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 : Civil** **Sem :Third**

Course Code	Subject	Periods			EVALUATION SCHEME					Credits
					SESSIONAL EXAM			ESE	SUB TOTAL	
		L	T	P	TA	CT	TOTAL			
MA-03	Mathematics - III	3	1	-	10	20	30	70	100	4
CE-05	Engineering Geology	3	1	-	10	20	30	70	100	4
CE-07	Building Drawing & Design	3	1	-	10	20	30	70	100	4
CE-11	Mechanics of Materials	3	1	-	10	20	30	70	100	4
CE-12	Materials of Construction	3	1	-	10	20	30	70	100	4
(PRACTICAL/DRAWING/DESIGN)										
CE-13L	Material Testing Lab	-	-	2	20	-	20	30	50	2
CE-06L	Engineering Geology Lab	-	-	2	20	-	20	30	50	2
CE-08L	Building Drawing & Design Lab	-	-	2	20	-	20	30	50	2
CS-05L	Computer Programming Lab-II	-	-	2	20	-	20	30	50	2
CE-56L	Mechanics of Materials Lab	-	-	2	50	-	50	-	50	2
CE-57L	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	
Civil	**MATHEMATICS- III**	MA03	Min "D"	Min "D"	5.0

MATHEMATICS – III

Unit – I : Fourier Series : Conditions for a fourier expansion, having finite number of discontinuities, change of interval and half- rang series.

Laplace transform and inverse Laplace transform of simple functions, their elementary properties and application in solution of ordinary differential equations.

Unit – II : Analytic functions, Harmonic conjugates, Cauchy-Reimann equations, line integral, cauchy's theorem, Cauchy's integral formula, poles, residues, Residues theorem, evaluation of real integral, Bilinear transformation.

Unit – III : Difference operators, errors and approximation, interpolation (Newtons interpolation formulae, Central interpolation formulae, Lagranges interpolation, Newtons divided difference interpolation – formula inverse interpolation.

Numerical differentiation, maxima and minima.

Unit – IV : Numerical integration by using simpson's method, weddels rule, Gauss-Legendre open quadrature formula.

Solution of algebraic and transcendental equations by using Regula-Falsi, Newton-Rephson, iterative, Graffes root squaring method, Bairstow's method.

Unit – V : Solution of simultaneous algebraic equatins by using gauss elimination, Gauss-Jorden, Crout's jacobbi iterative, Gauss-siedal, Relaxation methods.

Solution of ordinary differential equations (Taylor series, Picard's Modified Euller method, Runge-kutta, predictor corrector method.)

References :

1. Laplace transform, by R.V. Churchill
2. Higher Engineering Mathematics by B.V Ramanna, TMH
3. Advanced Engineering Mathematics by Kreysizig E, willey Eastern Limited.
4. Introductory Methods of Numerical Analysis by S.S. Sastry
5. Higher Engineering Mathematics by B.S.Grewal, Khanna Publishers.

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	
Civil	**ENGINEERING GEOLOGY**	CE05	Min "D"	Min "D"	5.0

ENGINEERING GEOLOGY

UNIT – I : PHYSICAL GEOLOGY :

The Earth as a Planet, important parts of the Earth, Action of Atmosphere, Weathering of Rocks, Principles and processes, Engineering significance of weathering, Geologic Action of wind erosion transportation and deposition, Action of River, Ground water and glaciers. Processes and features with all Engineering consideration.

UNIT – II : MINERALOGY & PETROLOGY :

Study of Rocks : their origin, composition, classification. Detailed study of important Igneous, Sedimentary, Metamorphic Rocks with Rock cycle. Bowens reaction series, distribution of rocks on Indian sub continent. Civil Engineering importance of Rock forming minerals , Study of Minerals with their importance, hand specimen properties. distribution of some economic minerals on Indian sub continent.

UNIT – III : STRUCTURAL GEOLOGY :

Structural features of rocks, Folds, Faults, Joints, Lineaments, Mountains, valleys. terminology, classification, their Engineering properties for Civil Engineering considerations. Earth quakes : Their causes,

UNIT – IV : REMOTE SENSING, GIS & ITS APPLICATION :

Remote Sensing technology, E.M.S., Spectral signatures , its Applications in Civil Engineering, Geographical information system, data base management, use of Remote sensing in G.I.S. for soil, rock, site selection purposes.

UNIT – V : APPLIED GEOLOGY :

Study of major and minor structures of Civil Engineering like Dam ,Tunnel, Bridges, Culvert, Roads. their terminology, classification, different causes for failure, Geological considerations different methods for sub- surface, surface, aerial, satellite investigations for site selection of such structures.

References :

1. Engineering Geology by Kranine & Jade
2. Engineering Geology by Pravin Singh
3. Physical and Engineering Geology by S.K.Garg

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	
Civil	**BUILDING DRAWING & DESIGN**	CE07	Min "D"	Min "D"	5.0

BUILDING DRAWING & DESIGN

UNIT-I : Components of a building and their functions. Drawing & dimensions of various types of foundations, doors, windows, ventilators, lintels, chhajjas, stairs, trusses.

UNIT-II : Basics of building planning : Orientation, sun diagram. Principles of building planning viz aspect, prospect, roominess, Grouping, elegance etc, building lay-out. Energy Efficient buildings, principle of architectural composition (i.e. unit, scale, contest etc.)

UNIT-III : Percentage built up area concept, FAR, open area, set backs, height of buildings, municipal bye laws National building code and its important provisions. Preparation of submission drawing. Basics of colony planning. Fire safety measures.

UNIT-IV : Planning of residential buildings on different sizes of plots including plan, elevation sectional elevation. drawing to show all dimensions of various components of buildings. health buildings.

UNIT-V : Planning of school & Hostel buildings including drawings selection of site and salient features related to dimensions of each components of these buildings.

References :

1. Building planning, Designing & scheduling by Gurcharan Singh & Jagdish Singh
2. Building Design & Drawing by Shah, Kale & Patki
3. Building Design & Drawing by Malik & Meo
4. Building Construction by B.C. Punamia
5. Estimating & Costing by B.N. Datta

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	
Civil	**MECHANICS OF MATERIALS**	CE11	Min "D"	Min "D"	5.0

MECHANICS OF MATERIALS

Unit 1 ***Simple Stress and Strains:*** Concept of Elastic body, stress and Strain, Hooke's law, Concept of stress and strains & their relationships, Fatigue and thermal stresses, Creep. Equilibrium equations, Elastic constants, Stresses in compound bars, composite and tapering bars, Complex Stress and Strains: Two dimensional and three dimensional stress system. Normal and tangential stresses, Principal Planes, Principal Stresses and strains, Mohr's circle of stresses and strain, Combined Bending and Torsion, Theories of failure.

Unit 2 ***Bending & Deflection:*** Theory of simple bending: Concept of pure bending and bending stress, Equation of bending. Neutral axis, Section-Modulus, Determination of bending stresses in
simply supported, Cantilever and Overhanging beams subjected to point load and uniformly distributed loading. Bending & shear stress distribution across a section in Beams.

UNIT 3 ***Deflection of beams:*** Double Integration Method. Conjugate Beam Method, Macaulay's Method Area Moment Method. Unit load method : Strain Energy in direct stress, bending and shear. Theory of Plates and Shells, Introduction to theory of elasticity and photo-elasticity.

Unit 4 ***Torsion of Shafts:*** Concept of pure torsion, Torsion equation, Determination of shear stress and angle of twist of shafts of circular section, Hollow shafts,
Open and closed coil springs, Leaf Spring, Helical Spring, Pressure Vessels: Thin and Thick walled cylinders and spheres. Stress due to internal pressure, Change in diameter and volume, Compound cylinders and shrink fittings. Stresses in thin, thick cylinders and rotating discs.

Unit 5 ***Unsymmetrical Bending:*** Principal moment of Inertia, Product of Inertia, Bending of a beam in a plane which is not a plane of, symmetry. Concept of shear flow and shear centre. Curved beams: Pure bending of curved beams of rectangular, circular and trapezoidal sections, Stress distribution and position of neutral axis.

Columns and Struts: Euler's buckling load for uniform section, various end conditions, slenderness Ratio, Stress in columns, Rankine formulae, Eccentric loading on columns. Combined Stresses and Bending

Reference

1. E.P. Popov, Engineering Mechanics of Solids, 2nd Ed., Prentice Hill, New Delhi, 1999.
2. F.P. Beer, E.R. Johnston and J.T. DeWolf, Mechanics of Materials, 3rd Ed., Tata McGraw Hill, New Delhi, 2004.
3. I.H. Shames and J.M. Pitarresi, Introduction to the Solid Mechanics, 3rd Ed., Prentice Hill, New Delhi, 1989.
4. J.M. Gere, Mechanics of Materials, 5th Ed., Brooks/Cole, Chennai, 2001. S.H. Crandall, N.C. Dhal and T.J. Lardner,
5. Mechanics of Solids: An Introduction, McGraw Hill, Tokyo, 1994. S.M.A. Kazimi, Solid Mechanics, Tata McGraw-Hill, New Delhi, 1981.
6. Nash; Strength of Materials (Schaum), TMH.
7. Ramamrutham; Strength of Materials, ,
8. Subramaniam; Strength of Materials; R; Oxford

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	
Civil	**MATERIAL OF CONSTRUCTION**	CE12	Min "D"	Min "D"	5.0

MATERIAL OF CONSTRUCTION

Unit – I

Stones : Occurrence, varieties, characteristics and engineering properties, bricks and tieles : Manufacturing, characteristics, classification and uses, Alternate fuels for burning, fly ash bricks.

Mortars : Lime, cement and surkhi mortars

Timber : Engineering properties of timber & uses, defects in timber, seasoning and treatment, need for wood substitutes.

Unit – II

Concrete : Concrete making materials : High strength concrete and light weight concrete, concrete admixtures, new materials to enhance durability of special concrete, Design of concrete mixes, Dam proofing materials, types of concrete, Different types of steel.

Unit – III

Building Construction : An index of building components and their functions, selection of site, preliminary investigations, trail pit borings and sounding, shoring, under pinning and scaffolding.

Foundation : Types of soil bearing capacity improvement of bearing capacity, settlement and safe limits, types of foundation: cause of failure and remedial measures timbering for trenches dewatering of foundation.

Unit – IV

Masonry & Walls : Brick masonry, bonds jointing, stone masonry, casting and laying, masonry construction, Brick cavity walls, code provisions regarding load bearing and non load bearing walls. Common defects in construction and their effects on strength and performance of walls. Pre cast stone masonry blocks, hollow cone blocks plastering and pointing, dampness and its protection.

Floors and Roofs : Types, construction, floor finishes, Different types of roofs, false ceiling, water proofing.

Unit – V

Doors, Windows and ventilators : Types based on materials etc, size location fittings construction sun shades, sills and jambs, RCC doors / windows frames. Staris types rule of proportionality.

Services : Water supply, drainage, Electrification fire protection, thermal insulation Air conditioning. Acoustics & sound insulation.

Book References :

1. Advance in Building Materials & Construction, Mohan Rai & M.P. Jai Singh.
2. Engineering Materials, S.C. Rangwala
3. Building Construction, Sushil Kumar
4. Building Construction, B.C. Punamia
5. Building Construction, Mitchell
6. Engineering Materials, Surerndra Singh

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	
Civil	**MATERIAL TESTING LAB**	CE13L	Min "D"	Min "D"	5.0

MATERIAL TESTING LAB
(Suggested Exercise)

List of Experiments

The experimental work to cover tension, compression, bending and impact test etc. on steel, cast iron, RCC and timber, Fire Resistant Test of Structures and Combustibility of Building Materials Test as per I.S.I. and other experiments based on the syllabus.

1. Tests on Bricks (conduct all the tests on a brick sample)
2. Conduct all the tests on cement sample.
3. Conduct all the tests on a coarse aggregates sample.
4. Conduct all the tests on fine aggregates sample.
5. Conduct tests on fresh concrete.
6. Design of concrete mixed M15, M20, M25, M30
7. Design of concrete mixed M40, M50, M60 with the help of suitable super plasticizer and chemical admixture
8. Conduct on all test on reinforcing bars.
9. Study of Non-destructive testing equipments

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	
Civil	**ENGINEERING GEOLOGY LAB**	CE06L	Min "D"	Min "D"	5.0

ENGINEERING GEOLOGY LAB
(Suggested Exercise)

1. Identify the given minerals sample for the following :
"HAND SPECIMEN" Mega-scopic Identification on the basis of physical properties .
   i. Rock forming minerals
   ii. Ore forming minerals
   iii. Gangue minerals

2. Identify the given rock sample for the following :
"HAND SPECIMEN" Mega-scopic Identification on the basis of physical properties
   i. Igneous rocks
   ii. Sedimentary rocks
   iii. Metamorphic rocks

3. Study the given geological maps for the following :

i. Topography - Configuration of the ground surface with the help of (dotted lines) contours drawn at a regular interval.
ii. Geologic rock boundaries (dark continuous lines.) superimposed on geographic map.
iii. Inter relationship of different rock types with each other i.e. unconfornities, sequence etc.
iv. Structural feature of the rock formations in the form of folds, faults igneous intrusions etc.

4. Use the given geological map for the site selection of a Dam, Bridge, Canal & Tunnel.

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	
Civil	**BUILDING DRAWING & DESIGN LAB**	CE08L	Min "D"	Min "D"	5.0

BUILDING DRAWING & DESIGN LAB
(Suggested Exercise)

1. Drawing of various types of foundations.
2. Drawing of various types of foundations door, window, ventilators, stair case
3. Drawing of plan section & elevation of simple four Roomed building
4. Planning & Drawing of residential building
5. Planning & Drawing of simple health building
6. Planning & Drawing of school
7. Planning & Drawing of Hostel
8. Planning & Drawing of Shopping complex.

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	
Civil	**COMPUTER PROGRAMING LAB-II**	CS05L	Min "D"	Min "D"	5.0

Introduction

- Creation of Java, importance of Java to internet, Java buzzwords
- JVM –The heart of Java
- Java's Magic Bytecode

Language Fundamentals

- The Java Environment:
- Installing Java.
- Java Program Development
- Java Source File Structure
- Compilation
- Executions.
- Basic Language Elements:
- Lexical Tokens,Identifiers
- Keywords,Literals, Comments
- Primitive Datatypes,Operators
- Assignments.
- Console Input and output in java
- Branch control and loop control statements

Object Oriented Programming

- Class Fundamentals.
- Object & Object reference.
- Creating and Operating Objects.
- Constructor & initialization code block.
- Use of Modifiers with Classes & Methods.

Extending Classes and Inheritance

- Use and Benefits of Inheritance in OOP
- Types of Inheritance in Java
- Inheriting Data Members and Methods
- Interfaces.

Exception Handling:

- The Idea behind Exception
- Exceptions & Errors
- Types of Exception
- Use of try, catch, finally, throw, throws in Exception Handling.

Thread :

- Understanding Threads
- Needs of Multi-Threaded Programming.
- Thread Life-Cycle

Applet

- Applet & Application
- Applet Architecture.
- Embedding Applets in Web page.

GUI Programming

- Components and Containers
- Basics of Components
- Using Containers
- Layout Managers
- AWT Components

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	
Civil	**MECHANICS OF MATERIALS LAB**	CE56L	Min "D"	Min "D"	5.0

The experimental work to cover tension, compression, bending & impact test etc. on steel, cast iron, RCC & timber. Fire resistant test of structures & combustibility of building materials tests as per ISI & other experiments based on the syllabus.

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	
Civil	**SEMINAR/GROUP DISCUSSION**	CE57L	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.