JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA-533003, Andhra Pradesh (India)

INFORMATION TECHNOLOGY

COURSE STRUCTURE

I YEAR   **I SEMISTER**

S. No.	Subject	T	P	Credits
1	English – I	3	-	2
2	Mathematics - I	3	-	2
3	Engineering Physics – I	3	-	2
4	Engineering Chemistry I	3	-	2
5	C Programming	3	-	2
6	Environmental Studies	3	-	2
7	Engineering Physics & Engineering Chemistry Laboratory -I	-	3	2
8	Engineering Workshop (Carpentry, Fitting, House wiring,)	-	3	2
9	C Programming Lab	-	3	2
10	English Proficiency Lab	-	3	2
	Total			**20**

I YEAR   **II SEMISTER**

S. No.	Subject	T	P	Credits
1	English – II	3	-	2
2	Mathematics – II	3	-	2
3	Engineering Physics – II	3	-	2
4	Engineering Chemistry-- II	3	-	2
5	Engineering Drawing	3	-	2
6	Mathematical Methods	3	-	2
7	Engineering Physics & Engineering Chemistry Laboratory -II	-	3	2
8	English - Communication Skills Lab	-	3	2
9	IT Workshop	-	3	2
	Total			**18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA-533003, Andhra Pradesh (India)

INFORMATION TECHNOLOGY

COURSE STRUCTURE

II YEAR   **I SEMISTER**

S. No.	Subject	T	P	Credits
1	Managerial Economics and Financial Analysis	4	-	4
2	Probability & Statistics	4	-	4
3	Mathematical Foundations of Computer Science and Engineering	4	-	4
4	Digital Logic Design	4	-	4
5	Electronic Devices and Circuits	4	-	4
6	Data Structures	4	-	4
7	Electronic Devices and Circuits Lab	-	3	2
8	Data Structures Lab	-	3	2
9	Professional Communicational skills	-	2	1
10	Professional Ethics and Morals-I	2	-	-
	Total			**29**

II YEAR   **II SEMISTER**

S. No.	Subject	T	P	Credits
1	Data Communication	4	-	4
2	Principles of Programming Languages	4	-	4
3	Object Oriented Programming through Java	4	-	4
4	Computer Organization & Architecture	4	-	4
5	Data Base Management Systems	4	-	4
6	Automata Theory & Compiler Design	4	-	4
7	Object Oriented Programming Lab	-	3	2
8	Data Base Management Systems Lab	-	3	2
9	Professional Communicational skills	-	2	1
10	Professional Ethics and Morals-II	2	-	-
	Total			**29**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA-533003, Andhra Pradesh (India)

INFORMATION TECHNOLOGY

COURSE STRUCTURE

III YEAR   **I SEMISTER**

S. No.	Subject	T	P	Credits
1	Software Engineering	4	-	4
2	Computer Networks	4	-	4
3	Web Technologies	4	-	4
4	Operating Systems	4	-	4
5	Computer Graphics	4	-	4
6	Advanced Data structures	4	-	4
7	Operating Systems & Compiler Design Lab	-	3	2
8	Advanced Data Structures Lab	-	3	2
9	IPR and Patents- 1	2	-	-
	Total			28

III YEAR   **II SEMISTER**

S. No.	Subject	T	P	Credits
1	Advanced Computer Networks	4	-	4
2	UNIX Programming	4	-	4
3	Design and analysis of Algorithms	4	-	4
4	Object Oriented Analysis and Design	4	-	4
5	Management Science	4	-	4
6	Advanced Java Programming	4	-	4
7	Computer Networks and Unix Lab	-	3	2
8	Advanced Java and Web Technologies Lab	-	3	2
9	IPR and Patents- 2	2	-	-
	Total			28

w.e.f. 2010-2011 academic year

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY: KAKINADA
KAKINADA-533003, Andhra Pradesh (India)

INFORMATION TECHNOLOGY

COURSE STRUCTURE

IV YEAR   **I SEMISTER**

S. No.	Subject	T	P	Credits
1	Cryptography and Network Security	4	-	4
2	Design Patterns	4	-	4
3	Data Ware Housing and Data Mining	4	-	4
4	Mobile Computing	4	-	4
5	**Open Elective** i. MATLAB ii.Web Services iii. Open Source Software iv. Cyber Laws	4	-	4
6	**Elective –I:** i. Information Retrieval Systems ii. Parallel Computing iii. Distributed Systems iv. Artificial Intelligence v. Computer Architecture	4	-	4
7	UML & Design Patterns Lab	-	3	2
8	Mobile Application Development Lab	-	3	2
	Total			**28**

IV YEAR   **II SEMISTER**

S. No.	Subject	T	P	Credits
1	**Elective –II** i) Human Computer Interaction ii) Advanced Operating Systems iii) Mobile Adhoc & Sensor Networks iv)Pattern Recognition v) Digital Image Processing	4	-	4
2	**Elective –III** i) Embedded and Real time Systems ii) Simulation and Modeling iii) Computer Forensics	4	-	4

	iv)Machine Learning v) Multimedia & Application Development			
3	**Elective –IV** i) Software Testing Methodologies ii) Neural Networks & Soft Computing iii)Social Networks and the Semantic Web iv) Cloud Computing v) E- Commerce	4	-	4
4	Software Project Management	4	-	4
5	Project			12
	Total			**28**

JNTUWORLD

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Information Technology – I Sem.

SOFTWARE ENGINEERING

Unit – I :
Introduction to Software Engineering:
The evolving role of software, Changing Nature of Software, Software myths.(Text Book 3)
The software problem: Cost, schedule and quality, Scale and change.

Unit – II :
Software Process:
Process and project, component software process, Software development process models : Waterfall model, prototyping, iterative development, relational unified process, time boxing model, Extreme programming and agile process, using process models in a project. Project management process.

Unit - III :
Software requirement analysis and specification: Value of good SRS, requirement process, requirement specification, functional specifications with use-cases, other approaches for analysis, validation.

Unit – IV:
Planning a software project: Effort estimation, project schedule and staffing, quality planning, risk management planning, project monitoring plan, detailed scheduling.

Unit – V:
Software Architecture: Role of software architecture, architecture views, components and connector view, architecture styles for C & C view, documenting architecture design, evaluating architectures.

Unit – VI:
Design : Design concepts, function-oriented design, object oriented design, detailed design, verification, metrics

Unit VII:
Coding and Unit testing : Programming principles and guidelines, incrementally developing code, managing evolving code, unit testing, code inspection, metrics.

Unit VIII:
Testing : Testing concepts, testing process, black-box testing, white-box testing, metrics.

Text books :
1. A Concise introduction to software engineering (undergraduate topics in computer science), Pankaj Jalote, Springer International Edition.
2. Software Engineering, A Precise approach, Pankaj Jalote, Wiley

3. Software Engineering, 3/e ,& 7e Roger S.Pressman , TMH

REFERENCE BOOKS:
1. Software Engineering ,8/e, Sommerville, Pearson.
2. Software Engineering principles and practice, W S Jawadekar, TMH
3. Software Engineering concepts, R Fairley, TMH

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Information Technology – I Sem.

COMPUTER NETWORKS

Unit - I: Introduction: Data Communication, components, data representation, data flow; **Networks**: distributed processing, network criteria, physical structures, network models, categories of network, inter connection of networks; **The Internet:** brief history**,** internet today**, Protocols &standard layers:** protocols, standards, standard organization, internet standards**, Layered Tasks:** sender, receiver, carrier, hierarchy.
The OSI models: layered architecture, peer to peer process, encapsulation**, Layers in OSI model**: physical layer, data link layer, Network layer, transport layer, session layer , presentation layer , application layer , **TCP/IP protocol suite**: physical and data link layers, network layer, transport layer, application layer, **Addressing**: physical address, logical address, port address, specific address.

Unit-II: Physical layer and overview of PL Switching: Multiplexing: frequency division multiplexing, wave length division multiplexing, synchronous time division multiplexing, statistical time division multiplexing, **introduction to switching**: Circuit Switched Networks, Datagram Networks, Virtual Circuit Networks.

Unit -III : Framing: fixed size framing, variable size framing, , Flow control, Error control ,**Error detections Error correction**: block coding, linear block codes, **cyclic codes:** cyclic redundancy check, hard ware implementation, polynomials, cyclic code analysis, advantages**, Checksum:** idea, one's complement internet check sum, services provided to Network Layer, **elementary Data link Layer protocols-** Unrestricted Simplex protocol, Simplex Stop-and-Wait Protocol, Simplex protocol for Noisy Channel.

Unit-IV: Sliding Window Protocol: One bit, Go back N, Selective Repeat-Stop and wait protocol , data link layer **HDLC**: configuration and transfer modes, frames, control field, **point to point protocol(PPP):** framing, transition phase, multiplexing, multi link PPP.

Unit -V: Random Access : ALOHA, career sense multiple access (CSMA), career sense multiple access with collision detection, career sense multiple access with collision avoidance , **Controlled Access**: Reservation, Polling, Token Passing, **Channelization**: frequency division multiple access(FDMA),time division multiple access(TDMA), code division multiple access(CDMA).

Unit-VI: IEEE Standards: data link layer, physical layer, Manchester encoding, **Standard Ethernet**: MAC Sub Layer, physical layer, **Fast Ethernet**: MAC Sub Layer, physical layer, **IEE-802.11:** Architecture, MAC sub layer, addressing mechanism , frame structure.

Unit -VII : Blue tooth : Architecture, blue tooth layers, Protocol stack, Frame structure ,**cellur Telephony**-frequency reuse Transmitting, receiving, roaming, **Satellite Networks** – GEO,LEO,MEO satellite.

Unit-VIII : Data Link Layer Switching-Bridges, Local internet working Spanning tree bridges, remote bridges, switch virtual LANs.

Text Books:
1) Data communications and networking 4th edtion Behrouz A Fourzan, TMH
2) Computer networks   4th editon Andrew S Tanenbaum, Pearson
3) Computer networks, Mayank Dave,   CENGAGE

Reference Books:
1) http://nptel.iitm.ac.in/courses/Webcourse-contents/IIT%20Kharagpur/Computer%20networks/New_index1.html
2) Computer networks, A system Approach, 5th ed, Larry L Peterson and Bruce S Davie, Elsevier

JNTUWORLD

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Information Technology – I Sem.

WEB TECHNOLOGIES

UNIT I: History of the Internet and World Wide Web – HTML 4 protocols – HTTP, SMTP, POP3, MIME,
IMAP. **HTML Common tags**- List, Tables, images, forms, Frames, Links and Navigation, Image Maps

UNIT II: CSS: Introduction, CSS Properties, Controlling Fonts, Text Formatting, Pseudo classes, Selectors, CSS for Links, Lists, Tables.

UNIT III: Page Layout : Understanding site, Page size, Designing pages, Structuring pages and Design issues.

Learning Java script: Variables, operators, Functions, Control structures, Events , Objects.

UNIT IV: Advanced Java Script with DHTML DOM and forms.

UNIT V: XML: XML DTD, XML Schema, Parsing XML, XPath,and XML Transformations .

UNIT VI: PHP Programming: Introducing PHP: Creating PHP script, Running PHP script.
Working with Variables and constants: Using variables, Using constants, Data types, Operators.

UNIT VII: Controlling program flow: Conditional statements, Control statements, Arrays, functions. Working
          With forms and Database using MySql.

UNIT VIII: AJAX: Introduction, AJAX with XML and PHP, Common Gateway Interface and Perl programming.

Text books:
1. Web programming with HTML, XHTML and CSS, 2e, Jon Duckett, Wiley India
2. Web Technolgies, Uttam Roy, OXFORD University press

Reference:
1. Web programming Bai, Michael Ekedahl, CENAGE Learning , India edition.
2. An Introduction to Web Design + Programming, Paul S.Wang, India Edition

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Information Technology – I Sem.

OPERATING SYSTEMS

UNIT I : Computer System and Operating System Overview: Overview of computer operating systems, operating systems functions, protection and security, distributed systems, special purpose systems, operating systems structures and systems calls, operating systems generation.

UNIT II : Process Management – Process concept- process scheduling, operations, Inter process communication. Multi Thread programming models. Process scheduling criteria and algorithms, and their evaluation.

UNIT III : Concurrency : Process synchronization, the critical- section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples

UNIT IV : Memory Management : Swapping, contiguous memory allocation, paging, structure of the page table , segmentation

 UNIT V : Virtual Memory Management:
virtual memory, demand paging, page-Replacement, algorithms, Allocation of Frames, Thrashing

UNIT VI : Principles of deadlock – system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock,

UNIT VII : File system Interface- the concept of a file, Access Methods, Directory structure, File system mounting, file sharing, protection.
File System implementation- File system structure, file system implementation, directory implementation, allocation methods, free-space management

UNIT VIII : Mass-storage structure overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling, swap-space management

TEXT BOOKS :
1. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.
2. Operating Systems' – Internal and Design Principles Stallings, Sixth Edition–2005, Pearson education

REFERENCES :
1. http://nptel.iitm.ac.in/courses/Webcourse-contents/IISc-BANG/Operating%20Systems/New_index1.html
2. Operating systems- A Concept based Approach-D.M.Dhamdhere, 2nd Edition, TMH

3. Operating System A Design Approach-Crowley, TMH.
4. Modern Operating Systems, Andrew S Tanenbaum 3rd edition PHI.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Information Technology – I Sem.

COMPUTER GRAPHICS

UNIT I : Introduction: Application of Computer Graphics, raster scan systems, random scan systems, raster scan display processors.
Output primitives : Points and lines, line drawing algorithms(Bresenham's and DDA Line derivations and algorithms), mid-point circle and ellipse algorithms.

UNIT II : Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms. Inside and outside tests.

UNIT III : 2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems. (p.nos 204-227 of text book-1).

UNIT IV : 2-D viewing : The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

UNIT V : 3-D object representation : Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces.

UNIT VI : 3-D Geometric transformations : Translation, rotation, scaling, reflection and shear transformations, composite transformations. 3D Viewing pipeline, clipping, projections(Parallel and Perspective).

UNIT VII : Visible surface detection methods: Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSPtree methods, area sub-division and octree methods.

UNIT VIII : Computer animation : Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.

TEXT BOOKS:
1. Computer Graphics C version, Donald Hearn, M.Pauline Baker, Pearson
2. Computer Graphics with Virtual Reality Systems, Rajesh K Maurya, Wiley
3. Introduction to Computer Graphics, Using Java 2D and 3D, Frank Klawonn, Springer
4. Computer Graphics, Steven Harrington, TMH
5. Computer Graphics, Amarendra N Sinha, Arun Udai, TMH

REFERENCE BOOKS:
1. Computer Graphics Principles & practice, 2/e, Foley, VanDam, Feiner, Hughes, Pearson
2. Computer Graphics, Peter, Shirley, CENGAGE
3. Principles of Interactive Computer Graphics, Neuman , Sproul, TMH.

4. The Computer Graphics manual, Vol 2, David, Soloman, Springer
5. Procedural elements for Computer Graphics, David F Rogers, 2/e, TMH

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Information Technology – I Sem.

ADVANCED DATA STRUCTURES
(Note: C++ and Java implementation is not included in the syllabus)

Unit I : Dictionaries : Sets, Dictionaries, Hash Tables, Open Hashing, Closed Hashing (Rehashing Methods), Hashing Functions(Division Method, Multiplication Method, Universal Hashing), Analysis of Closed Hashing Result (Unsuccessful Search, Insertion, Successful Search, Deletion), Hash Table Restructuring, Skip Lists, Analysis of Skip Lists. (Reference 1)

Unit II : Balanced Trees : AVL Trees: Maximum Height of an AVL Tree, Insertions and Deletions. 2-3 Trees : Insertion, Deletion.

Unit III : Priority Queues :
Binary Heaps : Implementation of Insert and Delete min, Creating Heap.
Binomial Queues : Binomial Queue Operations, Binomial Amortized Analysis, Lazy Binomial Queues

Unit IV : Graphs : Operations on Graphs: Vertex insertion, vertex deletion, find vertex, edge addition, edge deletion, Graph Traversals- Depth First Search and Breadth First Search(Non recursive) .
Graph storage Representation- Adjacency matrix, adjacency lists.

Unit V : Graph algorithms : Minimum-Cost Spanning Trees- Prim's Algorithm, Kruskal's Algorithm Shortest Path Algorithms: Dijkstra's Algorithm, All Pairs Shortest Paths Problem: Floyd's Algorithm, Warshall's Algorithm,

Unit VI : Sorting Methods : Order Statistics: Lower Bound on Complexity for Sorting Methods: Lower Bound on Worst Case Complexity, Lower Bound on Average Case Complexity, Heap Sort, Quick Sort, Radix Sorting, Merge Sort.

Unit VII : Pattern matching and Tries : Pattern matching algorithms- the Boyer –Moore algorithm, the Knuth-Morris-Pratt algorithm
Tries: Definitions and concepts of digital search tree, Binary trie, Patricia , Multi-way trie

Unit VIII : File Structures: Fundamental File Processing Operations-opening files, closing files, Reading and Writing file contents, Special characters in files.
Fundamental File Structure Concepts- Field and record organization, Managing fixed-length, fixed-field buffers.
(Reference 5)

Text Books :
1. Data Structures, A Pseudocode Approach, Richard F Gilberg, Behrouz A Forouzan, Cengage.
2. Fundamentals of DATA STRUCTURES in C: 2nd ed, , Horowitz , Sahani, Anderson-freed, Universities Press

3. Data structures and Algorithm Analysis in C, 2nd edition, Mark Allen Weiss, Pearson

Reference Books:
1.   Web : http://lcm.csa.iisc.ernet.in/dsa/dsa.html
2. http://utubersity.com/?page_id=878
3. http://freevideolectures.com/Course/2519/C-Programming-and-Data-Structures
4. http://freevideolectures.com/Course/2279/Data-Structures-And-Algorithms
5. File Structures :An Object oriented approach with C++, 3rd ed, Michel J Folk, Greg Riccardi, Bill Zoellick
6.   C and Data Structures: A Snap Shot oriented Treatise with Live examples from Science and Engineering, NB Venkateswarlu & EV Prasad, S Chand, 2010.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Information Technology – I Sem.

OPERATING SYSTEM & COMPILER DESIGN LAB

PART – A:
1. Design a Lexical analyzer for the given language. The lexical analyzer should ignore redundant spaces, tabs and newlines. It should also ignore comments. Although the syntax specification states that identifiers can be arbitrarily long, you may restrict the length to some reasonable value.
2. Implement the lexical analyzer using JLex, flex or lex or other lexical analyzer generating tools.
3. Design Predictive parser for the given language
4. Design LALR bottom up parser for the given language.
5. Convert the BNF rules into Yacc form and write code to generate abstract syntax tree.

PART- B:
1. Simulate the following CPU scheduling algorithms
   a) Round Robin b) SJF c) FCFS d) Priority
2. Simulate all file allocation strategies
   a) Sequentialb) Indexed c) Linked
3. Simulate MVT and MFT
4. Simulate all File Organization Techniques
   a) Single level directory b) Two level c) Hierarchical d) DAG
5. Simulate Bankers Algorithm for Dead Lock Avoidance
6. Simulate Bankers Algorithm for Dead Lock Prevention
7. Simulate all page replacement algorithms
   a) FIFO b) LRU c) LFU Etc. …
8. Simulate Paging Technique of memory management.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Information Technology – I Sem.

ADVANCED DATA STRUCTURES LAB

1. To implement functions of Dictionary using Hashing (division method, Multiplication method, Universal hashing)
2.   To perform various operations i.e, insertions and deletions on AVL trees
3. To perform various operations i.e., insertions and deletions on 2-3 trees.
4. To implement operations on binary heap.
5. To implement operations on graphs
    i) vertex insertion
    ii) Vertex deletion
    iii) finding vertex
    iv)Edge addition and deletion
6. . To implement Depth First Search for a graph nonrecursively.
7. To implement Breadth First Search for a graph nonrecursively.
8. To implement Prim's algorithm to generate a min-cost spanning tree.
9. To implement Krushkal's algorithm to generate a min-cost spanning tree.
10. To implement Dijkstra's algorithm to find shortest path in the graph.
11 .To implement pattern matching using Boyer-Moore algorithm.
12. To implement Knuth-Morris-Pratt algorithm for pattern matching.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

III Year B. Tech. Information Technology – I Sem.

INTELLUCTUAL PROPERTY RIGHTS AND PATENTS -1