KANNUR UNIVERSITY

FACULTY OF ENGINEERING

Curricula, Scheme of Examinations & Syllabus for Semesters V & VI of B.Tech. Degree Programme in Computer Science & Engineering with effect from 2007 Admissions
### FIFTH SEMESTER

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>Hours/Week</th>
<th>Sessional Marks</th>
<th>University Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L</td>
<td>T</td>
<td>P/D</td>
</tr>
<tr>
<td>2K6 CS 501</td>
<td>Engineering Mathematics IV</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2K6 CS 502</td>
<td>Economics &amp; Business Management</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2K6 CS 503</td>
<td>Theoretical foundation of Computation</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2K6 CS 504</td>
<td>Programming Language Concepts</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2K6 CS 505</td>
<td>Operating Systems</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2K6 CS 506</td>
<td>Software Engineering</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2K6 CS 507(P)</td>
<td>Programming Environment Lab</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>2K6 CS 508(P)</td>
<td>Systems Lab</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>18</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

### SIXTH SEMESTER

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>Hours/Week</th>
<th>Sessional Marks</th>
<th>University Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>L</td>
<td>T</td>
<td>P/D</td>
</tr>
<tr>
<td>2K6 CS 601</td>
<td>Environmental Engg. &amp; Disaster Management</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2K6 CS 602</td>
<td>Graph Theory &amp; Combinatorics</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2K6 CS 603</td>
<td>Data Base Management Systems</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2K6 CS 604</td>
<td>Compiler Design</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2K6 CS 605</td>
<td>Data Communication &amp; Computer Networks</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2K6 CS 606</td>
<td>Elective - I</td>
<td>3</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>2K6 CS 607(P)</td>
<td>Networks &amp; DBMS Lab</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>2K6 CS 608(P)</td>
<td>Compiler Lab</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td>18</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

**Elective I**
- 2K6 CS 606 (A) – Distributed Computing
- 2K6 CS 606 (B) - Bioinformatics
- 2K6 CS 606 (C) – Software Project Management
- 2K6 CS 606 (D) – Digital Signal Processing
- 2K6 CS 606 (E) - Entrepreneurship
- 2K6 CS 606 (F) – Advanced Mathematics
**Module I** Probability distributions (13 hours)  

**Module II** Statistical inference (13hours)  
Population and Sample-Sampling Distributions of Mean and Variance-Point Estimation-Interval Estimation -Null Hypotheses and Significance tests-Hypotheses concerning one mean- Confidence Intervals of mean and variance - Estimation of Variances-Hypotheses concerning one variance-Hypotheses concerning two variance- Chi square test as test of goodness of fit.

**Module III** (Series solutions of differential equations (13hours)  
Power series method of solving ordinary differential equations - series solution of Bessel's equation – Recurrence formula for Jn(x)-expansions for J_0 and J_1 – value of J_1/2 - generating function for Jn(x)- Orthogonality of Bessel functions - Legendre’s equation – series solution of Legendre’s differential equation -Rodrigues formula-Legendre Polynomials – Generating function for Pn(x)- Recurrence formulæ for Pn(x) -Orthogonality of Legendre polynomials

**Module IV** Quadratic forms and Fourier Transforms (13 hours)  
Quadratic forms - Matrix associated with a quadratic form - Technique of Diagonalization using row and column transformations on the matrix - Definite, Semidefinite and Indefinite forms - their identification using the Eigen values of the matrix of the quadratic form.  

**Text book**  
Johnson RA, Miller & Freund's Probability and Statistics for Engineers, Prentice Hall of India  
(For Module I and II only)

**Reference Books**  

**Sessional work assessment**  
Two tests                                2 x 15 = 30  
Two assignments                        2 x 10 = 20  
Total marks                            = 50

**University Examination Pattern**  
Q I - 8 short answer type questions of 5 marks, 2 from each module.  
Q II - 2 questions of 15 marks each from module I with choice to answer any one.  
Q III - 2 questions of 15 marks each from module II with choice to answer any one.  
Q IV - 2 questions of 15 marks each from module III with choice to answer any one.  
Q V - 2 questions of 15 marks each from module IV with choice to answer any one.
Module I (12 hours)
Definition of economics-nature and scope of economic science-nature and scope of managerial economics-central problems of an economy-scarcity and choice-opportunity cost-objectives of business firms-forms of business- proprietorship-partnership-joint stock company-co-operative organization-state enterprise

Module II (14 hours)

Module III (14 hours)

Module IV (12 hours)
Market structures and price determination – perfect competition-monopoly -monopolistic competition-oligopoly-kinked demand curve-money and banking-nature and functions of money-money market and capital market-commercial banks –functions-central banking functions-methods of credit control.

Text books and References
1. Varshney R.L & Maheshwari K.L., Managerial economics, S Chand & Co. Ltd.
2. Dwivedi D.N, Managerial Economics, Vikas Publishing House Pvt Ltd
3. Dewett K.K, Modern Economic Theory, S Chand & company Ltd.
8. Joel Dean, Managerial Economics, Prentice-Hall of India Pvt Ltd.

Sessional work assessment
Two tests 2 x 15 = 30
Two assignments 2 x 10 = 20
Total 50

University examination pattern
Q I - 8 short answer type questions of 5 marks, 2 from each module.
Q II - 2 questions A and B of 15 marks from module I with choice to answer any one.
Q III - 2 questions A and B of 15 marks from module II with choice to answer any one.
Q IV - 2 questions A and B of 15 marks from module III with choice to answer any one.
Q V - 2 questions A and B of 15 marks from module IV with choice to answer any one.

3 hours lecture and 1 hour tutorial per week
Module I (14 hours)
Introduction; alphabets, Strings and Languages; Automata and Grammars - Finite automata (FA) - DFA-NFA – Finite Automata with epsilon-transitions - Equivalence of DFAs and NFAs - Regular expressions (RE) - Definition, RE to FA, FA to RE, algebraic laws for RE, applications of REs - Regular grammars and FA - Proving languages to be non-regular - Pumping Lemma - Applications. Closure properties of Regular languages - Closure under Boolean operations, reversal, homomorphism, inverse homomorphism, etc. – Myhill-Nerode theorem - DFA Minimization - Decision properties of Regular languages - Two-way finite automata, Finite automata with output.

Module II (13 hours)
Context-free Grammars (CFG) - Parse tree - Ambiguity in grammars and Languages - Applications of CFG - Pushdown Automata (PDA) - Equivalence of PDAs and CFGs - DPDA's - Definition, DPDAs and Regular Languages - DPDA and Ambiguous grammars - CK algorithm - Simplification of CFGs - Normal forms - CNF and GNF - Pumping lemma for CFLs, Closure properties of CFLs - Decision properties of CFL.

Module III (13 hours)
Turing Machines - Formal definition and behavior - TM as a computer of integer functions - Programming techniques for TMs - Storage in state, multiple tracks, subroutines, etc. - Computing a partial function with Turing machine - Variants of TMs - Multi-tape TMs, Nondeterministic TMs - TMs with semi-infinite tapes, multistack machines - universal Turing Machines - Equivalence of the various variants with the basic model - Models of computation and Church-Turing Thesis.

Module IV (13 hours)
Computability - Closure properties of recursive and recursively enumerable language. Undecidability - A language that is not RE – An undecidable problem that is RE – Undecidable problems about TM - Halting problem – Post Correspondence Problem – The Chomsky hierarchy - Context sensitive language and LBA – Equivalence of LBA and CSG.

Text books
2. John C Martin : Introduction to Languages and the Theory of Computation (3rd Edition), TMH

Reference books
1. H R Lewis and C H Papadimitriou : Elements of Theory of Computation
2. Sipser : Introduction to Theory of Computation, CENAGE LEARNING Indian Edition
3. Linz P : An Introduction to Formal Languages and Automata, Narosa

Sessional work assessment
Assignments 2x10 = 20
2 tests 2x15 = 30
Total marks = 50

University examination pattern
Q I - 8 short answer type questions of 5 marks, 2 from each module
Q II - 2 questions A and B of 15 marks from module I with choice to answer any one
Q III - 2 questions A and B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A and B of 15 marks from module III with choice to answer any one
Q V - 2 questions A and B of 15 marks from module IV with choice to answer any one
Module I (12 hours)

Module II (15 hours)
Data types-Primitive-Character strings-Array types-Associative arrays-record and union types-Pointer and reference types-Expression and assignment statements-arithmetic expressions-Overloaded operators-type conversions-relational and Boolean expressions-short circuit evaluation-assignment statements-mixed mode assignment-statement level control structures-selection and iterative statements- unconditional branching and guarded commands- subprograms-Design issues – parameter passing methods-over loaded subprograms-Implementing subprograms-blocks-implementing dynamic scope

Module III (12 hours)
Concept of Abstraction-Data abstraction-design issues-encapsulation constructs-Object oriented programming-Design issues-support for object oriented programming in C++,JAVA,C#-Implementation of object oriented constructs- Concurrency – Subprogram level concurrency-monitors-message passing-threads-statement level concurrency- Exception handling in JAVA & C++-event handling with JAVA.

Module IV (12 hours)
Functional programming languages – Mathematical functions – fundamentals of functional programming languages- Introduction to COMMON LISP, ML-Application of functional languages- Comparison of functional & Imperative languages – Logic programming languages – Introduction to predicate calculus-Overview of logic programming-origins of prolog-basic elements of prolog Applications of logic programming

Text books
4. Robert W Sebesta, Concepts of programming Languages (7 edn) – Pearson Education

Reference books
2. Scott M L, Programming language Pragmatics, Morgan Kaufman

Sessional work assessment
Assignments 2x10 = 20
2 tests 2x15 = 30
Total marks = 50

University examination pattern
Q I 8 short answer type questions of 5 marks, 2 from each module
Q II 2 questions A and B of 15 marks from module I with choice to answer any one
Q III 2 questions A and B of 15 marks from module II with choice to answer any one
Q IV 2 questions A and B of 15 marks from module III with choice to answer any one
Q V 2 questions A and B of 15 marks from module IV with choice to answer any one
2K6 CS 505: OPERATING SYSTEMS

3 hours lecture and 1 hour tutorial per week

Module I (12 hours)
Computers and Software – General System software- Resource abstraction & Sharing-Operating system strategies (Batch, Timesharing, real time, embedded etc) – Concept of Multiprogramming- Operating system organization – Basic functions-Implementation considerations-Computer organization-bootstrapping the machine-Mobile computers, Multiprocessors and parallel computers- Device Management-Device controllers & Device drivers – I/O strategies (direct I/O with polling, Interrupt driven I/O, DMA ), Buffering, Disk scheduling strategies

Module II (15 hours)

Module III (12 hours)
Memory management- address space abstraction-address binding-memory allocation-Fixed partition & variable partition memory strategies-dynamic address binding-swapping-paging-virtual memory address translation-dynamic paging-static paging algorithms-dynamic paging algorithm-working set algorithm-segmentation-implementation-memory mapped files-concept of memory management in Linux & Windows NT/XP.

Module IV (12 hours)

Text books
5. Gary Nutt, Operating Systems (3rd edn), Pearson education

Reference books
3. Siberschatz & Galvin, Operating system concepts (7 edn), Addison Wesley
4. Crowley C., Operating Systems – A Design oriented Approach, TMH
5. Tanenbaum A. S, Modern Operating Systems, Prentice hall, Pearson Education

Sessional work assessment
Assignments 2x10 = 20
2 tests 2x15 = 30
Total marks 50

University examination pattern
Q I - 8 short answer type questions of 5 marks, 2 from each module
Q II - 2 questions A and B of 15 marks from module I with choice to answer any one
Q III - 2 questions A and B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A and B of 15 marks from module III with choice to answer any one
Q V - 2 questions A and B of 15 marks from module IV with choice to answer any one
2K6 CS 506: SOFTWARE ENGINEERING

Module I (12 hours)

Module II (13 hours)
Design Engineering- Design concepts, design model, pattern based software design Architectural Design-system structuring, control models, modular decomposition, Object oriented Design, Component based design, User Interface Design

Module III (13 hours)
Software Testing- Testing process, Testing strategies- Verification and validation, Software inspection, Unit testing and Integration Testing, Validation testing, System testing Testing tactics- Software Testing Fundamentals, Black box testing, White box testing, Object-oriented testing, Clean room engineering process

Module IV (14 hours)
Project Management- Metrics for process and projects, Estimation- Project planning process, Software scope and feasibility, Resources, software project estimation, Decomposition techniques, Project scheduling, Risk Management- Risk identification, Risk projection, Risk refinement, RMMM Quality management-Product metrics, Quality-Quality control, Quality assurance, Cost of Quality, Change Management-Configuration Management, Software re-engineering, Reverse Engineering, CBSE process

Text books

Reference books
2. Rajib Mall

Sessional work assessment
Assignments 2x10 = 20
2 tests 2x15 = 30
Total marks = 50

University examination pattern
Q I - 8 short answer type questions of 5 marks, 2 from each module
Q II - 2 questions A and B of 15 marks from module I with choice to answer any one
Q III - 2 questions A and B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A and B of 15 marks from module III with choice to answer any one
Q V - 2 questions A and B of 15 marks from module IV with choice to answer any one
Object-oriented programming in Java/C++
1. Define a base class “Shape” and derived classes for “Rectangle”, “Square”, “Ellipse” and “Circle” with proper class hierarchy.
2. Implement operator and function overloading.
3. Design and implement an interface.
4. Design and implement a Generic class

Functional Programming in LISP/Scheme
1. Write a program to implement Tower of Hanoi problem for n number of disks.
2. Write a program to implement Missionaries and Cannibals problem.
3. Write a program to implement Binary Search Tree (BST) and do the following operations on BST.
   (i) Insertion of an element
   (ii) Deletion of a n element
   (iii) Display of BST
   (iv) Display of Maximum and Minimum elements of BST
4. Write a program to implement Quick Sort on both list of numbers and list of strings.
   If strings, sort them in lexicographic order.

Concurrent Programming in Java/Ada
1. Design and implement a multi-threaded program.
2. Design and implement a multi-process application

Reference books
1. Robert W Sebesta, Concepts of programming Languages (7 edn) – Pearson Education
3. Scott M L, Programming language Pragmatics, Morgan Kaufman

Sessional work assessment
| Laboratory practical and Record | 35 |
| Test | 15 |
| Total marks | 50 |

2K6 CS 508(P): SYSTEMS LAB
Operating systems

1. Inter-process communication using pipes, FIFO, message queues and shared memory
2. Producer-Consumer problem using mutex and condition variables
3. Producer-Consumer problem using semaphores
4. Detection and handling of signals like death of child process, user generated interrupts etc. by a process.
5. Open a directory and display its contents, size of each file, total size etc.
6. Banker’s algorithm
7. Simulation of various process scheduling algorithms (Pre-emptive and non pre-emptive)
8. Simulation of various memory page replacement strategies

Reference books

2. Garry Nutt, Operating Systems

Sessional work assessment

<table>
<thead>
<tr>
<th>Component</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory practical and Record</td>
<td>35</td>
</tr>
<tr>
<td>Test</td>
<td>15</td>
</tr>
<tr>
<td>Total marks</td>
<td>50</td>
</tr>
</tbody>
</table>

2K6CS 601 ENVIRONMENTAL ENGG: & DISASTER MANAGEMENT

3 hours lecture and 1 hour tutorial per week
MODULE I (12 HOURS)

Multidisciplinary nature of Environmental studies – Definition – scope and importance – need for public awareness
Natural resources – renewable and non-renewable resources – natural resources – forest resources - water resources
Mineral resources – food resources – energy resources – Land resources – use, overuse and misuse of these resources
with appropriate case studies to substantiate – effect on the environment – role of individual in conservation of natural
resources – equitable use of resources for sustainable lifestyle.

MODULE II (12 HOURS)

Ecosystem – concept – structure and function – producers, consumers & decomposers – energy flow in the ecosystem - Ecological successive food chains - food webs (all in brief)
Ecological pyramids – introduction, types and characteristic features, structure and function of forest, grassland,
desert and aquatic ecosystems (ponds, lakes, streams, rivers, oceans and estuaries)
Biodiversity and its conservation – Introduction – definition : genetic species and ecosystem diversity – Biogeographical classification
of India – value of biodiversity – consumptive and productive use, social, ethical, aesthetic and option values –
biodiversity at global, national and local levels – India as a mega-diversity nation – hot spots of biodiversity – threats
to biodiversity : habitat loss, poaching of wildlife, man-wildlife conflicts – endangered and endemic species of India
– conservation of biodiversity : In-situ and Ex-situ conservation of biodiversity.

MODULE III (13 HOURS)

Environmental Pollution – Definition – causes – effects and control measures of : Air Pollution – water Pollution –
soil Pollution – marine Pollution – noise Pollution – thermal Pollution – Nuclear hazards.
Solid waste management – causes, effects and control measures of urban and industrial wastes – Role of an
individual in preventing Pollution – Environmental Protection Act – Prevention and control of air and water
Pollution – Wildlife Protection Act – Forest Conservation Act – Issues involved in Enforcement of Environmental
Legislation – Public awareness.
Disaster Management – Principles of disaster management – nature and extent of disasters – natural disasters ,
hazards, risks and vulnerabilities – man-made disasters – chemical, industrial, nuclear and fire. – preparedness and
mitigation measures for various hazards – financing relief expenditure – legal aspects - post disaster relief –
voluntary agencies and community participation at various stages of disaster management – rehabilitation
programmes.

MODULE IV (10 HOURS)

Social Issues and the Environment – From unsustainable to sustainable development – urban problems related to
ergy – water conservation, rain water harvesting, watershed management – resettlement and rehabilitation of
people ; its problems and concerns, case studies – environmental ethics : Issues and possible solutions – climate
change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case studies – waste land
reclamation – consumerism and waste products.
Human population and the environment – Population growth, variations among nations – population explosion –
Family welfare programmes – Environment and human health – Pollution hazards, sanitation and health – Human
rights for a clean environment – value education – HIV/AIDS – social concern – Women and Child welfare – role of
Information Technology in environment and human health – Case studies.

FIELD WORK (5 HOURS)

• Visit to a local area to document environmental assets – river / forest / grassland / hill / mountain
• Visit to local polluted site – urban / rural / industrial / agricultural
• Study of common plants, insects , birds
• Study of simple ecosystems – pond, river, hill slopes, etc.

**Text book**
4. S. Deswal & A . Deswal, A Basic Course in Environmental Studies, Dhanpat Rai & Co
5. Environmental Studies – Dr. B. S. Chauhan, University Science Press.

**Reference Books**
2. Bharucha erach, Biodiversity of India, Mapin Publishing Pvt.Ltd.
6. Hawkins R.E. Encyclopediaof Indian Natural History, Bombay Natural History Society ..
11. Sharma B.K., Environmental Chemistry Goel Publ. House, Meerut
12. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards,

**Sessional work assessment**

<table>
<thead>
<tr>
<th>Assignments</th>
<th>2x10 = 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 tests</td>
<td>2x15 = 30</td>
</tr>
<tr>
<td><strong>Total marks</strong></td>
<td>= 50</td>
</tr>
</tbody>
</table>

**University Examination Pattern**
Q I – 8 short answer type questions of 5 marks, 2 from each module.
Q II- 2 questions of 15 marks each from module I with choice to answer any one.
Q III- 2 questions of 15 marks each from module II with choice to answer any one.
Q IV- 2 questions of 15 marks each from module III with choice to answer any one.
Q V- 2 questions of 15 marks each from module IV with choice to answer any one.
Module I (13 hours)
Introduction to graphs-definitions and examples-subgraphs-complements-isomorphism-vertex degree-Euler trails and circuits-.Planar Graphs-Kuratowski’s theorem(without proof).Graph coloring and chromatic polynomials

Module II (13 hours)

Module III (13 hours)
Fundamental principles of counting-The rules of sum and product -permutations and combinations-binomial theorem-principle of inclusion and exclusion-derangements.-Rook polynomials

Module IV (14 hours)
Generating functions-definitions and examples-calculational and techniques.-partitions of integers-exponential generating functions-recurrence relations-first order linear recurrence relation-second order linear homogeneous recurrence relation with constant coefficients-Non homogeneous recurrence relation-method of generating function

Text Books

Reference books
5. Fred Buckley and Frank Harry, “Distance in graphs”, Addison Wesley

Sessional work assessment
Assignments 2x10 = 20
2 tests 2x15 = 30
Total marks = 50

University examination pattern
Q I   - 8 short answer type questions of 5 marks, 2 from each module
Q II  - 2 questions A and B of 15 marks from module I with choice to answer any one
Q III - 2 questions A and B of 15 marks from module II with choice to answer any one
Q IV  - 2 questions A and B of 15 marks from module III with choice to answer any one
Q V   - 2 questions A and B of 15 marks from module IV with choice to answer any one
Module I (12 hours)
Introduction - Characteristics of Database approach - Advantages of using DBMS approach - Data models - schemas and instances - Three-schema architecture and data independence - Database languages and interfaces - The database system environment - Centralized and client-server architectures - Classification of Database Management systems.

Entity-Relationship Model - Entity Types, Entity Sets, Attributes and Keys - Relationship types, Relationship Sets, Roles and Structural Constraints - Weak Entity Types - Refining the ER Design - ER Diagrams and Naming Conventions - Example of Other Notation: UML Class Diagrams

Module II (16 hours)

SQL - Data Definition and Data Types - Specifying constraints - Schema change statements - Basic queries – Aggregate functions and grouping - Insert, Delete and Update statements - Assertions and Triggers - Views


Module III (12 hours)

Indexing Structures for Files - Types of Single-Level Ordered Indexes - Multilevel Indexes - Dynamic Multilevel Indexes Using B-Trees and B+ Trees - Indexes on Multiple Keys

Module IV (14 hours)
Transaction Management - Transaction and System Concepts – ACID Properties - Schedules - Characterizing Schedules Based on Recoverability and Serializability - Transaction Support in SQL

Concurrency Control Techniques - Locking Techniques - Timestamp Ordering - Multiversion Concurrency Control - Optimistic Concurrency Control - Using Locks for Concurrency Control in Indexes


Text books
Reference books

2. Database systems, a practical approach to design implementation and management – Thomas Connolly and Carolyn Begg, Pearson Education,
4. C.J. Date, A. Kannan, S. Swamynathan: An Introduction to Database Systems, Pearson education

Sessional work assessment

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>2x10 = 20</td>
</tr>
<tr>
<td>2 tests</td>
<td>2x15 = 30</td>
</tr>
<tr>
<td>Total marks</td>
<td>= 50</td>
</tr>
</tbody>
</table>

University examination pattern

Q I   - 8 short answer type questions of 5 marks, 2 from each module
Q II  - 2 questions A and B of 15 marks from module I with choice to answer any one
Q III - 2 questions A and B of 15 marks from module II with choice to answer any one
Q IV  - 2 questions A and B of 15 marks from module III with choice to answer any one
Q V   - 2 questions A and B of 15 marks from module IV with choice to answer any one
Module 1 (12 Hrs)

Module 2 (14 Hrs)
Syntax analyzer: Role of syntax analyzer-Review of context free grammar-derivation and parse trees-Basic parsing approaches-Top down parsing-Recursive Descent parsing –LL(1) parsing-Bottom up parsing-Shift reduce parsing-Operator precedence parsing-LR parsing-Simple LR, Canonical LR and LALR parsers- Design of syntax analyzer using YACC

Module 3 (15 Hrs)
Semantic analysis: Need for semantic analysis-Syntax directed definitions-S attributed definitions- L- attributed definitions-Translation schemes-Type system and Type checking-Design of a simple type checker

Storage Management: Memory allocation strategies (static, stack and heap allocations)-Memory allocation in block structured languages-Accessing local and non local data-Array allocation and access-Procedure calls-Parameter passing methods- Runtime stack and storage management

Synthesis phase: Intermediate Code Generation (ICG)-Need for ICG-IC Formats-3 Address code-Triples and quadruples

Module 4 (14 Hrs)
Code optimization: Need for code optimizer-Basic blocks and program flow graph-Machine dependent and machine independent optimizations-Optimization transformations-Local and global optimizations Code Generation-Basic issues in code generation-Data descriptors-Expression trees-Generating target code from expression trees-Symbol table handling-Symbol table requirements and organization. Error handling-Types of errors-Compile time errors and recovery-Runtime errors-Runtime Error Handling

Text books
1. Aho A Ravi Sethi and J D Ullman, Compilers Principles Techniques and Tools, Addison Wesley

Reference books
2. D M Dhamdhare, System programming and operating system, TMH
3. Tremblay and Sorenson, The theory and practice of Compiler writing, TMH
3. Allen T Hollub, Compiler design in C, PHI

Sessional work assessment
Assignments 2x10 = 20
2 tests 2x15 = 30
Total marks = 50

University examination pattern
Q I - 8 short answer type questions of 5 marks, 2 from each module
Q II - 2 questions A and B of 15 marks from module I with choice to answer any one
Q III - 2 questions A and B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A and B of 15 marks from module III with choice to answer any one
Q V - 2 questions A and B of 15 marks from module IV with choice to answer any
2K6 CS 605: DATA COMMUNICATION & COMPUTER NETWORKS

Module I (14 hours)
Components – Direction of Data flow – networks – Components and Categories – types of Connections –
Interfacing sequences - Modulation-Multiplexing-TDM FDM WDM OFDM

Module II (16 hours)
Data link layer services - Error detection and correction – Parity – LRC – CRC – Hamming code HDLC. - Multiple
Access Protocols - Link Layer addressing - Hub and Switches -PPP. LAN - Ethernet IEEE 802.3 - IEEE 802.4 -
IEEE 802.5 - FDDI - SONET – Bridges.

Module III (13 hours)
Network layer: Introduction - Virtual circuit and datagram networks - Router - Internet Protocol -Forwarding and
addressing in the Internet - Routing Algorithms -LS -DV -Hierarchical routing -Routing in the Internet -Broadcast
and Multicast routing.

Module IV (14 hours)
Transport layer : Introduction and services-multiplexing and demultiplexing - Connectionless transport UDP -
Principles of Reliable data transfer - Connection oriented transport TCP - Principles of Congestion Control - TCP
congestion control. Application Layer -Principles -HTTP - FTP -SMTP - DNS.

Text books

Reference books
1. Crowley C., Operating Systems - A Design Oriented Approach, TMH
2. Tanenbaum A S, Computer Networks, PHI

Sessional work assessment
Assignments 2x10 = 20
2 tests 2x15 = 30
Total marks = 50

University examination pattern
Q I - 8 short answer type questions of 5 marks, 2 from each module
Q II - 2 questions A and B of 15 marks from module I with choice to answer any one
Q III - 2 questions A and B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A and B of 15 marks from module III with choice to answer any one
Q V - 2 questions A and B of 15 marks from module IV with choice to answer any one
Module I (16 hours)
Theoretical Foundation for Distributed System: Limitation of Distributed system, absence of global clock, shared memory, Logical clocks, Lamport’s & vectors logical clocks, Causal ordering of messages, Global state, termination detection. Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and non-token based algorithms, performance metric for distributed mutual exclusion algorithms.

Module II (14 hours)
Distributed Deadlock Detection: system model, resource vs communication deadlocks, deadlock prevention, avoidance, detection & resolution, centralized dead lock detection, distributed dead lock detection, path pushing algorithms, edge chasing algorithms. Agreement Protocols: Introduction, System models, classification of Agreement Problem-Interactive consistency Problem, Applications of Agreement algorithms.

Module III (12 hours)
Distributed Objects and Remote Invocation: Communication between distributed objects, Remote procedure call, Events and notifications, Java RMI case study. Transactions and Concurrency Control: Transactions, Nested transactions, Locks, Optimistic Concurrency control, Timestamp ordering, Comparison of methods for concurrency control

Module IV (12 hours)
Distributed Transactions: Introduction, Flat and nested distributed transactions, Atomic commit protocols, concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery. Distributed shared memory – Design and Implementation issues, consistency models..CORBA Case Study: CORBA RMI, CORBA services.

Text books
2. Coulouris, Dollimore, Kindberg, "Distributed System: Concepts and Design", Pearson Education

Reference books

Sessional work assessment
Assignments 2x10 = 20
2 tests 2x15 = 30
Total marks = 50

University examination pattern
Q I - 8 short answer type questions of 5 marks, 2 from each module
Q II - 2 questions A and B of 15 marks from module I with choice to answer any one
Q III - 2 questions A and B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A and B of 15 marks from module III with choice to answer any one
Q V - 2 questions A and B of 15 marks from module IV with choice to answer any one
Module I (12 hours)

Module II (16 hours)

Module III (16 hours)

Module IV (10 hours)

Reference books

Sessional work assessment
Assignments 2x10 = 20
2 tests 2x15 = 30
Total marks = 50

University examination pattern
Q I - 8 short answer type questions of 5 marks, 2 from each module
Q II - 2 questions A and B of 15 marks from module I with choice to answer any one
Q III - 2 questions A and B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A and B of 15 marks from module III with choice to answer any one
Q V - 2 questions A and B of 15 marks from module IV with choice to answer any one
Module I (12 hours)

Project Planning- Integration Management, Project Plan Development, Plan Execution, Scope Management, Methods for Selecting Projects , Project Charter, Scope Statement, Work Breakdown Structure, Main Steps in Project Planning , Use of Software to Assist in Project Planning Activities

Module II (16 hours)
Project Scheduling : Time Management- Importance of Project Schedules, Schedules and Activities , Sequencing and Scheduling Activity Project Network Diagrams- Network Planning Models , Duration Estimating and Schedule Development, Critical Path Analysis, Program Evaluation and Review Technique (PERT)  Use of Software to Assist in Project Scheduling


Module III (12 hours)
Project Quality Management- Quality of Information Technology Projects, Stages of Software Quality Management, Quality Planning , Quality Assurance , Quality Control Quality Standards- Tools and Techniques For Quality Control

Project Human Resources Management- Keys to Managing People , Organizational Planning- Issues in Project Staff Acquisition and Team Development , Project Communication Management - Communications Planning, Information Distribution, Performance Reporting..

Module IV (14 hours)
Project Risk Management - The Importance of Project Risk Management, Common Sources of Risk in IT projects, Risk Identification, Risk Quantification, Risk Response Development and Control


Reference books
Sessional work assessment

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Assignments</td>
<td>2x10 = 20</td>
</tr>
<tr>
<td>2 tests</td>
<td>2x15 = 30</td>
</tr>
<tr>
<td>Total marks</td>
<td>= 50</td>
</tr>
</tbody>
</table>

University examination pattern

Q I - 8 short answer type questions of 5 marks, 2 from each module
Q II - 2 questions A and B of 15 marks from module I with choice to answer any one
Q III - 2 questions A and B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A and B of 15 marks from module III with choice to answer any one
Q V - 2 questions A and B of 15 marks from module IV with choice to answer any one
2K6 CS 606 (D): DIGITAL SIGNAL PROCESSING

Module I (13 hours)

Module II (16 hours)

Module III (13 hours)

Module IV (14 hours)
Finite word length effects in digital filters: Introduction - Number Representation - Fixed Point- Sign-Magnitude - One’s-complement- Two’s - complement forms -Addition of two fixed point numbers- Multiplication in Fixed Point arithmetic - Floating point numbers- Block floating point numbers- quantization - truncation- rounding- effects due to truncation and rounding- Input quantization error - Product quantization error - Co-efficient quantization error- zero-input limit cycle Oscillations - Overflow limit cycle Oscillations - Scaling- Quantization in Floating Point realization IIR digital filters - Finite Word Length Effects in FIR Digital Filters- Quantization effects in the Computation of the DFT- quantization errors in FFT algorithms.

Reference books
1. Ifechor-, Digital signal processing, Pearson edn.
2. Oppenhiem, Desecrate time signal processing, Pearson edn.
3. Oppenhiem and Sheffer, Digital signal processing, PHI
4. Johny R Johnson, Introduction to Digital signal processing
5. Proakis and Manolakis, Digital signal processing

Sessional work assessment

| Assignments | 2x10 = 20 |
| 2 tests     | 2x15 = 30 |
Total marks  = 50

University examination pattern
Q I - 8 short answer type questions of 5 marks, 2 from each module
Q II - 2 questions A and B of 15 marks from module I with choice to answer any one
Q III - 2 questions A and B of 15 marks from module II with choice to answer any one
Q IV - 2 questions A and B of 15 marks from module III with choice to answer any one
Q V - 2 questions A and B of 15 marks from module IV with choice to answer any one
Module I (20 hours)
Entrepreneurial perspectives - understanding of entrepreneurship process - entrepreneurial decision process - entrepreneurship and economic development - characteristics of entrepreneur - Entrepreneurial competencies - managerial functions for enterprise

Module II (10 hours)

Module III (12 hours)
Process and strategies for starting a venture - stages of small business growth – entrepreneurship in international environment - entrepreneurship – achievement - motivation - time management creativity and innovation - structure of the enterprise - planning, implementation and growth

Module IV (10 hours)
Technology acquisition for small units - formalities to be completed for setting up a small scale unit - forms of organizations for small scale units - financing of project and working capital-venture capital and other equity assistance available - break even analysis and economic ratios technology transfer and business incubation

Reference books
5. Dr. Patel V. G.: Seven Business Crisis, TMH

Sessional work assessment

| Assignments | 2x10 = 20 |
| 2 tests | 2x15 = 30 |
| Total marks | = 50 |

University examination pattern
1. Q I - 8 short answer type questions of 5 marks, 2 from each module
2. Q II - 2 questions A and B of 15 marks from module I with choice to answer any one
3. Q III - 2 questions A and B of 15 marks from module II with choice to answer any one
4. Q IV - 2 questions A and B of 15 marks from module III with choice to answer any one
5. Q V - 2 questions A and B of 15 marks from module IV with choice to answer any one
Module I: (10 hours)


Module II: (10 hours)


Module III: (10 hours)


Module IV: (9 hours)


**Text books and References**
3. Hadley G. ‘Linear Programming’ Narosa.
5. Taha H.A. ‘Operation Research, An Introduction’ PHI.

**Sessional work assessment**
Two tests 2 x 15 = 30
Two assignments 2 x 10 = 20
Total = 50

**University examination pattern**
Q I - 8 short answer type questions of 5 marks, 2 from each module
Q II - 2 questions of 15 marks from module I with choice to answer any one
Q III - 2 questions of 15 marks from module II with choice to answer any one
Q IV - 2 questions of 15 marks from module III with choice to answer any one
Q V - 2 questions of 15 marks from module IV with choice to answer any one
2K6 CS 607(P) – NETWORKS & DBMS LAB

3 hours practical per week

1. Study and configuration of NIC cards.
2. Implementation of client server model using TCP protocol.
5. Implementation of POP3 protocol.
7. File transfer-using socket.
8. DNS – Tracing the path and find the root/name servers
10. Web server installation and configuration.
11. Mail server configuration.
12. Setting up multiple virtual hosts in a single domain.
13. Simulation of Medium access control protocols-Go back N, Selective repeat, sliding window
14. Perform a case study about the different routing algorithms to select the network path with its optimum and economical during data transfer.
   ▪ Shortest path routing
   ▪ Flooding
   ▪ Link State
   ▪ Hierarchical

Database Management Systems

Recommended Software: Mysql /Oracle latest version
1. DDL statements in SQL
2. DML statements in SQL
3. Simple Queries using SELECT command on a given database.
4. Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSECT and Constraints.
5. Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING
6. Creation and dropping of Views
7. High level language extension with cursors.
8. High level language extension with triggers.

Reference books

Sessional work assessment

<table>
<thead>
<tr>
<th>Laboratory practical and Record</th>
<th>= 35</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test</td>
<td>= 15</td>
</tr>
<tr>
<td>Total marks</td>
<td>= 50</td>
</tr>
</tbody>
</table>
1. Design of a Lexical Analyzer using Finite Automation (including Symbol table)  
   (The program should be designed for a specific number of keywords, identifiers, numbers, 
   operators, punctuators etc. Finite automata should be designed for each type of token)
2. Design of lexical analyzer using LEX
3. Design of recursive descent and LL (1) parsers (including syntax tree)  
   (The programme should be designed for a subset of PL features (For example Arithmetic 
   expressions with operators +, -, *, /, ↑ etc)
4. Implementation of Operator precedence Parsing (including syntax tree) 
5. Design of parser for arithmetic expressions using YACC
6. Design of a simple type checker (For eg for the primitive types of C) 
7. Generation of IC for arithmetic expressions 
8. Simple code optimization strategies (For example Constant folding, Loop invariant 
   elimination, common sub expression elimination etc) 
9. Design of a code generator for arithmetic expressions using Expression tree 
   (The program should take a set of IC as the input and produce the target code for some 
   machine such as Intel 8086 Microprocessor)
10. Writing a simple Compiler for a subset of Language features

**Reference books**
7. Scott M L, Programming language Pragmatics, Morgan Kaufman

**Sessional work assessment**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory practical and record</td>
<td>35</td>
</tr>
<tr>
<td>Test</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
</tr>
</tbody>
</table>