

SEMESTER VII

(Applicable to the students admitted from the Academic year 2006 – 2007 onwards)

| Code No. | Course Title | L | T | P | M |
|------------------|--|---|---|---|-----|
| THEORY | | | | | |
| 1 | Environmental Science and Engineering | 4 | 0 | 0 | 100 |
| 2 | Component Based Technology | 4 | 0 | 0 | 100 |
| 3 | Mobile Computing | 4 | 0 | 0 | 100 |
| 4 | Object oriented Analysis and Design | 4 | 0 | 0 | 100 |
| 5 | Elective II | 4 | 0 | 0 | 100 |
| 6 | Elective III | 4 | 0 | 0 | 100 |
| PRACTICAL | | | | | |
| 1 | Software Components Laboratory | 0 | 0 | 3 | 100 |
| 2 | Software Engineering & Case tools lab | 0 | 0 | 3 | 100 |

SEMESTER VII

ENVIRONMENTAL SCIENCE AND ENGINEERING

1. INTRODUCTION AND COMPONENTS OF ENVIRONMENT 9

Definition - Scope and Role of Environmental Engineer - Components – Water, air and land – Inter-relationship between components – Subcomponents; Ecosystem – Structure and functional components of ecosystem – Development and evolution of ecosystem – Energy flow and material cycling in ecosystem.

2. ENVIRONMENTAL IMPACTS OF DEVELOPMENT 9

Natural and man made impacts on water, air and land; Environment and development – Concept of sustainable development - Environmental impacts of Development – sustainable development – Environmental pollution – Water, Air and Land.

3. PLANNING FOR WATER SUPPLY AND SEWERAGE SYSTEMS 9

Public water supply and sewerage systems – Objectives – Design period – Population forecasting – Water demand – Sources of water – Source Selection – Water quality – Characterization – Water quality standards – Sources of wastewater – Quantity of sanitary sewage – Estimation of storm runoff – Characteristics and composition of sewage and their significance – Effluent standards.

4. CONVEYANCE SYSTEM 9

Water supply – intake structures – Pipe materials - Hydraulics of flow in pipes – Transmission main design – Laying, jointing & testing of pipes – appurtenances – Pumps – Sewerage – Hydraulics of flow in sewers – Design of sanitary and storm sewers – Computer applications – Laying, jointing & testing of sewers – appurtenances – Pumps.

5. WATER SUPPLY AND DRAINAGE IN BUILDINGS 9

Principles of design of water supply and drainage in buildings – House service connection – Sanitary fixtures and fittings – Systems of sanitary plumbing – House drainage – House sewer connection.

Total Hours = 45

Text Books:

1. Garg, S.K., Environmental Engineering, Vols. I and II, Khanna Publishers, New Delhi, 1994
1. C.S.Shah, Water Supply and Sanitation, Galgotia Publishing Company, New Delhi, 1994.

References:

1. Manual on Water Supply and Treatment, CPHEEO, Ministry of Urban Development, Government of India, New Delhi, 1999.
2. Manual on Sewerage and Sewage Treatment, CPHEEO, Ministry of Urban Development, Government of India, New Delhi, 1993
3. H.S.Peavy, D.R.Rowe and George Tchobanoglous, Environmental Engineering, McGraw-Hill Book Company, New Delhi, 1995.

SEMESTER VII

COMPONENT BASED TECHNOLOGY

AIM

To introduce different software components and their application.

OBJECTIVE

Introduces in depth JAVA, Corba and .Net Components

Deals with Fundamental properties of components, technology and architecture and middleware.

Component Frameworks and Development are covered indepth.

UNIT I INTRODUCTION 9

Software Components – objects – fundamental properties of Component technology – modules – interfaces – callbacks – directory services – component architecture – components and middleware

UNIT II JAVA BASED COMPONENT TECHNOLOGIES 9

Threads – Java Beans – Events and connections – properties – introspection – JAR files – reflection – object serialization – Enterprise Java Beans – Distributed Object models – RMI and RMI-IIOP

UNIT III CORBA COMPONENT TECHNOLOGIES 9

Java and CORBA – Interface Definition language – Object Request Broker – system object model – portable object adapter – CORBA services – CORBA component model – containers – application server – model driven architecture

UNIT IV .NET BASED COMPONENT TECHNOLOGIES 9

COM – Distributed COM – object reuse – interfaces and versioning – dispatch interfaces – connectable objects – OLE containers and servers – Active X controls – .NET components - assemblies – appdomains – contexts – reflection – remoting

UNIT V COMPONENT FRAMEWORKS AND DEVELOPMENT 9

Connectors – contexts – EJB containers – CLR contexts and channels – Black Box component framework – directory objects – cross-development environment – component-oriented programming – Component design and implementation tools – testing tools - assembly tools

TOTAL : 45

TEXT BOOK

Clemens Szyperski, “Component Software: Beyond Object-Oriented Programming”, Pearson Education publishers, 2003

REFERENCES

Ed Roman, “Mastering Enterprise Java Beans”, John Wiley & Sons Inc., 1999.

Mowbray, “Inside CORBA”, Pearson Education, 2003.

Freeze, “Visual Basic Development Guide for COM & COM+”, BPB Publication, 2001.

Hortsamann, Cornell, “CORE JAVA Vol-II” Sun Press, 2002.

SEMESTER VII

MOBILE COMPUTING

AIM

To provide basics for various techniques in Mobile Communications and Mobile Content services.

OBJECTIVES

To learn the basics of Wireless voice and data communications technologies.

To build working knowledge on various telephone and satellite networks.

To study the working principles of wireless LAN and its standards.

To build knowledge on various Mobile Computing algorithms.

To build skills in working with Wireless application Protocols to develop mobile content applications.

UNIT I WIRELESS COMMUNICATION FUNDAMENTALS 9

Introduction – Wireless transmission – Frequencies for radio transmission – Signals – Antennas – Signal Propagation – Multiplexing – Modulations – Spread spectrum – MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks.

UNIT II TELECOMMUNICATION NETWORKS 11

Telecommunication systems – GSM – GPRS – DECT – UMTS – IMT-2000 – Satellite Networks - Basics – Parameters and Configurations – Capacity Allocation – FAMA and DAMA – Broadcast Systems – DAB - DVB.

UNIT III WIRELESS LAN 9

Wireless LAN – IEEE 802.11 - Architecture – services – MAC – Physical layer – IEEE 802.11a - 802.11b standards – HIPERLAN – Blue Tooth.

UNIT IV MOBILE NETWORK LAYER 9

Mobile IP – Dynamic Host Configuration Protocol - Routing – DSDV – DSR – Alternative Metrics.

UNIT V TRANSPORT AND APPLICATION LAYERS 7

Traditional TCP – Classical TCP improvements – WAP, WAP 2.0.

TOTAL : 45

TEXT BOOKS

Jochen Schiller, “Mobile Communications”, PHI/Pearson Education, Second Edition, 2003. (Unit I Chap 1,2 &3- Unit II chap 4,5 &6-Unit III Chap 7.Unit IV Chap 8- Unit V Chap 9&10.)

William Stallings, “Wireless Communications and Networks”, PHI/Pearson Education, 2002. (Unit I Chapter – 7&10-Unit II Chap 9)

REFERENCES

Kaveh Pahlavan, Prasanth Krishnamoorthy, “Principles of Wireless Networks”, PHI/Pearson Education, 2003.

Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, “Principles of Mobile Computing”, Springer, New York, 2003.

Hazysztof Wesolowski, “Mobile Communication Systems”, John Wiley and Sons Ltd, 2002.

SEMESTER VII

OBJECT ORIENTED ANALYSIS AND DESIGN

(Common to VII SEM CSE)

AIM

To understand the concepts of object oriented analysis and design.

OBJECTIVES

To understand the object oriented life cycle.

To know how to identify objects, relationships, services and attributes through UML.

To understand the use-case diagrams.

To know the Object Oriented Design process.

To know about software quality and usability.

UNIT I INTRODUCTION 8

An Overview of Object Oriented Systems Development - Object Basics – Object Oriented Systems Development Life Cycle.

UNIT II OBJECT ORIENTED METHODOLOGIES 12

Rumbaugh Methodology - Booch Methodology - Jacobson Methodology - Patterns – Frameworks – Unified Approach – Unified Modeling Language – Use case - class diagram - Interactive Diagram - Package Diagram - Collaboration Diagram - State Diagram - Activity Diagram.

UNIT III OBJECT ORIENTED ANALYSIS 9

Identifying use cases - Object Analysis - Classification – Identifying Object relationships - Attributes and Methods.

UNIT IV OBJECT ORIENTED DESIGN 8

Design axioms - Designing Classes – Access Layer - Object Storage - Object Interoperability.

UNIT V SOFTWARE QUALITY AND USABILITY 8

Designing Interface Objects – Software Quality Assurance – System Usability - Measuring User Satisfaction

TOTAL : 45+15 HRS

TEXT BOOKS

Ali Bahrami, “Object Oriented Systems Development”, Tata McGraw-Hill, 1999 (Unit I, III, IV, V).

Martin Fowler, “UML Distilled”, Second Edition, PHI/Pearson Education, 2002. (UNIT II)

REFERENCE BOOKS

Stephen R. Schach, “Introduction to Object Oriented Analysis and Design”, Tata McGraw-Hill, 2003.

James Rumbaugh, Ivar Jacobson, Grady Booch “The Unified Modeling Language Reference Manual”, Addison Wesley, 1999.

3. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado, “UML Toolkit”, OMG Press Wiley

Publishing Inc., 2004.

SEMESTER VII

SOFTWARE COMPONENTS LABORATORY

LIST OF EXPERIMENTS

1. COM COMPONENT: Development of simple com components in VB and use them in applications. [2 example].
2. ENTERPRISE JAVA BEANS: Deploying EJB for simple arithmetic operator.
3. RMI: Deploying RMI for client server applications. [2 Experiments].
4. Creation Of DLL Using VB And Deploy it in Java [2 Experiments]
5. Naming Services In CORBA
6. DSI, DII IN CORBA.
7. INTER ORB IN COMMUNICATION [IIOP, IOR] Jac ORB & Visi broker ORB
8. STUDYING J2EE SERVER.
9. SIMPLE APPLICATION USING CORBA.

SEMESTER VII

SOFTWARE ENGINEERING & CASE TOOLS LAB

(i) SOFTWARE ENGINEERING LAB

Develop two or three of the following applications using the software engineering methodologies given below using C/C++ as front-end and MS-ACCESS as Backend.

- Requirements Analysis
- Design Concepts
- Function Point Analysis
- Implementation
- Software Testing Techniques
- Error Tracking

Suggested List of Applications:

- Library Management System
- Bank Management System
- Inventory System
- Software for a Game
- Text Editor
- Natural Language Based Grammar Checker
- Airline Reservation System
- Online Survey
- Financial Accounting System
- Graphics Toolkit

(ii) CASE TOOLS LAB

Prepare the following documents for two or three of the experiments listed below and develop the software engineering methodology.

1. Program Analysis and Project Planning.
Thorough study of the problem – Identify project scope, Objectives, Infrastructure.
1. Software requirement Analysis
Describe the individual Phases / Modules of the project, Identify deliverables.
3. Data Modeling
Use work products – Data dictionary, Use diagrams and activity diagrams, build and test class diagrams, Sequence diagrams and add interface to class diagrams.
4. Software Development and Debugging
5. Software Testing
Prepare test plan, perform validation testing, Coverage analysis, memory leaks, develop test case hierarchy, Site check and Site monitor.

Suggested List of Applications:

- Student Marks Analyzing System
- Quiz System
- Online Ticket Reservation System
- Payroll System
- Course Registration System
- Expert Systems
- ATM Systems
- Stock Maintenance
- Real-Time Scheduler
- Remote Procedure Call Implementation

