Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonepat)
SCHEME OF STUDIES & EXAMINATIONS
B.Tech. 2nd YEAR (SEMESTER – III: CIVIL ENGINEERING)
Credit Based Scheme w.e.f. 2013-14

S. No.	Course No.	Course Title	Teaching Schedule L	T	P/D	Marks of Class work	Examination Marks Theory	Practical	Total	Credit	Duration of Exam
1	GES 201 B OR MGT 201B	ENVIRONMENTAL STUDIES **FOR GROUP 'B'** OR ENGINEERING ECCONOMICS COMMON **FOR ALL BRANCHES EXCEPT BT & BME GROUP 'A'**	3 4	- -	- -	- 25	75* 75	- -	75* 100	- 4	3 3
2	CE 201B	STRENGTH OF MATERIALS	3	1	-	25	75	-	100	4	3
3	CE 203B	SURVEYING	3	1	-	25	75	-	100	4	3
4	CE 205B	FLUID MECHANICS	3	1	-	25	75	-	100	4	3
5	CE 207B	BUILDING CONSTRUCTION AND DRAWING	3	-	3	25	75	-	100	4.5	3
6	CE 209B	BUILDING MATERIALS	3	1	-	25	75	-	100	4	3
7	CE 211B	STRENGTH OF MATERIALS LAB	-	-	2	20		30	50	1	3
8	CE 213B	SURVEYING LAB	-	-	2	20		30	50	1	3
9	CE 215B	FLUID MECHANICS LAB	-	-	2	20		30	50	1	3
10	GES 203B	ENVIRONMENTAL STUDIES COMMON FOR ALL BRANCHES FIELD WORK GROUP 'B'	-	-	-	-	-	25	25*	-	
11	ME217	WORSHOP COMMON FOR ALL BRANCHES EXCEPT BT & AE	-	-	2*	50	-	-	50	2	
		Total Group B	**18**	**4**	**11**	**235**	**375**	**115**	**725**	**25.5**	
		Group A	**19**	**4**	**11**	**260**	**450**	**115**	**825**	**29.5**	

Note:

1 **Every student has to participate in the sports activities. Minimum one hour is fixed for sports activities either in the morning or evening. Weightage of Sports is given in General Proficiency Syllabus.**
2 **The Environmental studies (GES-201 B) & Environment Studies Field work (GES-203B) are compulsory & qualifying courses.**
3 **The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator is prohibited in the examination.**
4 **Electronics gadgets including Cellular phones are not allowed in the examination**
5. * Assessment of workshop training undergone in summer vacations at the end of second semester will be based on seminar /viva voce/report and certificate of workshop training by the students from in house workshop

GES 201B ENVIRONMENTAL STUDIES

B. Tech. Semester – III/IV (Common for all Branches)

L	T	P	Credit			
				Examination	:	75Marks
3	--	--	0	Total	:	75 Marks
				Duration of Examination	:	3 Hours

UNIT – I **The Multidisciplinary nature of environmental studies, Definition, scope and importance.**

Need for Public awareness

UNIT – II **NATURAL RESOURCES:**

Renewable and non-renewable

resources: Natural resources and

associated problems.

a) **Forest resources: Use and over-exploitation: deforestation, case studies, Timber exploitation, mining, dams and their effects and forests tribal people.**
b) **Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.**
c) **Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.**
d) **Food resources: World food problems, changes, caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.**
e) **Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources; case studies.**
f) **Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification.**
   - **Role of an individual in conservation of natural resources.**
   - **Equitable use of resources for sustainable lifestyles.**

UNIT- III **ECOSYSTEMS:**

- **Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids.**
- **Introduction, types, characteristic features, structure and function of the following eco-system:**
  a) Forest ecosystem, Grassland ecosystem, Desert ecosystem.
  b) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

UNIT- IV **BIODIVERSITY AND ITS CONSERVATIONS:**

- **Introduction – Definition: Genetic, species and ecosystem diversity.**
- **Biogeographically classification of India.**

- **Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values.**
- **Biodiversity at global, National and local levels.**
- **India as a mega-diversity nation.**
- **Hot-spots of biodiversity.**
- **Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts.**
- **Endangered and endemic species of India.**

UNIT – V ENVIRONMENTAL POLLUTION:

Definition, causes, effects and control, measures of:

Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal Pollution, Nuclear hazards

1. **Solid waste management: Causes effects and control measures of urban and industrial wastes.**
2. **Role of an individual in prevention of pollution.**
3. **Pollution case studies.**
4. **Disaster management: Floods, earthquake, cyclone and landslides.**

UNIT – VI SOCIAL ISSUES AND THE ENVIRONMENT:

a) **From unsustainable to sustainable development**
b) **Urban problems related to energy**
c) **Water conservation, rain water harvesting, watershed management**
d) **Resettlement and rehabilitation of people; its problems and concerns, case studies**
e) **Environmental ethics: Issues and possible solutions**
f) **Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, Case studies**
g) **Wasteland reclamation, Consumerism and waste products**
h) **Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act**
i) **Issues involved in enforcement of environmental legislation, Public awareness**

UNIT – VII Human population and the Environment., Population growth, variation among nations.

Population explosion – Family Welfare Programme, Environment and human health, Human Rights, Value Education, HIV/ AIDS, Woman and Child Welfare. Role of Information Technology in Environment and human health. Case Studies.

REFERENCES:

1. **Agarwal, K.C. 2001, Environmental Biology, Nidi Pub. Ltd. Bikaner.**
2. **Bharucha, Franch, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380013, India .**
3. **Brunner R.C. 1989, Hazardous Waste Incineration, Mc. Graw Hill Inc. 480p.**
4. **Clark R.S., Marine Pllution, Slanderson Press Oxford (TB).**
5. **Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Pub. House, Mumbai. 1195p.**
6. **De A.K., Environmenal Chemistry, Wiley Eastern Ltd.**
7. **Down to Earth, Centre for Science and Environment ®.**
8. **Gleick, H.P., 1993. Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security, Stockholm Env. Institute, Oxford Univ., Press 473p.**
9. **Hawkins R.E. Encyclopedia of Indian Natural History, Bomaby Natural History Scociety, Bombay (R).**
10. **Heywood, V.H. & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press 1140p.**

11. Jadhav, H & Bhosale, V.M. 1995, Environmental Protection and Laws, Himalaya Pub. House, Helhi 284p.
12. Mckinney, M.L. & Schoch, RM 1996, Environmental Sciences Systems & Solutions, Web enhanced Edition 639p.

13. Mhaskar A.K., Mater Hazardous, Tekchno-Sciences Publications (TB).
14. Miller T.G. Jr. Environmental Science, Wadsoworth Publishing Co. (TB).
15. Odum, E.P. 1971, Fundamentals of Ecology, W.B. Saunders Co. USA, 574p.
16. Rao M.N. & Dutta, A.K. 1987, Waste Water Treatment. Oxford & IBH Publ. Co. Pvt. Ltd., 345p
17. Sharma, B.K., 2001, Environmental Chemistry, Goel Publ. House, Meerut.
18. Survey of the Environment, The Hindu (M).
19. Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Sciences (TB).
20. Trivedi, R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II Enviro Mdiea (R).
21. Trividi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol I and II Enviro Media (R).
22. Trividi R.K. and P.K. Goel, Introduction to air pollution, Techno Sciences Pub. (TB).
23. Wagner K.D., 1998, Environmental Management, W.B. Saunders Co. Philadelophia, USA 499p.
24. A text bok environmental education G.V.S. Publishers by Dr. J.P. Yadav.

(M) Magazine (R) Reference (TB) Textbook

Note: 1. Examiner will set eight questions. Students will be required to attempt five Questions.

2. The awards of this paper shall not be counted in the award of the Degree/DMC.

CE – 201B: STRENGTH OF MATERIALS

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits			
				Class Work	:	25 Marks
3	1	--	4	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT - I

Introduction: Concept of Equilibrium General Equilibrium equations, concept of free body diagrams , Concept of stress and strain, generalized Hooke's law, Stress-strain diagram of ductile and brittle material, compound and composite bars, thermal stresses, Analysis of Principal stresses and Strains, Mohr's stress circle, Relationship among elastic constants.

Shear force and Bending moment diagrams: Types of load on beam and frames, classification of beams, statically determinate and indeterminate problems, shear force and bending moment diagrams: simply supported, overhung and cantilever beams subjected to any combination of point loads, uniformly distributed and varying load and moment, relationship between load, shear force and bending moment.

UNIT – II

Theory of pure bending: Centroid of simple and built up section, second moment of area, derivation of flexural formula for straight beams, bending stress calculation for beams of simple and built up section, RCC beams.

Shear Stresses in Beams: Shear stress formula for beams, shear stress distribution in beams. UNIT – III

Torsion of Circular shafts: Basic assumptions, torsion formula, power transmitted by shafts, design of solid and Hollow shafts based on strength and stiffness.

Columns & Struts: Column under axial load, concept of instability and buckling, slenderness ratio, derivation of Euler's formulae for the elastic buckling load, Eulers, Rankine, Gordon's formulae Johnson's empirical formula for axial loading columns and their applications, eccentric compression of a short strut of rectangular & circular sections, Numericals.

UNIT - IV

Slope & Deflection: Relationship between bending moment, slope & deflection, Mohr's theorem, moment area method, method of integration, Macaulay's method, calculations for slope and deflection of (i) cantilevers and (ii) simply supported beams with or without overhang under concentrated load, Uniformly distributed loads or combination of concentrated and uniformly distributed loads, Numericals.

Strain energy: strain energy under axial, bending, shear, torsion, gradual, sudden and impact loading, theories of failures

Text Books

1. **Strength of Materials by G H Ryder, ELBS publishers**
2. **Elements of Strength of Materials by Timoshenko & Young, East- West Press, New Delhi**
3. **Mechanics of Materials by Beer and Johnston, Tata McGraw Hill.**
4. **Elementary Structural Analysis, Norris & Wilbur, McGraw Hill Publisher**
5. **Engineering Mechanics Shames**

Reference Books

1. **Strength of Materials by Sadhu Singh, Khanna Publishers**
2. **Basic Structural Analysis, C.S. Reddy, Tata McGraw Hill Publication.**
3. **Fundamentals of Solid Mechanics by M L Gambhir, Prentice Hall of India**
4. **Strength of Materials Ramamurtham and Narayanan, S. Chand & Co.**

5. Fundamentals of Structural Analysis B D Nautiyal, New Age Publishers

Note:

1. **In the semester examination, the examiner will set one question from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.**
2. **The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.**

CE – 203B: SURVEYING
B. Tech. 2nd Year (Semester – III)

L	T	P	Credits			
				Class Work	:	25 Marks
3	1	--	4	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT - I

Introduction to Surveying: Definition, importance, Objectives, Maps, Scale, Principles of survey, Classification of surveys, different techniques of surveying, Chain Surveying: Ranging, Chaining, Offsets, Errors in Chaining, Corrections to length measured with a tape

Compass surveying & Plane Table Surveying: Purpose of compass surveying, Comparison of compass surveying and chain surveying, Dip, Magnetic Declination, W.C.B., Q.B., and R.B Introduction to plane table surveying, principle, instruments, working operations, setting up the plane table, centering, leveling, Orientation, methods of plane table survey, danger circle, Lehmann's Rules, errors in plane tabling.

UNIT - II

Leveling: definitions of terms used in leveling, different types of levels, parallax, staves, adjustments, bench marks, classification of leveling, booking and reducing the levels, rise and fall method, line of collimation method, errors in leveling, permanent adjustments, Two peg test, reciprocal leveling, Corrections to curvature and refraction, setting out grades, longitudinal leveling.

Trigonometric Leveling: Definitions & terms, curvature & refraction Methods: direct & reciprocal, eye and object correction, coefficient of refraction. Contours: Definition, representation of reliefs, horizontal equivalent, contour interval, characteristics of contours, methods of contouring, contour gradient, uses of contour maps.

UNIT - III

Tachometry: Definitions and terms used in tachometry, angular tachometry with staff vertical and staff inclined, Analytic lens theory, Tachometric field work, tangential method of tachometry, subtense method of tachometry, direct reading tachometer.

Theodolite Traversing: types of theodolities, measurement of angles, temporary and permanent adjustments, closed & open traverse, omitted measurements, consecutive and independent co-ordinates, advantages & disadvantages of traversing closing error, Bowditch, Transit rules.

UNIT - IV

Triangulation: Triangulation systems, classification, strength of figure, selection of triangulation stations, grade of triangulation, field work of triangulation, triangulation computations, Introduction to EDM, Total Station and its working, survey adjustment and treatment of observation, adjustment of triangulation figures by method of least squares.

Curves: Definition, elements of a simple curve, different methods of setting out a simple circular curve, elements of a compound curve, reverse curves, transition curves, their characteristics and setting out, vertical curves, setting out vertical curves, sight distances.

Text Books

1. **Surveying by R. Agor, Khanna Publishers, New Delhi**
2. **Surveying-1 by Sanjay Mahajan, Satya Prakashan, New Delhi**
3. **Surveying Vol. I and II by B.C. Punmia, Luxmi Publications, New Delhi**
4. **Syrveying and Levelling by R. Subramanian, Oxford University Press.**

Reference Books

1. **Surveying by N. Singh, Tata McGraw Hill, New Delhi.**
2. **A Text Book of Surveying by C.Venkataramiah, Universities Press, Hyderabad**

Note:

1. **In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.**

2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 205B: FLUID MECHANICS

B. Tech. 2nd Year (Semester – IV)

L	T	P	Credits			
				Class Work	:	25 Marks
3	1	--	4	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT - I

Scope & development of Fluid Mechanics Fluid properties – Density, Specific weight, Viscosity, Kinematic and Dynamic viscosity, Surface tension, Compressibility, Newtonian and Non Newtonian fluids, Types of fluids, capillary action. Kinematics of fluid motion, Classification of flow: Laminar and Turbulent flows, Reynolds experiments. Stream lines, Path lines, Streak lines. Continuity equations in Cartesian coordinates, Rotational and Irrotational flows, Velocity Potential, Stream Function and Flow nets.

UNIT - II

Fluid statics – Absolute and Gauge pressure, Measurement of pressure, Mechanical gauges, Barometers, Piezometers, Simple and Differential manometer, Inclined manometer, and Micro manometer. Hydrostatic forces on plane horizontal, Vertical and Inclined surfaces, Curved surface. Buoyant force, Archimedes principle, Metacentric height, Theoretical and Experimental determination of metacentric height. Stability of floating and submerged bodies, Static fluid subjected to uniform acceleration and fluid rotation about a vertical axis.

UNIT - III

Fluid dynamics and pipe flows – Euler's equation of motion, Bernoulli's equation and its limitations, Momentum equation, Energy and Momentum correction factors, Energy losses in pipe flows, Darcy-Weisbach equation, Estimation of friction factor, Loss at sudden expansion, contraction and bends, Pipe flow computations, Hydraulic gradient and total energy lines, Pipes in series and parallel. Flow measuring devices: Venturimeter and Orifice meters, etc.

UNIT - IV

Laminar flow- Navier stokes equation of motion (no derivation), Laminar flow through pipes, parallel plates, Couttee flow, Flow past a sphere, Stokes law. Boundary layer - development of boundary layer on a flat surface, boundary layer thickness, laminar and turbulent boundary layers, separation of boundary layer and methods for prevention. Drag and lift – Definitions, Pressure drag and Friction drag, Stream line and Bluff bodies, Total drag, Drag at different Reynolds numbers, Profile drag. Drag characteristics of two dimensional bodies, Circulation, Lift and Magnus effect, Lift characteristics of Aerofoils.

Text Books:

1. R. J. Garde and Mirajgaonkar, "Engineering Fluid Mechanics", Nem Chand & Brothers, Roorkee.
2. K L Kumar, "Engineering Fluid Mechanics", Eurasia Publishing House.

Reference Book

1. H. Schlichting, "Boundary Layer Theory", McGraw Hill Publishing Company, New York.

2. **Fox R. W. and McDonald, A T, “Introduction to Fluid Mechanics”, John Wiley Wilson**
3. **Fluid Mechanics Through Problems, R J Garde, Nem Chand & Brothers, Roorkee**
4. **Hydraulics and Fluid Mechanics, P N Modi & S M Seth**
5. **Streeter, V L and Benjamin, W E , “Fluid Mechanics”, McGraw Hill.**

Note:

1. **In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.**

2. **The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.**

CE – 207B: BUILDING CONSTRUCTION AND DRAWING

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits			
				Class Work	:	25 Marks
3	-	3	4.5	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT - I

Components of a building and building specifications, Site preparation and setting out of works, Building layout, Building bye-laws.

Masonry, stone masonry, basic terms, materials for stone masonry, classification, dressing of stones, joints in stone masonry, Brick Masonry, laying tools, basic terms, bonding of bricks, tools, inspection of brickwork, strength of brick work, Cavity walls, features, wall ties, construction of cavity wall, Lintels, classifications, Arches, classification and construction, Temporary works: Formwork and Scaffolding, Drawings.

UNIT - II

Doors & windows: Introduction, location in buildings, basic terms, standard sizes, size of timber, types of doors, fittings for doors, door frames, types of doors, types of windows, standard sizes of windows, drawings

Roofs & roof coverings: types of roofs, pitched roofs, Flat roofs etc, Roof covering: tiles, ACC, Tin & G.I. Sheets with details at joints bearings and ridges. Drawings.

UNIT - III

Earthwork, Damp proof course: Points of its requirement in buildings, D.P.C. at Plinth level, in basement and roof tops etc., Anti-termite treatment, Basement & Retaining walls. Drawings. Foundation types and suitability, spread, arch, combined, cantilevered, Raft, Grillage, Piles & wells, Footings in block cotton soil, IS Specifications and drawings.

UNIT - IV

Housing: Introduction, definitions, Acoustics and sound proofing, Ventilation and air-conditioning, Fire hazards, fire fighting system means of escape alarms system, Fire prevention measures, maintenance standards, Maintenance of floorings, doors, windows, sanitary appliances, electrical systems and septic tanks.

Stairs & Stair cases: Suitability of location, stairs in multi-storeyed buildings, Residential and public buildings, dimensions, Requirements, classification, types of stairs, Lift & escalators, drawings

Text Books

1. **Building Construction by Sushil Kumar, Standard Publisher and Distributors.**
2. **Building Construction by B. C. Punima, Laxmi Publisher House**

Reference Books

1. **Indian Practical Civil Engg. Handbook, P N Khanna, Engineers Publishers, 2000.**
2. **National Building Code, B. I. S.**
3. **Handbook of Building Construction, M M Goel, Amrindia Consultancy.**
4. **Building Construction by P C Varghese, PHI**
5. **Masonry & timber structures including earthquake resistant design, A S Arya, Nem Chand & Bros.**

Note:

1. **In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.**
2. **The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.**

CE – 209B: BUILDING MATERIALS

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits			
				Class Work	:	25 Marks
3	1	--	4	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

UNIT - I

Mechanical Properties of Materials: Hardness, Creep, Fatigue and fracture, Wear properties. Corrosion Process: Corrosion, Cause of corrosion, types of corrosion, protection against corrosion. Bricks: Composition of good brick earth, harmful ingredient, manufacture of bricks, characteristics of good bricks, classification of bricks as per IS 1077-1985. Stones: Classification of rocks, test for stones, characteristics of a good building stone, deterioration of stones, common building stones of India, comparison of the brick work and stone work.

UNIT - II

Cement: Types, Manufacture, basic properties of cement compounds, grades, packing, storage, quality control and curing, additives, special cements, testing

Lime: Classifications & Properties, and tests. Preparation, types and tests for mortars UNIT - III

Timber: Classification and identification of timber, defects in timber, characteristics of good timber, seasoning of timber and its methods, preservation of timber, varieties of industrial timber, famous Indian timber trees, Plywood.

Steel: Manufacture of steel, market forms of steel e.g. mild steel and HYSD steel bars, rolled steel sections, stainless steel

UNIT - IV

Building glasses: characteristics and performance, uses, manufacture and classification, treatment, testing.

Paints and Varnishes: classification, selection criteria, distempers, varnishes, industrial paints, Properties and uses of Bitumenous materials, Flyash, Geosynthetics, Adhesives and Admixtures in civil works.

Text Books

1. Building Materials by P C Varghese, PHI.
2. Engineering Materials, by S.C. Rangawala, Charotar Publishing House, Anand.

Reference Books

1. Engineering Materials, by Sushil Kumar, Metropolitan Press
2. Engineering Materials by N.C. Choudhary, Technical Publishers.
3. Materials Science, J.C. Anderson & KDB Lever, ELBS fifth Edn., 2004.
4. Indian Practical Civil Engg. Handbook, P N Khanna, Engineers Publishers, 2000.
5. National Building Code, B. I. S.

Note:

1. In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.
2. The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed.

CE – 211B: STRENGTH OF MATERIALS LAB

B. Tech. 2nd Year (Semester – III)

L	T	P	Credits			
--	--	2	1	Class Work	:	20 Marks
				Examination	:	30 Marks
				Total	:	50 Marks
				Duration of Examination	:	3 Hours

List of Experiments:

1. To determine Rockwell hardness number of the specimen of steel/soft metal.
2. To determine Brinnel hardness number of the specimen of steel/soft metal.
3. To determine Vickers hardness number of the specimen of steel/soft metal.
4. To study the behavior of ductile material under tension on Universal Testing Machine
5. To study the behavior of brittle material under tension on Universal Testing machine
6. To study the behavior of brittle material under comprssionon Universal Testing machine
7. To determine the modulus of rigidity of brass bar on torsion testing machine
8. To determine the impact strength of M.S./C.I. specimen on Izod impact testing machine.
9. To determine the impact strength of M.S./C.I. specimen on Charpy impact testing machine.
10. To determine Young's modulus of the material of a beam simply supported at the ends and carrying a concentrated load at the centre

Note: Seven experiments are to be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

CE – 213B: SURVEYING LAB
B. Tech. 2nd Year (Semester – III)

L	T	P	Credits			
				Class Work	:	20 Marks
--	--	2	1	Examination	:	30 Marks
				Total	:	50 Marks
				Duration of Examination	:	3 Hours

List of Experiments

1. Chain Survey of an area
2. Leveling Exercises.
3. Measurement of vertical and horizontal angles with Theodolite.
4. Tachometric Survey
5. Tachometric Constants.
6. Two point / three point problem.
7. Plane table survey of an area.
8. Setting out a simple circular curve by different methods.
9. Setting out transition curve.
10. Measurements with Total Station.

Note: Ten experiments are to be performed in the Semester taking atleast seven experiments from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

CE – 215B: FLUID MECHANICS LAB

B. Tech. 2nd Year (Semester – IV)

L	T	P	Credits			
				Class Work	:	20 Marks
--	--	2	1	Examination	:	30 Marks
				Total	:	50 Marks
				Duration of Examination	:	3 Hours

List of Experiments

1. **Verification of Bernoulli's Theorem.**
2. **Calibration of Venturimeter.**
3. **Calibration of an orifice meter.**
4. **Determination of Coefficients of Contraction, Velocity and Discharge of a circular orifice.**
5. **Determination of friction factor for pipes.**
6. **Visualization of laminar and turbulent flow and estimating critical Reynold's number.**
7. **Determination of metacentric height of a ship model.**
8. **To measure the velocity distribution over a flat surface in a wind tunnel and to determine the Reynold's no. and boundary layer thickness along the plate.**
9. **To measure the pressure distribution around a cylinder in a wind tunnel and to calculate the coefficient of drag at different Reynold's number.**

Note: Students are required to complete at least eight experiments from the above list.

GES 203B ENVIRONMENTAL STUDIES FIELD WORK
B. Tech. Semester – IIIrd (Common for all Branches)

L	T	P	Credits		
--	--	--	0	Field Work	: 25Marks
				Total	: 25 Marks

FIELD WORK:

- **Visit to a local area to document environmental assets – river/ forest/ grassland/ hill/ mountain.**
- **Visit to a local polluted site-Urban/ Rural/ Industrial/ Agricultural.**
- **Study of common plants, insects, birds.**
- **Study of simple ecosystems – pond, river, hill slopes, etc. (Field work equal to 5 lectures hours).**

Note: The awards of this paper shall not be counted in the award of the Degree/DMC.

ME 217 B WORKSHOP

B. Tech. Semester – III (Common for all branches)

L	T	P	Credits			
				Class Work	:	50 Marks
				Duration of Examination	:	3 Hours
-	-	2	2			

Each student has to undergo a workshop atleast 4 weeks (80-100 hours) at the end of II semester during summer vacations. Out of the four weeks, two weeks would be dedicated to general skills and two weeks training for specialized discipline/ department. The evaluation of this training shall be carried out in the III semester

LIST OF JOBS TO BE CARRIED OUT DURING THIS PERIOD

1. **To study and prepare different types of jobs on machine tools (lathe, shaper, planer, slotter, milling, drilling machines).**
2. **To prepare lay out on a metal sheet by making and prepare rectangular tray, pipe shaped components e.g. funnel.**
3. **To prepare joints for welding suitable for butt welding and lap welding.**
4. **To study various types of carpentry tools and prepare simple types of wooden joints.**
5. **To prepare simple engineering components/ shapes by forging.**
6. **To prepare mold and core assembly, to put metal in the mold and fettle the casting.**
7. **To study of CNC lathe, CNC Milling and EDM Machines.**
8. **Any work assigned in electrical workshop, computer hardware/language lab, electronics workshop, biomedical hardware, automobile workshop etc.**

This student will prepare job(s)/project as an individual or in a group using workshop in house infrastructure.

The student shall submit a typed report.

Training will be evaluated on the spot out of 50 marks.

The report will be evaluated in the III Semester by a Committee consisting of two teachers.

The student will interact with the committee through presentation to demonstrate his/her learning. The basis of evaluation will primarily be the knowledge and exposure of students on different kinds of Machines/instruments/tools/ skills etc. The committee will evaluate out of 50 marks.

The committee shall submit the awards out of 100 marks.

ENGINEERING

MGT 201B ECONOMICS

B. Tech. Semester – III (Common for all Branches Except BT& BME)

L	T	P	Credits			
				Class Work	:	25 Marks
4	-	--	4	Examination	:	75Marks
				Total	:	100 Marks
				Duration of Examination	:	3 Hours

__COURSE OBJECTIVE: The aims of this course are to:

1. **Acquaint the student with the basic economic concepts and their operational significance**
2. **Stimulate him to think systematically and objectively about cotemporary economic problems.**

UNIT-I

Definition of economics- various definitions, nature of Economic problem, Micro and macro economics- their feature and scope, production possibility curve, Economic laws and their nature. Relation between Science, Engineering Technology and Economics. Concept and measurement of utility, Law of Diminishing Marginal Utility, Law of equi-marginal utility – its practical application and importance.

UNIT-II

Meaning of Demand, Individual and Market demand schedule, Law of demand, shape of demand curve. Elasticity of demand, measurement of elasticity of demand, factors effecting elasticity of demand, practical importance & application of the concept of elasticity of demand. Various concepts of cost-Fixed cost, variable cost, average cost, marginal cost, money cost, real cost, opportunity cost. Shape of average cost, marginal cost, total cost etc. in short run and long run.

UNIT III

Meaning of production and factors of production; Law of variable proportions, Law of Return to Scale, Internet and External economics and diseconomies of scale. Meaning of Market, Type of Marker– perfect Competition, Monopoly, Oligopoly, Monopolistic competition (Main features of these markers).

UNIT-IV

Supply and Law of Supply, Role of Demand & Supply in Price Determination and effect of changes in demand and supply on prices . Nature and characteristics of Indian economy, privatization – meaning, merits and demerits. Globalisation of India economy – merits and demerits. Elementary Concept of WTO & TRIPS agreement, Monitory Policy & Fiscal Policy

TEXT BOOKS:

1. **Ahuja H.L"Micro Ecomomic Theory" S. Chand Publication, New Delhi**
2. **Dewett K.K "Modern Ecomomic Theory" S. Chand Publication, New Delhi**
3. **Jain T.R, Grover M.L, Ohri V.K Khanna O.P,"Economics for engineers" V.K .Publication ,New Delhi**

SUGGESTED BOOKS:

1. Jhingan M.L"Micro Ecomomic Theory" S.Chand Publication ,New Delhi

2. **Chopra P.N “Principle of Economics” Kalyani Publishers, Delhi**
3. **Mishra S.K “Modern Micro Economics” Pragati Publication Mumbai.**
4. **Dwivedi D.N ”Micro Economics ” Pearson Education, New Delhi.**

Note:

1. **In the semester examination, the examiner will set two questions from each unit (total 08 questions in all), covering the entire syllabus. The students will be required to attempt only 5 questions selecting at least one question from each unit.**
2. **The use of scientific calculator will be allowed in the examination. However, programmable calculator and cellular phone will not be allowed**