

PROPOSED SYLLABUS OF INFORMATION TECHNOLOGY
FIFTH AND SIXTH SEMESTER
RTM NAGPUR UNIVERSITY, NAGPUR
ACADEMIC SESSION: 2014-2015

FOUR YEAR BACHELOR OF ENGINEERING (B. E.) DEGREE COURSE
SEMESTER: FIFTH
BRANCH: INFORMATION TECHNOLOGY

Sr. No.	Subject Code	Subjects	Workload				Credit				Marks				
			L	P	T	Total Hrs/Week	L	P	T	Total	Theory		Practical		Total Marks
											Sess.	Univ.	Sess.	Univ.	
1	BEIT501T	System Programming	3	-	1	4	3	-	1	4	20	80	-	-	100
2	BEIT502T	Design and Analysis of Algorithms	4	-	1	5	4	-	1	5	20	80	-	-	100
3	BEIT503T	Software Engineering	3	-	1	4	3	-	1	4	20	80	-	-	100
4	BEIT503P	Software Engineering	-	2	-	2	-	1	-	1	-	-	25	25	50
5	BEIT504T	Computer Graphics	4	-	1	5	4	-	1	5	20	80	-	-	100
6	BEIT504P	Computer Graphics	-	2	-	2	-	1	-	1	-	-	25	25	50
7	BEIT505T	Java Programming	3	-	1	4	3	-	1	4	20	80	-	-	100
8	BEIT505P	Java Programming	-	2	-	2	-	1	-	1	-	-	25	25	50
9	BEIT506T	Industrial Economics and Entrepreneurship Development	4	-	-	4	4	-	-	4	20	80	-	-	100
		Total	21	6	5	32	21	3	5	29	120	480	75	75	750

FOUR YEAR BACHELOR OF ENGINEERING (B. E.) DEGREE COURSE
SEMESTER: SIXTH
BRANCH: INFORMATION TECHNOLOGY

Sr. No.	Subject Code	Subjects	Workload				Credit				Marks				
			L	P	T	Total Hrs/Week	L	P	T	Total	Theory		Practical		Total Marks
											Sess.	Univ.	Sess.	Univ.	
1	BEIT601T	Computer Networks	4	-	1	5	4	-	1	5	20	80	-	-	100
2	BEIT602T	Operating Systems	4	-	1	5	4	-	1	5	20	80	-	-	100
3	BEIT603T	Database Management Systems	4	-	1	5	4	-	1	5	20	80	-	-	100
4	BEIT603P	Database Management Systems	-	2	-	2	-	1	-	1	-	-	25	25	50
5	BEIT604T	Internet Programming	4	-	1	5	4	-	1	5	20	80	-	-	100
6	BEIT604P	Internet Programming	-	2	-	2	-	1	-	1	-	-	25	25	50
7	BEIT605T	Functional English	2	-	1	3	2	-	1	3	10	40	-	-	50
8	BEIT606P	Mini Project and Industrial Visit	-	2	-	2	-	2	-	2	-	-	25	25	50
		Total	18	6	5	29	18	4	5	27	90	360	75	75	600

Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
Scheme of Absorbtion of New course(C.B.S.) to Old course of Fifth Semester
B. E. (Information Technology)

As per Old course scheme of RTM,
Nagpur University

Sr. No	Sem	Subjects	Th/Pr
1	V	System Software	Th
2	V	Computer Graphics	Th
3	V	Computer Graphics	Pr
4	V	Principles of Management	Th
5	V	Information Theory and Data Communication	Th
6	V	Information Theory and Data Communication	Pr
7	V	Discrete and Integrated Circuits	Th
8	V	Discrete and Integrated Circuits	Pr
9	V	Object Oriented Methodologies	Th
10	V	Object Oriented Methodologies	Pr

As per New course(C.B.S.) scheme of RTM,
Nagpur University

Subject Code	Subjects	Th/Pr
BEIT501T	System Programming	Th
BEIT504T	Computer Graphics	Th
BEIT504P	Computer Graphics	Pr
BEIT506T	Industrial Economics and Entrepreneurship Development	Th
BEIT502T	Design and Analysis of Algorithms	Th
BEIT503T	Software Engineering	Th
BEIT503P	Software Engineering	Pr
BEIT505T	Java Programming	Th
BEIT505P	Java Programming	Pr

Note: If any student has cleared any subject as mentioned in absorption scheme of relevent semester in previous semester of old course will be exempted for appearing in the examination for that subject

Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur
Proposed Scheme of Absorbtion of New course(C. B. S.) to Old course of Sixth Semester
B. E. (Information Technology)

As per Old course scheme of RTM,
Nagpur University

As per New course (C. B. S.)scheme of RTM,
Nagpur University

Sr. No	Sem	Subjects	Th/Pr
1	VI	Software Engineering	Th
2	VI	Software Engineering	Pr
3	VI	JAVA Programming	Th
4	VI	JAVA Programming	Pr
5	VI	Database Management Systems	Th
6	VI	Database Management Systems	Pr
7	VI	Operating Systems	Th
8	VI	Microprocessors	Th
9	VI	Microprocessors	Pr
10	VI	Visual Techniques	Th
11	VI	Visual Techniques	Pr

Subject Code	Subjects	Th/Pr
BEIT603T	Database Management Systems	Th
BEIT603P	Database Management Systems	Pr
BEIT602T	Operating Systems	Th
BEIT601T	Computer Networks	Th
BEIT604T	Internet Programming	Th
BEIT604P	Internet Programming	Pr
BEIT605T	Functional English	Th
BEIT606P	Mini Project and Industrial Visit	Pr

Note: If any student has cleared any subject as mentioned in absorbtion scheme of relevent semester in previous semester of old course will be exempted for appearing in the examination for that subject

BEIT501T

SYSTEM PROGRAMMING
(Theory Credit: 04)

Teaching Scheme:
Lecture: 3 Hours/week
Tutorial: 1 Hour/week

Examination Scheme:
Theory: T (U): 80 Marks T (I): 20 Marks
Duration of University Exam. : 03 Hours

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UNIT I:

Introduction to System Software and IBM 360 Machine:

Evolution of components of programming system, Operating System, Overview, Functions and Facilities o, Goals of System software, Views of System Software, Virtual machine. General machine structure IBM 360/370, Machine Language Assembly language.

UNIT II:

Assembler:

Design of Pass-I and Pass-II Assemblers, Table Processing, Searching and Sorting, Problems based on symbol table, Base table and Literal table generation, Machine code generation and Searching and sorting.

UNIT III:

Macro Language and Macro Processor:

Macro instruction, Features of Macro facility, Implementation of 1-Pass, 2-Pass Macro processor, Macro calls within macro, macro definition within macros.

UNIT IV:

Loaders and Linkers:

Different Loading Schemes, Binders, Overlays, Linking loaders, Design of absolute loaders, Design of Direct Linking loaders.

UNIT V:

Compiler:

Phases of Compiler, Cross Compiler, Bootstrapping, Erros in each phases, ,Compiler writing tools, Lex and YACC, Databases used in Compilation process.

UNIT VI:

UNIX Device Drivers:

Introduction to Device drivers, Types of Device Drivers, Design issues in Device Drivers, Driver installation with example, character driver-A/D Converter, Block Driver-RAM Disk driver, Terminal Driver-The COM1 port driver

Text Books:

1. J. J. Donovan; System Programming; TMH, 2012
2. D.M. Dhamdhare; System Programming; THM; 2011
3. George Pajari; Eriting Unix Device Drivers; Pearson Education; 2011
4. O.G. Kakade; Principles of Compiler Design; Laxmi Pub. 2008

Reference Books:

1. Leland Beck, D. Manjula; System Software; An Introduction to System Programming; Pearson Education; 2013
2. Alfred Aho, J. Ullman; Principles of Compiler Design; Narosa Pub. 2010

Teaching Scheme:

Lecture: 4 Hours/week

Tutorial: 1 Hour/week

Examination Scheme:

Theory: T (U): 80 Marks T (I): 20 Marks

Duration of University Exam. : 03 Hours

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UNIT I :

Mathematical foundation, summation of arithmetic and geometric series, Σn , Σn^2 , bounding summation using integrations, recurrence relations, solutions of recurrence relations using technique of characteristic equation, recursion tree method and master theorem, generating functions, Complexity calculation of various standard functions, principles of designing algorithms

UNIT II :

Asymptotic notations of analysis of algorithms, analyzing control structures, worst case, average case and best case analysis of insertion sort, selection sort and bubble sort, lower bound proof, amortized analysis, application of amortized analysis, Sorting networks, comparison networks, biotonic sorting network.

UNIT III :

Divide and conquer strategies: Binary search, quick sort, merge sort, heap sort, Strassen's matrix multiplication algorithm, min-max algorithm. Greedy Approach: Basic strategy, activity selection problem, application to job sequencing with deadlines problem, knapsack problem, optimal merge pattern, Huffman code, minimum cost spanning tree using Prim's and Kruskal's algorithm,

UNIT IV :

Dynamic Programming: Basic Strategy, Multistage graph (forward and backward approach), Longest Common Subsequence, matrix chain multiplication, Optimal Binary Search Tree, 0/1 Knapsack problems, Travelling Salesman problem, single source shortest path using Bellman-Ford algorithm, all pair shortest path using Floyd- Warshall algorithm.

UNIT V :

Basic Traversal and Search Techniques, breadth first search and depth first search, connected components. Backtracking: basic strategy, 4-Queen's problem, 8-Queen's problem, graph coloring, Hamiltonian cycles etc, Approximation algorithm and concepts based on approximation algorithms

UNIT VI :

NP-hard and NP-complete problems, basic concepts, non-deterministic algorithms, NP-hard and NP-complete, Cook's theorem, decision and optimization problems, polynomial reductions, graph based problems on NP Principle, Computational Geometry, Approximation algorithm.

Text Books:

1. "Introduction to Algorithms", Third Edition, Prentice Hall of India by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein.
2. "The Design and Analysis of Computer Algorithms", Pearson education by Alfred V. Aho, John E. Hopcraft, Jeffrey D. Ullman.

3. "Fundamentals of Computer Algorithms", Second Edition, University Press By Horowitz, Sahani, Rajsekharan.
4. "Fundamentals of Algorithms", Prentice Hall by Brassard, Bratley
5. "Design and Analysis of Algorithms", Pearson Education, IIInd Edition, Parag Dave, Himanshu Dave

Reference Books:

1. Computer Algorithms: Introduction to Design and analysis, 3rd Edition, By Sara Baase and A. V. Gelder Pearson Education.

BEIT503T

SOFTWARE ENGINEERING

(Theory Credit: 04)

Teaching Scheme:

Lecture: 3 Hours/week

Tutorial: 1 Hour/week

Examination Scheme:

Theory: T (U): 80 Marks T (I): 20 Marks

Duration of University Exam. : 03 Hours

UNIT I:

Basics: Introduction to Software Engineering, Software Myths, Software Engineering- A Layered Technology, Software Process Framework, Software Process Models: The Waterfall Model, Incremental Process Models, Evolutionary Process Models, Specialized Process Models, Agile Process Models

UNIT II:

Measures Metrics and Indicator, Metrics for process & projects: Software measurement, metrics for software quality, metrics for small organization, Estimation: Software scope and Feasibility, Resources, Software project estimation, Decomposition Techniques, Empirical Estimation Models, Make-buy Decision, Project scheduling

UNIT III:

System Engineering: Hierarchy, Business Process Engineering, Product Engineering, System Modeling, Requirements Engineering: Requirements Analysis, Analysis Modeling Approaches, Data Modeling, Object-Oriented Analysis, Scenario-Based Modeling, Flow-Oriented Modeling, Class-based Modeling, Behavioral Model, Metrics for Analysis Models

UNIT IV:

Design Engineering Concepts, Design Model, Pattern-Based Software Design, Architectural Design, Mapping data flow into software architecture, Cohesion, Coupling, User interface analysis and Design, Metrics for Design Models

UNIT V:

Unit Testing, Integration Testing, Validation Testing, System Testing, Art of Debugging, Software Testing Fundamentals, Black-Box Testing, White-Box Testing, Metrics for Source Code, Metrics for Testing & Maintenance

UNIT VI:

Risk Management: Risk strategies, Software risks, Risk identification, Risk refinement, RMMM Quality Management: Quality Concepts, Software Quality Assurance, Software Reviews, Formal Technical Review, Software Reliability, Change Management: Software Configuration Management, SCM Repository, SCM Process, Reengineering: Software reengineering, Reverse Engineering, Restructuring, Forward Engineering

Text Books:

1. Software Engineering-A Practitioner's Approach (Sixth Edition) by Roger Pressman (TMH)
2. Software Engineering (Ninth Edition)-Ian Sommerville (Pearson)
3. Software Engineering for students (4th Edition)- Douglas Bell(Pearson)

Reference Books:

1. Schaum's Outline of Theory and Problems of Software Engineering by David Gustafson (TMH)
2. Software Engineering (Third Edition) by K. K. Aggarwal and Yogesh Singh (New age International Publishers)
3. Software Engineering, Theory and Practice(4th Edition)- Pfleeger, Atlee(Pearson)

BEIT503P

SOFTWARE ENGINEERING
(Practical Credit: 01)

Teaching Scheme:
Practical: 2 Hours/week

Examination Scheme:
Practical: P (U): 25 Marks P (I): 25 Marks
Duration of University Exam. : 02 Hours

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Note:

1. Practicals are based on SOFTWARE ENGINEERING syllabus (subject code: BEIT503T)
2. Practicals are based on:
 - a) DFD
 - b) UML diagrams for software
 - c) Testing Tools
 - d) CASE Tools
3. Minimum ten practicals have to be performed
4. Do not include study experiments

BEIT504T

COMPUTER GRAPHICS

(Theory Credit: 05)

Teaching Scheme:

Lecture: 4 Hours/week

Tutorial: 1 Hour/week

Examination Scheme:

Theory: T (U): 80 Marks T (I): 20 Marks

Duration of University Exam. : 03 Hours

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UNIT I:

Geometry and line generation: points, lines, planes, pixels and frames buffers, types of display devices and its architecture DDA and Bresenham's algorithms for line generation, Bresenham's algorithm for circle generation, aliasing, anti-aliasing and its techniques.

UNIT II:

Graphics primitives: Display files, algorithms for polygon generation, polygon filling algorithms, NDC (normalized device co-ordinates), 2D transformations: scaling, rotation, translation, rotation about arbitrary point, reflections, shearing.

UNIT III:

Segment tables: operations on segments, data structures for segments and display files, Windowing and clipping: window, viewport, viewing transformations, clipping, line and Polygon clipping.

UNIT IV:

3D Graphics: 3D Transformation, parallel, perspective and isometric projections, 3D Transformations. Hidden surfaces and line removal: Painter's, Z-buffer, Warnock's, Back-face Removal algorithm

UNIT V:

Curves and surfaces: Methods of interpolation, Bezier and B-splines, surface rendering methods: Gouraud Shading, Phong Shading, Constant Intensity Shading, Fast Shading.

UNIT VI:

Color Models and Color Application: Properties of light, standard primaries, chromaticity Diagram, Intuitive colour concept RGB, YIQ CMY, HSK, colour models and their conversion, colour selection and applications. Animation: Design of Animation sequences, animation Function, Raster animation, animation Language, Key-Frame System, motion Specification.

Text Books:

1. Procedural elements for computer graphics by David F. Rogers, Mc-Graw Hill.
2. Computer Graphics 'C' Version, Second Edition By Donald Hearn and M.Pauline Baker, Pearson publication
3. Mathematical elements for computer graphics by David Rogers and J. Alan Adams, Tata Mcgraw Hill Education Private Limited
4. Computer graphics principles and practice in C by Foley, Vandam, Feiner and Huges (Pearson)
5. Computer Graphics, Vikas publications, Neeta Jain
6. Principles of interactive computer graphics by Newman and Sproul.

BEIT504P

COMPUTER GRAPHICS
(Practical Credit: 01)

Teaching Scheme:
Practical: 2 Hours/week

Examination Scheme:
Practical: P (U): 25 Marks P (I): 25 Marks
Duration of University Exam. : 02 Hours

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Note:

1. Practicals are based on COMPUTER GRAPHICS syllabus (subject code: BEIT504T)
2. There should be at the most two practicals per unit
3. Minimum ten practicals have to be performed
4. Do not include study experiments

BEIT505T

JAVA PROGRAMMING

(Theory Credit: 04)

Teaching Scheme:

Lecture: 3 Hours/week

Tutorial: 1 Hour/week

Examination Scheme:

Theory: T (U): 80 Marks T (I): 20 Marks

Duration of University Exam. : 03 Hours

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UNIT I :

Introduction to Java, Data types, Literals: Types of Literals, Operators, Control Statements: If, switch, do-while, while, for, enhanced for loop, Nested Loop, break, continue, return statements, Classes: Fundamentals of classes, Declaring objects, Assigning objects, Reference variables, Overloading methods, Constructors, this keyword, Wrapper classes, Using object as parameter, Argument passing, Command line arguments, returning object, static modifier, final modifier, Nested classes: inner classes, Garbage collection.

UNIT II :

Arrays, Vectors and Generics, String Handling: String and StringBuffer class, String constructors, Data conversion using valueOf(), toString() methods, Methods for String Comparison, Searching string and modifying string.

UNIT III :

Object class, Inheritance, Abstract classes and methods, Interfaces, Method Overriding, Packages: Package Fundamental, Access protection, Importing packages, Exception Handling: Fundamental Exception type: Checked, Unchecked and Uncaught Exceptions, throw and throws keywords, Creating user defined exceptions, Built-in Exceptions.

UNIT IV :

Multithreading: Fundamentals, Thread Life Cycle, Ways of creating threads, Creating multiple threads, isAlive (), join (), Thread Synchronization, Thread priorities, Interthread communication, Methods for suspending, resuming and stopping threads.

UNIT V :

I/O stream, Byte stream, Character stream, Pre-defined streams, Reading console input, Writing console output, PrintWriter class, Reading and Writing files, transient and volatile modifiers, instanceof, strictfp and native methods.

UNIT VI :

Introduction to Swings, AWT as a origin of Swing, Key swing features, Components and container, Swing packages, Event handling, Creating swing applets, Controls: label and image icons, JTextField, Swing Buttons, Tabbed Panes, JScrollPane, JList, JComboBox, JTable.

Text Books:

1. The Complete Reference (Seventh Edition) by Herbert Schildt, TATA MCGRAW-HILL Publications

Reference Books:

1. Sun Certified Java Programmer for Java 6 by Kathy Sierra.
2. The Java™ Programming Language (3rd Edition) by Arnold, Holmes, Gosling, Goteti
3. Core Java for Beginners by Rashmi Kanta Das (III Edition) Vikas Publication
4. Programming in Java (Second Edition) by Sachin Malhotra and Saurabh Choudhary, Oxford University Press

BEIT505P

JAVA PROGRAMMING
(Practical Credit: 01)

Teaching Scheme:
Practical: 2 Hours/week

Examination Scheme:
Practical: P (U): 25 Marks P (I): 25 Marks
Duration of University Exam. : 02 Hours

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Note:

1. Practicals are based on JAVA PROGRAMMING syllabus (subject code: BEIT505T)
2. There should be at the most two practicals per unit
3. Minimum ten practicals have to be performed
4. Do not include study experiments

BEIT506T INDUSTRIAL ECONOMICS AND ENTREPRENEURSHIP DEVELOPMENT
(Theory Credit: 03)

Teaching Scheme:
Lecture: 4 Hours/week
Tutorial: Nil

Examination Scheme:
Theory: T (U): 80 Marks T (I): 20 Marks
Duration of University Exam. : 03 Hours

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Objective:

Study of this subject provides an understanding of the scope of an industrial economics and entrepreneurship development, key areas of business development, sources of finance, project preparation, methods of taxation and tax benefits, significance of entrepreneurship and economic growth, application of engineering skills in entrepreneurial activities etc.

UNIT I:

Industrial economics, Types of Business structures, top and bottom line of the organization, economic analysis of business, economics of operations, economic prudence in business.

UNIT II:

Market structures- Monopoly, Oligopoly, and Monopolistic competition. Pricing strategies, business integration- forward backward integration, economies of scale, diseconomies of scale, liberalization, privatization and globalization. Business cycles, optimum size of firm.

UNIT III:

The functions of central bank and commercial banks, Foreign Direct Investment, Free trade vs. Protectionism, Capital formation, Inflation, Recession and stagnation, Inclusive growth, Public-Private partnership for development, Multiplier effect, Accelerator effect.

UNIT IV:

Entrepreneurship meaning, Major Motives Influencing an Entrepreneur, Factors Affecting Entrepreneurial Growth. Project Formulation, Product development, Market Survey and Research, Demand forecasting techniques, Techno Economic Feasibility Assessment – Preparation of Preliminary Project Reports – Project Appraisal – Sources of Information – Classification of Needs and Agencies.

UNIT V:

Need – Sources of Finance, Term Loans, Capital Structure, venture capital. Angel funding, Financial Institution, management of working Capital, Costing, Break Even Analysis, Network Analysis Techniques of PERT/CPM – Taxation – Direct, Indirect Taxes.

UNIT VI:

Sickness in small Business, Major problems faced by SSIs, Foreign Direct Investments and threat to SSI, Technical consultancy organizations, safeguard measures against variation in currency value, Government Policy for Small Scale Enterprises, tax holidays, and incentives to SSIs.

TEXT BOOKS

Industrial Economics. By, Ranjana Seth, Ane Book Pvt Ltd.

Modern Economic Theory By, K.K. Dewett. S.Chand.

Industrial Economics. By, Jagdish Sheth, Pearson Publication.

“Entrepreneurial Development” By, S.S.Khanka S.Chand & Co. Ltd. Ram Nagar New Delhi, 1999.

Hisrich R D and Peters M P, “Entrepreneurship” 5th Edition Tata McGraw-Hill, 2002.

Management of Entrepreneurship. By, N.V.R. Naidu, I.K. International Pvt Ltd.

Entrepreneurial Development. By, S.Anil Kumar. New Age International.

Small- Scale Industries and Entrepreneurship, By, Dr. Vasant Desai, Himalaya Publication.

REFERENCE BOOKS:

Business Economics. By, K.Rajgopalchar. Atalantic Publishers.

Microeconomics. By, Robert Pindyk

Business Economics. By, H.L. Ahuja,H. L. Ahuja,Louis Prof. De Broglie. S.Chand.

Rabindra N. Kanungo “Entrepreneurship and innovation”, Sage Publications, New Delhi, 1998.

Financing Small Scale Industries in India, By, K.C.Reddy.Himalaya Publication.

BEIT601T

COMPUTER NETWORKS
(Theory Credit: 05)

Teaching Scheme:

Lecture: 4 Hours/week

Tutorial: 1 Hour/week

Examination Scheme:

Theory: T (U): 80 Marks T (I): 20 Marks

Duration of University Exam. : 03 Hours

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UNIT I: Introduction

Introduction to computer networks & Internet, Network architecture, layered approach, OSI reference model, TCP/IP protocol suite, performance issues in networks, throughput, delay, latency, jitter, packet delivery ratio, packet loss rate, reliability, Introduction to Wireless Networks, IEEE 802.11, Bluetooth and WiMAX, wireless transmission, infrared transmission

UNIT II: Data Link Layer

Design issues, framing, error control, flow control, error-correcting and detecting codes, Data link protocols, unrestricted simplex protocol, simplex stop-and-wait protocol, one-bit sliding window protocol, Go Back N ARQ protocol, selective repeat ARQ protocol, static and dynamic channel allocation, ALOHA, CSMA/CD, CSMA/CA

UNIT III: Network Layer

Design issues, classful and classless addressing, IPv4 addressing mechanism, Subnetting and Supernetting, Next generation IP, IPv6 addressing, transition from IPv4 to IPv6, ICMPv6, routing algorithms, shortest path routing, flooding, flow-based routing, distance vector routing, link state routing, hierarchical routing, congestion control algorithms, OSPF, BGP, Multicasting, firewalls

UNIT IV: Transport layer and Application Layer

Quality of service, transport service primitives, elements of transport protocol, addressing, establishing a connection, releasing a connection, flow control and buffering, multiplexing, crash recovery, client server model, concurrency, processes, sockets, socket system calls

UNIT V:

BOOTP and DHCP, packet formats, operation, error control, transition states, DNS (Domain Name System), DNS in the Internet, Resolution, FTP and TFTP, connection, communication, command processing, file transfer, messages

UNIT VI:

Mobile IP, addressing, agents, three phases, agent discovery, registration, data transfer, Internet Security, privacy, digital signature, application layer security, transport layer security, security at the IP layer IPsec, Real Time traffic over the Internet

Text Books:

1. Computer Networks, Fifth Edition, Andrew Tanenbaum(Pearson Education)
2. TCP/IP Protocol Suite, Behrouz A Forouzan, McGraw Hill Fourth Edition

BEIT602T

OPERATING SYSTEMS
(Theory Credit: 05)

Teaching Scheme:

Lecture: 4 Hours/week

Tutorial: 1 Hour/week

Examination Scheme:

Theory: T (U): 80 Marks T (I): 20 Marks

Duration of University Exam. : 03 Hours

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UNIT I :

Introduction: What is Operating System(OS), structure of OS, history of OS, Types of OS: Time sharing, real-time, multiprocess (Asynchronous & Synchronous), multiprogramming (loosely coupled, tightly coupled), Distributed, web-based, client-server, peer-to-peer, services of OS, user view & machine view of OS, System calls, Spooling and buffering. Case Studies: Android, Linux, Windows 8.

UNIT II :

File Management: File Concept, file attributes, file operations, file system structure, file system implementation, file access methods, Disk Scheduling Algorithms, File protection, free space management on disk.

UNIT III :

Process Management: Process concept, process scheduling, operations on process, interprocess communication, communication between client-server, multithreaded model, process scheduling criteria, scheduling algorithm.

UNIT IV :

Memory Management: Preliminaries, Bare machine, resident monitor, swapping, multiple partitions, paging, segmentations, combined systems. Virtual Memory: Overlays, demand-paging performance, of demand paging, page replacement, virtual memory concepts, page replacement algorithms. Allocation algorithm, thrashing.

UNIT V

Process Synchronization: Critical Section problem, semaphores, classic problems: Dining Philosopher problem, producer-consumer, reader-writers problem, bounded buffer problem, monitors, Atomic transaction, synchronization examples.

UNIT VI :

Deadlock and Protection: System model, deadlock characterization, methods for handling deadlocks, prevention, detection, recovery, avoidance, Banker's Algorithm. Goal of protection, mechanism & policies, domain protection, access matrix, implementation of access matrix, dynamic protection structures, revocation, existing systems & language based protection, protection problem security.

Text Books:

1. Modern Operating Systems – A. S. Tanenbaum, Pearson Education
2. Operating System- A. S. Godbole, Tata McGraw Hill, third edition
3. Operating System Concepts- Silberchatz and Galvin, Addison Wesley
4. Android application Development for Java Programmers by James c. Sheusi, CENGAGE Learning.

Reference Books:

1. Operating Systems concepts and Design – Milan Milenkovic, Tata McGraw Hill

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BEIT603T

DATABASE MANAGEMENT SYSTEMS

(Theory Credit: 05)

Teaching Scheme:

Lecture: 4 Hours/week

Tutorial: 1 Hour/week

Examination Scheme:

Theory: T (U): 80 Marks T (I): 20 Marks

Duration of University Exam. : 03 Hours

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UNIT I: Introduction to Database Systems

Database Systems: Significance and advantages, Types of Databases, Limitations of File processing system, the DBMS Environment, Data Abstraction, Data Independence, DBMS Architecture, Functions of DBMS, Formal relational query languages: Relational Algebra, Tuple Relational calculus, Domain Relational Calculus.

UNIT II: File Organization, Indexing and Hashing

File organization, Organization of records in files, Data dictionary storage, Basic concepts of indexing, Ordered indices, B+ Tree index files, B+ Tree indexing, B+ Tree Extensions, Multiple Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices, Index Definition in SQL.

UNIT III: Data Models and Relational Database Design

Evolution of Data Models, Entity Relationship Model, Development of ER Diagrams, Extended Entity Relationship Model. Relational model: Logical View of Data, Keys, Integrity Rules, Relational set operators, Data Dictionary and System Catalog, Indexes, Codd's Relational Database Rules. Normalization of Database Tables: Need and Significance, the normal forms - 1NF, 2NF, 3NF, BCNF, 4NF, 5NF, normalization & database design, denormalization.

UNIT IV: Query Processing and Query Optimization

Overview of Query Processing, Measures of Query cost, Selection Operation, Sorting, Join Operation, Other Operations, and Evaluation of Expressions. Overview of Query Optimization, Transformation of Relational Expressions, Estimating Statistics of Expression results, Choice of Evaluation Plans, Materialized Views

Unit V: Transaction Management

Transactions: Concept, Transaction Model, Transaction atomicity and Durability, Transaction Isolation, Serializability, Transaction Isolation Levels and Implementations. Concurrency Controls: Lock Based Protocol, Deadlock Handling, Time-stamp Based Protocols, and Validation Based Protocols. Recovery System: Failure Classification, Log Based Recovery, Advanced Recovery Techniques.

UNIT VI: SQL and Advanced SQL

Introduction to SQL: SQL Data Definition, Basic Structure of SQL Queries, Set Operations, Null values, Aggregate functions, Nested Sub-queries, Modifications of the Databases Intermediate SQL: Join Expressions, Views, Integrity Constraints, SQL Data types and Schemas, Authorization. Advanced SQL: Dynamic SQL and Embedded SQL, Functions and Procedures, Triggers.

Text Books:

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan, Database System Concepts, 6th Edition, McGraw Hill (SIE), 2013.
2. Carlos Coronel, Steven Morris and Peter Rob, Database Principles – Fundamentals of Design, Implementation and Management, 9th Edition, Cengage Learning, 2013.
3. Hector-Garcia Molina, Jeffrey Ullman and Jeniffer Widom, Database Systems – the Complete Book, 2nd Edition, Pearson Education, 2014.
4. Database Systems Concepts, Designs and Application(2e Pearson) by Shio Kumar Singh
5. The database book, Principles and Practice using MySQL by Narain Gehani, University Press.
6. An Introduction to Database Systems(8e Pearson) by Date, Kannan, Swamynathan

Reference Books:

1. Alexis Leon and Mathews Leon, Database Management Systems, Vikas Publishing, 2008.
2. Ramez Elmasri and Shamkant Navathe, Database Systems - Models, Languages, Design and Application Programming, 6th Edition, Pearson Education, 2009.

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BEIT603P

DATABASE MANAGEMENT SYSTEMS

(Practical Credit: 01)

Teaching Scheme:
Practical: 2 Hours/week

Examination Scheme:
Practical: P (U): 25 Marks P (I): 25 Marks
Duration of University Exam. : 02 Hours

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Note:

1. Practicals are based on DATABASE MANAGEMENT SYSTEMS syllabus (subject code: BEIT603T)
2. Practicals are to be performed using SQL
3. Minimum ten practicals have to be performed
4. Do not include study experiments

BEIT604T

INTERNET PROGRAMMING

(Theory Credit: 05)

Teaching Scheme:

Lecture: 4 Hours/week

Tutorial: 1 Hour/week

Examination Scheme:

Theory: T (U): 80 Marks T (I): 20 Marks

Duration of University Exam. : 03 Hours

UNIT I:

HTML and common tags: Introduction, www, Internet, URL, Common tags: Text formatting tags Line and Paragraph tags, Lists: ordered list Unordered List, definition List, anchor tag , Absolute and relative path, Tables and its attributes, Image tag- alt attribute, image mapping frames, forms , cascading style sheet, External style sheet, internal Style sheet.

UNIT II:

Java Scripts: Introduction Benefits of java script, Editing java scripts Displaying information, Alerts(), Prompts(), confirm box, Operators, conditional statements, conditional loops, functions, arrays, Objects-math, string, date, Boolean, number, document, windows. DHTML with java script, Object model collection, events in java script, filters and transitions-Flip filter, Image mask, shadow filter, alpha filter, Blur filter. Difference between HTML and DHTML

UNIT III:

XML: Introduction, Advantages, Difference between HTML and XML, XML Namespace, Well formed and valid XML, XML Document type definition, XML schemas, Data types Attribute Types, XML Transformation- xsl, Document object model (DOM) using XML processors: DOM and SAX.

UNIT IV:

The Server Side: Client side Vs. Server side, Transformation from static to dynamic sites, Java Servlets, reading environment parameters, accessing parameter data, state management, event driven tracking.

UNIT V:

Java Server Pages: Need of JSP, JSP Life Cycle, Elements in JSP Page, Implicit JSP Objects, JSP Objects scope, JSP tags, JSP exceptions ,Expression Language, JSP standard tag Library custom tag Library, JSP and Equivalent Technologies.

UNIT VI:

Android applications Project: android applications components, application design, the screen layout and main.xml file, component Ids, few simple controls, getting and configuring android emulator, Key Classes like Button, TextView, EditText, View. OnClickListener

Text Books:

1. Web Technology Theory and Practices by M. Shrinivasan, PEARSON publication.
2. Android application Development for Java Programmers by James c. Sheusi, CENGAGE Learning.

3. The Modern approach to Web Technologies by Dr. Vaka Murali Mohan and Mr. S. Pratap Singh SCITECH Publications.
4. Web Technologies TCP/IP architecture, and Java Programming by Achyut S. Godbole & Atul Kahate , Tata McGraw-Hill publication Second edition.

Reference Books:

1. HTML: The Complete Reference, by Thomas A. Powell, McGraw Hill
2. XML: The Complete Reference, by Williamson, McGraw Hill

BEIT404P

INTERNET PROGRAMMING
(Practical Credit: 01)

Teaching Scheme:
Practical: 2 Hours/week

Examination Scheme:
Practical: P (U): 25 Marks P (I): 25 Marks
Duration of University Exam. : 02 Hours

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Note:

1. Practicals are based on INTERNET PROGRAMMING syllabus (subject code: BEIT404T)
2. Practicals are to be performed using Apache Tomcat and Eclipse IDE
3. There should be at the most two practicals per unit
4. Minimum ten practicals have to be performed
5. Do not include study experiments

BEIT605T

FUNCTIONAL ENGLISH
(Theory Credit: 03)

Teaching Scheme:

Lecture: 2 Hours/week

Tutorial: 1 Hour/week

Examination Scheme:

Theory: T (U): 40 Marks T (I): 10 Marks

Duration of University Exam. : 02 Hours

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Objective: At the end of the semester, students will have enough confidence to face competitive examinations (IELTSES/ TOEFL/CAT/ MAT/ XAT/SNAP/GMAT/GATE etc.) to pursue masters degree. They will also acquire language skills required to write their Reviews/Projects/Reports. They will be able to organize their thoughts in English and hence face job interviews more confidently.

Scope: The Curriculum designed is student –centered and it is guidance for their career

Course Structure

Unit 1. Functional Grammar: (4 periods) (3+3+2+2=10)

Common errors, Transformation of Sentences, Phrases, Idioms & Proverbs.
[50 sentences of common errors, 50 examples of Transformation of Sentences, (5 each type), 50 noun/prepositional phrases, 50 idioms/proverbs]

Unit II. English for Competitive Exams & Interview Techniques: (6 periods)
3+3+2+2=10 or (10X1=10)

IPA (vowel & consonant phonemes), Word building [English words /phrases derived from other languages), Technical Jargons, Synonyms/Antonyms, Analogies, Give one word for, Types & Techniques of Interview

Assignment : [25 Words for teaching IPA, 25 words/phrases of foreign origin, 25 technical jargons, 25 words for Synonyms/ Antonyms, 25 words for Analogies, 50 examples of give one word for]

Unit III (A) Formal Correspondence (8 periods) (10X1=10)

Business Letters, Technical Report Writing, Writing Resumes, e-mail etiquettes
[Orders, Complaints , Enquiries, Job applications & Resume Writing ,Writing Memoranda]

(B) Analytical comprehension: [Four fictional & four non-fictional unseen texts]

Unit IV. Technical & Scientific Writing: (4 periods) (10X1=10)

Writing Reviews, Features of Technical Writing, Writing Scientific Projects, Writing Research papers.

Assignment: (Any one project/review as assignment)

Total number of periods required = 22 for each Branch of Engineering

Reference Books:

1. Oxford Learners' Dictionary of Current English
2. Business Communication - KK Sinha, Galgotia Publishers
3. Developing Communication skills- Krishna Mohan & Meera Banerjee
4. Effective technical Communication –Barun K Mitra
5. Effective Business Communication – Herta A Murphy, Habert Hidebrandt, Jane P Thomas

Evaluation Pattern:**Internal Examination: Weightage = 10 mrks**

Written Examination: 05 marks

Project Seminar : 05 marks

External Examination: Weightage = 40 marks**Question Pattern for End Semester Examination.**

Q No.	Unit No	Que.type	No. of Questions	Weightage
1 or 2	I	objective	2 bunches of 4 questions each	(3+3+2+2)=10
3 or 4	II	Objective	2 bunch of 4 questions each	(3+3+2+2)=10 or (10X1=10)
5 or 6	III	subjective	1 out of 2	(10X1=10)
7 or 8	IV	Subjective	1 out of 2	(10X1=10)

BEIT606P

MINI PROJECT AND INDUSTRIAL VISIT
(Practical Credit: 02)

Teaching Scheme:
Practical: 2 Hours/week

Examination Scheme:
Practical: P (U): 25 Marks P (I): 25 Marks
Duration of University Exam. : 02 Hours

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Course Objective:

1. To develop an understanding of applications in real life
2. To develop research skills of students
3. To help the students in exploring career opportunities in their areas of interest.
4. To give an insight into the overall functioning of the organisations where students visited.
5. To develop Institute-Industry Interaction
6. To provide means to immerse students in actual supervised professional experiences

Constraints:

1. The students shall work in groups of 4-5 each and work on small application or research based/Industry oriented real time problems.
2. Local Mentor and Industry Mentor shall work in coordination if students are doing project in industry.
3. Industry visit should be planned to explore students about real time problems.
4. Students shall work on providing solutions to identified problems
5. Detailed reports are expected to be submitted at the end
6. Evaluation should be done based on feedback of Local and Industry Mentor

Expected Outcome:

1. Problem Identification and Definition
2. Defining data requirements and Identifying data sources
3. Literature Survey
4. Primary data collection
5. Software and Hardware requirements
6. Overall Project development as per the phases of SDLC
7. Outcome of the project
8. Utility of the project to the organisation
