

Semester 4 (2nd year 2nd Semester)

Course Title: Operating System and System Programming

Course Code: CSE401

Course Credit: 2 Credit Theory and 1 Credit Lab

Course Outline: Introduction: What is operating system? History of operating system Operating system concepts Operating system structure Processes and Threads Processes Threads Interprocess communication Scheduling Classical IPC problems Memory Management No memory abstraction Virtual memory Page replacement algorithms Design issues for paging systems Implementation issues File Systems Files Directories File system management Input / Output Principles of I/O hardware Principles of I/O software I/O software layers Disks Clocks Thin clients Deadlocks Resources Detection Recovery Avoidance Prevention Virtualization and Cloud

Course Reference Books:

1. Operating System Concepts, 7th edition, by Silberschatz, Galvin, Gagne
2. Modern Operating Systems, 4th edition, Tanenbum, Bos

Course Title: Business Psychology

Code: GE 402

Credit: 3 Credit Theory

Course Outline: Fundamentals: Definition of Psychology, Subfields of Psychology, Major Perspectives of Psychology, Psychology in Business; Job Analysis: Job-oriented Approach, Person-oriented Approach, Purposes of Job Analysis, Methods of Job Analysis, Job Evaluation; Assessment Methods for Selection and Placement: Psychological Tests: Ability Test, Personality Test, Intelligence Test, Vocational Interest Test; Training and Development: Training Need Analysis, Training Designs, Training Methods, Evaluation of Training; Theories of Employee Motivation: Need Theories, Reinforcement Theory, Expectancy Theory, Goal Setting Theory; Job Attitude and Emotion: Nature of Job Satisfaction, Assessment of Job Satisfaction, Antecedents of Job Satisfaction, Potential Effects of Job Satisfaction, Organizational Commitment, Emotion at work; Productive and Counterproductive Employee Behavior: Productive Behavior, Job Performance; Counterproductive Behavior, Withdrawal, Aggression, Mistreatment, Sabotage, and Theft; Occupational Health Psychology: Occupational Health and Safety, Work Schedules, Occupational Stress, Work-Family Conflict, Burnout, Hawthorne Studies; Leadership: Approaches to the Understanding of Leadership Trait Approach, Leader Behavior Approach, Contingency Theory, Path-Goal Theory, Leader-Member Exchange (LMX) Theory, Transformational Leadership Theory; Organizational Development and Theory: Organizational Development Employee Acceptance of Change, Management by Objectives, Survey Feedback, Team Building, T-Group; Effectiveness of Organizational Development: Organizational Theories, Bureaucracy, Theory X and Theory Y, Open System Theory, Socio-technical System Theory.

References:

2. Industrial and Organizational Psychology: Research and Practice, Paul E. Spector, 5th Edition

Course Title: Database Management Systems I

Code: CSE 404

Credit: 2 Credit Theory 1 Credit Lab

Course Outline: Introduction to Database Systems: Evolution of file processing systems, role of databases in organizations, core components of a database environment; Data Modeling: the Entity-Relationship Diagram and its symbols and constructs; The Relational Model and Normalization: relational model, normalization, transformation of an entity-relationship data diagram into a relational model; SQL - A Standard Navigation Language for Relational Databases; Overview of Object-Oriented Databases: object-oriented data model, implementation of object persistence using relational databases.

References:

1. Database System Concepts by Avi Silberschatz, Henry F. Korth and S. Sudarshan, Sixth Edition

Course Title: Business Studies for Engineers

Code: CSE 405

Credit: 3 Credit Theory

Course Outline: Managers and Entrepreneurs: Management Defined, Role of a Manager, Small-Business Management, The Evolution of Management Thought, Organization, Organization Charts, Contrasting Theories of Organization, Organizational Effectiveness, Organizational Cultures, Change, Conflict, and Negotiation in Organization; The Strategic Management Process, Strategic Implementation and Control, Forecasting. **Accounting Basic:** Forms of Business Organization, Types of Activities performed by Business Organization, Financial statements of Business Organization, The Accounting Equation, The Account and Rules of Debit and Credit, The Journal: Recording of Transaction, Adjusting the Accounts, Closing Entries, and Preparing Financial statements from the Work Sheet. **Analysis and Interpretation of Financial Statement:** Objectives of Financial Statement Analysis, Analysis of a Balance Sheet, Analysis of Statement of Income and Retained Earnings, Ratio Analysis: Liquidity Ratios, Equity or Long Term Solvency Ratio, Profitability Test, Market Test.

References:

1. Stephen P. Robbins and Mary Coulter, *Management*, Prentice Hall, Latest Edition
2. Jerry J. Weygandt, Donald E. Kieso, and Paul D. Kimmel, *Accounting Principles*, Wiley, 8th Ed.

Course Title: Software Requirements Specification and Analysis

Code: SE 406

Credit: 2 Credit Theory and 1 Credit Lab

Course Outline: Review of – The Nature of Software, Software Engineering, The Software Process, Software Engineering Practices, Generic Software Process Model, Process Assessment and Improvement, Prescriptive Process Models, Specialized Process Model and Agile Development. Requirements Engineering, Establishing the ground work, Eliciting Requirements, Negotiating Requirements, Validating Requirements, Requirements Analysis, Scenario-Based Modeling, UML Models, Data Modeling Concept, Class Based Modeling, Requirements Modeling Strategies, Flow-Oriented Model, Behavioral Model, Requirements Modeling for WebApps.

Lab: One small real life system will be given to all the students for analyzing in the class room. Three real life mid-scale systems will be distributed among groups (created randomly) of 5/6 students to analyze (one project per group). The output of both of the analysis will be specification reports.

References:

1. R. S. Pressman, Software Engineering. A Practitioner's Approach, 7/e or higher, McGraw Hill
2. Ian Sommerville. Software Engineering, 9th or higher Edition, Addison-Wesley.

Course Title: Information Security

Code: CSE 411

Credit: 2 Credit Theory and 1 Credit Lab

Course Outline: Overview: Network Security Concepts, Security Attacks, Services and Mechanisms; Classical Encryption techniques: Symmetric Cipher Model, Substitution and Permutation Ciphers, Steganography; Block Ciphers and Data Encryption Standard: Design principles and modes of operation; Public-key cryptography: Introduction to number theory, RSA and Diffie-Hellman; Message Digest: Requirements for cryptographic hash functions, MD5, SHA, Message authentication codes, digital signatures; Key Management and Distribution: Symmetric Key Distribution using Symmetric Encryption, Symmetric Key Distribution using asymmetric Encryption, public key distribution, public key certificates, x.509 certificates; Network and Internet Security: Transport Layer Security, Wireless LAN security, e-mail security.

References:

1. Information Security: Principles and Practice by Mark Stamp 2nd Edition Wiley 2011