CBCS scheme 2016

Bachelor of Engineering (Information Technology) Semester: IV

S.No.	Subject Code	Subject Name	Maximum marks allotted									Hours/ Week			Total Credits
			Theory						Practical						
			End Sem	Minor-I	Minor-II	Quiz	Assignments	Problem Solving	End Sem	Lab Work	Voce /Assign	L	T	P	
241	1	EAS	Numerical Computation and Queuing Theory	60	10	10	5	5	10	-	-	-	3	1	-	4
242	2	DC	Algorithm Analysis and Design	60	10	10	5	5	10	10	20	20	2	1	2	4
246	3	EAS	Structured System Analysis and Design	60	10	10	5	5	10	-	-	-	3	1	-	4
243	4	DC	Principal of Communication	60	10	10	5	5	10	10	20	20	3	0	2	4
245	5	DC	Computer Architecture	60	10	10	5	5	10	10	20	20	2	1	2	4
244	6	DC	E-Commerce, E-Business and E-Governance	60	10	10	5	5	10	-	-	-	3	1	-	4
247	7	EAS	Computer Programming Lab- JAVA	-	-	-	-	-	-	10	20	20	-	-	4	2
HU-248	8	HU	NSS / NCC	-	-	-	-	-	-	-	-	-	-	-	-	Qualifier
			Total	360	60	60	30	30	60	40	80	80	16	5	10	26

P.T.O.

Dr. Kaur

S. Dhurandher

BE FOURTH SEMESTER(COMPUTER SCIENCE AND INFORMATION TECHNOLOGY)

COURSE CONTENT

SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
~~MA-215~~ IT-241	Numerical Computation and Queuing Theory	3	1	0	60	4

Roots of algebraic and transcendental equations: Bisection method, Regula-Falsi method, Newton-Raphson method, iteration method, Graffes root squaring method.

Solution of system of linear equations: Gauss elimination method, Gauss Jordan method, LU decomposition method, relaxation method, Jacobi and Gauss-Seidel methods.

Interpolation: Finite difference operator and their relationships, difference tables, Newton, Gauss, Bessel and Stirling's interpolation formulae, Divided differences, Lagrange Interpolation and Newton's divided difference interpolation.

Numerical differentiation and Integration: First and second order derivatives by various interpolation formulae, Trapezoidal, Simpsons 1/3rd and 3/8th rules with errors and their combinations, Gauss Legendre 2-points and 3-points formulae.

Numerical Solution of ordinary differential equations: Solution of ODE by Taylor series, Picard's method, Modified Euller method, Runge-kutta Method, predictor corrector method.

Numerical solution of Partial Differential Equations :Classification, Finite –difference approximation to derivatives, solution of Laplace's equation by Jecobi's and Gauss Seidel method, parabolic equation, Iterative method for the solution of equations, Hyperbolic equation and its numerical solution.

Markov Analysis: Stochastic process, Markove process, transition probability, Transition probability matrix, Markov chain, Some theorems and problems.

Queuing Theory: Queuing systems, Transient and steady state, traffic intensity, Distribution of queuing systems, classifications of queuing models (M/M/1: infinity/FCFS, M/M/1: N / FCFS, M/M/1: infinity/SIRO, M/M/S: infinity/ FCFS, M/M/C: infinity/FCFS, M/M/R: (k/GD); K<R, Power supply model)

References books

1. Numerical Methods in Engineering and science by B.S. Grewal, Khanna Publishers.
2. Numerical Methods by E. Balagurusamy, Tata Mc Graw- Hill Publishing CompanyLtd., New Delhi.
3. Numerical Methods for Scientific and Engineering Computation by Jain, M. K. , Iyengar, S. R. K. and Jain, R. K., New Age Pvt. Pub.New Delhi.
4. Operation Research, Taha H.A; PHI.
5. Introduction to OR, Hiller and Lieberman; TMH.

14/06/2016

14/6/16

14/06/16

BE FOURTH SEMESTER(INFORMATION TECHNOLOGY)						
COURSE CONTENT						
SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
IT-242	E-Commerce, E-Business and E-Governance	3	1	0	60	4

Unit I: Introduction to e-commerce: History of e-commerce, e-business models B2B, B2C, C2C, C2B, legal; environment of e-commerce, ethical issues, electronic data interchange, value chain and supply chain, advantages and disadvantages of e-commerce.

Unit II: Electronic Payment Systems: Credit cards, debit cards, smart cards, e-credit accounts, e-money, Marketing on the web, marketing strategies, advertising on the web, customer service and support, introduction to m-commerce, case study: e-commerce in passenger air transport.

Unit III: E-Government, theoretical background of e-governance, issues in e-governance applications, evolution of e-governance, its scope and content, benefits and reasons for the introduction of e-governance, e-governance models-broadcasting, critical flow, comparative analysis, mobilization and lobbying, interactive services / G2C2G.

Unit IV: E-readiness, e-government readiness, E- Framework, step & issues, application of data warehousing and data mining in e-government, Case studies: NICNET-role of nation wide networking in egovernance, e-seva.

Unit V: E-Government systems security: Challenges and approach to e-government security, security concern in e-commerce, security for server computers, communication channel security, security for client computers.

References:-

1. Gary P. Schneider, "E-commerce", Cengage Learning India.
2. C.S.R. Prabhu, "E-governence: concept and case study", PHI Learning Private Limited.
3. V. Rajaraman, "Essentials of E-Commerce Technology", PHI Learning Private Limited.
4. David Whiteley, "E-commerce study , technology and applications", TMH.
5. J. Satyanarayan, "E-government: The science of the possible", PHI Learning Private Limited.
6. P.T. Joseph, "E-Commerce An Indian Perspective", PHI Learning Private Limited.
7. Hanson and Kalyanam, "E-Commerce and Web Marketing", Cengage Learning India.

COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E CS/IT	PRINCIPLES OF COMMUNICATION	IT-243	Min "D"	Min "D"	5.0

PRINCIPLES OF COMMUNICATION

Unit I

Data and signal-Analog and digital signals, Time and frequency domain, Composite signals, Bandwidth, bit rate, bit length, Baseband and broadband transmission, Attenuation, distortion, noise, Nyquist bit rate ,Shannon capacity ,Throughout, delay ,Jitter, Bandwidth delay product.

Unit II

Sampling theorem, quantization, PCM, Delta modulation, Adaptive delta modulation, DPCM, bandwidth of PCM and delta modulation.ASK, BPSK, QPSK, DPSK, BFSK.

Unit III

Data transmission – Parallel and serial transmission, synchronous, and Asynchronous transmission, Simplex, half duplex and full duplex , unipolar and polar line codes, Non return to zero codes, return to zero codes, bipolar line codes, bauds , modem, Line configurations Point to point and point to multipoint configuration. Multiplexer: TDM, FDM, WDM. Data compression devices, Inverse multiplexer.

Unit IV

Digital interface standards: RS-232 standard, hand shaking, connecting a DTE in RS-232 C, RS –449, RS-422A and RS-423A standards. High-speed desktop serial interfaces. Remote digital transmission carrier ISDN, Packet data network, Modems, multispeed modems, high speed modems, Error Correcting modems, data compression in modems. Short-wave modems.

Unit V

Data Integrity, sources of error control approaches. Implementation of error control Echo checking parity checking and cyclical purity, Hammering code, checksums, Cyclical Redundancy check. Security and security measures.

Transmission media-Guided and unguided media, twisted pair, Unshielded twisted pair and Shielded twisted pair, coaxial cable.

Text Book:

1. Data & Computer Communication, William Stallings – Pearson Education.

References:

1. Data & Network Communication, Michael A. Miller – DELMAR (Thomson learning) / Vikas Publication.
2. Understanding Data Communication & Networks, William A Shay – Thomson Learning / Vikas Publication.

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COURSE CONTENT & GRADE (w.e.f. July ~~2010~~)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E CS/IT	ANALYSIS & DESIGN OF ALGORITHMS	IT-244	Min "D"	Min "D"	5.0

ANALYSIS & DESIGN OF ALGORITHMS

Unit I

Algorithm properties. Analysis of Algorithms: Priori analysis and Posteriori analysis. Worst, Best and Average case analysis. RAM model for analysis. Space and Time Complexities of algorithms. Step count and Recurrence Relation. Asymptotic notations Big O , Big Ω, θ, little o, little ω.

Unit II

Introduction to divide and conquer technique, analysis, design and comparison of various algorithms based on this technique, example binary search, merge sort, quick sort, and Stassen's matrix multiplication.

Unit III

Study of Greedy strategy, examples of greedy method like optimal merge patterns, Huffman coding, minimum spanning trees, knapsack problem, job sequencing with deadlines, single source shortest path algorithm, etc.

Unit IV

Concept of dynamic programming, problems based on this approach such as 0/1 knapsack, multistage graph, reliability design, Floyd-Warshall algorithm, etc. Backtracking concept and its examples like 8 queen's problem, Hamiltonian cycle, Graph coloring problem etc.

Unit V

Introduction to branch & bound method, examples of branch and bound method like traveling salesman problem etc. Lower bound theory and its use in solving algebraic problem. Deterministic and Non Deterministic Algorithm. NP-completeness: P, NP, NP-Hard and NP-Complete problems.

Text Books:

1. Horowitz & Sahani; Analysis & Design of Algorithm
2. Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education Asia, 2003.

References:

1. Coremen Thomas, Leiserson CE, Rivest RL; Introduction to Algorithms; PHI.
2. Dasgupta; algorithms; TMH
3. Ullmann; Analysis & Design of Algorithm;
4. Michael T Goodrich, Robarto Tamassia, Algorithm Design, Wiely India

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COURSE CONTENT & GRADE (w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E CS/IT	COMPUTER ARCHITECTURE	IT-245	Min "D"	Min "D"	5.0

COMPUTER ARCHITECTURE

Unit I Computer Basics and CPU: Von Newman model, various subsystems, CPU, Memory, I/O, System Bus, CPU and Memory registers, Program Counter, Accumulator, Instruction register, Micro operations, Register Transfer Language, Instruction Fetch, decode and execution, data movement and manipulation, Instruction formats and addressing modes of basic computer.

Unit-II Control Unit Organization: Hardwired control unit , Micro programmed control unit Control Memory, Address Sequencing, Micro Instruction formats, Micro program sequencer, Microprogramming, Arithmetic and Logic Unit: Arithmetic Processor, Addition, subtraction, multiplication and division, Floating point and decimal arithmetic and arithmetic units, design of arithmetic unit.

Unit-III System Organization: Modes of data transfer – program controlled, interrupt driven and direct memory access, Interrupt structures, I/O Interface, Asynchronous data transfer, I/O processor , Multiprocessors: Pipeline and Vector processing, Instruction and arithmetic pipelines, Vector and array processors, Interconnection structure and inter-processor communication.

Unit-IV Memory organization: Memory Maps, Memory Hierarchy, Cache Memory - Organization and mappings. Associative memory, Virtual memory, Memory Management Hardware.

Unit V Introduction to Microprocessor: 8085 architecture and organization, instruction set , counters and timing delays, stacks and subroutines , 8085 I/O structure, Interrupts , basic Interfacing concept , memory mapped and I/O mapped I/O, basic programming.

Text Books:

1. Morris Mano: Computer System Architecture, PHI.
2. Gaonkar: Micro processor Architecture, Programming, Applications with 8085; Penram Int.

References:

1. Tanenbaum: Structured Computer Organization, Pearson Education
2. J P Hayes, Computer Architecture and Organizations, Mc- Graw Hills. New Delhi
3. William Stallings: Computer Organization and Architecture, PHI
4. ISRD group; Computer Organization; TMH
5. Cart er; Comp ut er Architecture (Schaum); TMH
6. Carl Hamacher: Computer Organization, TMH

L. Kaur S. Dhuriya P. Jain

BE FOURTH SEMESTER(INFORMATION TECHNOLOGY)						
COURSE CONTENT						
SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
IT-246	STRUCTURED SYSTEM ANALYSIS AND DESIGN	3	1	0	60	4

1. Introduction

System Definition and concepts: General Theory systems, Manual and automated systems, Real-life Business Sub-Systems. System Environments and Boundaries, Real-time and distributed systems, Basic principles of successful systems, Approach to system development: Structured System Analysis and Design, Prototype, Joint Application Development, Role and Need of Systems Analyst. Qualifications and responsibilities, System Analysis as a Profession.

2. System Development Cycle

Introduction to Systems, Development Life Cycle (SDLC). Various phases of SDLC: Study Analysis, Design, Development, Implementation, Maintenance; Documentation: Principles of Systems Documentation, Types of documentation and their importance, Enforcing documentation discipline in an organization

3. System Planning

Data and fact gathering techniques: Interviews, Group Communication -Questionnaires; Assessing Project Feasibility: Technical, Operational, Economic, Cost Benefits Analysis, Schedule, Legal and contractual, Political. Modern Methods for determining system requirements: Joint Application, Development Program, Prototyping, Business Process Re-engineering. System Selection Plan and Proposal

4. Modular and Structured Design

Module specifications, Top-down and bottom-up design. Module coupling and cohesion. Structure Charts.

5. System Design and Modeling

Process Modeling, Logical and physical design, Conceptual Data Modeling: Entity /Relationship Analysis, Entity-Relationship Modeling, ERDs and DFDs, Concepts of Normalization. Process Description: Structured English, Decision Tree, Table; Documentation: Data Dictionary, Recording Data Descriptions.

6. Input/Output and Interface Design

Classification of forms, Input/output forms design. User-interface design, Graphical interfaces. Standards and guidelines for GUI design, Designing Physical Files and Databases: Designing Fields, Designing Physical Records, Designing Physical Files, Designing Databases, Introduction to CASE Tools; Features, Advantages and Limitations of CASE Tools, Awareness about some commercial CASE Tools.

7. System Implementation and Maintenance

Planning considerations, Conversion methods, procedures and controls, System acceptance criteria, System Evaluation and Performance, Testing and Validation. Preparing, User Manual, Maintenance Activities and Issues.

RECOMMENDED BOOKS

1. Hoffer J. A, George J.F, Valacich J.S, and Panigrahi P.K "Modern Systems Analysis and Design", Pearson Education, 2007.
2. A. Dennis and B. H. Wixom, "Systems Analysis and Design", John Wiley & Sons, Inc.

SUPPLEMENTARY READING

1. Whitten J. L, Bentley L. D, "Systems Analysis and Design Methods", Tata McGraw-Hill, 2008.
2. Kendall & Kendall, "Systems Analysis and Design", Seventh Edition, Pearson Education.

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