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. Fourth Year **Branch: Industrial & Production** **SEM: Eighth**

Course Code	Subject	Periods			EVALUATION SCHEME					Credits
		L	T	P	SESSIONAL EXAM			ESE	SUB TOTAL	
					TA	CT	TOTAL			
IP-41	Management & Entrepreneurship Concept	3	1	-	10	20	30	70	100	4
IP-42	Computer Aided Design	3	1	-	10	20	30	70	100	4
IP-52	Computer Integrated Manufacturing	3	1	-	10	20	30	70	100	4
Refer Table	Elective - II	3	1	-	10	20	30	70	100	4
(PRACTICAL/DRAWING/DESIGN)										
IP- 43L	Computer Aided Design Lab	-	-	2	20	-	20	30	50	2
IP-53L	CIM Lab	-	-	2	20	-	20	30	50	2
IP-55L	MIS Lab	-	-	2	20	-	20	30	50	2
IP-56L	Major Project	-	-	8	80	-	80	120	200	8
IP-57L	Seminar/Group Discussion			2	50	-	50	-	50	2
	Total	12	4	16	230	80	310	490	800	32

T.A. = Teachers Assessment, CT= Class Test, ESE= End Semester Examination
Total Marks= 800, Total Periods= 32, Total Credits= 32

Elective-II					
IP-054A	1. Management Information System	IP-054B	2. Simulation & Modeling	ME-35	3. Power Plant Engineering

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	**MANAGEMENT & ENTREPRENEURSHIP CONCEPTS**	IP-41	Min "D"	-	5.0

MANAGEMENT & ENTREPRENEURSHIP CONCEPTS

Unit I : Management: Importance, definition and functions; schools of theories, BCG matrix, SWOT analysis, steps in decision making, structured and unstructured decision; dimensions of organizations, departmentalization, spam and line of control, technology and Minzberg organization typology, line and staff organization, business process reengineering and process of change management, leader & manager, leadership grid, Maslow's need hierarchy and Herzberg two factor theory, team work and stress management, , HR planning placement and training

Unit II :Marketing: Importance, definition, core concepts of need want and demand, exchange & relationships, product value, cost and satisfaction (goods and services) marketing environment; selling, marketing and societal marketing concepts; four P's, product, price, placement, promotion; consumer, business and industrial market, market targeting, advertising, publicity, CRM and market research.

Unit III : **Finance:** Nature and scope, forms of business ownerships, balance sheet, profit and loss account, fund flow and cash flow statements, breakeven point (BEP) and financial ratio analysis, pay-back period, NPV and capital budgeting.

Unit IV : Intellectual Property System: Introduction, Definition of Intellectual property, Concept of Intellectual Property, Different Types of IP, Intellectual Property Rights (IPR), Benefits of securing IPRs;, Rationale behind Intellectual Property, Enforcement of IPRs, Patent Law in India, Interpretations and Implementations, Copyrights and related rights, Trademarks, Geographical indications, Industrial designs, Trade secrets and layout of Integrated circuits , Indian Legislations for the protection of various types of Intellectual Properties; TRIPs and various provisions in TRIPs Agreement.

Unit V : Entrepreneurship : Definition and concepts, characteristics, comparison with manager, Becoming an Entrepreneur, Need for Entrepreneurship, Benefits of Self-Employment, Who is an Entrepreneur?, Sensing Opportunities- Sources of Idea, Creating Efforts, SWOT Analysis, Entrepreneur and Economy, classification and function of entrepreneurs, sociological and economic theories of entrepreneurship, entrepreneur traits and behavior, roles in economic growth.

References:

1- Daft R; The new era of management; Cengage.
2- Bhat Anil, Arya kumar; Management: Principles ,Processes and Practices; Oxford higher edu.
3- Davis & Olson; Management Information System; TMH.
4- Steven Alter; Information systems, Pearson, www.stevenalter.com
5- Kotler P; Marketing management;
6- Khan, Jain; Financial Management;
7- ILO; Work study; ILO.
8- Mohanty SK; Fundamental of Entrepreneurship; PHI.

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	**COMPUTER AIDED DESIGN**	IP-42	Min "D"	Min "D"	5.0

COMPUTER AIDED DESIGN

UNIT- I Fundamental of CAD, Automation and CAD, Product Cycle & CAD, Introduction to computer Hardware, Design of workstation, Graphics terminal. Operator input & output devices, CPU and Secondary storage. Introduction to computer software and their application.

UNIT- II Computer Aided Drafting - Creating Drawing: Various drawing commands: Line, Pline, Ellipse, Circle, Arc, Hatch, Text, Dimension, Limits, Scale, Grid, Layers, Fill, Snap, Trace, Units, Ortho. Editing Drawing: Various editing commands: Move, Erase, Copy, Zoom, Pan, View, Chamfer, Break, Explode, Extend, Trim, Help, Rotate, Mirror etc.
Other Utilities: Block, Array, Save, Quit, Plot Advanced Features of Auto- CAD: UCS, 3D-line, 3D-Objects, DXF & DXB files.

UNIT–III Geometric modeling- introduction, wire frame model, data structures for computer graphics, Review of vector algebra, lines, circle, ellipses, parabolas, hyperbolas, conics, parametric representation of synthetic curves: hermite cubic splines, bezier curve, b spline curves, rational curves. Curves: Algebraic and geometric forms, tangents and normal, blending functions

UNIT–IV 2D and 3D geometric transformations, homogenous coordinates, translation, rotation, scaling, reflection, shear, and transformations between coordinate systems, affine transformations.3-D geometric transformations, 3-D viewing operations and graphics projections, visual realism, hidden line removal, shading and color models.

UNIT –V Methods to solve engineering problems- analytical, numerical, experimental, their merits and comparison, discretization into smaller elements and effect of size/ shape on accuracy, importance of meshing, boundary conditions, Computer Aided Engineering (CAE) and design, chain-bumping-stages vs concurrent-collaborative design cycles, computer as enabler for concurrent design and Finite Element Method (FEM), degree of freedom (DOF), mechanical systems with mass, damper and spring, stiffness constant K for tensile, bending and torsion; Practical applications of FEA in new design, optimization/ cost-cutting and failure analysis.

Reference Books:

1. Inside Autocad By Ranker
2. CAD/CAM – principle and application By P N Rao, TMH
3. CAD/CAM – Zeid Ibrahim,TMH
4. Practical Finite Element Analysis By Gokhle Nitin
5. Finite Element Analysis, Theory and programming By Krishnamoorthy,TMH

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	**COMPUTER INTEGRATED MANUFACTURING**	IP-52	Min "D"	Min "D"	5.0

COMPUTER INTEGRATED MANUFACTURING

Unit 1 Introduction to CIM: Objectives of CIM, Enterprise wide Integration of CIM Information requirements of manufacturing organizations, Scope of Computer Integrated Manufacturing Business forecasting and aggregate production plan, Production Activity Control (PAC), Manufacturing as a system, Production processes on volume-variety axes, Importance of batch and job shop production, CIM definition and CIM wheel, Evolution and benefits of CIM, Automation, Types of Automation, Advantages of Automation.

Unit II Computer Aided Process Planning (CAPP): Introduction to CAPP, Objectives to CAPP, Introduction to Process Planning, Approaches to Process Planning, Manual Experience-based Process Planning, Computer Aided Process Planning, Approaches to Computer Aided Process Planning, Variant Process Planning, Advantages and Disadvantages, Generative Process Planning, Advantages and Disadvantages, Knowledge-based Process Planning, Feature Recognition in Computer Aided Process Planning, Approaches to Part Feature Recognition, Recent Trends in Computer Aided Process Planning.

Unit III Computer Aided Manufacturing: Introduction to CAM, Numerical Control system, Suitability of NC technology, Need of NC system, Features and classification of NC system, Computer Numerical Control, Features of CNC , Direct Numerical Control, NC words used in part program, Manual and Computer Aided Part Program, APT Programming.

Unit IV Automated Material Handling and Storage: Introduction and Objectives of Automated Material Handling, Principles of Automated Material Handling, Factors considered in selection of automated material handling equipments, Material handling Equipment, Conveyor systems, Cranes and Hoists, Industrial Trucks, Monorail, Automated Guided Vehicle, Automated storage and Retrival System.

Unit V Group Technology: Importance of batch and job shop production, Merits of converting zigzag process layout flow to smooth flow in cellular layout, Production flow Analysis and clustering methods, Concept of part families and coding, Optiz, MIClass and Dclass coding, FMS.

Text Books

1. Roa. P.N. CAD/CAM, Tata McGraw Hill Publishing Co.
2. S.Kant Vajpay, Principles of CIM, PHI Publishing Co.
3. Radhakrishan P.CAD/CAM/CIM, New age Publishing Co.

References

1. Zeid A. CAD/CAM, Tata McGraw Hill Publishing Co.
2. Roa. CAD/CAM, Tata McGraw Hill Publishing Co.

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	**MANAGEMENT INFORMATION SYSTEM**	IP-054A	Min "D"	-	5.0

MANAGEMENT INFORMATION SYSTEM

UNIT-I : Management Information System (MIS): Concept of MIS, Definition, role of Management Information System , Objectives and benefits, MIS as strategic tool, obstacles and challenges for MIS, functional and cross functional systems, hierarchical view of CBIS, structured and unstructured decision, Decision process and MIS, information system components and activities, Value chain and MIS support. Database and data structures.

UNIT-II : System Engineering : System concepts, System control , Types of System, handling System, complexity system, efficiency and effectiveness, classes of system ,data processing system, business function processing system transaction processing system, Integrated information processing system, application processing system ,system analysis, need for system analysis, procedure for analyzing the existing system, work system model and comparison with input-process-output model, five views of work system, knowledge based systems.

UNIT-III : Information and e business technology : Information concepts, classification of information method of data and information collection ,Value of information, information storage and retrieval system ,general model of a human as an information processor, MIS and the Information and knowledge, introduction to e business, models of e business ,MIS in web environment, MIS and e business, Information technology and computer NW support to MIS

UNIT-IV : Planning and control Concepts: concept of corporate planning, dimensions of planning, Essentiality of strategic planning, Development of business strategic, types of strategies, tools of planning,MIS strategic business planning ,(SDLC) system development life cycle ,system investigation, analysis of needs, design and implementation phases, Control and Maintenance of Information Systems.

UNIT-V : Enterprise management System: EMS system concept, Enterprise resource planning(ERP)system ERP models and modules ,benefits of ERP,ERP product Evolution, ERP implementation(ERP) from MRP, information management in SCM, Customer relationship management (CRM),Integrated data model in ER, Business Process Re-Engineering (BPR), significance and functions,.

References

1. Davis and Olson, Management Information Systems, TMH
2. James O' Brian, Management Information Systems, TMH
3. Oz, Management Information Systems, Cengage
4. Alter Stevenson, Information Systems: Foundation of E-Business; (Prentice-Hall,USA)
5. Jayaraman, Business Process Re-Engineering, TMH.
6. Garg. V.K.; ERP, PHI
7. Kelkar SA; Management Information Systems A Concise Study; PHI Learning.
8. Radhakrishnan R and Balasuramanian S; Business Process Reengineering; PHI Learning.
9. Alex Leon ; ERP, TMH
10. Jawadekar WS; MIS- text and cases; TMH

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	**SIMULATION AND MODELING**	IP-054B	Min "D"	-	5.0

SIMULATION AND MODELING

Unit I

Introduction to Modeling and Simulation: Modeling and Simulation methodology, System modeling, Concept of simulation, Gaming, Static, Continuous and discrete event simulation.

Unit II

Basic concept of Probability: Generation and characteristics of random variables, Continuous and discrete variables and their distributions, mapping uniform random variables to other variable distributions, linear, nonlinear and stochastic models.

Unit III

Introduction to Queuing Theory: Characteristics of queuing system, Poisson's formula, Birth death system, Equilibrium of queuing system, Analysis of M/M/1 Queues. Introduction to multiple server. Queue models M/M/C. Application of queuing theory in manufacturing and computer system.

Unit IV

System Dynamics modeling: Identification of problem situation, Preparation of causal loop diagrams and floe diagrams, Equation writing, Level and rate relationship, Simulation of system dynamics models.

Unit V

Verification and Validation: Design of simulation experiments, Validation of experimental models, Testing and analysis. Simulation languages comparison and selection, Study of simulation software, Arena, Pro-model, Simula, Dynamo, Stella, Powersim.

Text Books

1. Law and Kelton W. Simulation Modeling and Analysis, Tata McGraw Hill Publishing Co.
2. Gordon G. System Simulation, PHI Publishing Co.
3. Taha H. Operations Research, PHI Publishing Co.
4. Hiller and Liberman. Operations Research, Tata McGraw Hill Publishing Co.
5. Sushil. System Dynamics, Wiley Eastern Publishing Co.

References

1. Spriet A. Computer Aided Modeling and Simulation, Academic Press INC,USA.
2. Payer T. Introduction to system Simulation, McGraw Hill.

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	**POWER PLANT ENGINEERING**	**ME-35**	Min "D"	-	5.0

POWER PLANT ENGINEERING

Unit I: Introduction to methods of converting various energy sources to electric power, direct conversion methods renewable energy sources, solar, wind, tidal, geothermal, bio-thermal, biogas and hybrid energy systems, fuel cells, thermoelectric modules, MHD-Converter.

Unit II: Fossil fuel steam stations: Basic principles of sitting and station design, effect of climatic factors on station and equipment design, choice of steam cycle and main equipment, recent trends in turbine and boiler sizes and steam conditions, plant design and layout, outdoor and indoor plant, system components, fuel handling, burning systems, element of feed water treatment plant, condensing plant and circulating water systems, cooling towers, turbine room and auxiliary plant equipment.,instrumentation, testing and plant heat balance.

Unit III: Nuclear Power Station: Importance of nuclear power development in the world and Indian context, Review of atomic structure and radio activity, binding energy concept, fission and fusion reaction, fissionable and fertile materials, thermal neutron fission, important nuclear fuels, moderators and coolants, their relative merits, thermal and fast breeder reactors, principles of reactor control, safety and reliability features.

Unit IV: Hydro-Power Station: Elements of Hydrological computations, rainfall run off, flow and power duration curves, mass curves, storage capacity, salient features of various types of hydro stations,component such as dams, spillways, intake systems, head works, pressure tunnels, penstocks,reservoir, balancing reservoirs, Micro and pico hydro machines, selection of hydraulic turbines for power stations, selection of site.

Unit V: Power Station Economics: Estimation and prediction of load. Maximum demand, load factor, diversity factor, plant factor and their influence on plant design, operation and economics; comparison of hydro and nuclear power plants typical cost structures, simple problems on cost analysis, economic performance and tariffs, interconnected system and their advantages, elements of load dispatch in interconnected systems.

References:

1- Nag PK; Power plant Engg; TMH
2- Al-Wakil MM; Power plant Technology; TMH
3- Sharma PC; Power plant Engg; Kataria and sons, delhi
4- Domkundwar; Power Plant Engg; Dhanpatrai & sons.
5- Rajput RK; A text book of Power plant Engg.; Laxmi Publications.
6- Yadav R; Steam and gas turbine and power plant engg by

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	**COMPUTER AIDED DESIGN LAB**	IP-43L	Min "D"	Min "D"	5.0

COMPUTER AIDED DESIGN

List of Experiment (Pl. expand it):

1. Preparation of 2-D drawings using various 2-D commands.
2. Preparation of 3-D drawings for machine components.
3. 3-D modeling - solid, surface, wireframe using standard CAD packages - Assembly of standard
   parts created using 3-D model.
4. Parametric modeling, creating standard machine parts, connecting rod, flange coupling, bearings
5. Analysis of simple machine parts by meshing into finite elements

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	**COMPUTER INTEGRATED MANUFACTURING LAB**	IP-53L	Min "D"	Min "D"	5.0

COMPUTER INTEGRATED MANUFACTURING LAB

Laboratory Assignments:

1. To prepare planning sheet using CAPP from conventional process planning sheet.
2. To study and prepare sheet of G codes for various controllers.
3. To study and prepare sheet of M codes for various controllers.
4. To prepare part programs in APT for various machining operations.
5. To prepare cellular layout from the existing conventional layout,(Industry supported case study).

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	**MIS LAB**	IP-55L	Min "D"	Min "D"	5.0

MANAGEMENT INFORMATION SYSTEM LAB

1. To prepare a report of survey/Study conducted in the industry/office where M.I.S. is implemented.
2. To prepare a report for implementing M.I.S. in the system (Industry/office) where M.I.S. is not Existing, stating clearly Advantages, that will be achieved by the organization by implementing M.I.S.

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	**MAJOR PROJECT**	IP-56L	-	Min "D"	5.0

MAJOR PROJECT

Objectives of the course Minor/Major Project are:

- To provide students with a comprehensive experience for applying the knowledge gained so far by studying various courses.
- To develop an inquiring aptitude and build confidence among students by working on solutions of small industrial problems.
- To give students an opportunity to do some thing creative and to assimilate real life work situation in institution.
- To adapt students for latest development and to handle independently new situations.
- To develop good expressions power and presentation abilities in students.

The focus of the Major Project is on preparing a working system or some design or understanding of a complex system using system analysis tools and submit it the same in the form of a write up i.e. detail project report. The student should select some real life problems for their project and maintain proper documentation of different stages of project such as need analysis market analysis, concept evaluation, requirement specification, objectives, work plan, analysis, design, implementation and test plan. Each student is required to prepare a project report and present the same at the final examination with a demonstration of the working system (if any)

Working schedule The faculty and student should work according to following schedule:
Each student undertakes substantial and individual project in an approved area of the subject and supervised by a member of staff.The student must submit outline and action plan for the project execution (time schedule) and the same be approved by the concerned faculty.

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**	IP-57L	-	Min "D"	5.0