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. Third Year Branch : Computer Science & Engineering Sem :Sixth

Course Code	Subject	Periods			EVALUATION SCHEME					Credits
					SESSIONAL EXAM					
		L	T	P	TA	CT	TOTAL	ESE	SUB TOTAL	
CS-20	Theory of Computation	3	1	-	10	20	30	70	100	4
CS-21	Artificial Intelligence	3	1	-	10	20	30	70	100	4
CS-23	Computer Graphics & Multimedia	3	1	-	10	20	30	70	100	4
CS-25	Wireless & Mobile Computing	3	1	-	10	20	30	70	100	4
CS-27-	Principle of Management & Industrial Organization	3	1	-	10	20	30	70	100	4
(PRACTICAL/DRAWING/DESIGN)										
CS-22L	Artificial Intelligence Lab	-	-	2	20	-	20	30	50	2
CS-24L	Computer Graphics & Multimedia Lab	-	-	2	20	-	20	30	50	2
CS-26L	Wireless & Mobile Computing Lab	-	-	2	20	-	20	30	50	2
CS-28L	Minor Project	-	-	2	20	-	20	30	50	2
CS-48L	Professional Activity			2	50	-	50	-	50	2
CS-49L	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	
BE	Theory of Computation	CS-20	Min "D"	Min "D"	5.0

THEORY OF COMPUTATION

UNIT I : Automata:
Basic machine, FSM , Transition graph, Transition matrix, Deterministic and nondeterministic FSM'S, Equivalence of DFA and NDFA, Mealy & Moore machines, minimization of finite automata, Two-way finite automata.

Regular Sets and Regular Grammars:
Alphabet, words, Operations, Regular sets, Finite automata and regular expression, Myhill- Nerode theorem Pumping lemma and regular sets, Application of pumping lemma, closure properties of regular sets.

UNIT II : Context –Free Grammars:
Introduction to CFG, Regular Grammars, Derivation trees and Ambiguity, Simplification of Context free grammars, Normal Forms (Chomsky Normal Form and Greibach Normal forms).

UNIT III : Pushdown Automata:
Definition of PDA, Deterministic Pushdown Automata, PDA corresponding to given CFG, CFG corresponding to a given PDA.

Context Free Languages:
The pumping lemma for CFL's, Closure properties of CFL's, Decision problems involving CFL's.

UNIT IV : Turing Machines:
Introduction, TM model, representation and languages acceptability of TM Design of TM,Universal TM & Other modification, Church's hypothesis, composite & iterated TM.Turing machine as enumerators.Properties of recursive & recursively enumerable languages,Universal Turing machine

UNIT V: Tractable and Untractable Problems:
P, NP, NP complete and NP hard problems, examples of these problems like satisfy ability problems, vertex cover problem, Hamiltonian path problem, traveling sales man problem, Partition problem etc.

References:-

1.John E. Hopcroft, Jeffery Ullman,"Introduction to Automata theory, Langauges & computation" , Narosa Publishers.
2. K.L.P Mishra & N.Chandrasekaran,"Theory of Computer Science", PHI Learning
3. Michael Sipsev,"Theory of Computation",Cenage Learning
4. John C Martin, "Introdution to languages and theory of computation", McGraw Hill
5. Daniel I.A. Cohen,"Introduction to Computer Theory",Wiley India.
6. Kohavi,"Switching & Finite Automata Theory",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	
BE	**ARTIFICIAL INTELLIGENCE**	CS-21	Min "D"	Min "D"	5.0

ARTIFICIAL INTELLIGENCE

Unit I: Meaning and definition of artificial intelligence, various types of production systems, Characteristics of production systems.

Unit II: Knowledge Representation, Problems in representing knowledge, knowledge representation using propositional and predicate logic, comparison of propositional and predicate logic, Resolution, refutation, deduction, theorem proving, inferencing, monotonic and non-monotonic reasoning.

Unit III: Probabilistic reasoning, Baye's theorem, semantic networks, scripts, schemas, frames, conceptual dependency, fuzzy logic, forward and backward reasoning.

Unit IV: Game playing techniques like minimax procedure, alpha-beta cut-offs etc, planning, Study of the block world problem in robotics, Introduction to understanding and natural languages processing.

Unit V: Introduction to learning, Various techniques used in learning, introduction to neural networks, applications of neural networks, common sense, reasoning, some example of expert systems.

References:-

Rich E and Knight K, "Artificial Intelligence", TMH, New Delhi.
Nelsson N.J., "Principles of Artificial Intelligence", Springer Verlag, Berlin

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	
BE	**COMPUTER GRAPHICS & MULTIMEDIA**	CS-23	Min "D"	Min "D"	5.0

COMPUTER GRAPHICS & MULTIMEDIA

Unit-I Introduction to raster scan displays, Pixels, frame buffer, Vector & Character generation, random scan systems, Graphics Primitives, Display devices, Display file
structure, Scan Conversion techniques, line drawing: simple DDA, Bresenham's Algorithm, Circle Drawing Algorithms. Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms

Unit-II 2D transformation: Translation, Rotation, Scaling, Shearing, Reflection. Inverse Transformation, Homogenous coordinate system, Matrices Transformation, Composite Transformation. Windowing & Clipping: World Coordinate System, Scree Coordinate System,ViewingTransformation, Line Clipping, Cohen Sutherland, Midpoint Line clipping algorithms, Polygon Clipping: Sutherland – Hodgeman, Weiler-Atherton algorithms.

Unit-III 3D transformations: translation, rotation, scaling. Parallel & Perspective
Projection,Types of Parallel & Perspective Projection. Hidden Surface elimination:
Depth comparison, Back face detection algorithm, Painters algorithm, Z-buffer algorithm. Curve generation, Bezier and B-spline methods.

Unit-IV Basic Illumination Model, Diffuse reflection, Specular reflection, Phong Shading Gourand shading, ray tracing, color models like RGB, YIQ, CMY, HSV.

Unit –V Multimedia System: An Introduction, Multimedia hardware, Multimedia System Architecture. Data & File Format standards. i.e RTF, TIFF, MIDI, JPEG, DIB,
MPEG,Audio: digital audio, MIDI, processing sound, sampling, compression. Video: Avi, 3GP,MOV, MPEG , compression standards, compression through spatial and temporal redundancy. Multimedia Authoring **.**

References:-

1. Donald Hearn and M.P. Becker "Computer Graphics" Pearson Pub.
2. Rogers, "Procedural Elements of Computer Graphics", Tata McGraw Hill
3. Folay Vandam, Feiner, Hughes "Computer Graphics Principle & Practice" , Pearson Pub.
4. Sinha and Udai , "Computer Graphics", Tata McGraw Hill
5. Parekh "Principles of Multimedia" Tata McGraw Hill
6. Prabhat k Andleigh, Kiran Thakral , "Multimedia System Design " PHI Pub.
7. Shuman "Multimedia in Action", Cengage Learning

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	
BE	**Wireless & Mobile Computing**	CS-25	Min "D"	Min "D"	5.0

WIRELESS & MOBILE COMPUTING

Unit I: Antenna , variation pattern, antenna types, antenna gain, propagation modes, types of fading. Model for wireless digital communication, multiple access technique-SDMA, TDMA, FDMA, CDMA, DAMA,PRMA, MAC/CA, Cellular network organization, operations of cellular system, mobile radio propogation effects, , handoff, power control, sectorization, traffic engineering, Infinite sources, lost calls cleared, grade
of service, poison arrival process

Unit II: GSM- Services, system architecture, radio interface, logical channels, protocols, localization and
calling, handover, security, HSCSD, GPRS-architecture, Interfaces, Channels, mobility management DECT,
TETRA, UMTS.

Unit III: IEEE 802.11: LAN-architecture, 802.11 a, b and g, protocol architecture, physical layer, MAC layer, MAC management, HIPERLAN-protocol architecture, physical layer, access control sub layer, MAC sub layer. Bluetooth-user scenarios- physical layer, MAC layer.

Unit IV: Mobile IP, DHCP, Ad hoc networks: Characteristics, performance issue, routing in mobile host. Wireless sensor network, Mobile transport layer: Indirect TCP, Snooping TCP, Mobile TCP, Time out Freezing, Selective retransmission, transaction oriented TCP. Introduction to WAP.

Unit V: Intruders, Intrusion detection, password management, viruses and related threads, worms, Trojan horse defense, difference biometrics and authentication system, firewall design principle.

References:-

1. J. Schiller, "Mobile Communication", Addision , Wile
2. William Stalling, "Wireless Communication and Network", Pearson Education
3. Upen Dalal," Wireless Communication", Oxford Higher Education
4. Dr. Kamilo Feher, "Wireless Digital communication", PHI
5. William C.Y Lee, "Mobile Communication Design Fundamental" , John Wiley.

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	
BE	**PRINCIPLE OFMANAGEMENT & INDUSTRIAL ORGANIZATION**	CS-27	Min "D"	Min "D"	5.0

PRINCIPAL OF MANAGEMENT & INDUSTRIAL ORGANIZATION

UNIT I. Introduction: Concept, Development, application and scope of industrial Management. **Productivity:** Definition, measurement, productivity index, types of production system, Industrial Ownership.

UNIT II. Managment Function: Principle of management-Management Tools-time and motion study , work simplicity-process charts and flow diagrams, Production planning, Specification of Production requirements.

UNIT III. Inventory Control: Inventory, cost, Deterministic models, Introduction to supply chain management.

UNIT IV. Quality Control: Meaning, process control SQC control chart, single, double and sequential sampling, introduction to TQM

UNIT V. Environmental Issues: Environmental Pollution- various management techniques to control Environmental pollution-various control acts for Air, Water, Solid waste and Noise pollution.

Reference books

1.Khanna O.P:Industrial Engineering
2.T.R. Banga:Industrial Engineering and Management
3. Sharma B.R: Environmental and Pollution Awareness

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	
BE	**ARTIFICIAL INTELLIGENCE LAB**	CS- 22L	Min "D"	Min "D"	5.0

ARTIFICIAL INTELLIGENCE LAB

LIST OF EXPERIMENTS :

1. Write a program to implementation of DFS
2. Write a program to implement BFS
3. Write a program to implement Traveling Salesman Problem
4. Write a program to implement Simulated Annealing Algorithm
5. Write a program to implement 8 puzzle problem
6. Write a program to implement Tower of Hanoi problem
7. Write a program to implement A* Algorithm
8. Write a program to implement Hill Climbing Algorithm
9. To Study JESS expert system
10. To Study RVD expert system

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	
BE	**COMPUTER GRAPHICS & MULTIMEDIA LAB**	CS-24L	Min "D"	Min "D"	5.0

COMPUTER GRAPHICS & MULTIMEDIA LAB

LIST OF EXPERIMENTS :

1. A brief study of various types of input and output devices.
2. Program to implement a line using slope intercept formula.
3. Program to implement line using dda algorithm.
4 .Program to implement line using bresenham's algorithm.
5. Program to implement circle using mid point algorithm.
6. Program to implement translation of a line and triangle
7. Program to implement rotation of a line and triangle
8. Program to implement scaling transformation.
9. Program to implement 3d rotation about an arbitrary axis .
10. Program to implement cohen sutherland line clipping .
11. Program to implement sutherland hodgman polygon clipping
12. Program to draw bezier curve.
13. Program to draw b-spline curve .

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	
BE	**Wireless & Mobile Computing Lab**	CS-26L	Min "D"	Min "D"	5.0

Wireless & Mobile Computing Lab

LIST OF EXPERIMENTS :

Study of wireless Communications using Communication Trainer Kits
1.a Baseband Communication
1.b. Adaptive Linear Equalizer
1. c. Code Division Multiple Access (CDMA) - Multipath
1. d Code Division Multiple Access (CDMA) – Multiuser
1. e Global System for Mobile Communication (GSM)
(Using WiCOMM-T - Wireless Digital Communication Training system – SDR Platform)
1.f. Spread Spectrum – DSSS Modulation & Demodulation (Using Emona 101 Tranier Kit)
Wireless Path loss Computations - Study of Propagation Path loss Models : Indoor & Outdoor(Using Matlab Programming)
2.a Free Space Propagation – Path Loss Model
2.b Link Budget Equation for Satellite Communication
2.c Carrier to Noise Ratio in Satellite Communication
2.d Outdoor Propagation – Okumura Model
2.e Outdoor Propagation – Hata Model
Antenna Design Concept (using 4NEC2)
3.a Dipole Antennas
3.b Yagi – Uda Antenna – 3 element
3.c Yagi – Uda Antenna – 5 element
3.d Yagi – Uda Antenna – 7 element

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	
BE	**MINOR PROJECT**	CS- 28L	Min "D"	Min "D"	5.0

MINOR PROJECT

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

Course	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
BE	**PROFESSIONAL ACTIVITY**	CS- 48L	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.

Note : The list of activities can be modified as per requirements of the department.

A hand written report of about 30 pages duly signed by the student and the concerned teacher should be submitted.

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

Course	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
BE	**SEMINAR/GROUP DISCUSSION**	CS-49L	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.