

JABALPUR ENGINEERING COLLEGE, JABALPUR (MP)
(An Autonomous Institute of Govt. of M.P.)
Affiliated to Rajiv Gandhi Technological University, Bhopal (MP)
Scheme of Study and Examination (w.e.f. July 2010)

B.E. Second Year

Branch :Comp.Science Engg.

Sem : Fourth

Course Code	Subject	Periods			EVALUATION SCHEME					Credits
		L	T	P	SESSIONAL EXAM			ESE	SUB TOTAL	
					TA	CT	TOTAL			
IT-04	Computer Architecture	3	1	-	10	20	30	70	100	4
MA-06	Discrete Structure	3	1	-	10	20	30	70	100	4
CS-08	Data Base Management System	3	1	-	10	20	30	70	100	4
IT-06	Principles of Communication	3	1	-	10	20	30	70	100	4
CS-10	Analysis & Design of Algorithms	3	1	-	10	20	30	70	100	4
(PRACTICAL/DRAWING/DESIGN)										
CS-11L	Analysis & Design of Algorithms Lab	-	-	2	20	-	20	30	50	2
CS-09L	Data Base Management System Lab	-	-	2	20	-	20	30	50	2
CS-12L	Dot net Lab	-	-	2	20	-	20	30	50	2
IT-07L	Principles of Communication Lab	-	-	2	20	-	20	30	50	2
CS-45L	Professional Activity	-	-	2	50	-	50	-	50	2
CS-46L	Seminar/Group Discussion	-	-	2	50	-	50	-	50	2
	Total	15	5	12	230	100	330	470	800	32

T.A. Teachers Assessment, CT- Class Test, ESE - End Semester Examination, Total Marks 800

Total Periods : 32, Total Credits : 32

COURSE CONTENT & GRADE

(w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E CS/IT	COMPUTER ARCHITECTURE	IT-04	Min “D”	Min “D”	5.0

COMPUTER ARCHITECTURE

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

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

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

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

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

Text Books:

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

References:

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

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

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E CS/IT	DISCRETE STRUCTURE	MA-06	Min “D”	Min “D”	5.0

DISCRETE STRUCTURE**Unit-I**

Set Theory, Relation, Function Set Theory: Definition of sets, countable and uncountable sets, Venn Diagrams, proofs of some general identities on sets Relation: Definition, types of relation, composition of relations, Pictorial representation of relation, Equivalence relation, Partial ordering relation, Function: Definition, , one to one, into and onto function, inverse function, composition of functions, recursively defined functions, pigeonhole principle. Theorem proving Techniques: Mathematical induction,

Unit-II

Algebraic Structures: Definition, Properties, types: Semi Groups, Monoid, Groups, Abelian group, properties of groups, Subgroup, cyclic groups, Cosets, factor group, Permutation groups, Normal subgroup, Homomorphism and isomorphism of Groups, , Rings and Fields: definition and examples

Unit-III

Propositional Logic : Proposition, first order logic, Basic Logical Operation, truth tables, tautologies, contractions, Algebra of Proposition, logical implications, logical equivalence, predicates, Introduction to finite state machines finite state machines as models of physical system equivalence machines, finite state machines as language recognizers.

Unit-IV

Graph Theory: Introduction and basic terminology of graphs, Planer graphs, Multigraphs and weighted graphs, Isomorphic graphs, Paths, Cycles and connectivity, Shortest path in weighted graph, Introduction to Eulerian paths and circuits, Hamiltonian paths and circuits, Graph coloring, chromatic number, Isomorphism and Homomorphism of graphs.

Unit-V

Posets, Hasse Diagram and Lattices: Introduction, ordered set, Hasse diagram of partially, ordered set, isomorphic ordered set, well ordered set, properties of Lattices, bounded and complemented lattices.

Recurrence Relation and Generating Function: Introduction to Recurrence Relation and Recursive algorithms , Linear recurrence relations with constant coefficients, Homogeneous solutions, Particular solutions, Total solutions , Generating functions , Solution by method of generating functions,

Text Books:

1. C.L.Liu, “Elements of Discrete Mathematics” Tata Mc Graw-Hill Edition.
2. Trembley, J.P & Manohar; “Discrete Mathematical Structure with Application CS”, McGraw Hill.

References:

1. Kenneth H. Rosen, “Discrete Mathematics and its applications”, McGraw Hill.
2. Lipschutz; Discrete mathematics (Schaum); TMH
3. Deo, Narsingh, “Graph Theory With application to Engineering and Computer.Science.”, PHI.
4. Krishnamurthy V; “Combinatorics Theory & Application”, East-West Press Pvt. Ltd., New Delhi.
5. S k Sarkar “ Discrete Mathematics”, S. Chand Pub

COURSE CONTENT & GRADE

(w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E CS/IT	DATA BASE MANAGEMENT SYSTEM	CS-08	Min “D”	Min “D”	5.0

DATA BASE MANAGEMENT SYSTEM

Unit 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.

Unit 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, Integrity constraints.

Unit 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.

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

Unit 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.

COURSE CONTENT & GRADE

(w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E CS/IT	PRINCIPLES OF COMMUNICATION	IT-06	Min “D”	Min “D”	5.0

PRINCIPLES OF COMMUNICATION

Unit I

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

Unit II

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

Unit III

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

Unit IV

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

Unit V

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

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

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E CS/IT	ANALYSIS & DESIGN OF ALGORITHMS	CS-10	Min “D”	Min “D”	5.0

ANALYSIS & DESIGN OF ALGORITHMS

Unit I

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

Unit II

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

Unit III

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

Unit IV

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

Unit V

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

Text Books:

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

References:

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

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

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E CS/IT	ANALYSIS & DESIGN OF ALGORITHMS LAB	CS-11L	Min “D”	Min “D”	5.0

ANALYSIS & DESIGN OF ALGORITHMS LAB**(Suggested Exercise)**

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.
10. Implement all pair shortest paths problem using Floyd's algorithm.
11. Find minimum cost spanning tree for a given undirected graph using Prim's algorithm.
12. Print all the nodes reachable from a given starting node in a given digraph using Depth first search technique.
13. Compute the transitive closure of a given directed graph using Warshall's algorithm.
14. Implement n-Queens problem using backtracking technique.

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

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E CS/IT	DATA BASE MANAGEMENT SYSTEM LAB	CS-09L	Min “D”	Min “D”	5.0

DATA BASE MANAGEMENT SYSTEM LAB (Suggested Exercise)

1. Delete duplicate row from the table.
2. Display the alternate row from table.
3. Delete alternate row from table.
4. Update multiple rows in using single update statement.
5. Find the third highest paid and third lowest paid salary.
6. Display the 3rd, 4th, 9th rows from table.
7. Display the ename, which is start with j, k, l or m.
8. Show all employees who were hired the first half of the month.
9. Display the three record in the first row and two records in the second row and one record in the third row in a single sql statements.
10. Write a sql statements for rollback commit and save points.
11. Write a pl/sql for select, insert, update and delete statements.
12. Write a pl/sql block to delete a record. If delete operation is successful return 1 else return 0.
13. Display name, hire date of all employees using cursors.
14. Display details of first 5 highly paid employees using cursors.
15. Write a database trigger which fires if you try to insert, update, or delete after 7'o' clock.
16. Write a data base trigger, which acts just like primary key and does not allow duplicate values.
17. Create a data base trigger, which performs the action of the on delete cascade.
18. Write a data base trigger, which should not delete from emp table if the day is Sunday.
19. In this subject the students are supposed to prepare a small database application in complete semester like financial accounting system, Railway reservation system, institute timetable management system. Student record system, library management system, hospital management system etc. **in RDBMS** as follows:

Section A:

Solving the case studies using ER datamodel (design of the database)

Section B:

Implement a mini project for the problem taken in section A.

COURSE CONTENT & GRADE

(w.e.f. July 2010)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even Semester
			L	T	
BE ME/IP/CS/IT	DOTNET LAB	CS-12L	Min “D”	Min “D”	5.0

DOTNET LAB

1. Overview of Web-Server, Web-Browser, Websites, Webpages, Html, DHTML
2. Net framework
3. Visual Studio IDE
4. Standard Controls
5. Data Control
6. ADO NET
7. Database Connectivity : Access/SqlServer/Oracle
8. Validation Controls
9. Navigation Controls
10. Login Controls
11. Crystal Report Controls
12. ASP.NET State Management
 - (a) Session Object
 - (b) Application Object
13. Working with Master Page
14. Working with CSS
15. AJAX Extensions
 - (a) Update Panel
 - (b) Update Progress
 - (c) Timer

(Suggested Exercise)

1. Working with call backs and delegates in C#
2. Code access security with C#.
3. Creating a COM+ component with C#.
4. Creating a Windows Service with C#
5. Interacting with a Windows Service with C#
6. Using Reflection in C#
7. Sending Mail and SMTP Mail and C#
8. Perform String Manipulation with the String Builder and String Classes and C#:
9. Using the System .Net Web Client to Retrieve or Upload Data with C#
10. Reading and Writing XML Documents with the XML Text-Reader/-Writer Class and C#
11. Working with Page and form s using ASP .Net
12. Data Sources access through ADO.Net,
13. Working with Data readers , Transactions
14. Creating Web Application

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

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E CS/IT	PRINCIPLES OF COMMUNICATION LAB	IT-07L	Min “D”	Min “D”	5.0

PRINCIPLES OF COMMUNICATION LAB

(Suggested Exercise)

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.

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

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E CS/IT	PROFESSIONAL ACTIVITY	CS-45L	Min “D”	Min “D”	5.0

**PROFESSIONAL ACTIVITY
(Suggested Exercise)**

- Student shall visit a nearby Industry and shall prepare a technical report suggesting some improvement in operation.
- Student shall Design and fabricate a new laboratory equipment. He shall prepare a design report.
- Student shall improve an existing lab equipment and prepare chart or lab manual .
- Student shall publish a review paper in some Indian Journal.
- Student shall make a report on an Industry employing latest technology/ Innovation.
- Student shall prepare a working model of a machine part.
- Student shall make a software/ comp. program for the Institute to enhance efficiency in its working.
- Student shall prepare a detailed project report to start a small-medium enterprise.
- A group of student shall register with the Industry cell and submit a report on work done there about Institute-Industry linkage.
- Experimental work on a new set of equipments.
- Seminar Presentation with a report submitted to the supervisor.

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

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
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B.E CS/IT	SEMINAR/GROUP DISCUSSION	CS-46L	Min “D”	Min “D”	5.0

Objectives of Group Discussion & Seminar is to improve the Mass Communication and Convincing/ understanding skills of students and it is to give student an opportunity to exercise their rights to express themselves.

Evaluation will be done by assigned faculty based on group discussion and power point presentation.