Issues – User Interface Design Process – Evaluation.

4. Software Configuration Management
Software Configuration items – SCM process – Identification of objects in software configuration – version and change control – configuration audit – status reporting, SCM standards and SCM issues.

5. Software Quality and Testing
Software Quality Assurance – Quality metrics
Software Reliability – Software testing – Path Testing – Control Structures Testing – Black Box Testing – Integration, Validation and system testing – Software Maintenance – Reverse Engineering.

6. Web Engineering
For web based applications – attributes, analysis, design and testing. Security Engineering, Service-Oriented Software Engineering, Aspect–Oriented Software Development and Test Driven Development.

References:
1. Roger Pressman, Software Engineering: A Practitioners Approach, (6th Edition), McGraw Hill, 1997.

6. I. Sommerville, Software Engineering, 7th edition, Adison Wesley, 1996.
7. Watts Humphrey, Managing software process, Pearson education, 2003.
8. James F. Peters and Witold Pedrycz, " Software Engineering – An Engineering Approach", Wiley.
9. Mouratidis and Giorgini. "Integrating Security and Software Engineering – Advances and Future", IGP. ISBN – 1-59904-148-0

Term Work
Term work shall consist of at least 10 Laboratory assignments and one written test.
Marks

2**.** Laboratory work (Experiments and Journal)   15 Marks
3. Test (at least   one)   10 Marks
The final certification and acceptance of Term Work ensures the satisfactory
Performance of laboratory Work and Minimum Passing in the term work.

Suggested List of Experiments
13. SRS in IEEE format for any case study.
14. Use project management tool to schedule project plan.
15. Use analysis and design tools and draw DFD / CFD.
16. Develop test cases for white box testing.
17. Assignment / code for stubs and drivers.
18. Change specifications and make different versions using any SCM tool.
19. Test Driven Development

DTABASE TECHNOLOGIES

CLASS T. E. (INFORMATION TECHNOLOGY)   SEMESTER VI

Hours per	Lectures	:	04	
Week	Tutorial	:	--	
Practical		:	02	
Hours	Marks			
Evaluation	Theory		3	100
System	: Practical		-	--
Oral	-		--	
Term work	-		25	

Objective of course:

- This course aims to provide continuum to where the first course of databases left off. Design aspects of relational databases are covered.
- Complex data models like OO OR parallel and distributed introduced.
- The course provides students a good overview of the ideas and the techniques, which are behind recent developments in the fields of data warehousing and Online Analytical Processing (OLAP)

1. **Overview**
   Review of relational database systems, ER diagram, SQL.

2. **Integrity and Security**
   Domain constraints; referential integrity, assertions; triggers; triggers and Assertions in SQL. Security and Authorization; Authorization in SQL.

3. **Relational database Design**
   First normal form; pitfalls in relational database design, functional dependencies; decomposition. Desirable properties of decomposition. Boyce-Code normal form; 3rd and 4th normal form. Mention of other formal forms.

4. **The ER Model Revisited**
   Motivation for complex data types, User Defined Abstract Data Types And Structured Types, Subclasses, Super classes, Inheritance, Specialization and Generalization, Relationship Types of Degree Higher Than Two.

5. Object-Oriented & Object relational databases
   Object Identity, Object Structure, and Type Constructors, Encapsulation of Operations, Methods, and Persistence, Type Hierarchies and Inheritance, Type extents and Queries, Database Design For An ORDBMS- Nested Relations and Collections; Storage And Access methods, Overview of SQL 3

6. Parallel and Distributed Databases

Parallel y Evaluation; Parallelizing Individual Operations, Sorting, Joins; Distributed Databases Concepts, Data Fragmentation, Replication, and Allocation technique for Distributed Database Design; Query Processing in Distributed Databases; Concurrency Control and Recovery in Distributed Databases.

7. Enhanced Data Models for Advanced Applications.
(Overview and Design issues)
Temporal Databases; Spatial Databases & Geographic Information Systems, Mobile Databases.

8. Data Warehousing and OLAP
   a) Data Warehousing Basics : Data Warehousing (DW) Introduction & Overview; Data Marts, DW components; Data warehouse architecture; ETL – Data Transformation-Extracting , Conditioning, cleansing, Scrubbing, Merging, etc.
   b) OLAP: Multidimensional modeling- Fact table, dimensions, measures, ROLAP, MOLAP, HOLAP; tools. OLAP Operations-Rollup, Drill-down, Dice slice, pivot.

Text Books:
1. Elmasri and Navathe, " Fundamentals of Database System", Pearson Education
2. Raghu Ramakrishna , Johannes Gerhke , "Database management Systems" McGraw Hill
3. Kimball, Ralph; Reeves, Laura et al Data warehousing lifecycle Toolkit: expert methods for designing, developing, and deploing data warehouses _ Wiley publications.

References:
1. Korth, Silberchatz, Sudarshan, "Database System concepts" Mcgraw Hill
2. K. J. Data, Longman, "Introduction to Database Systems", Pearson Education
3. Paulraj Ponnian, "Data Warehousing Fundamentals", John Wiley.

Term Work
Term Work shall consist of at least 10 assignments/programming assignments and one written test.

Marks
1. Laboratory work (Experiments & journal)   15 Marks
2. Test (at least one)   10 Marks

The final certification and acceptance of TW ensures the satisfactory performance of laboratory Work and Minimum Passing in the term work.

Suggested Experiment List

1. At least one or two review SQL assignments covering triggers, assertions and authorizations.
2. Object Oriented Queries
3. Case study assignments for OO and OR database.
4. At least one or two review SQL assignments covering triggers, assertions and authorizations.
5. Object Oriented Queries
6. Case study assignments for OO and OR database.
7. At least one or two review SQL assignments covering triggers, assertions and authorizations.
8. Object Oriented Queries
9. Case study assignments for OO and OR database.
10. Two mini projects in distributed and parallel databases.
11. Hands on any one good warehousing tool (Oracle/SQL Server Analysis tool
12. A full fledged mini project in which a student will design and implement a data warehouse. The data warehouse must be populated and OLAP Queries and operation to be demonstrated for the warehouse.
13. A full fledged mini project in which a student will design and implement a data warehouse. The data warehouse must be populated and OLAP Queries and operation to be demonstrated for the warehouse

PROGRAMMING FOR MOBILE AND REMOTE COMPUTERS

CLASS T.E. (INFORMATION TECHNOLOGY)			SEMESTER VI	
HOURS PER WEEK	LECTURES	:	04	
	TUTORIALS	:	--	
	PRACTICALS	:	02	
			HOURS	**MARKS**
EVALUATION SYSTEM:	THEORY		3	100
	PRACTICAL		--	25
	ORAL		--	--
	TERM WORK		--	25

1. Java EE 5: An Overview
Enterprise Architecture Types, Goals of Enterprise Applications. Introducing the Java EE Platform, Features of Java EE 5, The Runtime Infrastructure, Java EE 5 APIs, Architecture of Java EE 5, Describing Java EE Containers, Developing Java EE 5 Applications, Exploring Probable Java EE Application Architectures, Application Development and Deployment Roles

2. Java EE Related Technologies
Java Database Connectivity, Servlets, JavaServer Pages, Java Server Faces, JavaMail, Enterprise JavaBeans, Hibernate, Seam, Java EE Connector Architecture, Web Services, Struts, Spring, JAAS, AJAX

3. Web Applications and Java EE 5
Exploring the HTTP Protocol, Components of a Web Application, Structure /Modules of Web Applications, Describing Web Containers, Types of Web Containers, Building Web Applications, Applications with Basic HTML pages, Applications with Basic JSP Pages and Servlets, Applications with Modular Components, EJB-Centric Applications

4. Understanding J2ME
Configurations, Connected Device Configuration, Connected Limited Device Configuration, Profiles, Current Profiles, Mobile Information Device Profile, Platform Standardization, Anatomy of MIDP Applications, Advantages of MIDP, Portability, Security, MIDP Vendors, Fragmentation

5. Building MIDlets
Tooling Up, Debugging Your MIDlets, Creating Source Code, Compiling a Midlet. Preverifying Class Files, Sun's J2ME Wireless Toolkit Devices, Running MIDlets Using the Emulator Controls, Tour of MIDP Features, It's Java MIDlet Life Cycle, Generalized User Interface, The Likelihood of Server –Side Components, Packaging your Application, Manifest Information, Creating a MIDlet Descriptor, Using an Obfuscator, Using Ant, Running on a Real Device

6. MIDlets

The MIDlet Life Cycle, Requesting A Wakeup Call, A Bridge to the Outside World, Packaging MIDlets, MIDlet Manifest Information, Application Descriptor, MIDlet Properties, MIDlet Suite Security, Permissions, Protection Domains, Permission Types, Permissions in MIDlet Suite Descriptors, No Floating Point In CLDC 1.0, Java
. Lang, No Object Finalization, No Reflection, No Native Methods, No User Classloading, Multithreading, String and String Buffer, Math, Runtime and System, Streams In Java io

7. Creating User Interface

The View from the Top, Using Display, Event Handling with Commands Creating Command, Responding to Commands Lists And Forms: Using Lists, Understanding List Types, Event Handling for IMPLICIT Lists, Creating List, about Image, Editing a List, Working with List Selection Custom Items: Introducing Custom items, Custom item Painting, Showing, Hiding and Sizing Handling Events

8. Wireless Messaging Api

Bluetooth and Obex, Programming a Custom User Interface, the Game API, 3d Graphic, Sound, Music, and Video: MMAPI

10. Sing Li Jonathan Knudsen, "Beginning J2me From Novice to Professional", 3rd edition , Apress, Isbn No: 978-81-8128-292-7
11. Kogent Solutions Inc, J2EE 1.4 PROJECTS
12. James Keogh , "The Complete Reference J2ME", Tata McGraw Hill. ISBN -10: 0-07-053415-2
13. Jim Keogh, "The Complete Reference J2EE", Tata McGraw Hill. ISBN -10: 0-07-052912-4

References

20. Asoke Talukder, "Mobile Computing Technology, Application and Services Concepts", Tata McGraw Hill.
21. Riggs, "Programming Wireless Devices with Java 2 platform", 2nd Eition, Pearson Education.
22. Yaun, "Enterprise J2ME: Developing Mobile Java Application", Pearson.

Term Work

Term work shall consist of at least 10 experiments covering all topics and at least one written test.

Marks

1. Laboratory work (Experiments and Journal)   15 Marks
2. Test (at least   one)   10 Marks

The final certification and acceptance of Term Work ensures the satisfactory performance of laboratory Work and Minimum Passing in the term work.

Suggested List of Experiments

J2EE

1. Editing, debugging and execution of any one of the project incorporated in the text book J2EE
1.4 PROJECTS preferably- **project III: online shopping site**

J2ME

1. Creation of simple J2ME Midlet
2. Illustration of low level API using Cancas
3. Use of kepresses
4. Use of high level components
5. Use of RMS
6. Creating custom items and performing various operations like painting, showing, hiding and sizing.
7. Mixing 3D graphics, sound, music, video as applicable

INFORMATION TECHNOLOGY FOR MANAGEMENT OF ENTERPRISES

CLASS T.E. (INFORMATION TECHNOLOGY)			SEMESTER VI	
HOURS PER WEEK	LECTURES	:	04	
	TUTORIALS	:	01	
	PRACTICALS	:	--	
			HOURS	MARKS
EVALUATION SYSTEM:	THEORY		3	100
	PRACTICAL		--	--
	ORAL		--	25
	TERM WORK		--	25

1. **Organizational Performance: IT support and Applications.**

Doing Business in the Digital Economy, Business pressures, organizational performance and responses and IT support, Information Systems and Information Technology, the adaptive, Agile, Real time Enterprise, Information Technology Development and Trends.

2. IT Support Systems: Concepts and Management

Information Systems Concepts and Definitions, Classifications and Types of Information Systems, How IT supports People and Organizational Activities, How It supports Supply Chains and Enterprise Systems, Information Systems Infrastructure and Architecture, Emerging Computing Environments : SaaS, SOA and more, Managerial issues.

3. E Commerce and E Business:

Overview of E Business and E commerce, Major EC Mechanisms, Business to Consumer applications, B2B Applications, Major models of E Business : From E-Government to C2C, e Commerce Support Services : Advertising Payments and order Fulfillment, Ethical and legal issues in E Business, Managerial Issues.

4. **IT Compliance: Functional Applications and Transaction Processing**

Functional informational Systems, transaction processing Information systems, Managing Production / Operations and Logistics, Managing Marketing and Sales Systems, Managing the accounting and Finance Systems, Managing human Resource Systems, Integrating Functional Information Systems, How IT supports compliance, Managerial Issues.

5. **Understanding Enterprise Systems: Supply Chain**

Essentials of Enterprise systems and supply chains, supply chain challenges, supply chain opportunities, Business value of Enterprise systems, Enterprise resource planning systems, Business Process Management, Product life cycle Management, Customer Relationship Management, Managerial Issues

6. Global and Interorganizational Information Systems:

Interorganizational Activities and order fulfillment, Interorganizational information Systems and Virtual Corporations, Global Information Systems, Facilitating IOS and Global Systems from Demand driven Networks to RFID, Interorganizational Information Integration, Partner relationship Management and collaborative commerce, Managerial issues.

7. Managing Knowledge

Introduction to Knowledge Management, Organizational Learning and Memory, knowledge management activities, Approaches to Knowledge management, Information Technology in Knowledge Management, knowledge Management Systems implementation, Roles of people in knowledge management, Ensuring Success of KM Efforts, Managerial Issues.

8. Corporate Performance Management and Business Intelligence:
A framework of Business Intelligence: concepts and Benefits, Business Analytics: Online analytical processing reporting and querying, Data Text Web mining and Predictive Analytics, Data Visualization, Geographical Information Systems and virtual reality, real time business intelligence, and competitive Intelligence, Business Performance Management Scorecards and Dashboards, Managerial Issues.

9. Managerial Decision making and IT support systems
Managers and Decision making, Decision support systems,: for Individuals groups and Enterprise, Intelligent Support Systems : The basics, Expert Systems, Other intelligent systems, Automated Decision Support (ADS), Managerial Issues.

10. IT: Strategic objectives and Planning
IT Strategic Alignment, Competitive Forces Model, Value Chain Model, Strategic Resources and Capabilities, IT Planning, Interorganizational and international IT planning, Managing the IS department, Managerial issues.

11.Economics of IT
Financial and Economic Trends and the productivity paradox, Evaluating IT investment: Benefits Costs and Issues, Methods for evaluating and justifying IT Investment, IT Economics strategies: Chargeback and Outsourcing, Economic aspects of IT and Web Based Systems, Managerial Issues.

12. IT Application Acquisitions and Options
The landscape and framework of IT Application Acquisition, Identifying Justifying and planning IT systems applications, Acquiring IT applications: available options, Outsourcing, application service providers and utility computing, selecting an acquisition approach and other implementation issues, Connecting to Databases, Enterprise systems and Business Partners, Business Process Redesign, Managerial Issues.

13. IT Infrastructure
Overview of Databases, Warehouses, Network Computing, Wireless Devices and application.
Case study on the above topics.

Text Book
1. Efrain Turban, Dorothy Leidner, Ephrain McLean, James Wetherbe "Information Technology for Management: Transforming Organizations in the Digital Economy", 6th edition. ISBN: 978-8126-514410
2. Kenneth C. Laudon & Jane P. Laudon, "Management Information Systems: Managing the Digital Firm" 7th Ed.; Prentice Hall, Publisher. ISBN: 0-13-033066-3.
3. V. K. Narayanan, "Managing Technology and Innovation for Competitive Advantage", 1/e, Pearson Education.
4. Rainer, Turban, "Introduction to Information Systems: Supporting and Transforming Business", 2nd Edition
5. David M. Kroenke, "Using MIS", Prentice Hall.
6. William Stallings, "Business Data Communications", 5e

Term Work
Term work shall consist of at least 10 practical experiments covering all topics and one written test.

Marks
Distribution of marks for term work shall be as follows:

1. Laboratory work (Experiments and Journal)   15 Marks
2. Test (at least one)   10 Marks

The final certification and acceptance of Term Work ensures the satisfactory Performance of laboratory Work and Minimum Passing in the term work.

Suggested tutorial exercises

1. UML for modeling scenarios in Microsoft Visio or similar to model a solution to business model.
2. Workflow management in CRM, Procurement process.
3. Basic IT project management such as cost and schedule management.
4. Case studies in access. Design various schema and tables and generate reports as applicable.
5. Using Excel solver as decision support tool.
6. Data communications and technology.

- LAN
  - ETHERNET
  - How wiFi works.
  - How routers work.
  - Web hosting.
7. Data base processing.
  - Oracle.
  - SQL.
  - IBM DB2.
8. E-Commerce and supply chain
  - HTML tutorial.
  - XHTML tutorial.
  - Study B2B, C2C, B2C business.
  - M-commerce
9. Business intelligence and knowledge management.
  - Decision Support System (EXCEL solver for model driven DSS ,scenario manager for Knowledge driven DSS, Microsoft Netmeeting for communication driven DSS)
- Integrating EXCEL with WWW for web based and inter organizational DSS
- Using EXCEL macros.
- Data warehouse support in MS SQL
- Data mining and OLAP.
10. ERP,CRM development using open source frameworks like OF biz /JBseam, EBI neutrino for distribution, inventory, Ecommerce and workflow support
11. Information Security Management.