

**EQUIVALENCE OF SUBJECTS OF DIFFERENT SCHEMES OF UNDER GRADUATE COURSES (B.E. / B.Tech.)
OF INFORMATION TECHNOLOGY**

BECP7D13

S.No.	Schemes	Subject Code & Subject Name (Semester) Having Equivalence in Syllabus	Final Subject code & subject (after equivalence)
(i)	(ii)	(iii)	(iv)
1	Grading	-	IT 304 Object Oriented Concept on C++ B.Tech. III Sem.
	CBCS	IT231 Object Oriented Concept with C++ B.E. III Sem.	
	CBGS	-	
	AICTE	IT 304 Object Oriented Concept on C++ B.Tech. III Sem.	
2	Grading	IT-04 Computer Architecture B.E. IV Sem.	IT403 Computer Architecture B.Tech. IV Sem.
	CBCS	IT245 Computer Architecture B.E. IV Sem.	
	CBGS	IT4004 Computer Architecture B.E. IV Sem.	
	AICTE	IT403 Computer Architecture B.Tech. IV Sem.	
3	Grading	IT-06 Principles of Communication B.E. IV Sem.	IT404 Principles of Communication B.Tech. IV Sem.
	CBCS	IT243 Principles of Communication B.E. IV Sem.	
	CBGS	IT4003 Principles of Communication B.E. IV Sem.	
	AICTE	IT404 Principles of Communication B.Tech. IV Sem.	
4	Grading	-	IT402 Analysis and Design of Algorithm B.Tech. IV Sem.
	CBCS	IT244 Algorithm Analysis and Design B.E. IV Sem.	
	CBGS	IT4002 Algorithm Design and Analysis B.E. IV Sem.	
	AICTE	IT402 Analysis and Design of Algorithm B.Tech. IV Sem.	

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5	Grading	-	IT405 Structured System Analysis and Design B.Tech. IV Sem.
	CBCS	IT 246 Structured System Analysis and Design B.E. IV Sem.	
	CBGS	IT4005 Structured System Analysis and Design B.E. IV Sem.	
	AICTE	IT405 Structured System Analysis and Design B.Tech. IV Sem.	
6	Grading	IT-11 IT Enabled Services Ethics and Management B.E. V Sem.	IT5001 IT Enabled Services Ethics and Management B.E. V Sem.
	CBCS	-	
	CBGS	IT5001 IT Enabled Services Ethics and Management B.E. V Sem.	
	AICTE	-	
7	Grading	IT-13 Automata and Compiler Design B.E. VI Sem	IT502 ^A Automata and Compiler Design B.Tech. V Sem
	CBCS	-	
	CBGS	IT5004 Automata and Compiler Design B.E. V Sem	
	AICTE	IT502 Automata and Compiler Design B.Tech. V Sem	
8	Grading	IT-10 Information Theory and Coding B.E. VI Sem.	IT601 ^A Information Theory and Coding B.Tech. VI Sem.
	CBCS	-	
	CBGS	IT6001 Information Theory and Coding B.E. VI Sem.	
	AICTE	IT601 Information Theory and Coding B.Tech. VI Sem.	
9	Grading	IT-15 Microprocessor and Interfacing B.E. VI Sem.	IT602 ^A Microprocessor and Interfacing B.Tech. VI Sem.
	CBCS	-	
	CBGS	IT6002 Microprocessor and Interfacing B.E. VI Sem.	
	AICTE	IT602 Microprocessor and Interfacing B.Tech. VI Sem.	


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10	Grading		IT603 Object Oriented Analysis and Design B.Tech. VI Sem.
	CBCS	-	
	CBGS	IT6005A Object Oriented Analysis and Design B.E. VI Sem.	
	AICTE	IT603 Object Oriented Analysis and Design B.Tech. VI Sem.	
11	Grading		IT604 Software Engineering B.Tech. VI Sem.
	CBCS	-	
	CBGS	IT6003 Software Engineering B.E. VI Sem.	
	AICTE	IT604 Software Engineering B.Tech. VI Sem.	
12	Grading	IT-17 Internet and Webtechnology B.E. VI Sem.	IT 605 Internet and Webtechnology B.Tech. VI Sem.
	CBCS	-	
	CBGS	IT6004 Internet and Webtechnology B.E. VI Sem.	
	AICTE	IT 605 Internet and Webtechnology B.Tech. VI Sem.	
13	Grading		IT505 Data Base Management System B.Tech. V Sem.
	CBCS	IT235 Data Base Management System B.E. III Sem.	
	CBGS	IT5005A Data Base Management System B.E. V Sem.	
	AICTE	IT505 Data Base Management System B.Tech. V Sem.	
14	Grading	IT-19 Management Information system B.E. VI Sem.	IT5005D Management Information System B.E. V Sem.
	CBCS	-	
	CBGS	IT5005D Management Information System B.E. V Sem.	
	AICTE	-	


15	Grading	IT-22 Machine Learning B.E. VII Sem.	IT7003 Machine Learning B.E. VII Sem.
	CBCS	-	
	CBGS	IT7003 Machine Learning B.E. VII Sem.	
	AICTE	-	
16	Grading	IT-26 Wireless and Mobile Computing B.E. VII Sem.	IT7005B Wireless and Mobile Communication B.E. VII Sem.
	CBCS	-	
	CBGS	IT7005B Wireless and Mobile Communication B.E. VII Sem.	
	AICTE	-	
17	Grading	IT-27 Simulation and Modeling B.E. VII Sem.	IT7004A Simulation and Modeling B.E. VII Sem.
	CBCS	-	
	CBGS	IT7004A Simulation and Modeling B.E. VII Sem.	
	AICTE	-	
18	Grading	IT-029A Distributed System B.E. VII Sem.	IT7002 Distributed System B.E. VII Sem.
	CBCS	-	
	CBGS	IT7002 Distributed System B.E. VII Sem.	
	AICTE	-	
19	Grading	IT-32 Information Security B.E. VIII Sem.	IT8001 Information and Cyber Security B.E. VIII Sem.
	CBCS	-	
	CBGS	IT8001 Information and Cyber Security B.E. VIII Sem.	
	AICTE	-	


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20	Grading	IT-34 Data Mining and Warehousing B.E. VIII Sem.	IT8002 Data Mining B.E. VIII Sem.
	CBCS	-	
	CBGS	IT8002 Data Mining B.E. VIII Sem.	
	AICTE	-	
21	Grading	IT-36 Network management B.E. VIII Sem.	IT8003A Network Management B.E. VIII Sem.
	CBCS	-	
	CBGS	IT8003A Network management B.E. VIII Sem.	
	AICTE	-	
22	Grading	IT-08 Computer Networks B.E. V Sem. (CSE/IT)	IT503 Computer Network B.Tech. V Sem.
	CBCS	-	
	CBGS	IT5002 Computer Network B.E. V Sem.	
	AICTE	IT503 Computer Network B.Tech. V Sem.	
23	Grading	IT-20 E-Commerce and Governance B.E. VI Sem.	IT242 E-Commerce, E-Business and E-Governance B.E. IV Sem.
	CBCS	IT242 E-Commerce, E-Business and E-Governance B.E. IV Sem.	
	CBGS	-	
	AICTE	-	
24	Grading	CS-051B/IT-045C Software Project Management B.E. VIII Sem.	IT8004A Software Project Management B.E. VIII Sem.
	CBCS	-	
	CBGS	IT8004A Software Project Management B.E. VIII Sem.	
	AICTE	-	


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Jabalpur Engineering College, Jabalpur
(AICTE Model Curriculum based scheme)
B.Tech. (AICTE) III Sem. (Information Technology)

(w.e.f. July 2018)

Subject Code	Subject Name & Title	Maximum Marks Allotted					Hours/Week			Total Credits	
		Theory			Practical		Total Marks	L	T		P
		End Sem	Mid Sem MST	Quiz, Assignment	End Sem	Lab Work					
IT304	Object Oriented Concept on C++	70	20	10	30	20	150	3	-	2	4

Module 1 Concept of Object Oriented methodology: Role of programming methodology in software development, Comparison the concepts of structured-oriented programming (SOP) and object-oriented programming (OOP). Need for object oriented programming. Fundamental concepts of object-oriented programming (OOP): abstraction, encapsulation, modularity, data hierarchy through inheritance, Information Hiding, polymorphism and typing, parallelism and stability.

Module 2 Elements of object oriented: Object, Class, message passing. Relationships among objects:- links, aggregation. Relationships among classes:- association, aggregation, using, instantiation, meta-class.

Module 3 Beginning with C++: What is C++, Difference between C and C++. C++ program life cycle.

Functions in C++: Different forms of functions, function prototyping, call by value; call by Reference, Inline and friend Functions. Command Line Arguments

Module 4 Encapsulation and Abstraction in C++: Classes and Objects in C++, defining classes, defining member functions, declaration of objects to class, access to member variables from objects etc, Initialization and assignment for objects. Different forms of member functions, dependence on access specifiers (i.e. Private, public, protected), static data members. Constructor and Destructor in C++: constructors, parameterized constructors Multiple constructors in class dynamic initialization of objects destructors. Implementation of relationship. **Inheritance in C++:** Introduction, types of inheritance, single inheritance, multiple inheritance, multilevel inheritance, hierarchical inheritance, hybrid inheritance etc, virtual base class, abstract class, constructors in derived class.

Module 5 Polymorphism in C++: type of polymorphism, function overloading, **operator overloading:-** introduction, defining operator overloading, overloading -(unary, binary operators), overloading binary operators using friends, Rules for overloading operators. **Function overriding:-** introduction to pointers, pointers to objects, this pointer, pointers to derived class, virtual functions, abstract class, pure virtual functions. Introduction to C++ templates.

REFERENCES:

1. Herbert Schildt, "C++ the complete reference", III edition, TMH 1999
2. Balagurusamy, Entrepreneurial, "object oriented programming with C++", TMH
3. Barkakatin, "object oriented programming in C++", PHI 1995







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Jabalpur Engineering College Jabalpur, Jabalpur

Department of Information Technology

Semester: III SEM

Object Oriented Concept of C++ (IT304)

Course Objectives

1. To understand the principles used in OOP and its elements.
2. To introduce the C++ programming.
3. To discuss the encapsulation, inheritance and abstraction in C++.
4. To familiarize with the polymorphism and overloading.

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B.Tech. (AICTE) IV Sem. (Information Technology)

(w.e.f. July 2018)

Subject Code	Subject Name & Title	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem Exam	Quiz, Assignment	End Sem	Lab Work					
IT403	Computer Architecture	70	20	10	30	20	150	3	-	2	4

Module 1 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.

Module 2 Control Unit Organization: Hardwired control unit, Micro programmed control unit Control Memory, Address Sequencing, Micro Instruction formats, Micro program sequencer, Microprogramming, Arithmetic and Logic Units: Arithmetic Processor, Addition, subtraction, multiplication and division, Floating point and decimal arithmetic and arithmetic units, design of arithmetic unit.

Module 3 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.

Module 4 Memory organization: Memory Maps, Memory Hierarchy, Cache Memory - Organization and mappings, Associative memory, Virtual memory, Memory Management Hardware.

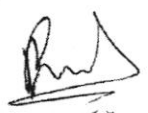

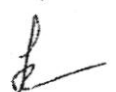
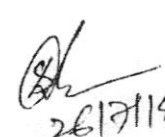
Module 5 Introduction to Microprocessor: 8085 architecture and organization, instruction set, counters and timing delays, stacks and subroutines, 8085 I/O structure, Interrupts, basic Interfacing concept, memory mapped and I/O mapped I/O basic programming.


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. Carter; Computer Architecture (Schaum); TMH
6. Carl Hamacher: Computer Organization, TMH



BE FOURTH SEMESTER(INFORMATION TECHNOLOGY)

COURSE CONTENT

SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
IT 403	COMPUTER ARCHITECTURE LAB	3		2	150	4

COMPUTER ARCHITECTURE LAB

Experiment List

1. REVERSING AN ARRAY : A block of 16 bytes are residing at locations standing from BLOCK1 WAP to transfer the block in reverse order at locations starting from BLOCK 2.
2. SORTING IN ASCENDING ORDER : A block (16 bytes are residing at locations starting from DATA : write a program to arrange the word in the same location in ascending order.
3. BINARY ADDITION : 16 bytes are residing at location starting from DATA WAP : to add all bytes and store the result location SUM and SUM+1
4. BCD ADDITION : 16 BCD NUMBER are residing at location starting from DATA WAP : to add all bytes and store the result location SUM and SUM+1
5. MULTIPLICATION : Two bytes are residing at location DATA 1 and DATA 2. Write a program to multiply the two bytes and store the result at location PROD 1 and PROD 2.
6. BINARY TO BCD : A binary number is residing at location BIN > WAP to convert the binary number into its equivalent BCD and store the result at BCD and BCD + 1
7. BCD TO BINARY : A BCD number is residing at location BCD; write a program to convert the BCD number into its equivalent binary and store the result at BIN
8. MULTIBYTE ADDITION : Two 10 bytes are residing at location starting from DATA 1 and DATA 2 respectively. Write a program to add them up and store the result at location starting from RESULT (result space 11 bytes)
9. MULTIBYTE BCD ADDITION : Two 6 digit BCD numbers are residing at location starting from DATA 1 and DATA 2 respectively. Write a program to add them up and store the result at locations starting from RESULT (Result space 7 bytes.)
10. RST 6.5: A block of 16 bytes is residing at location starting from DATA reverse the block and store the bytes at REVERSE whenever the RST 6.5 key is pressed.
11. EDITING OF ASCII STRING : A string of ASCII characters is residing at locations starting from READ which contain "IS BE \$ AN \$ ENGINEER". Edit string in such a way that it should contain "I \$ will \$ be \$ Engineer " keep the edited string in the same locations. Product the string from further editing. (\$ stands for a blank)
12. SIGNED BINARY ADDITION : A block of 16 signed binary numbers is residing at location NUMBERS. Add them up and store the result (in signed binary) at locations from RESULT.
13. ASCII CODE CONVERSION : A string of 16 ASCII characters are residing at locations starting from DATA. The string consists of codes for capital letters, small letters and BCD digits (0-9) Convert the ASCII characters in such a way that the codes for capital letters be converted into corresponding codes for small letters, codes for small letters into that of capital letters and codes for BCD digits into that of BCD number and store them at the same locations.
14. PARITY CHECK : A block of 32 bytes is residing at DATA count the number (BCD) of times even and odd PARITY bytes are appearing consecutive memory locations. Keep the count at MATCH.
15. SERIES GENERATION : Two BCD number a and b are residing at locations DATA 1 and DATA 2 respectively. Write a program to form a series in BCD with the elements of a. $a + 2b$, $a + 4b$, $a + 6b$, Stop the generation of the series whenever any element of the series in BCD with the elements of the series exceeds (99). Store the result at locations starting from RESULT. Count the number (BCD) of elements in the series and store it a NUMBER.

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Jabalpur Engineering College Jabalpur, Jabalpur

Department of Information Technology

Semester: IV SEM

Computer Architecture (IT-403)

Course Objectives

1. To give overview of computer basics, organization and subsystems.
2. To familiarize with different control generation techniques and design of A.L.U.
3. To compare various memory management techniques and mapping.
4. To introduce with the microprocessor 8085 architecture and its instruction set .

C O\ P O	1	2	3	4	5	6
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3	*	*	*			*
4	*	*				*



Jabalpur Engineering College, Jabalpur
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B.Tech. (AICTE) IV Sem. (Information Technology)

(w.e.f. July 2018)

Subject Code	Subject Name & Title	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem Exam	Quiz, Assignment	End Sem	Lab Work					
IT404	Principles of Communication	70	20	10	30	20	150	3	-	2	4

Module 1 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.

Module 2 Sampling theorem, quantization, PCM, Delta modulation, Adaptive delta modulation, DPCM, bandwidth of PCM and delta modulation. ASK, BPSK, QPSK, DPSK, BFSK.

Module 3 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, bipolar line codes, bauds, modem, Line configurations Point to point and point to multipoint configuration. Multiplexer: TDM, FDM, WDM. Data compression devices, Inverse multiplexer.

Module 4 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.

Module 5 Data Integrity, sources of error control approaches. Implementation of error control Echo checking parity checking and cyclical purity, Hamming 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.

BE FOURTH SEMESTER (INFORMATION TECHNOLOGY)

COURSE CONTENT

SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
IT 404	PRINCIPLES OF COMMUNICATION	3		2	150	4


PRINCIPLES OF COMMUNICATION LAB

Experiment List

1. To study basic introduction to Data Communication and importance of data communication.
2. To Perform Sampling & Reconstruction of original signal & to calculate the Sampling Frequency.
3. To Perform Amplitude shift keying (ASK) thereby determining relative change in Amplitude.
4. To perform frequency shift keying (FSK) thereby determining relative change in Frequency.
5. To perform phase shift keying (PSK) thereby determining relative change in phase.
6. To perform Quadrature phase shift keying (QPSK) thereby determining relative change in Phase.
7. To perform Quadrature Amplitude Modulation (QAM)
8. To perform Adaptive Delta Modulation, Demodulation.
9. To perform Delta Modulation and Compare it with Adaptive Delta Modulation (ADM)
10. To study & perform Transmission & Reception of signal using TDM Technique.
11. To study Quadrature phase shift keying Modulation.
12. Study of PCM Generation & Detention.
13. To study serial interface RS-232 and its applications.
14. To configure the modem of a computer.
15. To study different types of Medium in data communication.
16. To create a network cable for communicating two PC's
17. To study PC to PC communication
18. Write a program in 'C' for PC to PC communication using RS-232 port.
19. To study different types of transmission media.






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Principles of Communication (IT 404)

I. Course Educational Objectives

The objective of this course is to:

1. Provide the knowledge of data communication, various communication standards and signals used for these tasks.
2. Equip the students with capability to write the programs for implementation of communication protocols.
3. Providing the hand on experience of CRO, Modulation systems kits and other instruments used for data communication.

II. COURSE OUTCOMES

At the end of the course students will be able to:-

CO1: Familiarize with the concepts of communication system, transmission systems and parameters data communication systems.

CO2: Gain practical knowledge of baseband modulation and digital modulation techniques.

CO3: Understand and analyze the data transmission systems, signaling and multiplexing of various channels.

CO4: Understand and implement the serial communication protocol Rs-232 and get familiar with the working of modem and node to node communication.

CO5: Analyze and check the data integrity using the concepts of channel coding and will gain the knowledge about the transmission mediums used for communication.

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Module 1 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 .

Module 2 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 Strassen's matrix multiplication.

Module 3 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.

Module 4 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.

Module 5 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.

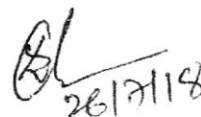
References:

1. Cormen Thomas, Leiserson CE, Rivest RL; Introduction to Algorithms; PHI.
2. Dasgupta; algorithms; TMH
3. Ullmann; Analysis & Design of Algorithm;
4. Michael T Goodrich, Roberto Tamassia, Algorithm Design, Wiley India
5. VOL-I Fundamentals Of Algorithms by D.E. Kunth.







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BE FOURTH SEMESTER(INFORMATION TECHNOLOGY)

COURSE CONTENT

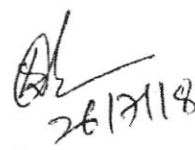
SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
IT402	ANALYSIS & DESIGN OF ALGORITHM LAB	3		2	150	4

ANALYSIS & DESIGN OF ALGORITHM LAB

Experiment List

1. Perform recursive binary and linear search
2. Sort a given set of elements using Heap sort technique.
3. Sort a given set of elements using Merge sort technique
4. Find solution of Knapsack problem using Greedy approach
5. Implement 0/1 knapsack problem using dynamic programming.
6. From a given vertex in a weighted connected graph, find shortest paths to other vertices using Dijkstra's algorithm.
7. Sort a given set of elements using Quick sort technique.
8. Find minimum cost spanning tree of a given undirected graph using Kruskal's algorithm.
9. Print all the nodes reachable from a given starting node in a digraph using Breadth first search technique.
1. Implement all pair shortest paths problem using Floyd's algorithm.
2. Find minimum cost spanning tree for a given undirected graph using Prim's algorithm.
3. Print all the nodes reachable from a given starting node in a given digraph using Depth first search technique.
4. Compute the transitive closure of a given directed graph using Warshall's algorithm.
5. Implement n-Queens problem using backtracking technique.




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Jabalpur Engineering College Jabalpur, Jabalpur

Department of Information Technology


Semester: IV SEM

Analysis and Design of Algorithms (IT-402)

Course Objectives

- CO1. To understand the space and time complexities and asymptotic notations for algorithms.
- CO2. To familiarize with divide and conquer techniques based algorithms.
- CO3. To understand the dynamic programming approach and based algorithms.
- CO4. To introduce with the branch and bound methods, deterministic and non deterministic algorithms

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3			*			
4	*					



Jabalpur Engineering College, Jabalpur
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B.Tech. (AICTE) IV Sem. (Information Technology)

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Subject Code	Subject Name & Title	Maximum Marks Allotted						Hours/ Week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem Exam	Quiz, Assignment	End Sem	Lab Work					
IT405	Structured System Analysis & Design	70	20	10	-	-	100	3	1	-	4

Module 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.

Module 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

Module 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 **Modular and Structured Design** Module specifications, Top-down and bottom-up design. Module coupling and cohesion. Structure Charts.

Module 4 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.

Module 5 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. **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.

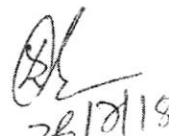
RECOMMENDED BOOKS

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.




BE FOURTH SEMESTER (INFORMATION TECHNOLOGY)

COURSE CONTENT

S. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
IT 405	STRUCTURED SYSTEM ANALYSIS AND DESIGN	3		2	100	4

STRUCTURED SYSTEM ANALYSIS AND DESIGN LAB

Experiment list

1. Planning and Requirements Analysis
2. Program Design, Pseudocode Data Storage Design – Physical Data Models
3. Business System Interaction Modeling with Use Case Analysis (UCA)
4. User Interface Design, navigation Input Screens, Paper forms, Reports, I/O technologies.
5. Business Process Modeling with Data Flow Diagramming (DFD)
6. Business Process Modeling & Data Modeling
7. Implementation & Security Project work
8. Team Course Project Presentations.

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Jabalpur Engineering College Jabalpur, Jabalpur

Department of Information Technology



Semester: IV SEM

Structured System Analysis and Design (IT-405)

Course Objectives

- C01. To discuss various types of systems and their environment and boundaries.
- C02. To familiarize with System Development Life Cycle .
- C03. To understand the system planning and fact gathering techniques.
- C04. To understand the system design and modeling.
- C05. To give the overview of the system implementation and maintenance.

C O P O	1	2	3	4	5	6
1	*					
2	*					*
3			*			
4			*	*		
5	*			*		



B.E.CBGS V SEMESTER IT ENABLED SERVICES, ETHICS AND MANAGEMENT

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	IT Enabled Services, Ethics and Management	IT5001	Min. "D"	Min. "D"	5.0

Unit I: Business Strategy: Challenges and Opportunities for IT:

Business Strategy: Challenges and Opportunities in the Globalized, Interconnected, Convergent World, Establish Principles before Practice, IT Strategy, Application Strategy, Technology Strategy for IT, IT Management Strategy, Developing IT Strategy for Competitive Advantage, Stages of IT Strategy Development and Implementation, Challenges of IT and Business Strategy Alignment, Inhibitors of Business and IT Strategy Alignment, Three-D Framework for Business and IT Strategy Alignment

Unit II : Strategic IT Planning:

Business Implications for IT Strategic and Planning, Strategic IT Planning Motivations, SITP Process: Prevalent Planning Approaches, Difficulties in Developing and Executing SITP, Best Practices for Achieving Good SITP, SITP Approaches: Prevalent Researches, Defining EITA, Contents of a Typical Enterprise IT Architecture, Standard for Enterprise IT Architecture, Technology Management strategy Framework, Prevalent Technology Reference Architectures Framework and Standards, Program Management, Benefits of PMO, Desired Qualities of a Program Office Manager, Maturity of PMO, Implementation of PMO Strategy, Measuring PMO Performance, Success Factors for PMO, Project Scope Management, PMO Dashboard and Reporting

Unit III : IT Service Management Strategy:

Information Technology Infrastructure Library (ITIL), ITIL Overview, ITIL Service Support Processes, Incident Management, Problem Management, Service Delivery, Service Level Management, Financial Management, Capacity Management, IT Service Continuity Management (ITSCM), Availability Management, Imperatives for Outsourcing, IT Management Layers, Variants of Outsourcing, Business Process Outsourcing, In sourcing

Unit IV : Copyright and IPR:

Understanding the concepts of Copyright, Intellectual Property Law, Patents, Indian Standards Institution and its role Indian copyright law of 1957 and its most important amendment from a software review point, Understanding Intellectual property, Caution with Internet, Email Etiquette, Spamming, Broadcasting.

Unit V : IT ethics:

Theoretical basis of Computer Ethics, defining Computer Ethics, computer professional's behavior, and social conduct, ease of misuse, do and don'ts with proprietary data, Understanding computer crime, Social Networking, Understanding Software Compliance, Software Piracy, Understanding Professional responsibilities

Books References:-

1. IT strategy and Management by Sanjiva Shankar Dubey, PHD
2. Marketing of Information Technology, by K.Venkatesh, TMH

B.Tech. FIFTH SEMESTER (INFORMATION TECHNOLOGY)**COURSE CONTENT (AICTE July 2019)**
IT 502 Copen Elective-I

SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
IT 502A	Automata and Compiler Design	3	1	—		4

Module I: Introduction: Alphabets, Strings and Languages; Automata and Grammars, Deterministic finite Automata (DFA)-Formal Definition, Simplified notation: State transition graph, Transition table, Language of DFA, Nondeterministic finite Automata (NFA), Equivalence of NFA and DFA, Minimization of Finite Automata, Regular expression, Regular Grammar, Regular languages, closure properties of Regular languages.

Module II: Context free grammars, Properties of context free languages. Pushdown Automata: Non deterministic push down automata: Definition of a push down automata, the language accepted by a push down automata, Push down automata for context free languages, CFG's for PDA, Deterministic Push down automata and Deterministic Context free languages.

Module III: Compiler Structure: Compilers and Translators, Various Phases of Compiler. Lexical Analysis: The role of Lexical Analyzer, A simple approach to the design of Lexical Analyzer, Implementation of Lexical Analyzer. The Syntactic Specification of Programming Languages: CFG, Derivation and Parse tree, Ambiguity, Capabilities of CFG. Basic Parsing Techniques: Top-Down parsers with backtracking, Recursive Descent Parsers, Predictive Parsers, Bottom-up Parsers, Shift-Reduce Parsing, Operator Precedence Parsers, LR parsers (SLR, Canonical LR, LALR)

Module IV: Intermediate Code Generation: Different Intermediate forms: three address code, Quadruples & Triples. Syntax Directed translation mechanism and attributed definition. Translation of Declaration, Assignment control flow, Boolean expression, Array References in arithmetic expressions, procedure calls, case statements, postfix translation.

Module V: Run Time Memory Management: Static and Dynamic storage allocation, stack based memory allocation schemes, Symbol Table management. Code Optimization and Code Generation: Local optimization, Loop optimization, Peephole optimization, Basic blocks and flow graphs, DAG, Data flow analyzer, Machine Model, Order of evaluation, Register allocation and code selection

References:-

- Louden, "Compiler construction", Cengage learning .
- Alfred V Aho, Jeffrey D. Ullman, "Principles of Compiler Design", Narosa.
- A.V. Aho, R. Sethi and J.D Ullman, "Compiler: principle, Techniques and Tools", AW.
- Michal Sipser, "Theory of Computation", Cengage learning.
- H.C. Holub, "Compiler Design in C", Prentice Hall Inc.
- Hopcroft, Ullman, "Introduction to Automata Theory, Languages and Computation", Pearson Education.
- K.L.P. Mishra and N.Chandrasekaran, "Theory of Computer Science : Automata, Languages and Computation", PHI.

List of Experiment

1. Write a program for executing the Deterministic Finite Automata (DFA). The program should be able to accept an input string, and able to result as ACCEPTED/NOT ACCEPTED. Design a DFA which accepts input string only if the pattern e.g. 'abc', is available in the input string. Example : Pattern "abc" I/P String : "xyabcp" ACCEPTED I/P String : "abxsc" NOT ACCEPTED I/P String : "abc" ACCEPTED
2. Design a lexical analyzer for given language and the lexical analyzer should ignore redundant spaces, tabs and new lines. 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. Simulate the same in C language.
3. Write a C program to identify whether a given line is a comment or not.
4. Write a C program to recognize strings under 'a', 'a*b+', 'abb'.
5. Write a C program to test whether a given identifier is valid or not.
6. Write a C program to simulate lexical analyzer for validating operators.
7. Implement the lexical analyzer using JLex, flex or other lexical analyzer generating tools
8. Write a C program for implementing the functionalities of predictive parser for the mini language specified in Note 1.
9. Write a C program for constructing of LL (1) parsing.
10. Write a C program for constructing recursive descent parsing.
11. Write a C program to implement LALR parsing.
12. Write a C program to implement operator precedence parsing.
13. Write a C program to implement Program semantic rules to calculate the expression that takes an expression with digits, + and * and computes the value.

Automata and Compiler Design (IT 502A)

- CO 1. Illustrate the concept of Automata and Compiler Design and minimization of finite Automata.
- CO 2. Formulate using CFC's for PDA and NPDA concept also define push down Automata.
- CO 3. To understand compiler structure and basic parsing techniques.
- CO 4. Classify intermediate Code Generation Techniques.
- CO 5. Explain Run time memory management and data flow analyzer machine model.

B.TECH. SIX SEMESTER (INFORMATION TECHNOLOGY)**COURSE CONTENT (AICTE w.e.f. July 2019)**

IT601 (Professional Elective - I)

SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
IT601A	Information Theory and Coding	3	1	-	100	4

Module I

Introductory Concepts Information Theory: Entropy and Uncertainty; Information Content;

Information rate, classification of codes, Kraft McMillan inequality, Source coding theorem, Shannon-Fano coding, Huffman coding, Extended Huffman coding Joint and conditional entropies, Mutual information -Discrete memoryless channels – BSC, BEC – Channel capacity, Shannon limit.

Module II

Compression Algorithms Optimal Compression; Compression Algorithms; Huffman Coding; Adaptive Huffman Compression; Statistical Modelling; Dictionary Based Compression; Sliding Window Compression; Speech Compression; LZW, RLE; Lossy Compression schemes; Image Compression using DCT.

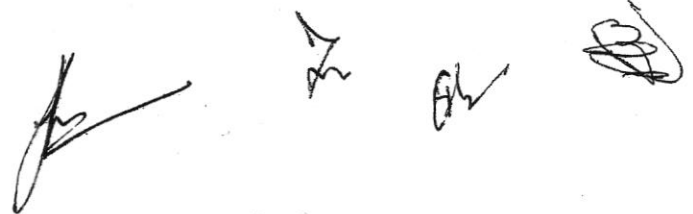
Module III - Error Control Coding Coding for reliable digital transmission and storage; Types of codes; Error Checking codes; Error Correcting Codes; Coding Schemes; Linear Block Codes; Cyclic Codes; Error Trapping; Decoding for cyclic codes; Convolution codes. Run length encoding, CCITT group 3-1-D compression, CCITT group 3 2D compression, CCITT group 4 2D compression.

Module IV - Video Image Compression: Requirement of full motion video compression. CITT H 261 Video coding algorithm, MPEG compression methodology. MPEG-2 compression, Audio (speech) compression.

Module V - Cryptography: Encryption, Decryption, Cryptogram (hypertext). Concept of cipher, Crypto analysis. **Keys:** Single key (secret key) cryptography, two-key (public-key) cryptography. Single key cryptography **Ciphers:** Block cipher codes, Stream ciphers, Requirement for secrecy, The Data Encryption Standard Public Key Cryptography: Diffie-Hellman public key distribution, The Rivest-ShamirAdelman (R-S-A) system for public key cryptography. Digital signature.

Reference Books:

1. Error correcting codes by W.W Peterson and E.J. Welton, The Mit Press (1978) ISBN 0262160390
2. Multimedia System Design by P.K. Andleigh & Kiran Thapar, Prentice Hall PTR Upper Saddle River, NJC (1996)
3. Bruce Schneier, Applied Cryptography: Protocol Algorithms & Source Code in C, John Wiley & sons, NY, 1994
4. Network Security by Stalling, PHI
5. Communication Systems, 3/e by Simon Haykin, John Wiley & sons (1995)

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Information Theory and Coding (IT 601A)

- CO 1. To get introduced with the various coding techniques.
- CO 2. To analyze and compare various compression algorithms.
- CO 3. To understand various types of coding schemes and error correction codes.
- CO 4. To familiarize with the video and image compression.
- CO 5. To understand the various cryptography techniques.

B.TECH. SIX SEMESTER (INFORMATION TECHNOLOGY)**COURSE CONTENT (AICTE w.e.f. July 2019)**

IT 602 (Opin Elective-II)

SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
IT 602A	Microprocessor and Interfacing	3	-	—		3

Module I

Intel 8086 Microprocessor: Introduction to 16-bit microprocessors, 8086 pin functions, Minimum and maximum mode operations. 8086 Architecture, register organization, addressing Modes, 8086 Memory banks and Memory organization, 8086 Instruction set and Assembly language programming.

Module II

Advanced microprocessors: Salient features of advanced microprocessors. Review of evolution of advanced microprocessors: 186 / 286 / 386 / 486 / Pentium. Super scalar architecture of Pentium. 80286/386 Memory segmentation with descriptor tables, Privilege levels, Changing privilege levels, Paging including address translation, Page level protection, MMU, cache memory, Virtual memory.

Module III

I/O INTERFACING: Introduction to the interfacing chips 8255. Interfacing keyboards, printers, LEDs with Intel 8086 Microprocessor. Interfacing of 8254 programmable interval timer, 8259A Programmable interrupt controller & 8257 DMA controller with Intel 8086 Microprocessor.

Module IV

Memory Interfacing: Interfacing of RAM and ROM with Intel 8086 Microprocessor.

Serial communication interface: RS 232C standards, Interfacing of USART chip 8251 with Intel 8086 Microprocessor.

Module V

Microcontroller: Introduction to micro controller 8051, its architecture, Register set, operational features, pin description, I/O configuration, interrupts, addressing modes, an overview of 8051 instruction set.

Books

1. B.B. Brey (PHI), "The Intel Microprocessors, Architecture, Programming and Interfacing".
2. A Triebel & Avtar Singh (PHI), "The 8088 & 8086 Microprocessor".

3. D. Hall (Mc-Graw Hill), "Advanced Microprocessor and Interfacing".
4. A. Pal (TME), "Microprocessors Principles & Applications".
5. A.P. Mathur (TMA), "Introduction to Microprocessors". Intel Corporation Microprocessors Data manuals.
6. Microprocessor Training Inc., "Microprocessor Fundamentals & Applications (Handson)".

Suggested List of Program

1. Write an 8086 ALP to find sum and average of 'n' integer numbers.
2. Write an 8086 ALP to find the factorial of a number.
3. Write an 8086 to find HCF of 2 unsigned 16-bit numbers.
4. Write an 8086 ALP to find LCM of 2, 16-bit unsigned numbers.
5. Write an 8086 ALP to print 'n' Fibonacci numbers.
6. Write an 8086 ALP to reverse a given string.
7. Write an 8086 ALP program to find the largest number from the array of numbers.
8. Write an 8086 ALP to perform Decimal to Binary conversions
9. Write an 8086 ALP to perform Decimal to Hexadecimal conversions
10. Write an 8086 ALP that reads a list of numbers and makes a count of Even and Odd numbers.

Microprocessor and Interfacing (IT 602A)

- C0 1. To understand the architecture of microprocessor 8086 and its instruction set.
- C0 2. To study and compare architecture of various advanced microprocessors.
- C0 3. To interface various peripherals with the microprocessor using support controllers.
- C0 4. To give the overview of 8051 microcontroller.

B.Tech SIX SEMESTER (INFORMATION TECHNOLOGY)**COURSE CONTENT (AICTE w.e.f. July 2019)**

SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
IT 603	Object Oriented Analysis and Design	3	-	2		4

Module I

Overview of Object Oriented concepts: Objects and classes, abstraction, generalization and inheritance, encapsulation, multiple inheritance, aggregation abstraction classes, polymorphism, link and association, Need for object oriented approach

Module II

System design life cycle, object oriented SW development process model, Object Oriented Analysis, Object Modeling Technique (OMT): object model, function model, relationship among models, object diagrams, state diagrams, data flow diagrams, analysis.

Module III

Object oriented Design: Overview of object design, Combination the models, Designing algorithms, design optimization, Implementation of control, Adjustment, Design of association, object representation, physical packaging, documenting design decision, comparison of use-case driven approach.

Module IV

Translation Object Oriented design into implementation, Programming style, Documentation, characterization of object oriented languages, Comparison of object oriented language like C++, JAVA, object programming.

Module V

Unified Modeling Language (UML): Class diagram sequence diagram Use case diagram, Collaboration, diagram, state, chart diagram, Activity diagram, component diagram, deployment diagram, Object oriented Database: Relational Vs .object oriented database, the architecture of object oriented database, query language for Object Oriented database.

References:-

1. Satzinger, Jackson and Burd, "Object oriented Analysis and design with the Unified Process", CENGAGE Learning.

2. Michael Blaha and J. Rumbaugh, "Object oriented Modeling and design with UML", Pearson Education
3. O'Docherty, "Object Oriented Analysis and Design Understanding, System Development with UML2.0", Wiley India.

Object Oriented Analysis and Design (IT-603)

- CO 1. To understand the principles used in OOP and its elements.
- CO 2. To introduce with the object oriented software development process model.
- CO 3. To compare the features of object oriented languages like C++, java etc.
- CO 4. To familiarize with the UML, object oriented database and query language for OO Database .

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B.Tech SIX SEMESTER (INFORMATION TECHNOLOGY)						
COURSE CONTENT (AICTE w.e.f. July 2019)						
SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
IT 604	Software Engineering	3	-	2		4

Module I: The Software Product and Software Process:

Software Product and Process Characteristics, Software Process Models: Linear Sequential Model, Prototyping Model, RAD Model, Evolutionary Process Models like Incremental Model, Spiral Model, Component Assembly Model, RUP and Agile processes. Software Process customization and improvement, CMM, Product and Process Metrics

Module II: Requirement Elicitation, Analysis, and Specification

Functional and Non-functional requirements, Requirement Sources and Elicitation Techniques, Analysis Modeling for Function-oriented and Object-oriented software development, Use case Modeling, System and Software Requirement Specifications, Requirement Validation, Traceability

Module III: Software Design

The Software Design Process, Design Concepts and Principles, Software Domain Modeling and UML, Architectural Design, Architectural Views and Styles, User Interface Design, Object-Oriented Design, Subsystem design, Object design, Function-oriented Design, Dataflow diagrams, Context diagram, SAVSD design method.

Module IV: Software Analysis and Testing

Software Static and Dynamic analysis, Code inspections, Software Testing Fundamentals, Software Test Process, Testing Levels, Test Criteria, Test Case Design, Test Oracles, Test Techniques, Black-Box Testing, White-Box Unit Testing and Unit Testing Frameworks, Integration Testing, System Testing and other Specialized Testing, Test Metrics, Testing Tools.

Module V: Software Maintenance & Software Project Measurement

Need and Types of Maintenance, Software Configuration Management (SCM), Software Change Management, Version Control, Change control and Reporting, Program Comprehension Techniques, Re-engineering, Reverse Engineering, Tool Support. Project Management Concepts, Feasibility Analysis, Project and Process Planning, Resources Allocations, Software efforts, Schedule, and Cost estimations, Project Scheduling and Tracking, Risk Assessment and Mitigation, Software Quality Assurance (SQA). Project Plan, Project Metrics.

Practical and Lab work

Lab work should include a running case study problem for which different deliverables at the end of each phase of a software development life cycle are to be developed. This will include modeling the requirements, architecture and detailed design. Subsequently the design models will be coded and tested. For modeling, tools like Rational Rose products. For coding and testing, IDE like Eclipse, Net Beans, and Visual Studio can be used.

Text Book:

Pankaj Jalote, "An Integrated Approach to Software Engineering", 3rd Edition, Narosa Pub, 2005.

Reference Books:

1. R S. Pressman, "Software Engineering: A Practitioner's Approach", Sixth edition 2006, McGraw-Hill.
2. Rajib Mall, "Fundamentals of Software Engineering" Second Edition, PHI Learning.
3. Sommerville, "Software Engineering", Pearson Education.
4. Richard H. Thayer, "Software Engineering & Project Managements", Willey India
5. Waman S. Jawadekar, "Software Engineering", TMH.
6. Schwalbe, "IT Project Managements", Cengage Learning.

Suggested List of Program

1. Introduction to UML and Course Outlines. Tools Description
2. Introduction to Rational Rose and Practical Implementation
3. Introduction to class Diagram
4. Class Diagram in Detail and Tasks Done by using Rational Rose
5. Introduction to Use-case Diagram, its Detail and implementation by using Rational Rose
6. Lab Quiz: 01 (Use-case Diagram)
7. Introduction to Sequence Diagram
8. Sequence Diagram in Detail and Tasks by using Rational Rose
9. Introduction of Component Diagram and its implementation by using Rational Rose
10. Introduction to Collaboration Diagram and Task by using Rational Rose
11. Test cases and Few Scenarios of test-cases in real life
12. Introduction to TestLog and An implementation on it

Software Engineering (IT 604)

- CO 1. To study various software process models.
- CO 2. To understand the requirement elicitation, analysis and specification.
- CO 3. To familiarize with the software design process.
- CO 4. To analyze and compare various software analysis and testing methods.
- CO 5. To understand the software maintenance and software project measurement.

B.Tech SIX SEMESTER (INFORMATION TECHNOLOGY)**COURSE CONTENT (AICTE w.e.f. July 2019)**

SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
IT 605	Internet and Web Technology	3	-	2		4

Module I

An Introduction to Web Engineering, History of web Development, Time line, Motivation, Categories of Web Applications, Characteristics of Web Applications. Evolution and Need for Web Engineering, Web Engineering Models, Software Engineering v/s Web Engineering. Introduction to Browser and search engines, Search fundamentals, Search strategies, Directories search engines and Meta search engines, Working of the search engines, Miscellaneous Web Browser details. Introduction to Web Servers: Features of web servers, caching, case study-IIS, Apache, Configuring web servers.

Module II

Technologies for Web Applications: HTML and DHTML, HTML Basic Concepts, Static and dynamic HTML, Structure of HTML documents, HTML Elements, Linking in HTML, Anchor Attributes, Image Maps, Meta Information, Image Preliminaries, Layouts, Backgrounds, Colors and Text, Fonts, Tables, Frames and layers.

Database integration, CSS, Positioning with Style sheets. Introduction to JAVA SCRIPT, Cookies Creating and Reading Cookies

Module III

Technologies for Web Applications: Introduction of XML, Validation of XML documents, DTD, Ways to use XML, XML for data files, HTML Vs XML, Embedding XML into HTML documents, Converting XML to HTML for Display, Displaying XML using CSS and XSL, Rewriting HTML as XML.

Module IV

Creating Cohesive Websites: Conceptual Overview of website Development, Website Design issues, Conceptual Design, High-Level Design, Indexing the Right Stuff, Grouping Content. Architectural Page Mockups, Design Sketches, Navigation Systems. Searching Systems Good & bad web design, Process of Web Publishing. Phases of Web Site development, enhancing your web-site, submission of website to search engines. Web security issues, security audit of websites, Web effort estimation, Productivity, Measurement, Quality usability and reliability.

Module V

Requirements Engineering for Web Applications: Introduction, Fundamentals, Requirement Source, Type, Notations Tools. Principles Requirements Engineering Activities, Adapting RE Methods to Web Application.

Introduction to http and https, http vs. https, Dynamic Web Content, Introduction of ASP.Net, PHP, Database connectivity (MySQL/Oracle)

TERM WORK

- At least ten practical experiments based on above syllabus and a mini project is desirable to be completed by a group of three that cover following tools.
 - HTML
 - DHTML
 - XML
 - Java Script

Recommended Books:

- Roger S.Pressman, David Lowe, "Web Engineering", Tata Mcgraw Hill Publication, 2007
- Achyut S Godbole and Atul Kahate, "Web Technologies", Tata McGraw Hill
- Gopalan N P, Akilandeswari "Web Technology: A Developer s Perspective", PHI

4. NEIL GRAY "Web server Programming" Wiley
5. CHRIS BATES Web Programming: Building Internet applications Wiley
6. Moller, "An Introduction to XML and Web Technologies", Pearson Education New Delhi, 2009
7. Beginning XML 4th Edition Hunter, Reiter, Fawcett Wiley India
8. Internet & World Wide Web How to Program, Pearson education, 3rd edition, by: H.M. Deitel, P.J. Deitel, A.B. Goldberg.
9. C. Xavier, "Web Technology & Design", Tata McGraw Hill. 10 Ivan Bay Ross, "HTML, DHTML, Java script, Perl CGI", BPB

Suggested list of Practical

1. Introduction to major internet protocol- HTTP, FTP, SMTP
2. Study of Web Browser- Microsoft Internet Explorer and Netscape Navigator.
3. Their Network options, security features, Cookies, file caching, temporary files etc.
4. HTML- Basics of HTML., text, image, other MIME types, lists, tables,
5. HTTP methods, forms.
6. Multimedia on the Web- Embedding audio and video files in HTML
7. Java Script- Introduction to Java Script for client side validation.
8. Server side scripting – Introduction to fundamentals concepts of ASP or JSP or PHP (any one platform depending on instructor).
9. Basics of CGI scripting using Perl or C.
10. Simple examples of request/ response objects.
11. Basic introduction to web solutions architecture.

Internet and Web Technology (IT 605)

- C0 1. To get introduced with the web engineering ,its evolution and applications.
- C0 2. To understand various web technologies.
- C0 3. To give the overview of the website development.
- C0 4. To understand various web servers and their services.

B.Tech. Fifth Semester (INFORMATION TECHNOLOGY)

COURSE CONTENT (AICTE w.e.f. July 2019)

SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
IT 505	DATA BASE MANAGEMENT SYSTEM	3		2		4

Module 1 Basic Concepts: DBMS Concepts and architecture Introduction, Database approach v/s Traditional file accessing approach, Advantages of database systems, Data models, Schemas and instances, Data independence, database users and DBA.

Module II: Data models and their Comparison, Entities and attributes, Entity Sets, Relationships, Extended E-R Features Defining the E-R diagram of database Relational Data models: Domains, Tuples, Attributes, Relations, and Integrity constraints. Key (super key, candidate key, primary key, foreign key, and referential key)

Module III: Structured Query Language ,Relational Query languages: Relational algebra, Relational algebra operations like select, Project, Join, Division, outer union. SQL: DDL, DML and their commands, Aggregate function, nested subquery, views in SQL, join Data retrieval queries, accessing SQL from programming language.

Module IV: Database Design Data Base Design: Introduction to normalization, Normal forms, Functional dependency, Decomposition, Dependency preservation and lossless join, multi-valued dependencies.

Module V: Transaction Processing Concepts: - Transaction System, Testing of Serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, Recovery from transaction failures. Log based recovery. Checkpoints deadlock handling. Concurrency Control Techniques: - Concurrency Control, locking Techniques for concurrency control, time stamping protocols for concurrency control, validation based protocol, multiple granularity. Multi version schemes, Recovery with concurrent transaction. Introduction to Distributed databases, data mining, data warehousing.

Text Books:

- 1) Database System Concepts, Silberschatz, Korth and Sudarshan
- 2) Fundamental of database system by Elmasri / Navathe the Benjamin / Cunnings Publishing company inc.

Reference:

- 3) Data Base Management System by C.J. Date
- 4) Data Base Management System by Ullman
- 5) Data base design by Gio Wiederhold. McGraw Hill
- 6) Fundamental of Data Base Management System by Leon & Leon, Vikas Publishing House Pvt. Ltd.
- 7) Oracle 9i Database Administration Fundamental-I, Volume I, Oracle Press, TMH.

- CO 1.** Understand the various data models.
- CO 2.** Apply the different operations over the relations using various queries.
- CO 3.** Obtaining the normalized relation by using different normal forms.
- CO 4.** Recognize the concurrency control techniques.

B.E.CBGS V SEMESTER (ELECTIVE-I) MANAGEMENT INFORMATION SYSTEM

Course	Subject Title	Subject Code	Grade for End Sem.		CGPA at the end of every even semester
			T	P	
B.E.	(Elective-I) Management Information System	IT5005D	Min. "D"	Min. "D"	5.0

Unit- I: Information System And Organization :

Matching the Information System Plan to the Organizational Strategic Plan – Identifying. Key Organizational Objective and Processes and Developing an Information System. Development – User role in Systems Development Process – Maintainability and Recoverability in System Design.

Unit- II: Pre Presentation And Analysis Of System Structure :

Models for Representing Systems: Mathematical, Graphical and Hierarchical (Organization Chart, Tree Diagram) – Information Flow – Process Flow – Methods and Heuristics – Decomposition and Aggregation – Information Architecture – Application of System Representation to Case Studies.

Unit –III: Systems, Information And Decision Theory:

Information Theory – Information Content and Redundancy – Classification and Compression – Summarizing and Filtering – Inferences and Uncertainty – Identifying Information needed to Support Decision Making – Human Factors – Problem characteristics and Information System Capabilities in Decision Making.

Unit- IV: Information System Application

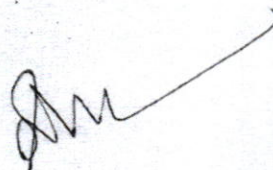
Transaction Processing Applications – Basic Accounting Application – Applications for Budgeting and Planning – Other use of Information Technology: Automation – Word Processing – Electronic Mail – Evaluation Remote Conferencing and Graphics – System and Selection – Cost Benefit – Centralized versus Decentralized Allocation Mechanism.

Unit- V: Development And Maintenance Of Information Systems 9

Systems analysis and design – System development life cycle – Limitation – End User Development – Managing End Users – off- the shelf software packages – Outsourcing – Comparison of different methodologies.

Books References:

1. Laudon K.C, Laudon J.P, Brabston M.E, "Management Information Systems - Managing the digital firm", Pearson Education, 2004.
2. Turban E.F, Potter R.E, "Introduction to Information Technology"; Wiley, 2 004.
3. Jeffrey A.Hoffer, Joey F.George, Joseph S. Valachich, "Modern Systems Analysis and Design", Third Edition, Prentice Hall, 2002.



Jabalpur Engineering College, Jabalpur
(Credit Based Grading System based scheme)

Bachelor of Engineering (CBGS) Semester: VII (Information Technology)

(w.e.f. July 2018)

Subject Code	Subject Name & Title	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz, Assignment	End Sem	Lab Work					
IT7003	Machine Learning	70	20	10	30	20	150	3	1	2	6

Unit I- Introduction of machine learning, mathematical concepts: random variables and probabilities, probability distributions, high-dimensional spaces, overview of machine learning, supervised, semi-supervised, unsupervised learning, inductive and transductive frameworks

Unit-II- Machine Learning Algorithm:- Introduction, unsupervised learning: Association rule mining, K-means, K-medoid. Classification: Decision Tree, The Tree Induction Algorithm, Split Algorithms Based on Information Theory, Split Algorithm Based on the Gini Index, Overfitting and Pruning, Decision Trees Rules. Cluster Analysis:- Introduction, Desired Features of Cluster Analysis, Types of Cluster Analysis Methods:- Partitional Methods, Hierarchical Methods, Density-Based Methods. Quality and Validity of Cluster Analysis Methods. Classification algorithms: linear and non-linear algorithms, perceptrons, logistic regression, naive Bayes, decision trees, neural networks, support vector machines, regression algorithms, least squares linear regression, neural networks, relevance vector machines

Unit-III- kernel methods, dual representations, RBF networks, graphical models, Bayesian networks, Markov random fields, inference, ensemble methods, bagging, boosting, random forests

Unit IV- practical aspects in machine learning, data preprocessing, overfitting, accuracy estimation, parameter and model selection.

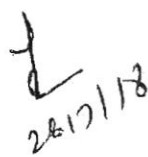
Unit V- special topics, PAC learning, sample selection bias, learning from graph data, learning from sequential data

Reference Books:

- *Machine Learning: A Multistrategy Approach* by Ryszard Spencer Michalski, Ryszard Stanislaw Michalski, George Tecuci.
- *Introduction to Machine Learning* by Ethem Alpaydin.






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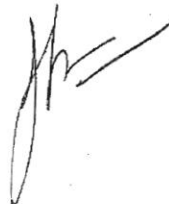
Semester: VII SEM

Machine Learning (IT-7003)

Course Objectives

1. To introduce with the mathematical foundations of machine learning.
2. To understand and outline various machine learning algorithms and their classification.
3. To give insights of the practical aspects in machine learning, data processing and accuracy establishment.
4. To discuss about some special topics PAC objects.

CEOPEO	1	2	3	4	5	6
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Jabalpur Engineering College, Jabalpur
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Bachelor of Engineering (CBGS) Semester: VII (Information Technology)

(w.e.f. July 2018)

Subject Code	Subject Name & Title	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz, Assignment	End Sem	Lab Work					
IT7005B	(Elective-IV) Wireless & Mobile Communication	70	20	10	-	-	100	3	1	-	4

Unit 1 : Introduction of Wireless Networks, Different Generations of Wireless Networks. Characteristics of the Wireless Medium: Radio Propagation Mechanisms, Path Loss Modelling and Signal Coverage, Effect of Multipath and Doppler, Channel Measurement and Modelling Techniques.

Unit II : Introduction to cellular mobile system A, basic cellular system, performance criteria, Uniqueness of Mobile Radio Environment, Operation of cellular systems, Planning and cellular system, Analog and digital cellular systems. Elements of cellular radio system design: General description of the problem, Concept of frequency channels, Co channel interference reduction factor, Cell splitting, Consideration of the components of cellular systems.

Unit III : Cell coverage for signal and traffic: General introduction, obtaining the mobile point-to-point mode propagation over water or flat open area, foliage loss, propagation near in distance, long distance propagation, point-to-point prediction model-characteristics, cell site, antenna heights and signal coverage cells, mobile-to-mobile propagation.

Unit IV : Introduction to Wireless LAN, Evolution of WLAN, Wireless Home Networking, Technologies for Home Area Network (HAN), Overview of IEEE 802.11, Reference Architecture, PHY and MAC Layer, Wireless ATM, HIPERLAN.

Unit V : IEEE 802.15 WPAN, HomeRF, Bluetooth, Interference between Bluetooth and 802.11, Adhoc Networks, Introduction to 2.5 G and 3 G Networks.

References:

1. Kaveh Pahlavan, Prashant Krishnamurthy "principles of Wireless Networks", PHI.
2. Qing- An Zeng, Dharma Prakash Agrawal "Introduction to Wireless and Mobile Systems"
3. CENGAGE Learning.
4. Sumit Kasera, Nishit Narang, A P Priyanka "2.5 G Mobile Networks: GPRS and EDGE", TMH
5. Dr. KAMILO FEHER "Wireless Digital Communications", PHI
6. Jochen Schiller "Mobile Communications", PEARSON
7. Cellular and Mobile Communication by Lee (McGraw Hill)
8. Wireless Digital Communication by Dr. Kamilo Faher (PHI)




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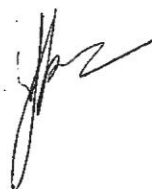
Semester: VII SEM

Subject: Wireless and Mobile Communication (IT70050)

Course Objectives

- 1) To compare various wireless systems.
- 2) To understand the cellular mobile system and its problems and its solution.
- 3) To outline the cell coverage for various control modules.
- 4) To give overview of IEEE reference architecture.
- 5) To discuss various generations of mobile wireless technology.

CO/PEO	1	2	3	4	5	6
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Bachelor of Engineering (CBGS) Semester: VII (Information Technology)

(w.e.f. July 2018)

Subject Code	Subject Name & Title	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz, Assignment	End Sem	Lab Work					
IT7004A	(Elective-III) Simulation & Modeling	70	20	10	-	-	100	3	1	-	4

Unit-I : Introduction to Modeling and Simulation: Nature of Simulation, Systems , Models and Simulation, Continuous and Discrete Systems, system modeling, Principles used in modeling, Static and Dynamic physical models, Static and Dynamic Mathematical models, concept of simulation, Components of a simulation study. Introduction to Static and Dynamic System simulation, continuous and discrete time simulation. Advantages, Disadvantages and pitfalls of Simulation.

Unit-II : Probability Concepts in Simulation: Stochastic variables, discrete and continuous probability functions, Distributed Random numbers, generation of random numbers-Uniform and Non Uniform Random numbers, variance reduction techniques-Introduction, Common Random numbers- Rationale, Applicability and Synchronization.

Unit-III : Introduction to Queuing Theory: Characteristics of queuing system, Poisson's formula, berth-death system, equilibrium of queuing system, Queuing Disciplines, Simulation of single and two server queue. Analysis of M/M/1 queues. Application of queuing theory in computer system like operating systems, computer networks etc.

Unit-IV : Discrete-Event Simulation: Components and Organization of a Discrete-Event Simulation Model, Determining the Events and Variables, approaches for time advance. Generation of arrival patterns, Simulation programming tasks, Gathering statistics, Measuring occupancy and Utilization , Recording Distributions and Transit times.

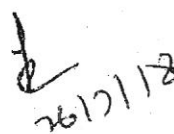
Unit-V : Introduction to Simulation languages: GPSS: Action times, Succession of events, Choice of paths, Conditional transfers, program control statements. SIMSCRIPT: Organization of SIMSCRIPT Program, Names & Labels, SIMSCRIPT statements.

References:

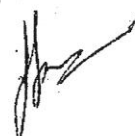
- ☐ Gorden G., System simulation, Printice Hall.
- ☐ Law ., Simulation Modeling And Analysis, McGraw Hill
- ☐ Payer T., Introduction to system simulation, McGraw Hill.
- ☐ Spriet, Computer Aided Modeling and Simulation, W.I.A.
- ☐ Sushil, System Dynamics, Wiley Eastern Ltd.
- ☐ Shannon R.E., System simulation, Prentice Hall.






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Semester: VII SEM

Simulation and Modeling (IT7004A)

Course Objectives

1. To understand the principles used in modeling.
2. To understand the probability concepts used in simulation
3. To give overview of discrete event simulation.
4. To introduce simulation languages GPSS, SIMSCRIPT.
5. To discuss queuing theory and its applications in computer system.

CEO\PEO	1	2	3	4	5	6
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Bachelor of Engineering (CBGS) Semester: VII (Information Technology)

(w.e.f. July 2018)

Subject Code	Subject Name & Title	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz, Assignment	End Sem	Lab Work					
IT7002	Distributed System	70	20	10	30	20	150	3	1	2	6

Unit-I : Characterization of Distributed Systems: Introduction, Examples of distributed Systems, Resource sharing and the Web Challenges. System Models: Architectural models, Fundamental Models 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.

Unit-II : 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, Byzantine agreement problem, Consensus problem, Interactive consistency Problem, Solution to Byzantine Agreement problem, Application of Agreement problem, Atomic Commit in Distributed Database system.

Unit-III : Distributed Objects and Remote Invocation: Communication between distributed objects, Remote procedure call, Events and notifications, Java RMI case study. **Security:** Overview of security techniques, Cryptographic algorithms, Digital signatures Cryptography pragmatics, Case studies: Needham Schroeder, Kerberos, SSL & Millicent. Distributed File Systems: File service architecture, Sun Network File System, The Andrew File System, Recent advances.

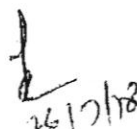
Unit-IV : Transactions and Concurrency Control: Transactions, Nested transactions, Locks, Optimistic Concurrency control, Timestamp ordering, Comparison of methods for concurrency control. Distributed Transactions: Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery. Replication: System model and group communication, Fault tolerant services, highly available services, Transactions with replicated data

Unit -V : Distributed Algorithms: Introduction to communication protocols, Balanced sliding window protocol, Routing algorithms, Destination based routing, APP problem, Deadlock free Packet switching, Introduction to Wave & traversal algorithms, Election algorithm. CORBA Case Study: CORBA RMI, CORBA services

Books:

1. Singhal & Shivaratri, "Advanced Concept in Operating Systems", McGraw Hill
2. Coulouris, Dollimore, Kindberg, "Distributed System: Concepts and Design", Pearson Ed.
3. Ramakrishna, Gehrke, "Database Management Systems", Mc Grawhill
6. Tenanuanbaum, Steen, "Distributed Systems", PHI
7. Gerald Tel, "Distributed Algorithms", Cambridge University Pres Gerald Tel, "Distributed Algorithms", Cambridge University Press







Jabalpur Engineering College Jabalpur, Jabalpur

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Semester: VII SEM

Distributed Systems (IT-7002)

Course Objectives

1. To give overview of distributed system and its characteristics.
2. To understand various distributed deadlock detection techniques.
3. To outline the communication between distributed objects and distributed file system.
4. To understand the transaction and concurrency control.
5. To give overview of various distributed algorithms.

CEO/PEO	1	2	3	4	5	6
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(w.e.f. July 2018)

Subject Code	Subject Name & Title	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz, Assignment	End Sem	Lab Work					
IT8001	Information & Cyber Security	70	20	10	30	20	150	3	1	2	6

Unit I: Basic of Cryptography, secret key cryptography, Types of attack, Substitution ciphers, Transposition ciphers, block ciphers and steam ciphers, Confusion and Diffusion, Data encryption standard, round function modes of operation, cryptanalysis, brute force attack, Security Goals (Confidentiality, Integrity, Availability).

Unit II: Public key Cryptography, Modulo arithmetic, Greatest common divisor, Euclidean algorithm, RSA algorithm, hash function, attack on collision resistance, Diffie hellman key exchange, Digital signature standard elliptic curve cryptography.


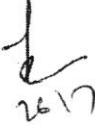
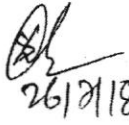
Unit III: Authentication: One way Authentication, password based, certificate based, Mutual Authentication, shared secret based, Asymmetric based, Authentication and key agreement, centralized Authentication, eavesdropping, Kerberos, IP security overview:- security association & Encapsulating security payload, tunnel and transfer modes, internet key exchange protocol, Secure Socket Layer(SSL), Transport Layer Security (TLS), O-Day(Zero Day) Attack.



Unit IV: Software vulnerabilities: Phishing Attacks, buffer overflow vulnerability, Format String attack, Cross Site Scripting, SQL injection Attacks, Email security:- Security services of E-mail, Establishing keys, Privacy, Authentication of the source, Message integrity, Non-Repudiation, Viruses, Worms, Malware.

Unit V: Web Issue: Introduction, Uniform Resource Locator/uniform resource identify, HTTP, Cookies, Web security problem, Penetration Testing, Firewalls:- functionality, Policies and Access Control, Packet filters, Application level gateway, Encrypted tunnel, Security architecture, Introduction to intrusion detection system.

References:-

- ☐ Bernard Menezes, "Network Security and Cryptography", CENGAGE Learning.
- ☐ Charlie Kaufman, "Network Security", PHI.
- ☐ Forouzan, "Cryptography & Network Security",
- ☐ TMH Randy Weaver, "Network Infrastructure Security", Cengage Learning.
- ☐ Atul Kahate, "Cryptography and Network Security", TMH.
- ☐ William Stallings, "Cryptography and Network security", Pearson.

BE VIII Semester (INFORMATION TECHNOLOGY)						
COURSE CONTENT						
SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
IT8001	INFORMATION SECURITY LAB	3	1	2	150	6

INFORMATION SECURITY LAB

List of experiments

1. Study of Network Security fundamentals - Ethical Hacking, Social Engineering practices.
2. System threat attacks - Denial of Services.
3. Sniffing and Spoofing.
4. Web Based Password Capturing.
5. Virus and Trojans.
6. Anti-Intrusion Technique - Honey pot.
7. Symmetric Encryption Scheme - RC4.
8. Block Cipher - S-DES, 3-DES.
9. Asymmetric Encryption Scheme - RSA.
10. IP based Authentication.

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Semester: VIII SEM

Information and Cyber Security (IT-8001)

Course Objectives

- C01.** To give overview of cryptography and DES.
- C02.** To understand various cryptography algorithms.
- C03.** To familiarize with the different authentication techniques.
- C04.** To introduce various software vulnerabilities.

CEO/PEO	1	2	3	4	5	6
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(w.e.f. July 2018)

Subject Code	Subject Name & Title	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz, Assignment	End Sem	Lab Work					
IT8002	Data Mining	70	20	10	30	20	150	3	1	2	6

UNIT I- Data Warehousing: Data warehousing Components –Building a Data warehouse –Mapping the Data Warehouse to a Multiprocessor Architecture–DBMS Schemas for Decision Support–Data Extraction, Cleanup, and Transformation Tools –Metadata.

UNIT II- Business Analysis: Reporting and Query tools and Applications – Tool Categories – The Need for Applications – Cognos Impromptu – Online Analytical Processing (OLAP) – Need – Multidimensional Data Model – OLAP Guidelines – Multidimensional versus Multirelational OLAP – Categories of Tools – OLAP Too's and the Internet.

UNIT III -Data Mining: Introduction – Data – Types of Data – Data Mining Functionalities – Interestingness of Patterns – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Data Warehouse – Issues –Data Preprocessing.

UNIT IV -Association Rule Mining And Classification: Mining Frequent Patterns, Associations and Correlations – Mining Methods – Mining Various Kinds of Association Rules – Correlation Analysis – Constraint Based Association Mining – Classification and Prediction - Basic Concepts - Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Back propagation – Support Vector Machines -- Associative Classification – Lazy Learners – Other Classification Methods - Prediction

UNIT V -Clustering And Applications And Trends In Data Mining: Cluster Analysis - Types of Data – Categorization of Major Clustering Methods – Kmeans – Partitioning Methods – Hierarchical Methods - Density-Based Methods –Grid Based Methods – Model-Based Clustering Methods – Clustering High Dimensional Data - Constraint – Based Cluster Analysis – Outlier Analysis – Data Mining Applications.

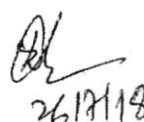
Text Books:

1. Alex Berson and Stephen J. Smith, "Data Warehousing, Data Mining & OLAP", Tata McGraw – Hill Edition, Tenth Reprint 2007.
2. Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques", Second Edition, Elsevier, 2007.

REFERENCES:

1. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction To Data Mining", Person Education, 2007.
2. K.P. Soman, Shyam Diwakar and V. Ajay, "Insight into Data mining Theory and Practice", Easter Economy Edition, Prentice Hall of India, 2006.
3. G. K. Gupta, "Introduction to Data Mining with Case Studies", Easter Economy Edition, Prentice Hall of India, 2006
4. Daniel T.Larose, "Data Mining Methods and Models", Wile-Interscience, 2006.




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Semester: VIII SEM

Data Mining and Warehousing (IT-8002)

Course Objectives

- CO1. To introduce with data warehousing components.
- CO2. To familiarize with data mining and integration with a data warehousing.
- CO3. To understand association rules and its classifications.
- CO4. To introduce various software vulnerabilities.

CEO\PEO	1	2	3	4	5	6
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Jabalpur Engineering College, Jabalpur
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Bachelor of Engineering (CBGS) Semester: VIII (Information Technology)

(w.e.f. July 2018)

Subject Code	Subject Name & Title	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz, Assignment	End Sem	Lab Work					
ELECTIVE-V IT8003A	Network Management	70	20	10	-	-	100	3	1	-	4

Unit-I : Protocols and architecture, Protocols, Characteristics, Functions, Need for multiple protocols, Conceptual layers of multiple protocol software, Protocol layering principles, Multiplexing and Demultiplexing.

Unit-II : Internet Protocol , Virtual network , Internet architecture and philosophy , Purpose of the internet protocol , Internet diagram , Routing in an internet , table driven IP internet , IP routing algorithm , Internet control message protocols (ICMP) , Internet protocol version 6 , Features , Format , Source routing , Options , address space assignment , User data gram protocol , Format of UDP messages , UDP encapsulation and protocol layering.

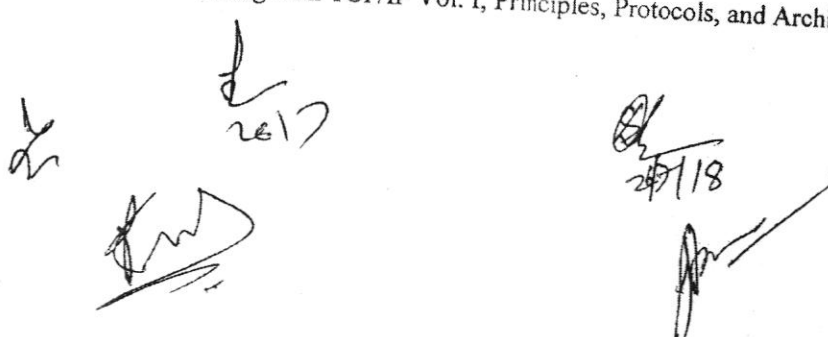
Unit-III : Introduction, layering, OSI Layering, TCP/IP Layering, Protocols & Standards, Internet standards, Internet administration, Internet Addresses, Internet protocol: introduction, IP header, IP routing, subnet addressing, subnet mask, special case of IP addresses, Comparative Study of IPV4 & IPV6, port numbers Address Resolution Protocol, ARP packet format, Proxy ARP, ARP command, ARP Example, Reverse Address Resolution Protocol (RARP): Introduction, RARP Packet format, RARP Examples, RARP server design

Unit-IV : Delivery and Routing of IP Packets, Routing Methods, Static versus Dynamic Routing, Routing table and Routing Module, Classless Addressing: CIDR. Internet Protocol (IP), Datagram, Fragmentation, Options, IP Package. Interior and Exterior Routing, Routing information protocol (RIP), Open shortest path first protocol (OSPF), BGP, GGP. Private Networks. Virtual Private Network (VPN), Network Address Translation (NAT).

Unit-V : Configuration management, Configuration management functions, Inventory managements, Network topology services, Order processing and provisioning, Charge management directory services. Fault management, Processes and procedure, Fault management functions, Performance management, Security management, accuracy management, Network capacity planning.

References :

- Forouzan, TCP/IP," Protocol Suite ",4th edition, TMH
- J.Richard Burkey," Network Management Concept and Practice", PHI
- Stevens," TCP/IP Illustrated Volume-I", Pearson
- Tittel: TCP/IP, Cenage Learning
- Uyless Black, "TCP/IP and related protocols," McGraw Hill.
- Doughals E. Comer," Internetworking with TCP/IP Vol. I, Principles, Protocols, and Architecture", PHI, India



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Department of Information Technology

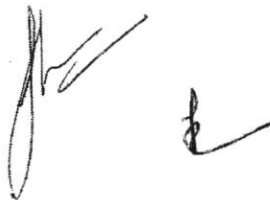
Semester: VIII SEM

Network Management (IT-8003A)

Course Objectives

- CO1. To discuss protocol layering principle and various standard architectures.
CO2. To understand TCP/IP supportive various protocols.
CO3. To compare various routing methods.
CO4. To give overview of configuration management, performance management, accuracy and security management..

CEO\PEO	1	2	3	4	5	6
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B.E. FIFTH SEMESTER (INFORMATION TECHNOLOGY)						
COURSE CONTENT (CBGS w.e.f. July 2019)						
SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
IT 503	Computer Networks	3		2		4

Module I Importance of computer networks, broadcast and point to point networks, Local area networks and Wide area networks, Introduction to ISO-OSI reference model, TCP/IP reference model, function of each layer, interfaces and services, Protocol data unit, connection oriented and connectionless services, service primitives, comparison of TCP/IP and ISO-OSI reference model, Novel Netware, Arpanet, X.25

Module II, Data-Link layer: - Data link layer design issues, framing, flow & error control, physical addressing, Stop & Wait protocol, Go back N ARQ, selective repeat ARQ, piggybacking and pipelining, HDLC LAN Protocol stack-Logical link control and Media Access Control sub layer, IEEE 802.2 LLC Frame format Data link layer in the internet, Serial line IP and Point to point protocol

Module III MAC layer Protocols-, static and dynamic allocation, Pure and slotted ALOHA protocols, Carrier sense multiple access, Persistent and non persistent CSMA, IEEE standard 802.3 and Ethernet, 802.3 cabling, IEEE 802.4, IEEE 802.5, FDDI Wireless LAN, Zigbee, Bluetooth, 6lowPan, Comparison of wired and wireless LAN, WIMAX

Module IV The Network layer- logical addressing, class full & classless addressing, address mapping, packet delivery & forwarding, unicast routing protocols, multicast routing protocols, Routing algorithm-Least Cost, Dijkstra's, Bellman-ford, congestion control algorithms, Internetworking devices, Introduction to Internet protocol IPv4 & IPv6

Module V Transport layer-Transport services, Process to process delivery, UDP, TCP, congestion control, quality of service, Integrated services, Differentiated services LAN-WAN Design and implementation-Configuring TCP/IP, using IP configure, ping command, study of structured LAN, study of internetworking devices and their configuration- switches, hubs, Bridges, routers and Gateways

References:-

1. "Local area networks", Forouzan, TMH, 1st edition
2. "Computer Networks" - Tanenbaum, PHI Learning.
3. "Computer Networks", N Olifer and V Olifer, Wiley publication

4. "Computer Communications & Networking Technologies"-Michael A. Gallo & William M. Hancock -Cengage pearson publications.

5. "Computer Networks: Protocols, Standards and Interfaces"- By Black, PHI learning pub.

Suggested List of Experiment:-

1. Establishment and configuration of LAN
2. Color coding standard of CAT 5,6,7 and crimping of cable in RJ-45
3. Study of WAN
4. Case study of STOP AND WAIT Protocols
5. Study of sliding window protocol
6. study of IEEE 802.3 , 802.4 ,802.5
7. Study of FDDI
8. Study of basic networking commands like ping, ipconfig, etc
9. Case study of various Routing Strategies
10. Case studies of various Network Topologies
11. Establishing & studying the various parameters of a home LAN Network
12. Study of IOS of routers
13. Configuring routers, bridges and switches and gateways

Computer Networks (IT 503)

- CO1. Infer the importance of computer networks and ISO-OSI reference model.
- CO2. Compare various logical link control protocols.
- CO3. Outline standard, 802.3 and Ethernet technology.
- CO4. To classify logical addressing mode and introduce internet protocol (IPV4 & IPV6).
- CO5. Illustrate TCP, UDP protocols with configuration implementation of internetworking devices.

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 e-governance, 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-governance: 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.

J. Kaur
J. Kaur

P. U. S.
P. U. S.

S. Sharma
S. Sharma

Jabalpur Engineering College, Jabalpur
(Credit Based Grading System Based Scheme)
Bachelor of Engineering (CBGS) Semester: VIII (Information Technology)

(w.e.f. July 2018)

(w.e.f. July 2018)

Subject Code	Subject Name & Title	Maximum Marks Allotted						Hours/Week			Total Credits
		Theory			Practical		Total Marks	L	T	P	
		End Sem	Mid Sem MST	Quiz, Assignment	End Sem	Lab Work					
ELECTIVE-VI IT8004A	Software Project Management	70	20	10	-	-	100	3	1	-	4

UNIT-I: Introduction and Software Project Planning : Fundamentals of Software Project Management (SPM), Need identification, Vision and Scope document, Project Management Cycle, SPM Objectives, Management Spectrum, SPM Framework, Software Project Planning, Planning Objectives, Project Plan, Types of project plan, Structure of a Software Project Management Plan, Software project estimation, Estimation methods, Estimation models, Decision process.

UNIT-II: Project Organization and Scheduling : Project Elements, Work Breakdown Structure (WBS), Types of WBS, Functions, Activities and Tasks, Project Life Cycle and Product Life Cycle, Ways to Organize Personnel, Project schedule, Scheduling Objectives, Building the project schedule, Scheduling terminology and techniques, Network Diagrams: PERT, CPM, Bar Charts: Milestone Charts, Gantt Charts.

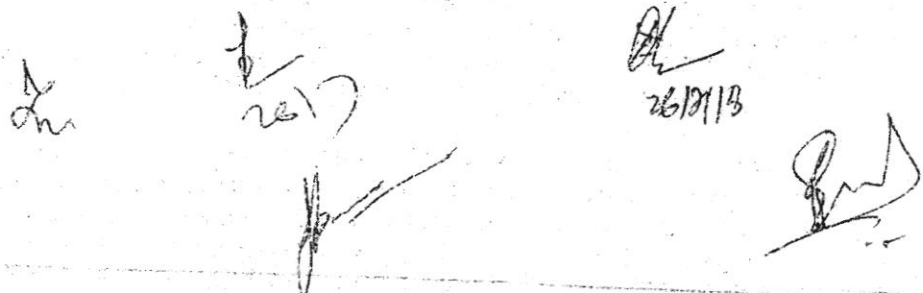
UNIT-III: Project Monitoring and Control : Dimensions of Project Monitoring & Control, Earned Value Analysis, Earned Value Indicators: Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI), Schedule Performance Index (SPI), Interpretation of Earned Value Indicators, Error Tracking, Software Reviews, Types of Review: Inspections, Deskchecks, Walkthroughs, Code Reviews, Pair Programming.

UNIT-IV: Software Quality Assurance and Testing : Testing Objectives, Testing Principles, Test Plans, Test Cases, Types of Testing, Levels of Testing, Test Strategies, Program Correctness, Program Verification & validation, Testing Automation & Testing Tools, Concept of Software Quality, Software Quality Attributes, Software Quality Metrics and Indicators, The SEI Capability Maturity Model (CMM), SQA Activities, Formal SQA Approaches: Proof of correctness, Statistical quality assurance, Cleanroom process.

UNIT-V: Project Management and Project Management Tools : Software Configuration Management: Software Configuration Items and tasks, Baselines, Plan for Change, Change Control, Change Requests Management, Version Control, Risk Management: Risks and risk types, Risk Breakdown Structure (RBS), Risk Management Process: Risk identification, Risk analysis, Risk planning, Risk monitoring, Cost Benefit Analysis, Software Project Management Tools: CASE Tools, Planning and Scheduling Tools, MS-Project.

Books:

1. Software Project Management by M. Cottereli
2. Information Technology Project Management
3. Management Information and Control by
4. Software Engineering – A Practitioner's approach, Roger S. Pressman (5th edi), 2001, MGH
5. Software Project Management, Walker Royce, 1998, Addison-Wesley.
6. Project Management 2/e. Maylor
7. Managing Global software Projects, Ramesh, 2001, TMH.
8. Software Project Management by S. A. Kelkar



 26/11/18

Jabalpur Engineering College Jabalpur, Jabalpur

Department of Information Technology

Semester: VIII SEM

Software Project Management (IT-8004 A)

Course Objectives

- CO1. To study project management cycle and SPM objectives.
- CO2. To understand the project organization and scheduling.
- CO3. To familiarize with the project monitoring and control.
- CO4. To analyze various testing and software quality assurance approaches.
- CO5. To understand the software management and project management tools.

CO\PO	1	2	3	4	5	6
1	*					
2	*		*			
3				*		
4	*	*	*			*
5	*		*			*

