



C. U. SHAH UNIVERSITY

FACULTY OF:-Technology and Engineering
DEPARTMENT OF:-Humanities, Mathematics and Sciences
SEMESTER :- II
CODE :- UGHM201
NAME – Engineering Mathematics-II (EMII)

TEACHING & EVALUATION SCHEME:-

| Subject Code | Name of the Subject | Teaching Scheme (Hours) | | | | Evaluation Scheme | | | | | | | | |
|--------------|--------------------------------------|-------------------------|----|----|-------|-------------------|-----|-----------------|-----|-------------------|---------|----|-------|-------|
| | | Th | Tu | Pr | Total | Theory | | | | Practical (Marks) | | | Total | |
| | | | | | | Sessional Exam | | University Exam | | Total | Pr/Viva | TW | | Total |
| | | | | | | Marks | Hrs | Marks | Hrs | | | | | |
| UGHM 101 | Engineering Mathematics – II (EM II) | 4 | 0 | 0 | 4 | 30 | 1.5 | 70 | 3 | 100 | 00 | 00 | 00 | 100 |

Objectives :-

- To learn concept of Matrix Algebra
- Learn to find solution of system of Linear Equations
- Learn to find Eigen value and Eigen vector
- Learn to solve Multiple Integrations
- Learn to solve ordinary Differential Equations
- To Learn concept of Vector Calculus(Line Integrals, surface Integrals)

Prerequisites :-

- Students should have a firm grasp of algebra, trigonometry, Set Theory.
- They should be able to graph elementary functions and solve both linear equations and inequalities.
- They must know the derivatives and integration..

Course Outline :-

| Sr. No. | Course Contents | Number of Hours |
|---------|---|-----------------|
| 1 | Determinants and its Applications: Determinants and its properties, Inverse matrix by determinants, Cramer's rule. | 04 |
| 2 | Matrices and its Applications: Types of Matrices, Elementary row operation, Row echelon form, Reduced row echelon form, Normal form, Rank, Methods to solve system of linear equations: Gauss elimination, Gauss Jordan method, Inverse of matrices by elementary transformations, Inversion Method, Rank by determinant. | 12 |



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| | | |
|---|--|----|
| 3 | Eigen values and Eigen vectors: Eigen values and Eigen vectors, Caley-Hamilton theorem, Eigen values of orthogonal, symmetric, skew symmetric, hermitian, skew hermitian, unitary and normal matrices, Algebraic and Geometric multiplicity. | 08 |
| 4 | Integral Calculus: Reduction formulae, Improper Integrals and its convergence, Application of definite integrals: volume by slicing, by rotation about an axis. | 08 |
| 5 | Multiple Integration: Double and Triple integrals, Change of order of integration, Change to polar coordinates, Change of variables, Jacobian, Applications: Area, Volume. | 08 |
| 6 | First Order and First Degree Ordinary Differential Equations and Applications: First order differential equations: basic concepts, Integrating factor, Linear differential equations, Bernoulli equations, Exact differential equations. | 04 |
| 7 | Vector Differential Calculus: Gradients, Directional derivatives, Divergence and Curl. | 04 |
| 8 | Vector Integral Calculus: Line integrals, Work, Circulation, Flux, Path independence, Conservative field, Surface integrals, Green's theorem, Stoke's theorem and Divergence theorem. | 08 |

Learning Outcomes :-

After the successful completion of the course, students will be able to

- Determine the line integration, surface integration
- Application of Matrix and determinants
- Application of Multiple Integrations
- Solve solutions of ODE
- Recognize applications to quadratic forms

The course will help students to apply these concepts to the problems related to models in work, circulation and flux Problems, hydrodynamics and fluid dynamics, electrical circuits, networking, linear programming, graph theory, computer graphics, construction of curves and surfaces through specified points etc.

Books Recommended :-

1. Elementary Linear Algebra with applications (9th Edition), **H. Anton**, Wiley-India (2008).
2. Advanced Engineering Mathematics (8th Edition), **E. Kreyszig**, Wiley-India (1999)
3. Higher Engineering Mathematics, Thirty-fifth edition, **B. S. Grewal**, Khanna Publication.
4. Thomas' Calculus, **Maurice D. Weir, Joel Hass, Frank R. Giordano**, Person Education.
5. Calculus – Single and Multivariable (3rd Edition), **Hughes – Hallett et al.**, JohnWiley and Sons (2003).



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6. Linear Algebra and its applications (4th Edition), **G. Strang**, Thomson, (2006).
7. Linear Algebra – A Geometric Approach, **S. Kumaresan**, Prentice Hall India (2006).

E-Resources :-

1. www.maths.nuigalway.ie/~rquinlan/
2. www.wiley.com/college/anton
3. www.wiley.com/college/egrade



C. U. SHAH UNIVERSITY

FACULTY OF:- Technology and Engineering
DEPARTMENT OF:- Humanities, Mathematics and Sciences
SEMESTER :- II
CODE :- UGHM202
NAME – Soft Skills & Behavioural Communication (SBC)

TEACHING & EVALUATION SCHEME :-

| Subject Code | Name of the Subject | Teaching Scheme (Hours) | | | | Evaluation Scheme | | | | | | | | |
|--------------|---|-------------------------|----|----|-------|-------------------|-----|-----------------|-----|-------------------|---------|----|-------|-------|
| | | Th | Tu | Pr | Total | Theory | | | | Practical (Marks) | | | Total | |
| | | | | | | Sessional Exam | | University Exam | | Total | Pr/Viva | TW | | Total |
| | | | | | | Marks | Hrs | Marks | Hrs | | | | | |
| UGHM 202 | Soft Skills & Behavioural Communication (SBC) | 2 | 0 | 2 | 4 | 30 | 1.5 | 70 | 2.5 | 100 | 30 | 20 | 50 | 150 |

Objectives :-

- To give a global competitive edge to the students by way of honing their Professional Communication Skills.
- To make them aware of the societal setting of the professional life.
- To train them in basic fundamentals skills of Communication – LSRW

Prerequisites :-

- Students should have basic knowledge of English Language and grammar.
- Students should have ability to speak and write correct sentences in their day to day language.
- Students should be familiar with correct usage of language.

Course Outline:-

| Sr. No. | Course Contents |
|---------|---|
| 0 | Prerequisites |
| 1 | Contributor Personality Development, Personal Grooming <ul style="list-style-type: none"> • Introduction to Contributor Personality Development • Personal Grooming & Etiquettes-Basics, Workplace etiquettes & PC Etiquettes • Behavioural Skills • Critical Thinking • Adaptability |



| | |
|----|--|
| 2 | Social and People Skills <ul style="list-style-type: none">• Matching and Mirroring to build rapport at the workplace• SOFTEN (Smile, Open posture, Forward Lean, Touch, Eye Contact, Nod) in PC• Interpersonal relations and communication• Essentials and Principles of people skills. |
| 3 | Team Dynamics & Leadership <ul style="list-style-type: none">• Understanding teams and their structures.• Roles and functions in a team.• Group processes and procedures.• Responsibilities, functions, styles of a leader.• Maintaining teams through effective communication. |
| 4 | Corporate ethics and Etiquettes <ul style="list-style-type: none">• An Introduction to corporate ethics, difference between ethics and morals.• Values, ethics and communication: ethical dilemmas.• Work ethics and work responsibilities.• A strategic approach to corporate ethics.• Ethical communication on internet. |
| 5 | Employability skills <ul style="list-style-type: none">• Skills- gap and employability.• Employability skill set: basic academic skills, higher –order thinking skills and personal qualities.• Knowledge , skills, attitude and aptitude.• Adaptability at the work place.• Basic, higher order thinking and effective skills. |
| 6 | Presentations <ul style="list-style-type: none">• Practical session for presentations. |
| 7 | Group discussions <ul style="list-style-type: none">• Speaking in group discussions• Discussing problems and solutions.• Organizational GD.• GD as a part of selection process.• Characteristics, evaluation and analysis. |
| 8 | Interviews <ul style="list-style-type: none">• Introduction• Objectives of interviews.• Types of interviews.• Preparation and process. |
| 9 | Resume building <ul style="list-style-type: none">• Job specific resume.• Resume pack. |
| 10 | Grammar vocabulary- 2 <ul style="list-style-type: none">• Homonyms, Homophones |



| | |
|----|---|
| | <ul style="list-style-type: none">• Direct –Indirect• Causal words.• Synonyms, antonyms. |
| 11 | Report Writing <ul style="list-style-type: none">• Introduction to Report, Importance, Objectives of report• Characteristics of Report• Types of Report• Lay out & Structure of report• Project-(Mini Report Submission) |
| 12 | Proposal Writing <ul style="list-style-type: none">• Introduction to Proposal, Definition & Purpose of Proposal• Types, Characteristics of Proposal• Structure of Proposal |
| 11 | Mini Project (Report Writing & Resume Building Submission) |

Learning Out comes:-

At the end of the course, students will be able to

- Communicate across the cultures in professional groups.
- Develop their critical listening skills.
- Improve their competences in professional writing.
- Use grammar & vocabulary in correct and appropriate manner.
- Articulate different sounds in effective ways.
- Improve their speaking skills in day to day life.
- Become techno-friendly.
- Students will become highly skilled and proficient in their field.
- Students will become competent enough to compete in today's cut throat competition
- Students will become self-motivated and self-employable.
- Students will be able to understand the value of the ethics and principles of Corporate world

Books Recommended:-

1. *Effective Personal Communication Skills For Public Relations*, **Green Andy**, Kogan Page, Limited, 2006
2. *Advanced Business Communication*, **John M. Penrose, Jr., Robert W. Rasberry, Robert J. Myers**, Thomson/South-Western, 2004
3. *Technical Communication*, **D.K.Chakradev**, Tech-max publication
4. *Basic Business Communication*, **Flatly and Lesicar**
5. *Basic Communication Skills for Technology*, **Andrea J. Rutherford**, Pearson Education
6. *From sentence to paragraph*, **William J. Kelly and Deborah L. Lawton**, Longman
7. *Technical Communication : Principles and Practice*, **Meenaxi Raman and Sangeeta Sharma**, Oxford Press



E-Resources:

4. www.en.wikipedia.org/wiki/antonym
5. www.en.wikipedia.org/wiki/synonym
6. www.aimpremjifoundation.org/html/calspeech.htm



C. U. SHAH UNIVERSITY

FACULTY OF :-Technology and Engineering
DEPARTMENT OF :- Humanities, Mathematics & Sciences
SEMESTER :- II
CODE :- UGHM203
NAME – Applied Physics (AP)

TEACHING & EVALUATION SCHEME :-

| Subject Code | Name of the Subject | Teaching Scheme (Hours) | | | | Evaluation Scheme | | | | | | | | |
|--------------|----------------------|-------------------------|----|----|-------|-------------------|-----|-----------------|-----|-------|-------------------|----|-------|-------|
| | | Th | Tu | Pr | Total | Theory | | | | | Practical (Marks) | | | Total |
| | | | | | | Sessional Exam | | University Exam | | Total | Pr/Viva | TW | Total | |
| | | | | | | Marks | Hrs | Marks | Hrs | | | | | |
| UGHM 203 | Applied Physics (AP) | 3 | 0 | 2 | 5 | 30 | 1.5 | 70 | 3 | 100 | 30 | 20 | 50 | 150 |

Objectives: -

- This course provides information about the Semiconductor Physics, Junction Diode, Diode Circuits, Bipolar Junction Transistor, Field Effect Transistors, LASER and Optical Fiber Communication and Electronic Instruments.
- This can be used to develop the design of electronic circuit.

Prerequisites:

- Basic concepts of physics is essential

Course Outlines: -

| Sr. No. | Course Contents | Hrs |
|---------|---|-----|
| 0 | Prerequisites | 02 |
| 1 | Semiconductor Physics: Crystalline material: mechanical properties, energy band theory, Fermi levels, Conductors, Semiconductors and Insulators: electrical properties, band diagrams. Semiconductors: intrinsic and extrinsic, energy band diagram, electrical conduction phenomenon, P-type and N-type semiconductors, drift and diffusion carriers, mass action law and continuity equation. | 07 |
| 2 | Junction Diode: Formation of P-N junction, Energy band diagram, Built-in-potential forward and reverse biased P-N junction, formation of depletion zone, V-I characteristics, Junction diode switching times, Zener breakdown, Avalanche breakdown and its reverse characteristics, junction capacitance and Varactor diode, Tunnel Diode, Photodiode and LED. | 07 |
| 3 | Diode Circuits: Simple diode circuits, load line, linear piecewise model; rectifiers: half wave, full wave and bridge, its PIV, DC voltage and current, ripple factor, efficiency, Clipper and Clamper | 06 |



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| | circuits, Capacitor filters. | |
| 4 | Bipolar Junction Transistor: Junction Transistor, Transistor Current Components, Transistor as an Amplifier, Transistor Construction, CB Configuration, CE Configuration, CE Cutoff region, CE Saturation Region, Typical Transistor, CE current Gain, CC Configuration, Analytical Expressions for Transistor Characteristics, Maximum Voltage Rating, Phototransistor, Operating Point, Bias Stability, Three types of biasing methods, Calculation of different stability factors. | 06 |
| 5 | Field Effect Transistors: Junction FET, Pinch-Off Voltage, JFET Volt-Ampere Characteristics, MOSFET: enhancement and depletion type and their characteristics, CS configuration, CG configuration, CD configuration, Biasing the FET, The FET as a Voltage Variable Resistor. | 06 |
| 6 | LASER and Optical Fiber Communication: Introduction and properties of LASER, Stimulated and spontaneous emission, relation between Einstein's 'A' and 'B' coefficients, population inversion, optical pumping, Nd Yag LASER and CO2 LASER, Holography, application LASER, Introduction of optical fiber communication, Optics systems, Advantages of fiber optics, Basic principles, Acceptance angle Numerical Aperture, Types of optical fibers, application of OFC | 06 |

Learning Outcomes: -

This subject develops and applies the fundamentals of electronic technology in order to develop the understanding of electronic devices that are part of the technologies that surround us.

- 10. Identify the applications and functions of electronics in Engineering.
- 11. Recognise basic electronic components and devices used for different electronic functions.
- 12. Be able to use basic techniques for analysing analogue and digital electronic circuits.
- 13. Be able to design analogue and digital electronic circuits at block level.
- 14. Be able to manage the tools in a basic electronics laboratory and use electronic simulation tools.

Books Recommended:-

- 1 *Electronic Devices and Circuits, Allen Mottershead, PHI Publication.*
- 2 *"Principles of Electronics", Mehta V. K. & Mehta Rohit, S. Chand & Co. Ltd.*
- 3 *"Basic of Electronics", De Debashis, Pearson Education.*
- 4 *"Electronic Devices & Circuit Theory", Boylestad Robert L. & Nashlesky Louis, PHI Publication, 9th edition.*
- 5 *"Electronics Devices", Thomas L. Floyd, Pearson Education.*



C. U. SHAH UNIVERSITY

FACULTY OF: - Technology & Engineering
DEPARTMENT OF: - MECHANICAL ENGINEERING
SEMESTER: - II
CODE: - UGME204
NAME – Engineering Graphics and CAD (EGC).

TEACHING & EVALUATION SCHEME:-

| Subject Code | Name of the Subject | Teaching Scheme (Hours) | | | | Evaluation Scheme | | | | | | | | |
|--------------|------------------------------------|-------------------------|----|----|-------|-------------------|-----|-----------------|-----|-------------------|---------|----|-------|-------|
| | | Th | Tu | Pr | Total | Theory | | | | Practical (Marks) | | | Total | |
| | | | | | | Sessional Exam | | University Exam | | Total | Pr/Viva | TW | | Total |
| | | | | | | Marks | Hrs | Marks | Hrs | | | | | |
| UGME204 | Engineering Graphics and CAD (EGC) | 2 | 0 | 4 | 6 | 30 | 1.5 | 70 | 3.0 | 100 | 30 | 20 | 50 | 150 |

Objectives:-

- Students should be able to visualize the objects.
- They should be able to understand and read drawing.
- They should be able to draw & present the same.

Prerequisites:-

- Basic knowledge of drawing skill and object visualisation power in space is required.

Course Outline:-

| Sr. No. | Course Content | Number of Hours |
|---------|---|-----------------|
| 01 | Introduction to Engineering Graphics, Drawing instruments and accessories, BIS – SP 46. Use of plane scales and Representative Fraction. | 2 |
| 02 | Engineering Curves a) Conic Section Construction of ellipse, parabola & hyperbola by various methods b) Cycloidal curves. Construction of cycloid, epicycloids & hypocycloid. Tangent & normal to the curve. c) Involute Involute of circle, square, pentagon, hexagon. d) Loci of points : Locus problems on i. four bar chain mechanism ii. Simple slider crank mechanism iii. Offset slider crank mechanism. | 4 |
| 03 | Projections of Points & Lines: Introduction to principal planes of projections, Projections of the points located in same quadrant and different quadrants, Projections of line with its inclination to one reference plane and with two reference planes. True length of the line and its inclination with the reference planes. | 6 |
| 04 | Projections of Planes: | 4 |



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| | Concept of different planes, Projections of planes with its inclination to one reference plane and with two reference planes. Concept of auxiliary plane method for projections of the plane. | |
| 05 | Projections of Solids & Section of Solids: Classification of solids. Projections of solids like Cylinder, Cone, Pyramid and Prism with its inclination to one reference plane and with two reference planes. Section of such solids and the true shape of the section. | 6 |
| 06 | Development of Lateral Surfaces: Concept of development of the different surfaces.Parallel Line Development and Radial Line Development. | 4 |
| 07 | Orthographic Projections: Principle of projection, Principal planes of projection, Projections from the pictorial view of the object on the principal planes for View from Front, View from Top and View from Side using first angle projection method and third angle projection method, Full Sectional View. | - |
| 08 | Isometric Projections and Isometric View or Drawing: Isometric Scale, Conversion of orthographic views into isometric projection, isometric view or drawing. | - |
| 09 | Introduction to Auto CAD:- Basic Drawing and Editing Commands. Knowledge of setting up layers, Dimensioning, Hatching, plotting and Printing. Drawing of orthographic projections using Auto CAD. Introduction to other commercial software's available for CAD. | 4 |

Topic number 7 and 8 i.e. Orthographic projections and Isometric Projections will be taught during laboratory hours only.

Learning Outcomes: - Logical method of explaining the core subject and the philosophy of the subject

Books Recommended:-

1. "Engineering Drawing (Plane and solid geometry)" **N.D. Bhatt**, Charotar Publishing House Pvt. Ltd.
2. "Machine Drawing", **N.D. Bhatt & V.M. Panchal**, Charotar, Publishing House Pvt. Ltd.
3. "Engineering Drawing" **M.B Shah & B.C Rana**, Pearson Publications.
4. "Engineering Graphics", **P.J. Shah**, S Chand Publications.
5. "Engineering Drawing", **Dhananjay A Jolhe**, Tata McGraw Hill
6. "(CAD Soft Technologies) Auto CAD 2012 (For engineers and Designers)", **Prof. Sham Tickoo (Purdue University) & Gaurav Verma**, Dreamtech Press NewDelhi.

E- Resources:-

1. www.pearsonhighered.com
2. www.igi-global.com/article



C. U. SHAH UNIVERSITY

FACULTY OF :-Technology and Engineering

DEPARTMENT OF :- DEPARTMENT OF COMPUTER ENGINEERING

SEMESTER :- II

CODE :- UGCE205

NAME – Object Oriented Programming (OOP)

TEACHING & EVALUATION SCHEME :-

| Subject Code | Name of the Subject | Teaching Scheme (Hours) | | | | Evaluation Scheme | | | | | | | | |
|--------------|-----------------------------------|-------------------------|----|----|-------|-------------------|-----|-----------------|-----|-------------------|---------|----|-------|-------|
| | | Th | Tu | Pr | Total | Theory | | | | Practical (Marks) | | | Total | |
| | | | | | | Sessional Exam | | University Exam | | Total | Pr/Viva | TW | | Total |
| | | | | | | Marks | Hrs | Marks | Hrs | | | | | |
| UGCE 205 | Object Oriented Programming (OOP) | 3 | 0 | 2 | 5 | 30 | 1.5 | 70 | 2.5 | 100 | 20 | 30 | 50 | 150 |

Objectives: -

- This course provides students with an depth knowledge in C++ computer programming language. The main aim of the course are to develop the programming ability in students.
- Object oriented programming provides knowledge for building efficient and flexible code as per the today's prime requirement.
- It enables to understand difference between procedure oriented and object oriented.

Prerequisites: -

- Programming concepts including flow chart, algorithm and good if have knowledge of programming language like 'C'

Course outline:-

| Sr. No. | Course Contents | Number of Hours |
|---------|--|-----------------|
| 1 | Introduction to C++ Overview of POP, Basic Introduction to OOP, Basic Concepts of OOP, Benefits of OOP, Application of OOP, Structure of C++ program, simple C++ program, token, keywords, identifiers, constants, data types-fundamental, derived and user-defined, #define keyword, variables, basic operators, Operators in C++, conditional statements, Control structure. | 7 |
| 2 | Functions in C++ Introduction function, User-defined function, function prototyping, Call by value, Call by reference, inline function, default argument function, function overloading. | 5 |
| 3 | Classes and Objects Introduction, structure Vs Class, Defining class, C++ program with class, inline function using class, access specifiers, nesting of member function, | 9 |



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| | arrays within a class, static data members and member function, array of object, Object as function argument and returning objects, friend function using class. Manipulating string: creating string objects, relational operations, characteristics and accessing, constructor with its different types with example, destructor. | |
| 4 | Operator overloading and type conversion Introduction, defining operator overloading, rules of operator overloading, Overloading unary operator: prefix and postfix, Overloading Binary operator with and without friend function, Manipulation of string using operators, type conversion-Basic to class, class to basic and from one type to another. | 7 |
| 5 | Inheritance Introduction, defining a derived class, types of inheritance: single, multilevel, multiple, hierarchical, hybrid, Virtual base class, Abstract classes, Introduction to containership | 6 |
| 6 | Pointers, Virtual functions and polymorphism Introduction, Polymorphism with its types, Pointers to objects, this pointer, Virtual function and pure virtual function | 5 |
| 7 | File management Introduction, classes for file stream, file operations, file modes, file pointers and manipulators, updating a file, error handling and command line arguments | 6 |
| 8 | Advanced Topics: Introduction of Exception Handling, Template, STL | 3 |

Learning Outcomes: -

- Provide clear understanding of basic object oriented fundamentals like class, objects, inheritance, polymorphism, abstraction which can be used to understand real world problems.
- Real world problems can be solved in more realistic using object oriented programming.

Books Recommended:

1. *Object Oriented Programming with C++*, **E. Balagurusamy**, PHI
2. *Object Oriented Programming in Turbo C++*, **Robert Lafore**, Galgotia,
3. *C++: The Complete Reference*, **Herbert Schildt**, McGrawHill
4. *C++ Programming, Black Book*, **Steven Holzner**, DreamTech
5. *Let us C++*, **Yaswant Kantikar**, BPB

E-Resources:

- 1 www.cplusplus.com
- 2 www.cprogramming.com
- 3 www.getacoder.com



C. U. SHAH UNIVERSITY

FACULTY OF: - Technology & Engineering

DEPARTMENT OF: - Civil Engineering

SEMESTER: - II

CODE: - UGME206

NAME OF THE SUBJECT – Basic of Civil and Structural Engineering (BCSE)

TEACHING & EVALUATION SCHEME :-

| Subject Code | Name of the Subject | Teaching Scheme (Hours) | | | | Evaluation Scheme | | | | | | | | |
|--------------|--|-------------------------|----|----|-------|-------------------|-----|-----------------|-----|-------|-------------------|----|-------|-------|
| | | Th | Tu | Pr | Total | Theory | | | | | Practical (Marks) | | | Total |
| | | | | | | Sessional Exam | | University Exam | | Total | Pr/Viva | TW | Total | |
| | | | | | | Marks | Hrs | Marks | Hrs | | | | | |
| UGME 206 | Basic of Civil and Structural Engineering (BCSE) | 4 | 0 | 2 | 6 | 30 | 1.5 | 70 | 2.5 | 100 | 20 | 30 | 50 | 150 |

Objectives: - To explore the basic mechanism of the structure and its strength along with survey and field work to incorporate the latest technological development to full fill the need of the industry.

Prerequisites: - Looking to the wide field of the civil engineering and mechanics there was a need of comprehensive course.

Course outline:-

| Sr. No. | Course Content | Total Hrs. |
|---------|---|------------|
| | SECTION-1 (Basic of Civil Engineering) | |
| 1 | Surveying: Surveying and leveling, Object and uses, Primary divisions, Fundamental principles, Classification of surveying, Plans and maps, Scales, Units of measure. Methods of linear measurements, Instruments used in chaining; Chain surveying, Ranging, Errors in Chaining, Conventional symbols. Types and uses of compass, Bearings, Whole Circle Bearings and Reduced Bearings. Leveling, object and uses, terms used in leveling, leveling instruments, methods of leveling, contours; characteristics and applications. | 12 |
| 2 | Modern tools of surveying and mapping: Introduction to Global Positioning System, Remote Sensing and Geographic Information System | 6 |
| 3 | Construction Materials: Requirement, types, uses, properties and importance of Civil Engineering materials like Stone, Bricks, Lime, Cement, Ferrous and Non Ferrous Metals, Ceramic Materials, Timber, Sand, Aggregate, Mortar and Concrete. | 8 |
| | SECTION-2 (Basic of Structural Engineering) | |
| 4 | Introduction: Scalar and Vector Quantities, composition and resolution of | 6 |



| | | |
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| | vectors, system of units, definition of space, time, particle, rigid body, force. | |
| 5 | Fundamentals of Statics: Principles of statics, coplanar, concurrent and non-concurrent, parallel and non-parallel forces, composition and resolution of forces, moments & couples - their properties, combination of coplanar couples and forces, equilibrant, equilibrium, free body diagrams, analytical conditions of equilibrium for coplanar force systems. | 9 |
| 6 | Truss: Simple determinate plane trusses and analysis for member forces using methods of joints and methods of sections. | 9 |
| 7 | Distributed forces, center of gravity and moment of inertia: Center of gravity of lines, plane areas, volumes and bodies, Pappus – Guldinus theorems, moment of inertia, polar moment of inertia & radius of gyration of areas, parallel & perpendicular axes theorems. | 10 |

Learning Outcomes :-

By studying this course ,

- The students will get an overview of surveying, building planning.
- The course provides an essential tool to understand the basics of civil engineering works that an engineer come across in professional as well as personal life.
- The students learn to prepare the layouts of buildings and other infrastructures with basic knowledge of structure mechanism.

Books Recommended :-

1. "Surveying Volume I & II" , **Dr.B. C. Punamia**, Laxmi Publications
2. "Surveying Volume I & II ,**Dr.K.R.Arora**
3. "Surveying Volume I & II , **S. K. Duggal** Tata McGraw Hill
4. "Surveying and leveling- Vol.I, **T.P. Kanetkar & Kulkarni**, Pune Vidyarthi Griha Prakashan
5. "Surveying and levelling, **N.N.Basak**, Tata McGraw Hill
6. "Surveying and levelling, **S.C.Rangwala**, Charotar Publication
7. "Fundamentals of surveying, **S.K.Roy**, Prentice Hall India, New Delhi
8. "Engineering Mechanics (Statics), **Beer and Johnston**,Tata McGraw Hill
9. "Applied Mechanics, **S. B. Junnarkar & H. J. Shah**
10. "Engineering Mechanics, **A.K. Taya**, IUmesh Publications
11. "Engineering Mechanics Vol. I&II, **Beer & Johnson**, Tata McGraw Hill
12. "Strength of material, **S. Ramamrutham**, Dhanpatrai & sons
13. "Engineering Mechanics, **R.S. Khurmi**, S. Chand
14. "Strength of Materials,**S. Ramamruthum & R. Narayan**, Dhanpatrai & sons

E- Resources:-

1. www.nptel.iitm.ac.in/courses.php?branch=Civil
2. www.nptel.iitm.ac.in/video.php?courseId=1053
3. www.nptel.iitm.ac.in/courses/Webcoursecontents/IITDelhi/Mechanics%20of%20Solids/index.htm
4. www.nptel.iitm.ac.in/courses.php?branch=Civil
5. www.nptel.iitm.ac.in/courses/Webcourse-contents/IIT-ROORKEE/SURVEYING/home.htm
6. www.nptel.iitm.ac.in/video.php?courseId=1040
7. www.nptel.iitm.ac.in/video.php?courseId=1059