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 : Civil Engineering** **Sem :Sixth**

Course Code	Subject	Periods			EVALUATION SCHEME					Credits
					SESSIONAL EXAM					
		L	T	P	TA	CT	TOTAL	ESE	SUB TOTAL	
CE-28	Geographical Information System	3	1	-	10	20	30	70	100	4
CE-30	Structural Analysis - II	3	1	-	10	20	30	70	100	4
CE-31	Transportation Engg - I	3	1	-	10	20	30	70	100	4
CE-33	Structural Design & Drawing - II (Steel)	3	1	-	10	20	30	70	100	4
CE-35	Environmental Engg. - I	3	1	-	10	20	30	70	100	4
(PRACTICAL/DRAWING/DESIGN)										
CE-32L	Transportation Engg Lab - I	-	-	2	20	-	20	30	50	2
CE-34L	Structural Design & Drawing - II (Steel) Lab	-	-	2	20	-	20	30	50	2
CE-36L	Environmental Engg Lab - I	-	-	2	20	-	20	30	50	2
CE-39L	Minor Project	-	-	2	20	-	20	30	50	2
CE-59L	Professional Activity			2	50	-	50	-	50	2
CE-60L	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)

Course	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
B.E.	**GEOGRAPHICAL INFORMATION SYSTEM**	CE-28	Min "D"	Min "D"	5.0

GEOGRAPHICAL INFORMATION SYSTEM

Unit-I

Definition of GIS, Maps & GIS, Digital representation of Geographic data, Data quality and data standards, Raster and Vector based data processing, Digital Terrain modeling, Spatial analysis and modeling.

Remote sensing, its terminology, Electro magnetic signatures , Atmospheric window . Active and Passive systems for remote sensing. Remote sensing applications.

Unit-II

Principle of Aerial Photograph, Flight planning, Relief displacement of vertical photographs. Stereoscope, Parallax bar , methods of aerial photo visual interpretation keys by this instrument.

Unit- III

Principle of Satellite image procurement, spectral reflectance curves, spatial, spectral, temporal, radiometric resolution characteristics of images. Errors of satellite images & their rectification. methods of visual interpretation of satellite images.

Unit - IV

Projection, different types of projections and applications in image correction. projection used in India. measure of shortest distance between two points on the Earth.

Unit - V

Remote Sensing , Technique used in Resource management (Soil, Water,) & Data Base Management system (Urban & Rural Planning) for Civil Engineering Projects. Global positioning system.

Reference Books :

1. Concept and Principle of Geographical Information system by: W.Yeung
2. Principle of Remote Sensing by Sabins
3. Manual of Remote Sensing by (A.S.R.S.) U.S.A.

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	
B.E.	**STRUCTURAL ANALYSIS - II**	CE-30	Min "D"	Min "D"	5.0

STRUCTURAL ANALYSIS – II

Unit – I : Moment distribution method in analysis of frames with sway, analysis of box frames, analysis of portals with inclined members, analysis of beams and frames by Kani's method.

Unit – II : Plastic analysis of beams and frames.

Unit - III : Analysis of tall frames, wind and earthquake loads, codal provisions for lateral loads. Approximate analysis of multistory frames for vertical and lateral loads.

Unit – IV : Matrix method of structural analysis : force method and displacement method.

Unit - V : Influence lines for intermediate structures, Muller Breslau principle, Analysis of Beam-Columns.

Reference Books :

1. Wang C.K. Intermediate Structural Analysis McGraw Hill New York
2. Kinney Streling J. Indeterminate structural Analysis. Addison Wesley.
3. Reddy C.S. Basic Structural Analysis, Tata Mc Graw Hill Pub. Co. New Delhi
4. Norris C.H. Wilbur J.B. and Utkys Elementary Structural Analysis, MC Graw Hill International Tokyo
5. Weaver W & Gere JM, Matrix Methods of Framed Structures, CBS Pub.& Dis. Delhi

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	
B.E.	**TRANSPOTATION ENGINEERING - I**	CE-31	Min "D"	Min "D"	5.0

TRANSPOTATION ENGINEERING – I

Unit – I : Introduction, Tractive resistances & Permanent way : Principles of Transportation, transportation by Roads, railways, Airways, Waterways, their importance and limitations. Route Surveys and alignment, railway track, development and gauges. Hauling capacity and tractive effort.

1. Rails : types, welding of rails, wear and tear of rails, rail creep.
2. Sleepers : types and comparison, requirement of a good sleeper, sleeper density.
3. Rail fastenings : types, Fish plates, fish bolts, spikes, bearing plates, chain deys, check and guard rails.
4. Ballast : Requirement of good ballast, various materials used as ballast, quantity of ballast. Different methods of plate laying, material trains, calculation of materials required, relaying of track

Unit –II : Geometric Design ; Station & Yards; Points and Crossings & Signaling and interlocking : Formation, cross sections, Super elevation, Equilibrium, Cant and cant deficiency, various curves, speed on curves. Types locations, general equipments, layouts, marshalling yards. Definition, layout details, design of simple turnouts. Types of signals in stations and yards, principles of signaling and inter-locking.

Unit – III : Bridge Site Investigation and Planning ; Loading Standards & Component parts : Selection of site, alignment, collection of bridge design data : essential surveys, hydraulic design, scour depth of bridge foundation, Economical span, clearance, afflux, type of road & railway bridges : Design loads and forces, Impact factor, Indian loading standards for Railways Bridges and Highway Bridges. Bridge super structure and sub-structures, abutments, piers, wing walls, return walls, approaches, floors & flooring system, choice of super structure.

Unit – IV : Bridge Foundations, Construction, Testing and Strengthening of Bridges : Different types of foundation : piles and wells, sinking of wells, coffer-dams. Choice of bridges and choice of materials, details of construction underwater and above water, sheet piles coffer dams, Erection of bridges, girders, equipments and plants, inspection and data collection, strengthening of bridges, Bridge failure.

Unit – V : Tunnels :

1. Selection of route, Engineering surveys, alignment, shape and size of tunnel, bridge action, pressure relief phenomenon, Tunnel approaches, Shafts, pilot shafts.
2. Construction of tunnels in soft soil, hard soil and rock. Different types of lining, methods of lining. Mucking operation, Drainage and ventilation. Examples of existing important tunnels in India and abroad.

Reference Books :

1. Railway Engineering by S.C. Rangwala – Charotar Pub. House, Anand
2. Railway Engineering by Arora & Saxena – Dhanpat Rai & Sons
3. Principles and Practice of Bridge Engineering by S.P. Bindra-Dhanpat Rai & Sons
4. Railway, Bridges & Tunnels by Dr. S.C. Saxena

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	
B.E.	**STRUCTURAL DESIGN & DRAWING – II (STEEL)**	CE-33	Min "D"	Min "D"	5.0

STRUCTURAL DESIGN & DRAWING – II (STEEL)

Unit – I : Various loads and mechanism of the load transfer, partial load factors structural properties of steel, Design of structural connections-Bolted, Rivetted and Welded connections.

Unit – II : Design of compression members, Tension members, Roof Trusses – Angular & Tubular, Lattice Girders

Unit – III : Design of Simple beams Built-up beams, plate girders and gantry girders.

Unit – IV : Effective length of columns, Design of columns- simple and compound , Lacings and battens. Design of footings fro steel structures, Grillage foundation.

Unit – V : Design of industrial building frames, multi-storey frames, Bracings for high rise structures. Design of transmission towers.

NOTE : All the Designs for strength and serviceability should strictly be as per the latest version of IS 800

Reference Books :

1. Design of Steel Structures by Subramanium
2. Design of Steel Structures by Duggle
3. Design of Steel Structures by Bhavi Katti

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	
B.E.	**ENVIRONMENTAL ENGINEERING – I**	CE-35	Min "D"	Min "D"	5.0

ENVIRONMENTAL ENGINEERING – I

Unit – I : Estimation of Ground and surface water resources, quality of water from different sources, demand & quantity of water, fire demand, water requirement for various uses, fluctuations in demand, forecast of population.

Unit – II : Impurities of water and their significance, water-bome diseases, physical, chemical and bacteriological analysis of water, water standards for different uses. Intake structure, conveyance of water, pipe materials, pumps operation & pumping stations.

Unit – III : Water Treatment methods theory and design of sedimentation, coagulation, filtration, disinfection, aeration & water softening, modern trends in sedimentation & filtration, miscellaneous methods of treatment.

Unit - IV : Layout and hydraulic of different distribution systems, pipe fittings, valves and appurtenances, analysis of distribution system. Hardy cross method, leak detection, maintenance of distribution systems, service reservoir capacity and height of reservoir.

Unit – V : Rural water sypply schemes, financing and management of water supply project, water pollution control act, conservancy & water carriage system, sanitary appliance and their operation, building drainage system of plumbing.

Reference Books :

1. Water Supply & Sanitary Engg. By G.S. Birdi-Laxmi publications (p) Ltd. New Delhi
2. Water & Waste Water Technology by Mark J.Hammer Prentice – Hall of India, New Delhi
3. Environmental Engineering – H.S. Paeavy & D.R. Rowe Mc Graw Hill Book Co. New Delhi
4. Water & Waste Water Technology G.M. Fair & J.C. Geyer.

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	
B.E.	**TRANSPOTATION ENGINEERING LAB-I**	CE-32L	Min "D"	Min "D"	5.0

TRANSPOTATION ENGINEERING LAB - I

Suggested Exercise :

1. Collection of different types of photographs showing
   a. Various bridge types
   b. Rail tracks
   c. Tunnels
2. Hydraulic design of bridges .
3. Various modern large span bridges : Pre stressed bridges and launching process.
4. Visit of Railway bridges for rehabilitation.

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	
B.E.	**STRUCTURAL DESIGN & DRAWING Lab – II (STEEL)**	CE-34L	Min "D"	Min "D"	5.0

STRUCTURAL DESIGN & DRAWING Lab – II (STEEL)

LIST OF EXPERIMENTS :

1. Design & drawing of structural connection
2. Design & drawing of members of roof trusses
3. Design & drawing of beams & Plate Girders
4. Design & drawing of build up Columns
5. Design & drawing of Footing

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	**ENVIRONMENTAL ENGINEERING LAB – I**	CE- 36L	Min "D"	Min "D"	5.0

ENVIRONMENTAL ENGINEERING LAB – I

LIST OF EXPERIMENTS :

1. To study the various standards for water
2. To study of sampling techniques for water
3. Measurement of turbidity
4. To determine the coagulant dose required to treat the given given turbid water sample
5. To determine the conc. Of chlorides in a given water samples.
6. Determination of hardness of the given sample.
7. Determination of residual chlorine by Chloroscope.
8. Determination of Alkalinity in a water samples
9. Determination of Acidity in a water samples
10. Determination of Dissolved oxygen (DO) in the water sample.

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**	CE-39L	Min "D"	Min "D"	5.0

Study regarding field data/Laboratory investigating Analysis /Design of the subject related to civil 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	
PTDC	**PROFESSIONAL ACTIVITY**	CE- 59L	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**	CE-60L	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.