

UTTRAKHAND TECHNICAL UNIVERSITY
STUDY AND EVALUATION SCHEME (B.TECH. III Year)- V Semester
B. Tech. INFORMATION TECHNOLOGY

(Effective from the session : 2008-2009)

Year: III, Semester-V

| S.No. | Course Code | Subject | PERIODS | | | EVALUATION SCHEME | | | | Subject Total |
|--|--------------|---|---------|---|---|-------------------|----|-------|----------|---------------|
| | | | | | | SESSIONAL EXAM | | | EXAM ESE | |
| | | | L | T | P | CT | TA | Total | | |
| 1 | TIT-501 | E-Commerce | 3 | 1 | 0 | 30 | 20 | 50 | 100 | 150 |
| 2 | TCS-501 | Computer Graphics | 3 | 1 | 0 | 30 | 20 | 50 | 100 | 150 |
| 3 | TCS-503 | Design & Analysis of Algorithms | 3 | 1 | 0 | 30 | 20 | 50 | 100 | 150 |
| 4 | TIT-502 | Introduction to Web Technology | 3 | 1 | 0 | 30 | 20 | 50 | 100 | 150 |
| 5 | THU-501 | Industrial Economics & Principles of Management | 3 | 1 | 0 | 30 | 20 | 50 | 100 | 150 |
| Practical/Training/Project | | | | | | | | | | |
| 1 | PCS-551 | Computer Graphics Lab | 0 | 0 | 2 | | 25 | 25 | 25 | 50 |
| 2 | PIT-552 | Web Technology Lab | 0 | 0 | 2 | | 25 | 25 | 25 | 50 |
| 3 | PCS-553 | Design & Analysis of Algorithms Lab | 0 | 0 | 2 | | 25 | 25 | 25 | 50 |
| | Total | | | | | | | | | 900 |
| | GP 651* | General Proficiency | | | | | | | | 100 |
| | DIS652* | Discipline | | | | | | | | 100 |
| * (The marks will be awarded in VI Semester based on the performance of V & VI Semester) | | | | | | | | | | |

UTTRAKHAND TECHNICAL UNIVERSITY
STUDY AND EVALUATION SCHEME (B.TECH. III Year)- VI Semester
B. Tech. Computer Science and Engineering

(Effective from the session : 2008-2009)

Year: III, Semester-VI

| S.No. | Course Code | Subject | PERIODS | | | EVALUATION SCHEME | | | Subject Total | |
|--|--------------|---------------------------------|---------|---|---|-------------------|----|----------|---------------|-------------|
| | | | L | T | P | SESSIONAL EXAM | | EXAM ESE | | |
| | | | | | | CT | TA | | | Total |
| 1 | TCS-601 | Operating Systems | 3 | 1 | 0 | 30 | 20 | 50 | 100 | 150 |
| 2 | TCS-602 | Computer Networks | 3 | 1 | 0 | 30 | 20 | 50 | 100 | 150 |
| 3 | TIT-601 | Software Project Management | 3 | 1 | 0 | 30 | 20 | 50 | 100 | 150 |
| 4 | TIT-602 | ERP Systems | 3 | 1 | 0 | 30 | 20 | 50 | 100 | 150 |
| 5 | THU-602 | Organizational Behavior | 3 | 1 | 0 | 30 | 20 | 50 | 100 | 150 |
| Practical/Training/Project | | | | | | | | | | |
| 1 | PCS-651 | Operating Systems Lab | 0 | 0 | 2 | | 25 | 25 | 25 | 50 |
| 2 | PCS-652 | Computer Networks Lab | 0 | 0 | 2 | | 25 | 25 | 25 | 50 |
| 3 | PIT-651 | Software Project Management Lab | 0 | 0 | 2 | | 25 | 25 | 25 | 50 |
| | Total | | | | | | | | | 900 |
| | GP 651* | General Proficiency | | | | | | | | 100 |
| | DIS652* | Discipline | | | | | | | | 100 |
| | Total | | | | | | | | | 1100 |
| * (The marks will be awarded in VI Semester based on the performance of V & VI Semester) | | | | | | | | | | |

E-COMMERCE (TIT-501)

UNIT I

Introduction

What is E-Commerce, Forces behind E-Commerce Industry Framework, Brief history of E-Commerce, Inter Organizational E-Commerce Intra Organizational E-Commerce, and Consumer to Business Electronic Commerce, Architectural framework

Network Infrastructure for E-Commerce

Network Infrastructure for E-Commerce, Market forces behind I Way, Component of I way

Access Equipment, Global Information Distribution Network, Broad band Telecommunication.

UNIT-II

Mobile Commerce

Introduction to Mobile Commerce, Mobile Computing Application, Wireless Application Protocols, WAP Technology, Mobile Information Devices,

Web Security

Introduction to Web security, Firewalls & Transaction Security, Client Server Network, Emerging Client Server Security Threats, firewalls & Network Security.

UNIT-III

Encryption

World Wide Web & Security, Encryption, Transaction security, Secret Key Encryption, Public Key Encryption, Virtual Private Network (VPM), Implementation Management Issues.

UNIT - IV

Electronic Payments

Overview of Electronics payments, Digital Token based Electronics payment System, Smart Cards, Credit Card I Debit Card based EPS, Emerging financial Instruments, Home Banking, Online Banking.

UNIT-V

Net Commerce

EDA, EDI Application in Business, Legal requirement in E-Commerce, Introduction to supply Chain Management, CRM, issues in Customer Relationship Management.

References:

1. Greenstein and Feinman, "E-Commerce", TMH
2. Ravi Kalakota, Andrew Whinston, "Frontiers of Electronic Commerce", Addison Wesley
3. Denial Amor, "The E-Business Revolution", Addison Wesley
4. Diwan, Sharma, "E-Commerce" Excel
5. Bajaj & Nag, "E-Commerce: The Cutting Edge of Business", TMH

COMPUTER GRAPHICS (TCS-501)

Unit-I

Line generation: Points lines, Planes, Pixels and Frame buffers, vector and character generation. Graphics Primitives: Display devices, Primitive devices, Display File Structure, Display control text.

Unit-II

Polygon: Polygon Representation, Entering polygons, Filling polygons. Segments: Segments table, creating deleting and renaming segments, visibility, image transformations.

Unit-III

Transformations: Matrices transformation, transformation routines, displays procedure. Windowing and Clipping: Viewing transformation and clipping, generalize clipping, multiple windowing.

Unit-IV

Three Dimension: 3-D geometry primitives, transformations, projection clipping. Interaction: Hardware input devices handling algorithms, Event handling echoing, Interactive techniques.

Unit-V

Hidden Line and Surface: Back face removal algorithms, hidden line methods. Rendering and Illumination: Introduction to curve generation, Bezier, Hermite and B-spline algorithms and their comparisons.

References :

1. Rogers, "Procedural Elements of Computer Graphics", McGraw Hill
2. Asthana, Sinha, "Computer Graphics", Addison Wesley Newman and Sproul, "Principle of Interactive Computer Graphics", McGraw Hill
3. Steven Harrington, "Computer Graphics", A Programming Approach, 2nd Edition
4. Rogar and Adams, "Mathematical Elements of Computer Graphics", McGraw Hill.

INTRODUCTION TO WEB TECHNOLOGY (TIT-502)

UNIT I

Introduction and Web Development Strategies
History of Web, Protocols governing Web, Creating Websites for individual and Corporate World, Cyber Laws
Web Applications, Writing Web Projects, Identification of Objects, Target Users, Web Team, Planning and Process Development.

UNIT II

HTML, XML and Scripting
List, Tables, Images, Forms, Frames, CSS
Document type definition, XML schemes, Object Models, Presenting XML, Using XML Processors: DOM and SAX
Introduction to Java Script, Object in Java Script, Dynamic HTML with Java Script.

UNIT III

Java Beans and Web Servers
Introduction to Java Beans, Advantage, Properties, BDK, Introduction to EJB,

Java Beans API Introduction to Servlets, Lifecycle, JSDK, Servlet API, Servlet Packages: HTTP package, Working with Http request and response, Security Issues.

UNIT IV

JSP

Introduction to JSP, JSP processing, JSP Application Design, Tomcat Server, Implicit JSP objects, Conditional Processing, Declaring variables and methods, Error Handling and Debugging, Sharing data between JSP pages- Sharing Session and Application Data.

UNIT V

Database Connectivity

Database Programming using JDBC, Studying Javax.sql.*package, accessing a database from a JSP page, Application-specific Database Action, Developing Java Beans in a JSP page, introduction to Struts framework.

REFERENCE:

1. Burdman, "Collaborative Web Development" Addison Wesley.
2. Chris Bates, "Web Programming Building Internet Applications", 2nd Edition, WILEY, Dreamtech
3. Joel Sklar, "Principal of web Design" Vikash and Thomas Learning
4. Horstmann, "CoreJava", Addison Wesley.
5. Herbert Schildt, "The Complete Reference:Java", TMH.
6. Hans Bergsten, "Java Server Pages", SPD O'Reilly

DESIGN & ANALYSIS OF ALGORITHMS (TCS-503)

Unit -I

Introduction: Algorithms, analysis of algorithms, Growth of Functions, Master's Theorem, Designing of Algorithms. Sorting and order Statistics: Heap sort, Quick sort, Sorting in Linear time, Medians and Order Statistics.

Unit -II

Advanced Data Structure: Red-Black Trees, Augmenting Data Structure. B-Trees, Binomial Heaps, Fibonacci Heaps, Data Structure for Disjoint Sets.

Unit -III

Advanced Design and Analysis Techniques: Dynamic Programming, Greedy Algorithms, Amortized Analysis, Back Tracking.

Unit -IV

Graph Algorithms: Elementary Graphs Algorithms, Minimum Spanning Trees, Single-source Shortest Paths, All-Pairs Shortest Paths, Maximum Flow, Traveling Salesman Problem.

Unit -V

Selected Topics: Randomized Algorithms, String Matching, NP Completeness, Approximation Algorithms.

References:

1. Coreman, Rivest, Lisserson, : "Algorithms", PHI.
2. Basse, "Computer Algorithms: Introduction to Design & Analysis",

Addision Wesley.

3. Horowitz & Sahani, "Fundamental of Computer Algorithm", Galgotia.

INDUSTRIAL ECONOMICS AND PRINCIPLES OF MANAGEMENT (THU 501)

Industrial Economics:

Unit –1.Introduction: Nature and significance of Economics. Meaning of Science, Engineering and Technology and their relationship with economic development.

Unit –2. Basic Concept: The concept of demand and supply. Elasticity of Demand and Supply. Indifference Curve Analysis, Price Effect, Income Effect and Substitution Effect.

Unit –3. Money and Banking: Functions of Money, Value of Money, Inflation and measures to control it. Brief idea of functions of banking system, viz., Commercial and central banking, Business fluctuations.

Management:

Unit –4. Introduction: Definition, Nature and Significance of Management,. Evaluation of

Management thought, Contributions of Max Weber, Taylor and Fayol.

Unit –5. Human Behaviour: Factors of Individual Behaviour, Perception, Learning and Personality Development, Interpersonal Relationship and Group Behaviour.

References:

1. Dewett, K.K. / Modern Economic Theory/S.Chand & Co.
2. Luthers Fred/ Organizational Behaviour.
3. Prasad L.M./ Principles of Management.
4. A.W. Stonier & D.C. Horgne / A TextBook of Economic Theory/ Oxford Publishing House

COMPUTER GRAPHICS LAB (PCS-551)

1. Implementation of line generation using slope's method, DDA and Bresenham's algorithms.
2. Implementation of circle generation using Mid-point method and Bresenham's algorithm.
3. Implementation of ellipse generation using Mid-point method.
4. Implementation of polygon filling using Flood-fill, Boundary-fill and Scan-line algorithms.
5. Implementation of 2D transformation: Translation, Scaling, Rotation, Mirror Reflection and Shearing (write a menu driven program).
6. Implementation of Line Clipping using Cohen-Sutherland algorithm and Bisection Method.
7. Implementation of Polygon Clipping using Sutherland-Hodgman algorithm.
8. Implementation of 3D geometric transformations: Translation, Scalind and rotation.
9. Implementation of Curve generation using Interpolation methods.
10. Implementation of Curve generation using B-spline and Bezier curves.
11. Implementation of any one of Back face removal algorithms such as Depth-Buffer algorithm, Painter's algorithm, Warnock's algorithm, Scan-line algorithm).

WEB TECHNOLOGY LAB (PIT-552)

- 1 Development of static pages using HTML of an online Departmental Store. The website should be user friendly and should have the following pages:
 - Home page
 - Registration and user login
 - User profile page
 - Items catalog
 - Shopping cart
 - Payment by credit card
 - Order confirmation
- 2 Add validations to the above static pages of registration, user login, user profile and payment by credit card using Java Script.
- 3 Creation of a XML document of 20 students of III IT. Add their roll numbers, marks obtained in 5 subjects, total and percentage and save this XML document at the server. Write a program that takes students' roll number as an input and returns the students marks, total and percentage by taking the students' information from the XML document.
- 4 Creation of a JavaBean which gives the converted value of Temperature (in degree celcius) into equivalent Fahrenheit.
- 5 Creation of a simple Bean with a label – which is a “count” of number of clicks. Then create a BeanInfo class such that only the “count” is visible in the Property Window.
- 6 Creation of two Beans a) Keypad b) Display pad. After that integrate the two beans to make it work as a calculator.
- 7 Installation of TOMCAT web server. Convert the static web pages of assignments 2 into dynamic web pages using servlets and cookies.
- 8 Do the assignment 7 using JSP by converting the static web pages of assignment 2 into dynamic web pages. Create database with User Information and Item information. The Item catalog should be dynamically loaded from the database.
- 9 Implementation of “Hello World!” program using JSP Struts Framework.

DESIGN AND ANALYSIS OF ALGORITHMS LABORATORY (PCS-553)

Programming assignments on each algorithmic strategy:

- Divide and conquer method (quick sort, merge sort, Strassen's matrix multiplication),
- Greedy method (knapsack problem, job sequencing, optimal merge patterns, minimal spanning trees).
- Dynamic programming (multistage graphs, OBST, 0/1 knapsack, traveling salesperson problem).
- Back tracking (n-queens problem, graph coloring problem, Hamiltonian cycles).
- Sorting : Insertion sort, Heap sort, Bubble sort
- Searching : Sequential and Binary Search
- Selection : Minimum/ Maximum, Kth smallest element

OPERATING SYSTEMS (TCS-601)

Unit - I

Introduction: Operating System and Function, Evolution of Operating System, Batch, Interactive, Time Sharing and Real Time System, System Protection. Operating System Structure:
' System Components, System Structure, Operating System Services.

Unit - II

Concurrent Processes: Process Concept, Principle of Concurrency, Producer / Consumer Problem, Critical Section, Problem, Semaphores, Classical Problems in Concurrency, Inter Processes Communication, Process Generation, Process Scheduling.

Unit - III

CPU Scheduling: Scheduling Concept, Performance Criteria Scheduling Algorithm, Evolution, Multiprocessor Scheduling. Deadlock: System Model, Deadlock Characterization, Prevention, Avoidance and Detection, Recovery from Deadlock, Combined Approach.

Unit - IV

Memory Management: Basic Machine, Resident Monitor, Multiprogramming with Fixed Partition, Multiprogramming With Variable Partition, Multiple Base Register, Paging, Segmentation, Paged Segmentation, Virtual Memory Concept, Demand Paging, Performance, Paged Replaced Algorithm, Allocation of Frames, Thrashing, Cache Memory Organization, Impact on Performance.

Unit - V

I/O Management & Disk Scheduling: I/O Devices and The Organization of I/O Function, I/O Buffering, Disk I/O, Operating System Design Issues. File System: File Concept, File Organization and Access Mechanism, File Directories, File Sharing, Implementation Issues.

Suggested Books And References:

1. Milenekovie, "Operating System Concept", McGraw Hill.
2. Petersons, "Operating Systems", Addison Wesley.
3. Dietal, "An Introduction to Operating System", Addison Wesley.
4. Tannenbaum, "Operating System Design and Implementation", PHI.
5. Gary Nutt, "Operating System, A Modern Perspective", Addison Wesley.
6. W. Stalling, "Operating System", Maxwell Macmillan
7. Silveschatza, Peterson J, "Operating System Concepts", Willey.
8. Crowley, "Operating System", TMH.

COMPUTER NETWORKS (TCS-602)

Unit - I

Introduction Concepts: Goals and Applications of Networks, Network structure and architecture, The OSI reference model, services, Network Topology Design - Delay Analysis, Back Bone Design, Local Access Network Design, Physical Layer Transmission Media, Switching methods, ISDN, Terminal Handling.

Unit-II

Medium Access sub layer: Medium Access sub layer - Channel Allocations, LAN protocols - ALOHA protocols - Overview of IEEE standards - FDDI. Data Link Layer - Elementary Data Link Protocols, Sliding Window protocols, Error Handling.

Unit - III

Network Layer: Network Layer - Point - to Pont Networks, routing, Congestion control Internetworking -TCP / IP, IP packet, IP address, IPv6.

Unit - IV

Transport Layer: Transport Layer - Design issues, connection management, session Layer-Design issues, remote procedure call. Presentation Layer-Design issues, Data compression techniques, cryptography - TCP - Window Management.

Unit-V

Application Layer: Application Layer: File Transfer, Access and Management, Electronic mail, Virtual Terminals, Other application. Example Networks - Internet and Public Networks.

References :

1. Forouzen, "Data Communication and Networking", TMH
2. A.S. Tanenbaum, Computer Networks, 3rd Edition, Prentice Hall India, 1997.
3. S. Keshav, An Engineering Approach on computer Networking, Addison Wesley, 1997
4. W. Stallings, Data and Computer Communication, Macmillan Press, 1989. 3. 4.

SOFTWARE PROJECT MANAGEMENT (TIT-601)**UNIT -I:**

Overview of Software Project Planning
Software Project, Categorization of software Project, Introduction to Stepwise Project Planning, Project Scope, Infrastructure, Resource Allocation etc, Project Plan Execution.

UNIT – II :

Project Evaluation
Strategy assessment, Technical Assessment, Cost Benefit Analysis, Cash flow forecasting, Risk Evaluation, Selection of Technologies, Rapid application Development, Prototyping Example.

Unit III:

Software Effort Estimation & Activity Play Over & under estimation problem, basis for software estimation, Estimation by analogy, COCOMO, Parameter Model function, point analysis, Project schedule, Planning Model, Project Time management, Activity duration estimation.

Unit IV

Risk management, Identification, Analysis and abatement of risk, Nature of

resources, critical, county cost, schedule, Monetary & control, Cost Monitoring, Priority by monetary, Managing Control , Contract Management, Human Resource Management.

Unit V

Software quality Assurance, Software quality in project planning, Software quality definition, ISO 9126 standards, Product quality management, SEICMM model

References :

- 1.Shtub, Bard, and Globerson, "Project Management: Engineering, Technology, & Implementation", Prentice Hall
- 2.Neal Whitten , "Managing Software Development Projects, Formula for Success", 2nd Edition, John Wiley & Sons
- 3.Bob Hughes, Mike Cotterell, "Software Project Management", 3rd Edition, McGrawHill

ERP SYSTEM (TIT- 602)

UNIT: I

ERP Overview, Benefit, Business Process Reengineering, Data ware Housing, Data Mining, LAP, Supply chain Management.

UNIT -II

ERP -A Manufacturing Perspective, ERP Module, ERP Market, ERP implementation life cycle, Options of various paradigms, Identification of suitable platforms, Role of SDLC/SSAD, Object oriented architecture.

UNIT:- III

ERP Implementation, Hidden costs, Vendors, Consultant Employees, Human Resource

UNIT :IV

ERP & E-Commerce, Future Directives- in ERP, ERP and Internet, Critical Factors guiding selection and evaluation, Strategies for successful implementation, Impediments and initiatives to achieve success, Critical success and failure factors, Integrating ERP into organizational culture.

UNIT-V

Using ERP tool: either SAP or ORACLE format to case study.

References :

- Enterprise Resource Planning: Integrating Applications and Business, Erin Callaway
- ERP: Making It Happen: The Implementers' Guide to Success with Enterprise ,Thomas F. Wallace, Michael H. Kremzar, NetLibrary, Inc
- Enterprise Resource Planning, Mary Sumner - Business & Economics
- Enterprise Resource Planning: Global Opportunities and Challenges, Liaquat Hossain, Jon David Patrick, Mohammad A. Rashid
- Enterprise Resource Planning Systems: Daniel Edmund O'Leary

ORGANIZATIONAL BEHAVIOR (THU-602)

Introduction to organizations and individuals:

What is an organization, components of organization, nature and variety of organizations (in terms of objectives, structure etc.), models of analyzing organizational phenomena, organizational and business variables, organizations in the Indian context, institutions and structures, basic roles in an organization, etc. perceptions, attitudes, motives (achievement, power and affiliation), commitment, values, creativity, and other personality factors, profile of a manager and an entrepreneur.

Interpersonal and group processes:

Interpersonal trust, understanding the other person from his/her point of view, interpersonal communication, listening, feedback, counseling, transactional analysis, self-fulfilling prophecy, etc., leadership, motivating people, working as a member of a team, team functioning, team decision-making, team conflict resolution, team problem solving.

Organizational structure and integrating interpersonal and group dynamics elements of structure, functions of structures, determinants of structures, dysfunctionalities of structures, structure - technology?environment-people relationships, principles underlying design of organizations, organizational politics, issues of power and authority, organizational communications, organizational change, integrating cases (s). Case method and lectures should be supplemented with a variety of other methodologies such as feedback on questionnaires and tests, role plays, and behavior simulation exercise.

References :

1. Jit S Chandan "Organizational Behavior", Vikas
2. M.N. Mishra :Organization Behavior", Vikas
3. Arnold, John, Robertson, Ivan 1. and Cooper, Cary, I.," Work Psychology :understanding human behavior in the workplace", Macmillan India Ltd., Delhi. 1996.
4. Dwivedi, RS., Human relations and organizational behavior: a global perspective, Macmillan India Ltd., Delhi, .1995.
5. Hersey and Blanchard (6th ed.). "Management of organizational behavior L utilising human resources", Prentice Hall of India Pv1. Ltd., New Delhi, 1996.
6. Robbins (4th ed.), "Essentials of organizational behavior", Prentice Hall of India Pv1. Ltd., New Delhi, 1995.
7. Luthans Fred., "Organizational Behavior", McGraw Hill, 1998.

OPERATING SYSTEMS LAB (PCS-651)

1. Simulation of the CPU scheduling algorithms a) Round Robin b) SJF c) FCFS d) Priority
2. Simulation of MUTEX and SEMAPHORES.
3. Simulation of Bankers Deadlock Avoidance and Prevention algorithms.
4. Implementation of Process Synchronization (Reader-Writer, Sleeping Barber and Dining Philosopher's Problem)
5. Simulation of page Replacement Algorithms a) FIFO b) LRU c) LFU
6. Simulation of paging techniques of memory management.
7. Simulation of file allocation Strategies a) Sequential b) Indexed c) Linked
8. Simulation of file organization techniques a) Single Level Directory b) Two Level c) Hierarchical d) DAG

COMPUTER NETWORKS LAB (PCS-652)

1. Implementation of the Data Link Layer framing method such as character stuffing and bit stuffing in C.
2. Implementation of CRC algorithm in C.
3. Implementation of a Hamming (7,4) code to limit the noise. We have to code the 4 bit data in to 7 bit data by adding 3 parity bits. Implementation will be in C.
4. Implementation of LZW compression algorithm in C.
5. Write a socket program in C to implement a listener and a talker.
6. Simulation of a network of 3 nodes and measure the performance on the same network.
7. Write a program in C to encrypt 64-bit text using DES algorithm.

SOFTWARE PROJECT MANAGEMENT LAB (PIT-651)

Do the exercises based on the following aspects of SPM:

1. Creating Work Breakdown Structure (WBS).
2. Comparing Gantt Chart.
3. Drawing Pert Chart and finding critical paths.
4. Resource Management
5. Time Scheduling and Management.

Exercises can be on any of the following:

- Intranet
- Library Automation
- Academic Management
- Departmental Store management.
- Hotel management

All the exercises should be done using MS project or any other case tool.