SEMESTER III

SUBJECT CODE	COURSE TITLE	L	P	M
THEORY				
3420318	Advanced Engineering Mathematics	3	0	100
3420319	Mechanics of Solids	3	0	100
3420320	Building Science - I	3	0	100
3420321	Fluid Mechanics	3	0	100
3420322	Surveying I	3	0	100
3420323	Architecture	3	0	100
PRACTICALS				
34203LB20	Strength of Materials lab	0	3	100
34202LB21	Survey Practical I	0	3	100

SEMESTER III
ADVANCED ENGINEERING MATHEMATICS

UNIT -1 PARTIAL DIFFERENTIAL EQUATIONS
9

Formation - Solutions of standard types of first order equations - Lagrange's Linear equation - Linear partial differential equations of second and higher order with constant coefficients

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UNIT -2 FOURIER SERIES
9

Dirichlet's conditions - General Fourier series - Half-range Sine and Cosine series - Parse Val's identity - Harmonic Analysis.

UNIT - 3 BOUNDARY VALUE PROBLEMS
9

Classification of second order linear partial differential equations - Solutions of one - dimensional wave equation, one-dimensional heat equation - Steady state solution of two-dimensional heat equation - Fourier series solutions in Cartesian coordinates.

UNIT - 4 LAPLACE TRANSFORMS
9

Transforms of simple functions - Basic operational properties - Transforms of derivatives and integrals - Initial and final value theorems - Inverse transforms - Convolution theorem - Periodic functions - Applications of Laplace transforms for solving linear ordinary differential equations upto second order with constant coefficients and simultaneous equations of first order with constant coefficients.

UNIT - 5 FOURIER TRANSFORMS
9

Statement of Fourier integral theorem - Fourier transform pairs - Fourier Sine and Cosine transforms – Properties - Transforms of simple functions - Convolution theorem - Parseval's identity.

Total

Hours: 45

Text Books:

1. Kreyszig, E., " Advanced Engineering Mathematics " (8th Edition), John Wiley and Sons, (Asia) Pte Ltd.,Singapore, 2000.
2. Grewal, B.S., " Higher Engineering Mathematics " (35th Edition), Khanna Publishers, Delhi 2000.

References:

1. Kandasamy, P. Thilagavathy, K., and Gunavathy, K., " Engineering Mathematics", Volumes II
III (4th Revised Edition), S. Chand & Co., New Delhi, 2001.
2. Narayanan, S., Manicavachagom Pillay, T.K., Ramanaiah, G., " Advanced Mathematics for Engineering Students ", Volumes II & III

(2ndEdition), S.Viswanathan (Printers & Publishers, Pvt, Ltd.) 1992.
3. Venkataraman, M.K. " Engineering Mathematics " Volumes III - A & B, 13th Edition National Publishing Company, Chennai, 1998.
Shanmugam, T.N. : http://www.annauniv.edu/shan/trans.htm

SEMESTER III
MECHANICS OF SOLIDS

UNIT -1 STRESS, STRAIN AND DEFORMATION OF SOLIDS
9

Rigid bodies and deformable solids - Stability, strength and stiffness - tension, compression and shear stresses - Deformation of simple and compund bars - Thermal Stresses - Elastic Constants.

UNIT - 2 ANALYSIS OF PLANE TRUSSES
9

Stability and equilibrium of plane frames - perfect frames - types of trusses - analysis of forces in truss members - Method of joints - Method of tension coefficients - Method of sections.

UNIT -3 TRANSVERSE LOADING ON BEAMS AND STRESSES IN BEAMS
9

Beams - Types and transverse loading on beams - Shear force and bending moment in beams - Cantilevers - Simply supported beams and over-hanging beams. Theory of simple bending - analysis of stresses - Load carrying capacity - Proportioning sections - Leaf springs - Flitched beams - Shear stress distribution - shear flow.

UNIT - 4 TORSION
9

Stresses and deformation in circular and hollow shafts - Stepped shafts - shafts fixed at the both ends - Stresses in helical springs - Deflection of springs - Design of buffer springs.

UNIT -5 ANALYSIS OF STATES OF STRESS (TWO DIMENSIONAL) AND DEFLECTION OF BEAMS
9

Biaxial state of stress - Thin cylinders and shells - Deformation of thin Cylinders and shells - Stresses at a point - Stress as tensor - Stresses on inclined planes - Principal stresses and principal planes - Mohr's circle of stress.Double integration method -

Macaulay's method - Area moment theorems for computation of slopes and deflections in beams - Conjugate beam method.

Total Hours: 45

Text Books:

1. Egor P. popov, “Engineering Mechanics of Solids ", Prentice Hall of India, New Delhi, 1997.
2. Srinath L.N., " Advanced Mechanics of Solids ", Tata McGraw Hill Publishing Company Ltd., New Delhi.

REFERENCES:

1. Junarkar S.B., " Mechanics of Structures ", Vol. 1, 21st Edition, Charotar Publishing House, Anand, India, 1995.
2. Kazimi S.M.A., " Solid Mechanics ", Tata McGrawHill Publishing Company, New Delhi, 1991.
3. Laudner T.J. and Archer R.R., " Mechanics of Solids in Introduction", McGrawHill International Editions, 1994.
4. William A. Nash, " Theory and Problems of Strength of Materials", Schaum's Outline Series, McGraw Hill International Editions, Third Edition, 1994.
5. Elangovan A., " Thinmavisaiyiyal (Mechanics of solids in Tamil) ", Anna University, Chennai, 1995

SEMESTER III
BUILDING SCIENCE I

UNIT -1 STONES
9

Classification - Selection - Application of stone in buildings - Requirement and testing of stones – Deterioration and preservation of stone work - Artificial stones.

UNIT -2 BRICKS AND BUILDING BLOCKS
9

Manufacture of bricks - classification - Qualities - Test on Bricks - Fire bricks - building blocks types and uses - joist and filter blocks - Curved shell units - Light weight concrete blocks.

UNIT -3 MORTARS - CEMENT – CONCRETE
9

Classification of mortar - Preparation - Selection of mortar - Tests for mortars - Manufacture of cement – Types of cement - Characteristics - Aggregates - Basic Characteristics - Types of aggregates - Admixtures – Properties of fresh concrete -

Properties of hardened concrete - Slump Test - Vebe test - Flow test - Compacting factor test - Types of Concrete.

UNIT -4 MATERIALS FOR BUILDINGS SERVICES
9

Timber - Market forms - Industrial timber - Plywood Veneer - Thermocole - Panels of laminates - Steel - Composition - uses - Market forms - Mechanical treatment - Paints - Vanishes - Distempers.

UNIT -5 SPECIAL MATERIALS
9

Glass - Ceramics - Sealants for joints - Sheets for pitched roof coverings - Fibre glass reinforced plastic – Clay products - Refractories - Composite materials - Types - Applications of laminar composites - Fibre textiles – mats and pads for earth reinforcement - Recycling of Industrial waste as building material - Polymers in Civil Engineering.

Total Hours: 45

TEXT BOOKS:

1. Rangwala, S.C., “Engineering Materials ", Charotar Publishing House, Anand, 1997.
2. Surendra Singh, “Building Materials ", Vikas Publishing Company, New Delhi, 1996.

References:

1. Neil Jackson and Ravindrakumar Dhir, “Civil Engineering Materials ".
2. National Building Code of India, “Building Materials ", Part V

SEMESTER III
FLUID MECHANICS

UNIT -1 FLUID PROPERTIES AND STATISTICS
9

Definitions - Fluid and Fluid Mechanics - Dimensions and units - Fluid properties - Continuum - Concept of system and control volume - Pascal's law and Hydrostatic equation - Forces on plane and curved surfaces - Buoyancy - Pressure measurement.

UNIT -2 FLUID KINEMATICS

9

Classification of flows -stream, streak and path lines - - Continuity equation - Stream and potential functions - Flow nets - Velocity measurement.

UNIT -3 FLUID DYNAMICS

9

Euler and Bernoulli's equations - Application of Bernoulli's equation - Discharge measurement- Momentum Principle - Laminar flows through pipes and between plates - Hagen Poiseuille equation - Turbulent flow.

UNIT – 4 BOUNDARY LAYER AND FLOW THROUGH PIPES

9

Definition of boundary layer - Thickness and classification - Displacement and momentum thick nesses - Development of Laminar and Turbulent flows in circular pipes - Darcy Weisbach formula - Moody diagram - Major and minor losses of flow in pipes - Pipes in series and in parallel - Pipe network.

UNIT – 5 SIMILITUDE AND MODEL STUDY

9

Dimensional analysis - Rayleigh's method - Buckingham P -Theorem - similitude and models - Scale effect and distorted models.

Total Hours = 45

Text Books:

1. Kumar K.L., " Engineering Fluid Mechanics ", Eurasia Publishing House (P) Ltd., New Delhi, 1995.
2. Fox, Robert W. and McDonald, Alan T., " Introduction to Fluid Mechanics ", John Willey & Sons, 1995.

References:

1. Streeter, Victor L. and Wylie, Benjamin E., " Fluid Mechanics ", McGraw-Hill Ltd., 1998.
2. Natarajan M.K., " Principles of Fluids Mechanics ", Anuradha Agencies, Vidayal Karuppur, Kumbakonam, 1995.

SEMESTER III
SURVEYING I

UNIT -1 INTRODUCTION AND CHAIN SURVEYING
9

Definition - Principles - Classification - Fields and office work - Scales - Conventional signs - Survey instruments, their care and adjustment - Ranging and chaining - Reciprocal ranging - Setting perpendiculars - well-conditioned trainagles - Traversing - Plotting - Enlarging and Reducing figures.

UNIT – 2 COMPASS SURVEYING AND PLANE TABLE SURVEYING
9

Prismatic compass - Surveyor's compass - Bearing - Systems and conversions - Local attraction – Magnetic declination - Dip - Traversing - Plotting - adjustment of error - Plane table instruments and accessories - Merits and demerits - Methods - Radiation - Intersection - Resection - Traversing.

UNIT - 3 LEVELLING AND APPLICATIONS
9

Level line - Horizontal line - Levels and Staves - Sprit level - Sensitiveness - Bench marks - Temporary and permanent adjustments - Fly and Check leveling - Booking - reduction - Curvature and Refraction - reciprocal levelling - Longitudinal and cross sections - Plotting - Calculation of areas and volumes - Contouring - Methods -Characteristics and uses of contours - Plotting - Earth work volume - Capacity of reserviors.

UNIT - 4 THEODOLITE SURVEYING
9

Theodolite - Vernier and micro optic - Description and uses - temporary and permanent adjustments of vernier transit - Horizontal angles - Vertical angles - Heights and Distances - Traversing - Closing error and distribution - Gales's tables - Omitted measurements.

UNIT - 5 ENGINEERING SURVEYS
9

Reconnaissance, Preliminary and location surveys for engineering projects - Layout - Setting out works – Route Surveys for highways, railways and waterways - Curve ranging - Horizontal and vertical curves - Simple Curves - setting with chain and tapes, tangential angles by theodolite, double theodolite - Compound and reverse curves - Transistion curves - Functions and requirements - Setting out by offsets and angles - Vertical curves - Sight distances - Mine Surveying - Instruments - Tunnels - Correlation of underground and surface surveys - Shafts - Adits.

Total Hours = 45

Text Books:

1. Bannister A. and Raymond S., " Surveying ", ELBS, Sixth Edition, 1992.
2. Heribert Kahmen and Wolfgang Faig, " Surveying ", Walter de Gruyter, 1995.

3. Kanetkar T.P., " Surveying and Levelling ", Vols. I and II, United Book Corporation, Pune, 1994.
4. Punmia B.C., " Surveying ", Vols. I , II and III, Laxmi Publications, 1999.

References:

1. Clark D., " Plane and Geodetic Surveying ", Vols. I and II, C.B.S. Publishers and Distributors, New Delhi, Sixth Edition, 1991.
2. James M. Anderson and Edward M. Mikhail, " Introduction to Surveying ", McGraw Hill Book Company, 1995.

SEMESTER III
ARCHITECTURE

UNIT - 1 ARCHITECTURAL DESIGN
9

Architectural design - an analysis - Integration of function and aesthetics - Introduction to basic elements and principles of design.

UNIT -2 CLIMATE RESPONSIVE DESIGN
9

Factors that determine climate - Characterestics of climate types - Design for various climate types - Passive and active energy controls.

UNIT - 3 BUILDING TYPES
9

Residential, institutional, commercial and Industrial - Planning concepts - Application of anthropometry and space standards - Interelationships of functions - Safety standards - Building rules and regulations - Integration of building services.

UNIT - 4 SITE PLANNING
9

Surveys - Site analysis - Development control - Zoning regulations - Layout regulations - Urban planning standards - Layout design concepts.

UNIT - 5 ENVIRONMENTAL DESIGN
9

Urban reneual - Conservation - Principles of Landscape design - Case studies.

Total Hours = 45

References:

1. Francis D.K. Ching, " Architecture: Form, Space and Order ", VNR, N.Y., 1999.
2. Givoni B., " Man Climate and Architecture ", Applied Science, Barking ESSEX, 1982.
3. Edward D. Mills, " Planning the Architects Handbook ", Butterworth London, 1995.
4. Gallian B. Arthur and Simon Eisner, " The Urban Pattern - City Planning and Design ",

Affiliated Press Pvt. Ltd., New Delhi, 1995.
5. Margaret Roberts, " An Introduction to Town Planning Planning Techniques ", Hutchinson, London, 1990.

SEMESTER III
STRENGTH OF MATERIALS LAB

1. Tension test on mild steel and tor steel rods.
2. Compression test on wooden specimen.
3. Double shear test on mild steel and aluminum rods.
4. Torsion test on mild steel rod.
5. Impact test on metal specimen.
6. Hardness test on metals.
7. Deflection test on metal beam.
8. Compression test on helical spring.
9. Y deflection test on carriage spring.

SEMESTER III
SURVEYING PRACTICAL I

1. **CHAIN SURVEYING**
   Ranging – chaining and traverse.
2. **COMPASS SURVEYING**.
   Traverse.
3. **PLANE TABLE SURVEYING**.
   Triangulation to find the distance between inaccessible points with and with out known
   scale. – Three point problem, two point problem.
4. **LEVELLING**
   Study of levels and leveling staff – Fly leveling using dumpy level. – fly leveling using
   tilting level. – Check leveling.

5. **THEODOLITE SURVEYING**
   Study of theodolite measurement of angles by reiteration and repetition of measurement
   of vertical angles.