JABALPUR ENGINEERING COLLEGE, JABALPUR (M.P.)

Choice Based Credit System (CBCS)

Scheme of Examination w.e.f.

Bachelor of Engineering (Civil Engineering)

SEMESTER III

S.No	Subject Category	Subject Code	Subject Name	Maximum Marks Allitted									Hours / Week			Total Credits
				Theory						Practical						
				End Sem	Minor I	Minor II	Quiz	Assignments / Tutorials / Problem Solving		End Sem	Lab Work	Viva Voce / Assignments	L	T	P	
1	BS	MA-231	MATHEMATICS -III	60	10	10	5	5	10				3	1		4
2	DC	CE-232	STRENGTH OF MATERIALS	60	10	10	5	5	10	10	20	20	2	1	2	4
3	DC	CE-233	BUILDING MATERIAL & CONSTRUCTION	60	10	10	5	5	10	10	20	20	3	0	2	4
4	DC	CE-234	BUILDING DRAWING & DESIGN	60	10	10	5	5	10	10	20	20	2	1	2	4
5	DC	CE-235	ENGINEERING GEOLOGY	60	10	10	5	5	10	10	20	20	3	0	2	4
6	HU	HU-236	COMMUNICATION SKILLS	60	10	10	5	5	10	10	20	20	1	0	2	2
7		CE-237	OBJECT ORIENTED PROGRAMMING									50			4	2
8		CE-238	LEARNING THROUGH EXPERTS									50		2		2
			TOTAL	360	60	60	30	30	60	50	100	150	14	5	14	26

L : Lecture T : Tutorial P : Practical

Note :

1 End Sem Theory Exam Min.Pass Marks 19 out of 60 and,4out of 10 for Practical Exam

2 For ' Idea Generation ', Learning through Experts';there will be no examination and credits will be awarded only on the basis of internal assessment.

3 For Material Science , 60% content will be common to all disciplines and 40% content will be based on parent discipline.

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B.E. THIRD SEMESTER (Civil, Mechanical and Industrial & Prod. Engineering)						
COURSE CONTENT						
SUB. CODE	SUB. NAME	L	T	P	MAX. MARKS	CREDITS
MA-231	Mathematics- III	3	1	0	60	4

Analytic functions, Cauchy- Reimann equations in Cartesian and polar coordinates, harmonic and conjugate harmonic functions, Complex integration, line integral, Cauchy's integral theorem, Cauchy integral formula.

Residue theorem, evaluation of simple real integrals, Taylors and Laurent series, Conformal mappings, mappings of elementary functions, Bilinear transformations, Joukvowaski's transformation, Schwarz - Christoffel transformation.

Roots of algebraic and transcendental equations: Bisection method, Regula-Falsi method, Newton-Raphson method, iteration method, Graffes root squaring method.

Solution of system of linear equations: Gauss elimination method, Gauss Jordan method, LU composition method, relaxation method, Jacobi and Gauss-Seidel methods.

Interpolation: Finite difference operator and their relationships, difference tables, Newton, Gauss, Bessel and Stirling's interpolation formulae, Divided differences, Lagrange Interpolation and Newton's divided difference interpolation.

Numerical differentiation and Integration: First and second order derivatives by various interpolation formulae, Trapezoidal, Simpsons 1/3rd and 3/8th rules with errors and their combinations, Gauss Legendre 2-points and 3-points formulae.

Numerical Solution of ordinary differential equations: Solution of ODE by Taylor series, Picard's method, Modified Euller method, Runge-kutta Method, predictor corrector method.

Sampling: Brief idea of sampling, t, F and χ^2 distribution and their applications, ANOVA, Statistical quality control, control charts, sampling inspection, acceptance sampling, Producers and consumers risk, O.C. curve, Taguchi method.

Reference Books :

1. Advanced Engineering Mathematics by E. Kreyszig John Willey & Sons
2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
3. Numerical Methods in Engineering and science by B.S. Grewal, Khanna Publishers .
4. Higher Engineering Mathematics by B.V. Ramana TMH.
5. Numerical Methods by E. Balagurusamy, Tata Mc Graw- Hill Publishing CompanyLtd., New Delhi.

14/06/2014 14/06/16 14/6/16

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B.E. III Semester

Branch	Subject Title	Subject Code	Hours/week			Total Credits
			L	T	P	
Civil Engg.	Strength of Materials	CE-232	2	1	2	4

STRENGTH 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

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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

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B.E. III Semester

Branch	Subject Title	Subject Code	Hours/week			Total Credits
			L	T	P	
Civil Engg.	BUILDING MATERIALS & CONSTRUCTION	CE-233	~~2~~ 3	~~1~~ —	2	4

BUILDING MATERIALS, 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

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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

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B.E. III Semester

Branch	Subject Title	Subject Code	Hours/week			Total Credits
			L	T	P	
Civil Engg.	Building Drawing & Design	CE-234	2	1	2	4

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

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Branch	Subject Title	Subject Code	Hours/week			Total Credits
			L	T	P	
Civil Engg.	ENGINEERING GEOLOGY	CE-235	3	—	2	4

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

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COURSE CONTENT & GRADE (w.e.f. July 2016)

Branch	Subject Title	Subject Code	Grade for End Sem		CGPA at the end of every even semester
			T	P	
BE III	COMMUNICATION SKILL	CHU-236	Min "D"	Min "D"	5.0

COMMUNICATION SKILL

Max:60

Course Objectives:

- **Student will be able to learn and understand the four major Skills of Communication i.e. LSRW (Listening, Speaking, Reading and Writing)**
- **Student will be able to write effective job application to show employers that they deserve to be shortlisted for an interview**
- **Student will be able to meet high professional expertise with the help of much developed written and communication skills**
- **Students' comprehension skills will be enhanced.**

Constituents of Technical Communication: Fundamental of Grammar usage, Requisites of Sentence Construction, Proper Use Tenses; antonyms, idioms and phrases, synonyms, homophones; The art of Condensation, Paragraph Development Techniques, Writing Bibliography and References

Basics of Technical Communication: Distinction between Technical and General Communication, Flow of Communication, 7 C's of Effective Communication, Overcoming the Barriers to Communication, Role of Feedback in communication.

Listening and Reading Skills for Effective Communication: Importance of Listening in Communication, Difference between Listening and Hearing, Types of Listening. Techniques of Reading, SQ3R, Proof Reading.

Developing Oral Communication: Interpersonal Communication, Facilitators and Impediments of interview and Group Discussion, Presentation Strategies: Defining Purpose, Organizing Contents, Preparing Outline, Audio-Visual Aids, Nuances of Delivery, Importance of Paralanguage and Kinesics in Communication, Audience Awareness, Setting and Achieving Goals

Written Communication: Writing Curriculum Vitae, Letter and Cover Letter and job Application; Letter Components and Layouts, Principles of Effective Letter Writing, E-mail etiquettes, Notice Agenda and Minutes, Writing Proposals: Nature and Significance, Types of Proposals, Parts of a Formal Proposal; a brief recap of Formats of Report Writing.

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