

Instruction : 3 Periods / week
Tutorial : 1 Period / week
Credits : 3

Sessional Marks : 30
End Examination Marks : 70
End Exam Duration : 3 Hours

Prerequisites: Object Oriented Programming through Java

Course Objectives:

1. To understand theories, methods, and technologies applied for professional software development.
2. To define software engineering and explain its importance
3. To discuss the concepts of software products and software processes

Unit I – Introduction to Software Engineering, Process Models

Introduction to Software Engineering: The evolving role of software, Software, Changing Nature of Software, Legacy software, Software evolution, Software myths, Software engineering- A layered technology.

Process Models: A process framework, the waterfall model, Incremental process models, Evolutionary process models, specialized process models, The Unified process. Personal and Team process models, The Capability Maturity Model Integration (CMMI)

Unit II – System Engineering, Requirements Engineering, Building the Analysis Model

System Engineering: An Overview of Business Process Engineering and Product Engineering.

Requirements Engineering: Requirements Engineering Tasks, Initiating the Requirements Engineering Process, Eliciting Requirements, Developing Use-Cases, Building the Analysis Model, Negotiating Requirements, Validating Requirements.

Building the Analysis Model: Requirements analysis, Analysis Modeling Approaches, Data Modeling Concepts, Object-Oriented Analysis, Scenario-Based Modeling, Flow-Oriented Modeling, Class-Based Modeling, Creating a Behavioral Model,

Unit III – Design Engineering, Creating an Architectural Design, Modelling Component level design

Design Engineering: Design process and Design quality, Design concepts, the design model, Pattern based software design.

Creating An Architectural Design: Software architecture, Data design, Architectural styles and patterns, Architectural Design, Assessing alternative architectural designs, mapping data flow into software architecture.

Modeling Component-Level Design: Designing class-based components, conducting component-level design, Object constraint language, Designing conventional components.

Unit IV – Performing User Interface Design, Testing Strategies

Performing User Interface Design: Golden rules, User interface analysis and design, Interface analysis, Interface design steps, Design evaluation.

Testing Strategies: A strategic approach to software testing, Test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

Unit V - Umbrella Activities

Umbrella Activities-I

Measurement: Software Measurement, Metrics for software quality.

Product Metrics: Software Quality, Frame work for Product metrics, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

Umbrella Activities-II

Risk management: Reactive vs. Proactive Risk strategies, Software risks, Risk Identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

Course Outcomes: At the end of the course, the student should be able to

- CO 1 : Understand the principles of software engineering and software myths.
- CO 2 : Know the usage of process models and CMMI levels.
- CO 3 : Identify requirements engineering process and related system models.
- CO 4 : Perceive software design process, design quality, design models and will be able to create architectural designs, component designs and UI designs.
- CO 5 : Appreciate the strategic approach to testing and will be able to apply the art of debugging.
- CO 6 : Understand the importance of software metrics in ensuring quality and will have the ability to apply them in a given context.

Text Book:

1. Software Engineering, A Practitioner's Approach, Roger S. Pressman, 6th Edition, McGraw-Hill, 2005.

References:

1. Software Engineering, Ian Sommerville, 7th Edition, Pearson Education, 2004
2. Software Engineering: A Precise Approach, Pankaj Jalote, 1st Edition, Wiley India, 2010.
3. Software Engineering: A Primer, Waman S Jawadekar, 1st Edition, Tata McGraw-Hill, 2008.
4. Fundamentals of Software Engineering, Rajib Mall, 3rd Edition, PHI, 2009.

Instruction : 4 Periods / week
Credits : 4

Sessional Marks : 30
End Examination Marks : 70
End Exam Duration : 3 Hours

Prerequisites: Object Oriented Programming through Java

Course Objectives:

1. To learn the basics of HTML elements
2. To learn the basics of java Console and GUI based programming
3. To introduce XML and processing of XML Data with Java
4. To introduce Server side programming with Java Servlets and JSP
5. To introduce Client side scripting with JavaScript and AJAX

Unit I

HTML Graphics: div, span, layers, image maps

CSS: Syntax structure, using style sheets, borders, margins, box model, fonts, and other advanced elements.

JavaScript: Introduction to JavaScript, data types, operators, loop structures, conditions, functions, Arrays, Objects, Regular expressions, error handling, JS HTML DOM, JS Browser DOM, JSON

Unit II

Introduction to JQuery: Syntax, selectors, events, effects, traversing

XML: Syntax, namespaces, DTD, Schema, XSLT, XML Processors-DOM,SAX, Introduction to AJAX

Unit III

Database Technologies: JDBC Drivers and types, JDBC Configuration (Database URLs, Registering a driver, connecting to a database), Executing SQL statements (Statement and ResultSet classes), query execution (prepared statements and callable statements), Scrollable and Updatable result sets, row sets, Meta data, transactions.

Web servers: An introduction to the various Web Servers (discuss the features and merits of 2-3 Web servers including Tomcat). A brief discussion of HTTP and its relevance to Web programming, Web application structure and deployment in Tomcat.

Unit IV

Servlet Technology: Servlets necessity, Servlet lifecycle, The Servlet API packages and class and interface hierarchy, Basic servlet program template, Handling requests and responses, Using form parameters, Using ServletContext and ServletConfig objects, Using initialization parameters (both context and config level), Session management (Cookies, Session API, URL Rewriting), Security issues, Servlet Listeners and Filters.

Unit V

JSP Technology: The Anatomy of a JSP Page, JSP Lifecycle, Scripting elements (Scriptlets, expressions, declarations, comments), JSP Directives, JSP Standard actions, JSP Implicit objects, JSP page scope, JSTL Concepts.

Expression Language: EL operators, EL Objects, EL functions, TLDs. Error handling, developing custom tag libraries.

Course Outcomes: Upon completing the course, a student will be

- CO 1: Able to write html, CSS codes.
- CO 2: Demonstrate JavaScript, XML, DHTML and related Technologies.
- CO 3: Implement the Database Connectivity and Component Technologies like Beans
- CO 4: Deploy the servlet technology & API
- CO 5: Construct the fundamentals of JSP, EL (Expression Language).

Text Books:

1. Beginning HTML, XHTML, CSS, and JavaScript, Jon Duckett, Wrox Publications, 2010
2. Head First Servlets and JSP, Bryan Basham, Kathy Sierra and Bert Bates, 2nd Edition, O'Reilly Media, 2008.
3. Core Java: Volume II – Advanced Features, Cay Horstmann and Gary Cornell, 9th Edition, Prentice Hall, 2013 (Only Chapter 4 for Database Programming)

References:

1. E-resource: <http://www.w3schools.com/>
2. Core Servlets and JSPs Volume I and II, Martin Hall and Larry Brown, Pearson.

MICROPROCESSOR AND INTERFACING

Instruction : 4 Periods / week

Sessional Marks : 30

Credits : 4

End Examination Marks : 70

End Exam Duration : 3 Hours

Prerequisite: Boolean Algebra and Circuit Design

Course Objectives:

1. To learn and understand architecture and programming of 8086.
2. To learn and understand different peripherals interfacing with 8086.
3. To learn and understand the development of microprocessor based system.

Unit I – 8086 Architecture

An Overview of 8085, 8086 Architecture–Functional Diagram, Register Organization, Memory Segmentation, Addressing Modes of 8086, Instruction Set of 8086, Assembler Directives, Macros, Procedures.

Unit II – Assembly Language Programming of 8086

Simple Programs involving Logical, Branch and Call Instructions, Sorting, Evaluating Arithmetic Expressions, String manipulations, Signal Descriptions of 8086, Common Function Signals, Minimum and Maximum Mode Signals, Physical Memory Organization, Timing Diagrams.

Unit III – Memory and I/O Interfacing

SRAM Interfacing and DRAM Interfacing, 8255 PPI Architecture, Various Modes of Operation of 8255 and Interfacing with 8086, Displays, Stepper Motor Interfacing, D/A and A/D Converter.

Unit IV – Interrupts and Serial Communication Interface

Interrupts: Interrupt Structure of 8086, Vector Interrupt Table, Interrupt Service Routine, Interrupt Controller 8259 Architecture and Interfacing with 8086. Introduction to DOS and BIOS Interrupts.

Serial Communication Interface: Serial Communication Standards, Serial Data Transfer Schemes, 8251 USART Architecture and Interfacing, RS-232.

Unit V – Introduction to 8051 Microcontroller

Overview of 8051 Microcontroller, Architecture, I/O ports, Memory Organization, Addressing Modes and Instruction Set of 8051, Simple Programs.

Course Outcomes: At the end of the course, the student should be able to

- CO 1 : Write assembly language programs for different application using assembler.
- CO 2 : Interface the processor with peripheral devices.
- CO 3 : Describe the instruction set and addressing modes of 8086 and 8051
- CO 4 : Understand the 8051 architecture and programming
- CO 5 : Understand the architectural difference between the processor and controller

Text Books:

1. Advanced Microprocessors and Peripherals, A. K. Ray and K. M. Bhurchandani, 2nd Edition, Tata McGraw-Hill, 2006.
2. Microprocessors and Interfacing, D.V. Hall, 2nd Edition, Tata McGraw-Hill, 2006.
3. The 8051 Microcontroller, Kenneth J. Ayala, 3rd Edition, Cengage Learning, 2010.

With effect from academic year 2017-18

References:

1. The 8051 Microcontroller and Embedded Systems, Muhammad Ali Mazidi and Janice Gillispie Mazidi, 2nd Edition, Pearson, 2008.
2. Micro Computer Systems: The 8086/8088 Family Architecture, Programming and Design, Yu-Cheng Liu and Glenn A. Gibson, 2nd Edition, Prentice Hall, 1986.
3. Microcontrollers and Application, Ajay V. Deshmukh, Tata McGraw-Hill, 2005.

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

(Common to all branches)

Instruction : 3 Periods / week
 Tutorial : 1 Period / week
 Credits : 3

Sessional Marks : 30
 End Examination Marks : 70
 End Exam Duration : 3 Hours

Course Objectives:

1. To learn various principles of Managerial Economics and to make them effective business decision makers
2. To make the students understand functional areas and potential problems in economics for efficient utilization of resources
3. To have an overview on investment appraisal methods and to promote the students to learn how to start new enterprises
4. To understand the basic elements involved in Capital budgeting process
5. To provide fundamental knowledge of accounting statements & analysis for effective business decisions

Unit I – Introduction to Managerial Economics, Demand and Demand Forecasting

Definition, Nature and Scope of Managerial Economics, Demand Analysis-Demand Determinants, Law of Demand and its exceptions, Elasticity of Demand-Definition, Types, Measurement and Significance of Elasticity of Demand, Introduction to Demand Forecasting Methods-Meaning, Factors Governing Demand Forecasting, Methods of Demand Forecasting (Statistical and Survey Methods).

Unit II - Theory of Production and Cost Analysis

Production Function-Isoquants and Isocosts, Marginal Rate of Technical Substitution, Least Cost Combination of Inputs, Laws of Returns, Internal and External Economies of Scale, Break-Even Analysis (BEA)-Determination of Break Even Point (simple problems), Managerial Significance and Limitations of BEA.

Unit III – Market Structures

Market structures-Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition, Price-Output Determination in case of Perfect Competition and Monopoly, Pricing Strategies

Unit IV - Capital Budgeting

Capital and its significance- Types of Capital, Working Capital, Nature and Scope of Capital Budgeting- Features of Capital Budgeting Proposals, Methods of Capital Investment Appraisal Techniques- Payback Period (PBP) Method, Accounting Rate of Return (ARR), Net Present Value (NPV) Method and Internal Rate of Return (IRR), Profitability Index

Unit V – Preparation of Financial Statements and Ratio Analysis

Introduction to Financial Accounting – Accounting principles – Accounting cycle – Journal, Ledger, Trial balance and Final Accounts. Financial Analysis Through Ratios- Computation, Analysis and Interpretation of Liquidity Ratios (Current and Quick Ratios), Activity Ratios (Inventory Turnover Ratio and Debtors Turnover Ratio), and Profitability Ratios (Gross Profit Ratio-Net Profit Ratio-Operating Profit Ratio – P/E Ratio and EPS), Leverage Ratio (Debt-Equity Ratio).

Course Outcomes: At the end of the course, the student should be able to

- CO 1 : Capable of analyzing fundamentals of economics such as demand, production, price, supply concepts etc., which helps in effective business administration
- CO 2 : Analyze economies of scale and the Break-Even Point
- CO 3 : Able to determine the Price-Output Relationship in different market Structures

With effect from academic year 2017-18

- CO 4 : Analyze how to invest adequate amount of capital in order to get maximum return from selected business activity
- CO 5 : Analyze accounting statements like income & expenditure statement, balance sheet to understand financial performance of the business and to initiate the appropriate decisions to run the business profitably

Text Books:

1. Financial Accounting, V.Rajasekaran and R.Lalitha, Pearson Education, 2010.
2. Managerial Economics, Suma Damodaran, Oxford University Press, 2009.

References:

1. Managerial Economics, Varshney and Maheswari, 2nd Edition, Sultan Chand & Co, 2009.
2. Managerial Economics in a Global Economy, Dominick Salvatore, 4th Edition, Cengage, 2009.
3. Financial Accounting for Management: Text & Cases, Subhash Sharma and M. Panduranga Vittal, Macmillan, 2008.
4. Financial Accounting, S. N. Maheswari and S. K. Maheswari, Vikas, 2008.
5. Managerial Economics and Financial Analysis, A. R. Aryasri, Tata McGraw-Hill, 2011.