

Course Title	BIOLOGY FOR ENGINEERS					B. Tech. CE,ME & EEE -III Sem ECE & CSE - IV Sem		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1823301	BSC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		2	--	--	2	30	70	100
Mid Exam Duration: 2Hrs					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> ● Introduction to Basics of Biology which includes cell, the unit of life, Different types of cells and classification of living organisms. ● Understanding what are biomolecules present in a cell, their structure function and their role in a living organism. Application of certain bio molecules in Industry. ● Brief introduction to human physiology, which is essential for bioengineering field. ● Understanding the hereditary units, that is genes and genetic materials (DNA and RNA) present in living organisms and how they replicate and pass and preserve vital information in living organisms. ● How biology can be applied in our daily life using different technology, for production of medicines to transgenic plants and animals to designing new biotechnological products 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Define the cells, its structure and function, and Different types of cells and basis for Classification of living organisms.							
CO 2	Explain about biomolecules its structure and function and their role in a living organism How biomolecules are useful in Industry & explain about human physiology.							
CO 3	Demonstrate the concept of biology and its uses in combination with different technologies for production of medicines and production of transgenic plants and animals.							
CO 4	Illustrate about genes and genetic materials (DNA & RNA) present in living organisms and how they replicate, transfer & preserve vital information in living organisms.							

UNIT-I

Introduction to Basic Biology

Cell: What is a Cell, Cell theory, Cell shapes, structure of a Cell, Cell cycle chromosomes
The Plant Cell and animal Cell, protoplasm, prokaryotic and eukaryotic Cell, Plant Tissue and Animal Tissue. Brief introduction to five kingdoms of classification.

UNIT-II

Introduction to Bio-molecules

Carbohydrates, proteins, Amino acid, nucleic acid (DNA and RNA) and their types.
Enzymes and their application in Industry. Large scale production of enzymes by Fermentation.

UNIT-III

Human Physiology

Nutrition (Classes of nutrients or food substances), Digestive systems, Respiratory system (two kinds of respiration – aerobic and anaerobic) Respiratory organs, respiratory cycle. Excretory system

UNIT-IV

Genes, Replication of DNA, And Introduction to recombinant DNA Technology:

Prokaryotic gene and Eukaryotic gene structure, gene replication, Transcription and Translation in Prokaryote and Eukaryote and synthesis of protein in Eukaryotes. Recombinant DNA technology and cloning introduction.

UNIT-V

Application of Biology

Brief introduction to Production of vaccines, Enzymes, antibodies, Cloning in microbes, plants and animals, Basics of biosensors, biochips, Bio fuels, and Biosensors. What is Tissue engineering? And its application, transgenic plants and animals, Bio engineering (production of artificial limbs, joints and other parts of body).

Text Books:

1. Cell and Molecular Biology-P.K.Gupta
2. Cell Biology-Verma and Agarwal
3. Cell Biology-Rastogi
4. N. A. Campbell, J. B. Reece, L. Urry, M. L. Cain and S. A. Wasserman, “Biology: A global approach”, Pearson Education Ltd, 2018.
5. T Johnson, Biology for Engineers, CRC press, 2011 Molecular Biology and Biotechnology 2nd ed. J.M. Walker and E.B. Gingold. Panima Publications. PP 434.

Reference Books:

1. AlbertsEt.Al. The molecular biology of the cell, 6/e, Garland Science, 2014
2. De Robertis EDP & EMF De Robertis. 2001. Cell and Molecular biology. Lippincott Williams &Wilkins.Bombay.
3. E. E. Conn, P. K. Stumpf, G. Bruening and R. H. Doi, “Outlines of Biochemistry”, John Wiley and Sons, 2009.
4. John Enderle and Joseph Bronzino Introduction to Biomedical Engineering, 3/e, 2012 Principles of Biochemistry. 2nd ed. 1993. A.L. Lehninger, D.L.Nelson.M.Cox. Panima Publications. PP. 1090.
5. Harper’s biochemistry. 1988. R.K. Murray. D.K. Granner, P.A. Mayes. Printice Hall International.
6. Introductory Microbiology. 1995, by Trevor Gross.
7. Molecular Biology by G. Padmanabhan, K. SivaramSastry, C. Subramanyam, 1995, Mac Millan.
8. Biochemistry of Nucleic Acids.1992.11thed.R.L.P.Adams.J.T.Knowler.D.PLeader.Chapman and Hall.
9. Genetic Engineering –SandhyaMitra.
10. Molecular Biology and Biotechnology by Meyers, RA, A comprehensive Desk reference (VCH Publishers).

Course Title	NUMERICAL METHODS, PROBABILITY AND STATISTICS					B. Tech. III Sem (Common to CE & ME Branches)		
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1821302	BSC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		3	0	--	3	30	70	100
Mid Exam Duration: 2Hrs					End Exam Duration: 3Hrs			
Course Objectives: The objective of this course is to familiarize the students with numerical methods of solving the non-linear equations, interpolation. Also to impart knowledge in basic concepts and few techniques in probability and statistics in relation to the engineering applications.								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Determine the roots of polynomial and transcendental equations by different methods. (L3)							
CO 2	Apply discrete and continuous probability distributions.(L3)							
CO 3	Demonstrate the components of a classical hypothesis test. (L3)							
CO 4	Infer the statistical inferential methods based on small and large sampling tests. (L4)							

UNIT I

Solution of algebraic and transcendental equations: Bisection method – False - position method – Newton - Raphson method. **Solution of System of equations:** Jacobi’s iteration method – Gauss- Seidel iteration method.

Learning Outcomes:

After completion of this unit student able to

- find approximate roots of an equation by using different numerical methods
- find solution of system of equations by using different numerical methods

UNIT II

Interpolation: Finite differences - Forward differences - Backward differences - Newton’s forward and backward difference formulae for interpolation - Lagrange’s formula for unequal intervals- Inverse interpolation.

Learning Outcomes:

After completion of this unit student able to

- explain various discrete operators and find the relation among operators
- apply Newton’s forward and backward formulas for equal intervals
- apply Lagrange’s formula to find inverse interpolation

UNIT III

Probability: Explaining basic concepts of Random variables (Without Problems) - Probability distributions: Binomial - Poisson approximation to the binomial distribution and normal distribution-their properties.

Learning Outcomes:

Course Title	Basic Mechanical Engineering				B. Tech. ME III Sem			
Course Code	Category	Hours/Week			Credits	Maximum Marks		
1803303	PC	L	T	P	C	Continuous Internal Assessment	End Exams	Total
		2	1	0	3	30	70	100
Mid Exam Duration: 2Hrs					End Exam Duration: 3Hrs			
Course Objectives:								
<ul style="list-style-type: none"> • The thermodynamic laws used in Mechanical engineering applications • Various Applications of Energy conversion devices • Need of refrigeration and air conditioning to the society and global warming effects. • Different Types of power plants ,materials and Various manufacturing methods. 								
Course Outcomes: On successful completion of this course, the students will be able to								
CO 1	Define principles of thermodynamics and apply the same to energy conversion devices							
CO 2	Use the fundamentals and principles of refrigeration to practical applications.							
CO 3	Describe power plants and Under stand manufacturing processes.							
CO 4	Analyze machining parameters for different machines.							

Unit 1: Thermodynamics Thermodynamic work, p-dV work in various processes, p-V representation of various thermodynamic processes and cycles Ideal gas equations, Properties of pure substance, Statements of I and II laws of thermodynamics and their applications in Mechanical Engineering.

Unit 2 : Energy conversion devices (Theoretical study using schematic diagrams only) Types of Boilers, Turbine(Impulse & Reaction turbine, Gas turbine, Hydraulic turbines), Working principle of two stroke and four stroke I.C. Engines (SI and CI), Fuels, CRDI ,MPFI ,Hybrid Engines, Reciprocating pumps, centrifugal pumps and hydraulic Pump.

Unit 3 : Refrigeration and Air Conditioning: Vapour compression refrigeration systems, Heat Pump, COP, Study of household refrigerator, Energy Efficiency Rating, Psychrometry, Psychrometric processes, window air conditioner, split air conditioner. Refrigerants and their impact on environment. .(Elementary ideas only)

Unit 4. Power Plants (Description with Block Diagrams) Thermal, Hydroelectric, Nuclear and Solar-Wind Hybrid Power Plants. Materials and manufacturing processes: Engineering materials, Classification, properties, Casting, Sheet metal forming, Sheet metal cutting, Forging, Rolling, Extrusion; Metal joining processes - soldering, brazing and welding; (Elementary ideas only).

Unit 5: Mechanisms: (Descriptive treatment only) Slider crank mechanism, Four bar chain mechanism, Machine Tools (Basic elements, Working principle and types of operations) Lathe Machine – Centre Lathe ,Drilling Machine –Introduction to NC and CNC machines

References :

Text Book: 1. P. K Nag “Thermodynamics”, Tata McGraw-Hill Publishing Co. Ltd

2. Clifford, M., Simmons, K. and Shipway, P., An Introduction to Mechanical Engineering Part I - CRC Press
3. Palany swamy Basices of civil and Mechanical Engineering

Reference Books:

1. Arora and Domkunwar, "Thermal Engineering", Dhanpat Rai and Sons.
2. Balachandran, Basic Mechanical Engineering, Owl Books
3. Benjamin, J., Basic Mechanical Engineering, Pentex Books

Course Title	Engineering Mechanics					B. Tech, CE 3 rd Semester		
Course Code	Category	L	T	P	Credits	Maximum Marks		
						Continuous Assessment	Internal Exam	Total
1801304	PCC	03	01	00	04	30	70	100
Mid Exam Duration: 02.00 Hrs						End Exam Duration: 03.00 Hrs		
Course Objectives:								
<ul style="list-style-type: none"> • Explain basic principles describing the equilibrium of system of forces under static conditions • Discuss various types of friction, laws of friction and analyse body/bodies lying on rough planes • Understand the assumptions in the analysis of trusses and list the types of trusses. • Distinguish between centroid, centre of mass and centre of gravity • Understand the concept of area moment of inertia and mass moment of inertia about any axes. 								
Course Outcomes: On successful completion of this course, the student will be able to								
CO 1	Understand the concept of forces and apply the static equilibrium conditions, Analyse co-planar and non-coplanar system of forces and apply the concepts of mechanics of engineering applications							
CO 2	Analyze the frictional forces to maintain the equilibrium of systems.							
CO 3	Determine the axial forces in the members of determinate truss.							
CO 4	Identify the location of center of gravity and moment of inertia of a body by using principle of moments.							
CO 5	Understand the engineering systems to prepare and demonstrate the models with the help of mechanics concept to solve the engineering problems.							

Unit – 1

Forces, Moments, Equilibrium: Introduction to Engineering Mechanics, Basic Concepts. **System of forces:** Classification of a force system -Coplanar forces, concurrent forces, Resultant, Moment of forces and its application, Varignon's principle, Couples and resultant of force system.

Equilibrium of systems of forces: Free body diagrams, equations of equilibrium of coplanar systems, Lami's theorem, Converse of the law of triangle of forces, converse of the law of polygon of forces, law of transmissibility of forces – Principle of superposition, conditions of equilibrium.

Unit – 2

Friction: Introduction, Types of friction, Laws of Solid friction, Definitions- coefficient of friction, Angle of friction, Angle of repose. Equilibrium of a body on horizontal rough plane-under horizontal & inclined force. Equilibrium of a body on a rough inclined plane- with force acting parallel to the plane and inclined to the plane. wedge friction - ladder friction, screw friction ,lifts by a simple screw jack with square threads

Unit – 3

Reactions in Beams: Types of loads, supports and beams – Support reactions for simply supported beams, cantilever and overhanging beams subjected to different types of loads ie Point load, UDL, UVL, Couple.

Analysis of Trusses: Introduction, Classification of trusses, Assumptions made in the analysis of perfect truss, Determination of Forces in members of plane, pin-jointed, perfect trusses by (i) method of joints and (ii) method of sections. Analysis of various types of cantilever and simply supported trusses by method of joints and method of sections. How to determine if a member is in tension or compression; Zero force members.

Unit – 4

Properties of surfaces and Solids (Centroid, Centre of Mass, Centre of Gravity): Determination of Areas and volumes, first moment of area and the centroid of sections- Rectangle, circle & triangle from method of integration, Composite sections: T-section, I-section, Angle Sections, Hollow Section by using standard formula, Pappu's theorems.

Unit – 5

Moment of inertia: Introduction, Second and product moments of plane area. Parallel Axis theorem, Perpendicular axis theorem, Moment of inertia of regular sections and composite sections by using standard formula. Polar moment of inertia, moment of inertia about inclined axis, principal moments of inertia of plane areas, Principal axes of inertia.

Mass Moment of Inertia: Derivation of mass moment of inertia for rectangular section, circular section, prism, cylinder, Cone, Sphere and Hook from first principles. Relation to area moments of inertia.

TEXT BOOKS

1. R.K. Bansal, "A Textbook of Engineering Mechanics", Laxmi Publications, New Delhi.
2. Shames and Rao, "Engineering Mechanics", Pearson Education India, New Delhi.

REFERENCE BOOKS

1. Timoshenko & Young, "Engineering Mechanics", Tata McGraw-Hill Companies, Inc. New York.
2. Bhavikatti and Rajasekharappa, "Engineering Mechanics", New Age International (P) Limited, Publishers, New Delhi.
3. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, "Mechanics of materials", Laxmi Publications, New Delhi.
4. R.K.Rajput, "Applied Mechanics", Laxmi Publications, New Delhi.

Course Title	Surveying and Geomatics					B. Tech, CE 3 rd Semester		
Course Code	Category	L	T	P	Credits	Maximum Marks		
						Continuous Internal Assessment	End Exam	Total
1801305	PCC	02	01	00	03	30	70	100
Mid Exam Duration: 02.00 Hrs						End Exam Duration: 03.00 Hrs		
Course Objectives:								
<ul style="list-style-type: none"> • Be familiar with Chain and Compass in measuring the horizontal and vertical distances, calculating simple areas and correcting different errors. • Identify the level instruments; record the levels in field book and determine the elevations of objects by different methods. • Determine the areas and volumes on the field by different methods. • Set out simple, compound and reverse curves for highway and railway projects using electronic total station (ETS). • Collection of data regarding various objects on the ground using photogrammetry and remote sensing. 								
Course Outcomes: On successful completion of this course, the student will be able to								
CO 1	Describe the chain and Compass survey.							
CO 2	Apply the various methods involved in application of levelling techniques							
CO 3	Compute areas and volumes for different field conditions.							
CO 4	Understand and apply the concepts of curves and utilize the Total Station instrument for different practical field conditions.							
CO 5	Apply concepts of remote sensing and photogrammetry.							

Unit – 1 Chain and Compass Surveying

Chain surveying: Principles of Chain surveying; Basic definitions; Corrections - Obstacles – Problems.

Compass Surveying: Prismatic compass – Surveyor’s compass – Meridians – Bearings – Magnetic dip and Declination – Compass Traverse – Local Attraction – Problems – Errors in Compass.

Unit – 2 Levelling

Levelling: Basics – Different methods of levelling – Different types of level instruments – Levelling staff – Level field book – Reciprocal Levelling – Calculation of Reduced Levels by Rise and Fall Method and Height of Instrument Method – Related problems

Unit – 3 Areas and Volumes

Areas: Computation of areas from filed notes & plotted figures – Methods of calculation of areas by Mid ordinate rule, Trapezoidal rule, Average ordinate rule and Simpson’s rule.

Volumes: computation of volumes by straight volumes of level, Two level, Side hill two level section, Trapezoidal and Prismoidal rule - Computation of volumes of borrow pit by spot levels.

Unit – 4 Curves and Total Station

Curves: Principle of Simple & Compound curves – Setting out of Simple curves by offsets from Long chord, Rankine’s One Theodolite and Two Theodolite methods – Reverse Curves & its components.

Total Station: Introduction – Functions – Principles – Handling & Setting of Total Station Instrument – Measuring of Horizontal and Vertical angles – Measuring of Areas by Total Station.

Unit - 5 Photogrammetry and Remote Sensing

Photogrammetry: Basic concepts – Perspective geometry of aerial photograph – Relief and Tilt displacements – Terrestrial Photogrammetry – Flight planning – Stereoscopy.

Remote Sensing: Introduction –Electromagnetic Spectrum - Interaction of electromagnetic radiation with the atmosphere and earth surface- Remote sensing data acquisition: platforms and sensors; Visual image interpretation;

Textbooks

1. Madhu, N, Sathikumar, R and Satheesh Gopi, “Advanced Surveying: Total Station, GIS, GPS and Remote Sensing”, Pearson Education India, New Delhi
2. N.N. Basak, “Surveying & Levelling”, Tata McGraw-Hill Companies, Inc. New York.

Reference Books

1. Bhavikatti, S.S, “Surveying and Levelling, Vol. I and II”, I.K. International Publishing House Pvt. Ltd., New Delhi.
2. Chandra, A.M, “Higher Surveying”, New Age International (P) Limited, Publishers, New Delhi.
3. Arora, K.R, “Surveying, Vol-I, II and III”, Standard Book House U-O Rajsons Publications Pvt. Ltd., New Delhi.
4. Manoj, K. Arora and Badjatia, “Geomatics Engineering”, Nem Chand & Bros. Publishers, Roorkee.
5. Anji Reddy, M, “Remote sensing and Geographical information system”, B.S. Publications, Hyderabad.
6. Dr. B.C. Punmia, Ashok Kumar Jain & Arun Kumar Jain, “Surveying and Levelling Vol. I, II & III”, Laxmi Publications, New Delhi.

Course Title	Building Materials and construction					B. Tech, CE 3 rd Semester		
Course Code	Category	L	T	P	Credits	Maximum Marks		
						Continuous Internal Assessment	End Exam	Total
1801306	PCC	02	01	00	03	30	70	100
Mid Exam Duration: 02.00 Hrs						End Exam Duration: 03.00 Hrs		
Course Objectives:								
<ul style="list-style-type: none"> • Know about load bearing materials. • Know about basic cementitious materials. • Acquiring knowledge on different types of finishings and its composition. • Know about masonry and its types. • Study about fenestrations, concepts of green building and intelligent buildings. 								
Course Outcomes: On successful completion of this course, the student will be able to								
CO 1	Ability to describe the usage of conventional materials such as stones, Bricks and Timber.							
CO 2	Understand the importance of cementitious materials like cement, Mortar and concrete.							
CO 3	Differentiate about the Paints, Varnishes and Asbestos.							
CO 4	Translate the knowledge on concepts of green and intelligent buildings and fenestrations, Building amenities.							
CO 5	Differentiate the different types of Masonry works and its construction.							

Unit – 1 Load Bearing Materials

Conventional Materials: Stones: classification of rocks – quarrying – dressing – properties – tests for stones. Bricks: composition – manufacturing – classification – qualities –uses – test for bricks. Timber: classification of trees – structure of tree – seasoning – Steel: introduction – types – properties – uses – market forms.

Unit – 2 Cementitious Materials

Cement: Introduction – ingredients – manufacture – types of cement – properties – tests - uses – Mortar: functions – types – properties – uses – tests on mortar. Concrete: Ingredients – functions – w/c ratio – grades – admixtures – test on concrete – properties – uses. RCC: Characteristics – elements - advantages – disadvantages - types of concrete – GGBS concrete - Fiber reinforced concrete – types of fibres – steel fibres – SFRC – properties – applications- Geo-polymer concrete - Self health monitoring concrete.

Unit – 3 Finishing Materials

Paints: Functions – constituents – characteristics – types of paints – defects. Varnishes: Elements – properties – types. Asbestos: Properties – uses – Glass: Constituents – composition – classification – properties – uses. Plastic: classification – properties– uses.

Unit – 4 Masonry Works

Masonry - Stone Masonry - Rubble and Ashlar Masonry - Brick Masonry - Bond - Types of bonds - English and Flemish bonds - Composite masonry - Concrete Masonry - Reinforced masonry - Types of walls - Types of Partition walls - Floors, Roofs, staircase-Classifications.

Unit – 5 Fenestrations, Ventilations and Building Amenities

Types of doors and windows - (Wood, Plywood, Steel and Fiber) – method of installations - Fixtures and fastening for doors and windows – plumbing – Ventilation - Damp proofing- Methods of damp proofing- Concepts of green and intelligent buildings (elementary part only).

Textbooks

1. P C Varghese, "Building Materials", PHI Learning Pvt. Ltd., Delhi.
2. Gurucharan Singh, "Building construction and Materials", Standard Book House U-O Rajsons Publications Pvt. Ltd., New Delhi.
3. Dr. B C Punmia, "Building Construction", Laxmi Publications, New Delhi.

Reference Books

1. S C Rangwala, "Engineering Materials", Charotar Publishing House Pvt. Ltd., Anand, Gujarat.
2. S K Duggal, "Building Materials:", New Age International (P) Limited, Publishers, New Delhi.
3. S. C. Rangwala, "Building Construction", Charotar Publishing House Pvt. Ltd., Anand, Gujarat.

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	Credits
1801403	PCC	Engineering Geology	2	0	0	30	70	2

Course Objectives:

- Student can understand geological knowledge for civil engineering field or projects
- Student can able to observe and identify mineral as well as rocks physical properties
- Student understand soil formation and characteristics.
- Student will able to solve various structural as well as geological mapping before plan of the major engineering projects.

Course Outcomes: On the completion of course students able to

- Identify geology and geological conditions of the project site.
- Find out geological problems after proper investigation of project site.
- Distinguish the characteristics of most of the geological formations and related problems to adopt appropriate solutions of various construction sites.
- To describe and interpret the geological structures in the geological maps, topo- sheets...etc

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3												3		
CO 2		3													
CO 3				2										2	
CO 4			3												2

Unit - 1

Introduction-various branches of geology - scope of geology and importance of geology in civil engineering projects. Weathering definition types of weathering processes, Factors affecting weathering and engineering consideration of weathering, weathering of rocks.

Unit-2

Mineralogy definition – study and classification of mineralogy, Physical properties of minerals, basic of optical mineralogy importance of minerals and their uses.

Unit-3

Petrology definition classification of Rocks-formation of rocks –Megascopic Characteristics of different types of rocks Structures and Texture rocks rock cycle-Igneous rocks -Engineering aspect to granite. Classification of sedimentary rocks and their Structure and Textures of sedimentary rocks-Metamorphic Rocks- Agents and types of metamorphism, structures & textures in metamorphic rocks. Important Distinguishing features of rocks and engineering consideration.

Unit-4

Definition of Structural Geology- Strength Behavior of Rocks- Stress and Strain in rocks. Concept of Rock Deformation & Tectonics. Dip and Strike. Outcrop and width of outcrop. Inliers and Outliers. Main types of discontinuities according to size. Fold Classification Engineering consideration Criteria for their recognition in field. Faults: Classification, recognition in field, effects on outcrops. Joints & Unconformity; Types, Stresses responsible, geotechnical importance.

Unit-5

Geological Hazards- Rock Instability and Slope movement: Concept of sliding blocks. Different controlling factors. Landslides Types of landslide-Ground water: Factors controlling water bearing capacity of rock-Earthquake- Seismic Zone in India.

Geology of dam and reservoir site- Required geological consideration for selecting dam and reservoir site.
Failure of Reservoirs.

Text Books

1. Parbin Singh, "Engineering and General Geology", S K Kataria & Sons., New Delhi.
2. N. Chenna Kesavulu, "Text Book of Engineering Geology", Macmillan Education, Noida.

Reference Books

1. P. K. Mukherjee, "Textbook of Geology", World Press Private Limited, Kolkata.
2. D. Venkat Reddy, "Engineering Geology", Vikas Publishing, Noida.

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	Credits
1801404	PCC	Fluid Mechanics	3	1	0	30	70	4

Course Objectives: The course is designed

- To introduce the basic concepts of Fluids.
- To know their behavioral properties.
- To explain the analysis of the Fluid Flows using primary equations.
- To explain various flow measuring devices
- To explain the concepts of dimensional analysis.

Course Outcomes: Upon the completion of this course, student will be able to,

- Understand definitions of the basic terms used in fluid mechanics.
- Understand the broad principles of fluid statics, kinematics & Dynamics
- Understand classification of flows.
- Apply the continuity momentum and energy principles.
- Apply dimensional analysis.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO 1	3												2		
CO 2	2														
CO 3	2														
CO 4	3												3		
CO 5		3											3		

Unit - 1

Basic Concepts and Definitions – Distinction between a fluid and a solid; Density, Specific weight, Specific gravity, Kinematic and dynamic viscosity; variation of viscosity with temperature, Newton law of viscosity; vapour pressure, boiling point, cavitations; surface tension, capillarity, Bulk modulus of elasticity, compressibility.

Unit - 2

Fluid Statics - Fluid Pressure: Pressure at a point, Pascals law, pressure variation with temperature, density and altitude. Piezometer, U-Tube Manometer, Single Column Manometer, U-Tube Differential Manometer, Micro manometers. pressure gauges, Hydrostatic pressure and force: horizontal, vertical and inclined surfaces. Buoyancy and stability of floating bodies.

Unit - 3

Fluid Kinematics- Classification of fluid flow : steady and unsteady flow; uniform and non-uniform flow; laminar and turbulent flow; rotational and irrotational flow; compressible and incompressible flow; ideal and real fluid flow; one, two and three dimensional flows; Stream line, path line, streak line and stream tube; stream function, velocity potential function. One-, two- and three -dimensional continuity equations in Cartesian coordinates

Unit - 4

Fluid Dynamics- Surface and body forces; Equations of motion - Euler's equation; Bernoulli's equation – derivation; Energy Principle; Practical applications of Bernoulli's equation : venturimeter, orifice meter and pitot tube; Momentum principle; Forces exerted by fluid flow on pipe bend; Vortex Flow – Free and Forced

Unit - 5

Dimensional Analysis and Dynamic Similitude - Definitions of Reynolds Number, Froude Number, Mach Number, Weber Number and Euler Number; Buckingham's π -Theorem.

Text Books

1. P. N. Modi and S. M. Seth, "Hydraulics and Fluid Mechanics Including Hydraulics Machines", [Standard Book House U-O Rajsons Publications Pvt. Ltd.](#), New Delhi.
2. S. K. Som and G. Biswas, "Introduction to Fluid Mechanics", Tata McGraw-Hill Companies, Inc. New York.

Reference Books

1. Merle C. Potter, David C. Wiggert and Bassem H. Ramadan, "Mechanics of Fluids", **Cengage Learning India Private Limited, Noida.**
2. Edward J. Shaughnessy, Ira M. Katz, and James P. Schaffer, "Introduction to Fluid Mechanics", Oxford University Press, New Delhi.
3. A. K. Mohanty, "Fluid Mechanics:", PHI Learning Pvt. Ltd., Delhi.

KSRM COLLEGE OF ENGINEERING, KADAPA

(Autonomous)

Course Title : **MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS (R18)**

(Common to ECE,CSE, CE & ME)

Semester :

L T P C

3 1 0 3

OBJECTIVES:

- To equip the budding engineering student with an understanding of concepts and tools of economic analysis.
- Provide knowledge of managerial economics through differential economics concepts, accounting concepts are necessary to analyze and solve complex problems relating financial matters in bog industries.
- An understanding of professional and ethical responsibility and ability to communicate effectively.
- The broad education necessary to understand the impact of engineering solutions in a global and societal context.
- Recognition of the need for, and an ability to engage in life-long learning and to meet contemporary issues.

UNIT – I: INTRODUCTION TO MANAGERIAL ECONOMICS

Definition, nature and scope of Managerial Economics – Demand analysis – Determinants, Law of Demand and its exceptions – Elasticity of Demand – Types and Measurement of Elasticity of Demand – Methods of Demand Forecasting (Statistical methods) – Supply Analysis.

UNIT – II: THEORY OF PRODUCTION AND COST ANALYSIS

Production Functions: Law of variable proportion, Isoquants and Isocost, least cost combination of inputs, Returns to Scale and Cobb- Douglas production function. Internal and external economies of scale.

Cost Analysis: Cost concepts – Break-Even Analysis (BEA) – Break Even Point – significance and limitations of BEA.

UNIT – III: INTRODUCTION TO MARKETS AND PRICING

Markets structures: Perfect and Imperfect competition – Features of Perfect Competition, Monopoly, Monopolistic Competition and Oligopoly. Price- Output determination under perfect competition, monopoly and monopolistic competition – Price rigidity in Oligopoly.

Methods of pricing – cost plus pricing, marginal cost pricing, skimming pricing, penetration pricing, differential pricing and administrative pricing.

UNIT – IV: BUSINESS ORGINATIONS AND CAPITAL BUDGETING

Business Organizations: Types of business organizations- Sole Proprietorship, Partnership, Joint Stock Company, Public Ltd and Private Ltd companies, Public Private Partnership (PPP).

(PPP).

[Handwritten signature] 03/06/19

[Handwritten signature] 03/06/19

[Handwritten signature] 2/6/19

[Handwritten signature] 02/06/19

[Handwritten signature] *[Handwritten signature]*

Capital Budgeting: Types of capital, methods and sources of raising Capital. Capital Budgeting Techniques: Payback Period Method, Accounting Rate of return (ARR) and Net Present Value Method (NPV) (simple problems).

UNIT – V: FINANCIAL ACCOUNTING AND ANALYSIS

Double Entry Book keeping, Journal, Ledger, Trail Balance – Final Accounts (Preparation of Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments). Analysis and interpretation of financial statements through ratios (Liquidity, Profitability and Activity Ratios) (Simple problems).

COURSE OUTCOMES: After completion of this course, the student will able to understand various aspects of Managerial Economics and analysis of financial statements and inputs therein will help them to make sound and effective decisions under different economic environment and market situations

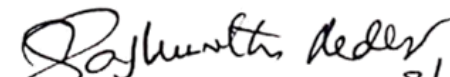
TEXT BOOKS:

1. Varshney & Maheswari: Managerial Economics, Sultan Chand Publishers, 2009.
2. Prasad and K.V.Rao: Financial Accounting, jaibharth Publishers, Vijayawada.

REFERENCES:

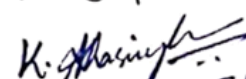
1. P.L Mehtha: Managerial Economics, Sulthan Chand Publishers
2. K K Dewett - Managerial Economics ,S. Chand Publishers
3. S.P Jain & K.L Narang: Financial Accounting, Kalyani publishers.
4. M.Sugunatha Reddy: Managerial Economics and Financial Analysis, Research India Publication, New Delhi, 2013.
5. Paul A Samuleson and William nordhaus : Economics, Oxford University Publications.
6. M L Jhingan : Micro Economics & Macro Economics, Vrinda Publacations (P) Ltd.



Sulthan Chand Publishers
03/06/19


Sugunatha Reddy
3/6/19


3/6/19


03/06/19


03/6/19


3/6/19

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	Credits
1824402	HSNC	Effective Communication Technical	02	01	00	30	70	03

Unit - 1

Communication – Meaning and Definition – Process – Functions – Objectives – Importance – Essentials of Good Communication – Types of Communication – Communication barriers – Overcoming communication barriers.

Unit - 2

Technical Writing, Grammar and Editing – Technical writing Process, forms of discourse, Writing drafts and revising, Collaborative writing, creating indexes, technical writing style and language. Basics of grammar, study of advanced grammar, editing strategies to achieve appropriate technical style. Introduction to advanced technical communication, Usability, Human factors, Managing technical communication projects, time estimation, Single sourcing, Localization.

Unit - 3

Self Development and Assessment – Self assessment, Awareness, Perception and Attitude, Values and belief, Personal goal setting, career planning, Self-esteem. Managing Time; Personal memory, Rapid reading, Taking notes; Complex problem solving; Creativity.

Unit - 4

Communication and Technical Writing – Public speaking, Group discussion, Oral presentation, Interviews, Graphic presentation, Presentation aids, Personality Development. Writing reports, Project proposals, brochures, newsletters, technical articles, manuals, official notes, business letters, memos, progress reports, minutes of meetings, event reports.

Unit - 5

Ethics – Business ethics, Etiquettes in social and office settings, Email etiquettes, Telephone Etiquettes, Engineering ethics, Managing time, Role and responsibility of engineer, Work culture in jobs, Personal memory, Rapid reading, Taking notes, Complex problem solving, Creativity.

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	Credits
1801405	PCC	Solid Mechanics – 1	3	1	0	30	70	4

Course Objectives: The objective of this course is to provide the student

- Knowledge of stresses, strains and elastic constants of different material and the concept of strain energy.
- Understanding of the shear force and bending moment for different types of beams.
- Ability to evaluate the flexural and shear stress concepts for different materials and shapes of the structure.
- Knowledge on deflection of beam for different materials under various loading conditions by moment area, double integration & Macaulay's method.

Course Outcomes: At the end of the course students will be able to

- Compute the stresses and strains of axially loaded members, elastic constants of different materials.
- Determine shear force and bending moment for determinate beams under transverse loading and draw shear force and bending moment diagrams.
- Determine the bending and shear stress variation for determinate beams.
- Evaluate the slope and deflection of determinate beams for the different end conditions and loading by using different methods such as Double Integration, Macaulay's and Moment Area Method etc.
- Analyze the effect of torsion on circular shafts and understand the concepts of springs.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3												3		
CO 2		3											3		
CO 3			3										3		
CO 4			3										3		
CO 5		3											3		2

Unit – 1

Simple Stresses and Strains- Concept of stress and strain, St. Venant's principle, stress and strain diagram, Elasticity and plasticity – Types of stresses and strains, Hooke's law – stress – strain diagram for mild steel – Working stress – Factor of safety – Lateral strain, Poisson's ratio and volumetric strain – Elastic moduli and the relationship between them – Bars of varying section – composite bars – Temperature stresses.

Strain Energy – Resilience – Gradual, sudden, impact and shock loadings – simple applications.

Unit – 2

Shear Force and Bending moment - Types of supports – Types of beams – Shear force and bending moment diagrams for cantilever, simply supported, over hanging beams with point loads, uniformly distributed load, uniformly varying loads and couples, combination of loads – Relationship between shear force and bending moment and rate of loading at a section of a beam.

Unit – 3

Flexural Stresses-Theory of simple bending – Assumptions – Derivation of bending equation: $M/I = f/y = E/R$ - Neutral axis – Determination of bending stresses – Section modulus of rectangular and circular sections (Solid and Hollow), I, T, Angle and Channel sections – Design of simple beam sections.

Shear Stresses- Derivation of formula – Shear stress distribution across various beam sections like rectangular, circular, triangular, I, T and angle sections.

Unit – 4

Deflection of Determinate Beams: Slope, deflection and radius of curvature and their relationship – Strength and stiffness of beams – Finding slope and deflections using Double integration method, Macaulay's method and Moment Area method.

Unit – 5

Torsion of Circular Shafts: Theory of pure Torsion – Derivation of Torsion equation - Assumptions made in pure torsion – Torsional theory applied to hollow and solid circular shafts – Power transmission by shafts.

Springs: Introduction – Types of Springs - Closed and open coiled helical springs under axial loads and axial twist – Springs in series and parallel– Carriage springs.

Text Books

1. R. K. Rajput, “A Textbook of Strength of Materials”, S. Chand Publishing, New Delhi.
2. R. K. Bansal, “A Textbook of Strength of Materials”, Laxmi Publications, New Delhi.

Reference Books

1. S. S. Bhavikatti, “Strength of Materials”, Vikas Publishing, Noida.
2. S. P. Timoshenko and D. H. Young, “Elements of Strength of Materials”, Eastern Wiley Publications, Noida.
3. D. S. Prakash Rao, “Strength of Materials – A Practical Approach”, Universities Press (India) Private Ltd., Hyderabad.
4. B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain, “Mechanics of Materials”, Laxmi Publications, New Delhi.

Subject Code	Subject Category	Subject Title	L	T	P	IM	EM	Credits
1801406	PCC	Disaster Preparedness & Planning Management	2	0	0	30	70	2

Course Objectives:

- To Understand basic concepts in Disaster Management
- To Understand Definitions and Terminologies used in Disaster Management
- To Understand Types and Categories of Disasters
- To Understand the Challenges posed by Disasters
- To understand Impacts of Disasters Key Skills

Course Outcomes: At the end of the course students will be able to

- Analyze relationship between Development and Disasters.
- Ability to understand Categories of Disasters
- Apply of Disaster Concepts and Management means
- Understand the responsibilities to society
- Understand different rehabilitation measures in effective zones

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1		2							2	2	2	2	2		
CO 2			2				2		3	2		3			
CO 3		2					2		3	2	3		2	3	
CO 4							2		3	2				2	
CO 5						2	2		2			3		2	

Unit - 1

Introduction -Concepts and definitions: disaster, hazard, vulnerability, risksseverity, frequency and details, capacity, impact, prevention, mitigation.

Unit - 2

Disasters- Disasters classification; natural disasters (floods, draught, cyclones, volcanoes, earthquakes, tsunami, landslides, coastal erosion, soil erosion, forest fires etc.); manmade disasters (industrial pollution, artificial flooding in urban areas, nuclear radiation, chemical spills, transportation accidents, terrorist strikes, etc.); hazard and vulnerability profile of India, mountain and coastal areas, ecological fragility.

Unit - 3

Disaster Impacts- Disaster impacts (environmental, physical, social, ecological, economic, political, etc.); health, psycho-social issues; demographic aspects (gender, age, special needs); hazard locations; global and national disaster trends; climate change and urban disasters.

Unit - 4

Disaster Risk Reduction (DRR)- Disaster management cycle – its phases; prevention, mitigation, preparedness, relief and recovery; structural and non-structural measures; risk analysis, vulnerability and capacity assessment; early warning systems, Post-disaster environmental response (water, sanitation, food safety, waste management, disease control, security, communications); sustainable and environmental friendly recovery; reconstruction and development methods.

Unit - 5

Environment and Development - Roles and responsibilities of government, community, local institutions, NGOs and other stakeholders; Policies and legislation for disaster risk reduction, DRR programmes in India and the activities of National Disaster Management Authority.

Text Books

1. PradeepSahni and MadhaviAriyabandu, "Disaster Risk Reduction in South Asia", PHI Learning Pvt. Ltd., Delhi.
2. B. K. Singh, "Handbook of Disaster Management: Techniques and Guidelines", Rajat Publications, Delhi.

Reference Books

1. G. K. Ghosh, "Disaster Management", APH Publishing Corporation, New Delhi.
2. <http://ndma.gov.in/> (Home page of National Disaster Management Authority).
3. <http://www.ndmindia.nic.in/> (National Disaster management in India, Ministry of HomeAffairs).
4. Disaster Medical Systems Guidelines. Emergency Medical Services Authority, State of California, EMSA no.214, June 2003.
5. Inter Agency Standing Committee (IASC) (Feb. 2007). IASC Guidelines on Mental Health and Psychosocial Support in Emergency Settings. Geneva: IASC.