

COURSE STRUCTURE FOR B.TECH. FIRST YEAR (Common for all Disciplines)

| SEMESTER I (Group I subjects) | | | B.TECH. FIRST YEAR (Common for all Disciplines) | | | | | | | | | | |
|-------------------------------|-----------------|--|---|----------|-----------|-----------|-----------|-------------|----|----|-----------|---------|-------------|
| Sr. No | Course Code | Course Name | Teaching Scheme | | | | | Exam Scheme | | | | | Total Marks |
| | | | L | T | P | C | Hrs/wk | Theory | | | Practical | | |
| | | | | | | | | MS | ES | IA | LW | LE/Viva | |
| 1 | MA 101T | Mathematics-I | 3 | 1 | 0 | 7 | 4 | 30 | 60 | 10 | -- | -- | 100 |
| 2 | ME/IE 101T | Engineering Graphics | 1 | 0 | -- | 2 | 1 | 30 | 60 | 10 | -- | -- | 100 |
| | ME/IE 101P | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 3 | CE 101T | Applied Mechanics | 3 | 1 | -- | 7 | 4 | 30 | 60 | 10 | -- | -- | 100 |
| | CE 101P | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 4 | SC 101T | Chemistry | 3 | 0 | -- | 6 | 3 | 30 | 60 | 10 | -- | -- | 100 |
| | SC 101P | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 5 | ME/IE104P | W. S. Practice | 0 | 0 | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 6 | HS 104T | Basic Environmental Studies | 1 | 0 | -- | 2 | 1 | 30 | 60 | 10 | -- | -- | 100 |
| 7 | MA 102T | Computer Programming | 2 | 0 | 0 | 4 | 2 | 30 | 60 | 10 | -- | -- | 100 |
| | MA 102P | | 0 | 0 | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 8 | NO101/ NS101 | *National Sports Organization (NSO)/National Service Scheme(NSS) | | | | PP/ NP | 2 | | | | | | |
| Total | | | 13 | 2 | 10 | 33 | 25 | | | | | | 850 |

MS = Mid Semester, ES = End Semester;

IA = Internal assessment (like quiz, assignments etc)

LW = Laboratory work; LE = Laboratory Exam

COURSE STRUCTURE FOR B.TECH. FIRST YEAR (Common for all Disciplines)

| SEMESTER I (Group II subjects) | | | B.TECH. FIRST YEAR (Common for all Disciplines) | | | | | | | | | | |
|--------------------------------|-------------|------------------------------------|---|----------|-----------|-----------|-----------|-------------|----|----|-----------|---------|-------------|
| Sr. No | Course Code | Course Name | Teaching Scheme | | | | | Exam Scheme | | | | | Total Marks |
| | | | L | T | P | C | Hrs/wk | Theory | | | Practical | | |
| | | | | | | | | MS | ES | IA | LW | LE/Viva | |
| 1 | MA 101T | Mathematics-I | 3 | 1 | 0 | 7 | 4 | 30 | 60 | 10 | -- | -- | 100 |
| 2 | ME/IE 102T | Engineering Materials | 2 | 0 | 0 | 4 | 2 | 30 | 60 | 10 | -- | -- | 100 |
| 3 | CE 102T | Elements of Civil Engineering | 2 | 1 | -- | 5 | 3 | 30 | 60 | 10 | -- | -- | 100 |
| | CE 102P | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 4 | EE 101P | Elements of Electrical Engineering | 2 | 1 | -- | 5 | 3 | 30 | 60 | 10 | -- | -- | 100 |
| | EE 101T | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 5 | ME/IE 103P | Elements of Mechanical Engineering | 2 | 1 | -- | 5 | 3 | 30 | 60 | 10 | -- | -- | 100 |
| | ME/IE 103T | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 6 | SC 102T | Physics | 3 | 1 | -- | 7 | 4 | 30 | 60 | 10 | -- | -- | 100 |
| | SC 102P | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 7 | HS103T | Comm. Skills | 1 | -- | -- | 2 | 1 | 30 | 60 | 10 | | | 100 |
| | HS103P | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| Total | | | 15 | 5 | 10 | 40 | 30 | | | | | | 950 |

MS = Mid Semester, ES = End Semester;

IA = Internal assessment (like quiz, assignments etc)

LW = Laboratory work; LE = Laboratory Exam

COURSE STRUCTURE FOR B.TECH. FIRST YEAR (Common for all Disciplines)

| SEMESTER II (Group I subjects) | | | B.TECH. FIRST YEAR (Common for all Disciplines) | | | | | | | | | | |
|--------------------------------|-----------------|--|---|----------|-----------|-----------|-----------|-------------|----|----|-----------|---------|-------------|
| Sr. No | Course Code | Course Name | Teaching Scheme | | | | | Exam Scheme | | | | | Total Marks |
| | | | L | T | P | C | Hrs/wk | Theory | | | Practical | | |
| | | | | | | | | MS | ES | IA | LW | LE/Viva | |
| 1 | MA 103T | Mathematics-II | 3 | 1 | 0 | 7 | 4 | 30 | 60 | 10 | -- | -- | 100 |
| 2 | ME/IE 101T | Engineering Graphics | 1 | 0 | -- | 2 | 1 | 30 | 60 | 10 | -- | -- | 100 |
| | ME/IE 101P | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 3 | CE 101T | Applied Mechanics | 3 | 1 | -- | 7 | 4 | 30 | 60 | 10 | -- | -- | 100 |
| | CE 101P | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 4 | SC 101T | Chemistry | 3 | 0 | -- | 6 | 3 | 30 | 60 | 10 | -- | -- | 100 |
| | SC 101P | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 5 | ME/IE104P | W. S. Practice | 0 | 0 | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 6 | HS 104T | Basic Environmental Studies | 1 | 0 | -- | 2 | 1 | 30 | 60 | 10 | -- | -- | 100 |
| 7 | MA 102T | Computer Programming | 2 | 0 | 0 | 4 | 2 | 30 | 60 | 10 | -- | -- | 100 |
| | MA 102P | | 0 | 0 | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 8 | NO101/ NS101 | *National Sports Organization (NSO)/National Service Scheme(NSS) | | | | PP/ NP | 2 | | | | | | |
| Total | | | 13 | 2 | 10 | 33 | 25 | | | | | | 850 |

MS = Mid Semester, ES = End Semester;

IA = Internal assessment (like quiz, assignments etc)

LW = Laboratory work; LE = Laboratory Exam

COURSE STRUCTURE FOR B.TECH. FIRST YEAR (Common for all Disciplines)

| SEMESTER II(Group II subjects) | | | B.TECH. FIRST YEAR (Common for all Disciplines) | | | | | | | | | | |
|--------------------------------|-------------|------------------------------------|---|----------|-----------|-----------|-----------|-------------|----|----|-----------|---------|-------------|
| Sr. No | Course Code | Course Name | Teaching Scheme | | | | | Exam Scheme | | | | | Total Marks |
| | | | L | T | P | C | Hrs/wk | Theory | | | Practical | | |
| | | | | | | | | MS | ES | IA | LW | LE/Viva | |
| 1 | MA 103T | Mathematics-II | 3 | 1 | 0 | 7 | 4 | 30 | 60 | 10 | -- | -- | 100 |
| 2 | ME/IE 102T | Engineering Materials | 2 | 0 | 0 | 4 | 2 | 30 | 60 | 10 | -- | -- | 100 |
| 3 | CE 102T | Elements of Civil Engineering | 2 | 1 | -- | 5 | 3 | 30 | 60 | 10 | -- | -- | 100 |
| | CE 102P | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 4 | EE 101P | Elements of Electrical Engineering | 2 | 1 | -- | 5 | 3 | 30 | 60 | 10 | -- | -- | 100 |
| | EE 101T | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 5 | ME/IE 103P | Elements of Mechanical Engineering | 2 | 1 | -- | 5 | 3 | 30 | 60 | 10 | -- | -- | 100 |
| | ME/IE 103T | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 6 | SC 102T | Physics | 3 | 1 | -- | 7 | 4 | 30 | 60 | 10 | -- | -- | 100 |
| | SC 102P | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| 7 | HS103T | Comm. Skills | 1 | -- | -- | 2 | 1 | 30 | 60 | 10 | | | 100 |
| | HS103P | | -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| Total | | | 15 | 5 | 10 | 40 | 30 | | | | | | 950 |

MS = Mid Semester, ES = End Semester;

IA = Internal assessment (like quiz, assignments etc)

LW = Laboratory work; LE = Laboratory Exam

| ME/IE 101T Engineering Graphics | | | | | | | | | | |
|--|---|----|---|----------|--------------------|----|----|-----------|---------|-------------|
| Teaching Scheme | | | | | Examination Scheme | | | | | |
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total Marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| 1 | 0 | -- | 2 | 1 | 30 | 60 | 10 | -- | -- | 100 |
| <p>UNIT I 3</p> <p>Introduction to Engineering Graphics, Drawing instruments and accessories, lettering, lines and dimensioning. BIS - SP46. Use of plane scales and Representative Fraction, Free hand sketching</p> <p>Engineering Curves: Classification of Engineering Curves, Construction of Conics, Cycloidal Curves, Involutives and Spirals.</p> <p>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.</p> <p>UNIT II 3</p> <p>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.</p> <p>Development of Lateral Surfaces: Concept of development of the different surfaces. Parallel Line Development and Radial Line Development.</p> <p>UNIT III 3</p> <p>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.</p> <p>UNIT IV 4</p> <p>Isometric Projections and Isometric View or Drawing: Isometric Scale, Conversion of orthographic views into isometric projection, isometric view or drawing.</p> <p style="text-align: right;">APPROXIMATE TOTAL 13 Hours</p> | | | | | | | | | | |
| <p>Texts and References</p> <ol style="list-style-type: none"> 1. N.D.Bhatt and V.M.Panchal "Engineering Drawing", Charotar Publishing House, Anand 2. K. Venugopal, "Engineering Drawing & Graphics", New Age International (P) Ltd. 3. D.A.Jolhe, "Engineering Drawing with an Introduction to AutoCAD", Tata McGraw-Hill Publishing Co.Ltd., New Delhi | | | | | | | | | | |

| ME/IE 101P Engineering Graphics | | | | | | | | | | |
|--|----|---|---|----------|--------------------|----|----|-----------|---------|-------------|
| Teaching Scheme | | | | | Examination Scheme | | | | | |
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total Marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| <p>List of Drawing Sheets:</p> <ol style="list-style-type: none"> 1. Engineering curves 2. Projection of Planes 3. Projections of Solids 4. Inter section of solids 5. Development of surfaces of solids 6. Orthographic projections 7. Isometric projections 8. Exp. to various CAD tools 9. Home assignments | | | | | | | | | | |

| ME/IE-102T ENGINEERING MATERIALS* | | | | | | | | | | |
|--|---|----|---|----------|--------------------|----|----|-----------|---------|-------------|
| Teaching Scheme | | | | | Examination Scheme | | | | | |
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total Marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| 2 | 0 | -- | 4 | 2 | 30 | 60 | 10 | -- | -- | 100 |
| *Department of Sciences will be the teaching department | | | | | | | | | | |
| UNIT I | | | | | 6 | | | | | |
| <p>Introduction: Historical perspective of Materials Science. Classification of materials. Advanced Materials, Future materials and modern materials & their needs</p> <p>Atomic structure. Atomic bonding in solids, Crystal structures, Crystalline and non- crystalline materials. Crystal systems, Crystallographic directions and Crystallographic planes. Point defects. Line defects and dislocations. Interfacial defects. Bulk or volume defects.</p> | | | | | | | | | | |
| UNIT II | | | | | 6 | | | | | |
| <p>Point defects. Line defects and dislocations. Interfacial defects. Bulk or volume defects.</p> <p>Mechanical Properties of Metals: Elastic deformation. Plastic deformation. Interpretation of tensile stress-strain curves, Yielding under multiaxial stress. Yield criteria and macroscopic aspects of plastic deformation.</p> | | | | | | | | | | |
| UNIT III | | | | | 7 | | | | | |
| <p>Basic Eng. Materials related to civil, electrical and mechanical industries includes application and types., plastics.Applications and Processing of Metals, Alloys and Engineering materials: Types of metals and alloys. Fabrication of metals. Thermal processing of metals. Heat treatment. Precipitation hardening. Types and applications of ceramics, glasses. Fabrication and processing of ceramics. Mechanical behavior of polymers,rubbers, Mechanisms of deformation and strengthening of polymers. Applications of composite materials, Particle reinforced composites. Fiber reinforced composites.</p> | | | | | | | | | | |
| UNIT IV | | | | | 7 | | | | | |
| <p>Properties of Materials: Electrical Properties: Electrical conduction. Semi conductivity. Super conductivity. Electrical conduction in ionic ceramics and in polymers. Dielectric behavior. Ferroelectricity. Piezoelectricity Thermal Properties: Heat capacity. Thermal expansion. Thermal conductivity. Thermal stresses</p> <p>Magnetic Properties: Diamagnetism and paramagnetism, Ferromagnetism, Antiferromagnetism and ferrimagnetisms.</p> | | | | | | | | | | |
| Approximate Hours: 26 Hrs | | | | | | | | | | |
| Texts and References | | | | | | | | | | |
| <ol style="list-style-type: none"> 1. W.D. Callister, Material Science and Engineering: An Introduction John Wiley 1997 2. James F. Shackelford and Madanapalli K. Muralidhara, Introduction to Materials Science for Engineers 6th Ed. 2010. 3. O.P. Khanna, Material Science, Dhanpat Rai Publication, 1987. 4. B C Punmia , Building Materials | | | | | | | | | | |

ME/IE-103T ELEMENTS OF MECHANICAL ENGINEERING

| Teaching Scheme | | | | | Examination Scheme | | | | | |
|-----------------|----------|-----------|----------|----------|--------------------|-----------|-----------|-----------|-----------|-------------|
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total Marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| 2 | 1 | -- | 6 | 3 | 30 | 60 | 10 | -- | -- | 100 |

UNIT I **9**

Introduction to thermodynamics: Definition and its applications. Systems and control volumes, thermodynamic properties, state and equilibrium processes and cycles, temperature and zeroth law of thermodynamics. Forms of Energy, energy transfer by work and heat, law of conservation of energy (First law of thermodynamics)

Properties of Pure substances: Definition, examples and phases; Phase change processes, Property diagrams and tables, ideal gas equation of state

UNIT II **10**

Closed system analysis: concept of moving boundary work, energy balance. Specific heats, internal energy and Enthalpy-expressions for ideal gas, liquids and gases

Control volume analysis: Conservation of mass, flow work, energy analysis of steady flow systems and applications

Introduction to Law of degradation of energy (Second law): limitations of first law, Thermal energy reservoirs, heat engines, refrigerators and heat pumps. Kelvin Plank and Clausius statements and their equivalence. Perpetual Motion Machines.

UNIT III **10**

Internal Combustion Engines: Introduction, classification and brief description of I.C. engines mechanism, 4-Stroke and 2-Stroke petrol, gas and diesel engines, Otto, Diesel and dual cycles and their air standard efficiencies and mean effective pressures. Valve timing diagrams, comparison of petrol and diesel engines. Engine efficiencies and performance

Reciprocating Air Compressors: Introduction and classification, work done in single stage air compressor, effect of clearance, volumetric efficiency.

UNIT IV **10**

Vapor Power Cycles: Introduction, Carnot cycle, Rankine cycle, Comparison of Carnot cycle and Rankine cycle, Efficiency of Rankine cycle, steam generators

Power transmission: Belt, chain ,rope and gear drives, couplings, clutches and brakes

Use of EES for solving the numerical problems

Approximate Total : 39 Hrs

Texts and References

1. Yunus A Cengel & Bole, Thermodynamics- An Engineering Approach by Tata Mcgraw Hill, New Delhi
2. P. K. Nag, Engineering Thermodynamics, Tata Mcgraw Hill, New Delhi
3. R.K.Rajput , Engineering Thermodynamics, EVSS Thermo Laxmi Publications
4. Rayner Joel , Engineering Thermodynamics, ELBS Longman.
5. R.Yadav , Fundamentals of Engineering Thermodynamics by, Central Publishing House, Allahabad

| ME/IE-103P ELEMENTS OF MECHANICAL ENGINEERING | | | | | | | | | | |
|---|----|---|---|----------|--------------------|----|----|-----------|---------|-------------|
| Teaching Scheme | | | | | Examination Scheme | | | | | |
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total Marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |
| <p>List of Experiments:</p> <ol style="list-style-type: none"> 1. Study of different types of Boilers: Cochran, Lancashire, Babcock & Wilcox & Locomotive Boilers 2. To study of four stroke I.C. Engines: (a) 4-S petrol engine (b) 4-S diesel engine 3. To study of two stroke I.C. Engines: (a) 2-S petrol engine (b) 2-S diesel engine 4. Study of various power transmission systems 5. Study of various types of couplings, clutches and brakes 6. Study of various types of pumps 7. Study different types of mechanisms and their inversions 8. Study of various types of bearings 9. Heat balance sheet 10. Study of various types of compressor. | | | | | | | | | | |

ME/IE 104P WORKSHOP PRACTICES

| Teaching Scheme | | | | | Examination Scheme | | | | | |
|-----------------|----|---|---|----------|--------------------|----|----|-----------|---------|-------------|
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total Marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| -- | -- | 2 | 1 | 2 | -- | -- | -- | 50 | 25 | 75 |

| | Experiments | No. of Turns |
|----|---|--------------|
| 1 | Introduction to workshop safety and visit and overview of the workshop | 1 |
| 2 | Introduction to Fitting shop and Measuring instruments. | 1 |
| 3 | Introduction to Carpentry shop and hands on experience. | 1 |
| 4 | Introduction to welding processes in the Welding shop. Introduction to Arc welding with Demonstration. | 1 |
| 5 | Introduction to Gas welding and Resistant welding with Demonstration | 1 |
| 6 | Introduction to Machine shop. To study about the Shaping Machine with demonstration. | 1 |
| 7 | To study about the Lathe Machine with demonstration | 1 |
| 8 | To study about the Milling Machine with demonstration. | 1 |
| 9 | To study about the Metal cutting, Grinding and Drilling Machine with demonstration. | 1 |
| 10 | To study about sheet metal work with hands on experience. | 1 |
| 11 | To study about CNC machines with demonstration | 1 |
| 12 | Hands on experience on Mini lath machine (aluminum block). | 1 |
| 13 | Hands on experience on Mini milling machine (aluminum block). | 1 |

Texts and References

1. Chapman, W.A.J., Workshop Technology, ELBS Low Price Text, Edward Donald Pub. Ltd.
2. Tejwani, V.K., Basic Machine Shop Practice Vol. I & II, Tata McGraw Hill Pub. Co.
3. Arora, B.D., Workshop Technology Vol. I & II, Satya Prakashan, New Delhi
4. Bava, H.S., Workshop Technology, Tata McGraw Hill Publishing Co. Ltd.
5. Hajra Chaudhary, S.K, Elements of Workshop Technology Vol. I, Asia Publishing House
6. Gupta, K.N. & Kaushish, J.P., Workshop Technology Vol. I & II, New Delhi Heights Pub., New Delhi
7. Raghuwanshi, B.S., Course in Workshop Technology, Dhanpat Rai & Sons, NewDelhi

| MA 101T MATHEMATICS I | | | | | | | | | | |
|-----------------------|---|----|---|----------|--------------------|----|----|-----------|---------|-------------|
| Teaching Scheme | | | | | Examination Scheme | | | | | |
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total Marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| 3 | 1 | -- | 7 | 4 | 30 | 60 | 10 | -- | -- | 100 |

UNIT I

8 Hours

Calculus of Single variable: Successive differentiation, Leibnitz theorem (without proof), Taylor's and Maclaurin's expansion of functions of single variable. Fundamental theorem of Integral calculus, Application of integrals to find length, area, volume and surface area of revolution.

Curve Tracing: Asymptotes, Cartesian, polar and parametric forms.

UNIT II

11 Hours

Calculus of Several variables: Partial derivatives, Euler's theorem, directional derivative and gradient, Taylor's and Maclaurin's expansion of functions of several variables, Maxima and minima of functions of several variables, Lagrange's method of undetermined multipliers, Multiple Integrals – double and triple, Jacobian, Change of order of integration, change of coordinates, evaluation of area, volumes of solids, Mass, center of gravity and moment of inertia.

UNIT III

11 Hours

Infinite Series & Improper Integrals: Convergence and divergence of Infinite series. Comparison test, D' Alembert's ratio test, Raabe's test, logarithmic test, Cauchy's root test. Alternating series; Leibnitz test, power series. Convergence of improper integrals, Beta and Gamma functions and its properties.

UNIT IV

9 Hours

Vector Calculus: Scalar and vector fields, Line and surface Integrals, Gradient divergent curl, Green's Theorem and Stoke's theorem (without proof) with application and physical significance.

APPROXIMATE TOTAL 39 Hours

Texts and References

1. Higher Engineering Mathematics, B. S Grewal, Khanna Pub., Delhi.
2. Calculus (5th Edition), James Stewart, Thomson (2003).
3. Higher Engineering Mathematics, R. K. Jain & S. R. K. Iyernagar
4. Thomas' Calculus, eleventh edition, Pearson.
5. E.Kreyszig, Advanced engineering mathematics (8th Ed.), John Wiley (1999)
6. Advance Engineering Mathematics, Michael D. Greenberg

| MA 102T Computer Programming | | | | | | | | | | |
|--|----|---|---|----------|--------------------|----|----|-----------|---------|-------------|
| Teaching Scheme | | | | | Examination Scheme | | | | | |
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total Marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| 2 | -- | 1 | 4 | 4 | 25 | 25 | 10 | -- | -- | 60 |
| <p>UNIT I 12 Hours How does computer executes a program?,Number Systems, Algorithm, Flowchart, Writing Simple C programs</p> <p>UNIT II 15 Hours Program requiring decisions, Writing Functions in various ways, Programs having loop, Recursive Functions, Array</p> <p>UNIT III 8 Hours Pointer, String Handling, Bit Level Programming, Managing Files</p> <p>UNIT IV 5 Hours Introduction to C++</p> <p style="text-align: right;">APPROXIMATE TOTAL 40 Hours</p> | | | | | | | | | | |
| Texts and References | | | | | | | | | | |
| <ol style="list-style-type: none"> 1. Let Us C, Yashavant Kanetkar, BPB Publication,9th Edition 2. Object Oriented Programming with C++, E. Balaguruswami, TMH, 3rd Edition 3. C: The Complete Reference, Herbert Schildt | | | | | | | | | | |

HS-103T COMMUNICATION SKILLS

| Teaching Scheme | | | | | Examination Scheme | | | | | |
|-----------------|---|---|---|----------|--------------------|----|----|-----------|---------|-------------|
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total Marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| 1 | | | 2 | 1 | 30 | 60 | 10 | | -- | 100 |

UNIT I (3 hrs)

Communication Skills:

Process, Types and Levels of Communication. Technical communication and General Communication. Factors to be considered in technical communication. Verbal and Non-Verbal communication (Kinesics): Components of non-verbal communication. Barriers to effective communication. Communication across culture.

UNIT II (3 hrs)

Listening Skills:

Types of Listening. Barriers in Effective Listening. Tips for effective listening. Barriers to effective communication

UNIT III (2 hrs)

Interview:

Introduction. General preparation for an interview. Types of questions generally asked in interview. Types of interviews. Importance of non-verbal aspects in an interview.

UNIT IV (6 hrs)

Letter Writing, Technical Proposals and Job Applications:

Business Letters, Structures and Types of Business Letters, Letters of Inquiry, Complaint, Regret and Adjustment

Definition of technical proposal, Purpose, Types, characteristics, Structure, Style and Appearance. Essential Parts of Application. Cover Letter and the Resume. Types of Resume. Chronological Resume, Functional Resume.

Approximate Total : 14 Hrs

Reference Books:

1. Meenakshi Raman & Sharma, Technical Communication Principles and Practice by Oxford University Press, New Delhi.
2. Basic Communication Skills for Technology, Andrea J. Rutherford (Pearson Education)
3. Communication Skills for Engineers, Sunita Mishra, C. Murali Krishna (Pearson Education)
4. Business Communication Strategies. Matthukutty M. Monipally (Tata-McGraw-Hills)

| | | | | | | | | | | |
|---|---|---|---|----------|--------------------|----|----|-----------|---------|-------------|
| PANDIT DEENDAYAL PETROLEUM UNIVERSITY GANDHINAGAR | | | | | | | | | | |
| SCHOOL OF TECHNOLOGY | | | | | | | | | | |
| CE 101T Applied Mechanics | | | | | | | | | | |
| Teaching Scheme | | | | | Examination Scheme | | | | | |
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| 3 | 1 | - | 7 | 4 | 30 | 60 | 10 | - | - | 100 |

UNIT I

10

Introduction: Scalar and Vector Quantities, composition and resolution of vectors, system of units, definition of space, time, particle, rigid body, force.

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.

UNIT II

10

Truss: Simple determinate plane trusses and analysis for member forces using methods of joints and methods of sections.

Distributed forces, center of gravity and moment of inertia: Center of gravity of lines, plane areas, volumes and bodies, Pappus – Goldinus theorems, moment of inertia, polar moment of inertia & radius of gyration of areas, parallel & perpendicular axes theorems.

UNIT III

10

Friction: Theory of friction, static and sliding friction, laws of friction, angle and coefficient of friction, inclined plane friction, ladder friction, wedges, belt and rope friction.

Simple Machines: Velocity ratio, mechanical advantage, efficiency, reversibility of machines, simple machines such as levers, pulley and pulley blocks, wheel and differential axle, Single purchase/double purchase crab, compound screw jacks.

UNIT IV

09

Simple stresses & strains: Elastic, homogeneous, isotropic materials; limits of elasticity and proportionality, yield limit, ultimate strength, strain hardening, section of composite materials, prismatic and non-prismatic sections. Strains: Linear, shear, lateral, thermal and volumetric, Poisson's ratio. Stresses: Normal stresses, axial – tensile & compressive, shear and complementary shear, thermal and hoop, Applications to composite material stepped & tapered bars.

Approximate Total 39 Hours

References/ Books :

1. Engineering Mechanics (Statics) Beer and Johnston, TMH 2005, N.D.
2. Engineering Mechanics: Jaget Babu
3. Engineering Mechanics Statics and Dynamics: R.C.Hibler, Ashok Gupta
4. Applied Mechanics S. B. Junnarkar & H. J. Shah, Charotar Publishing House, Anand
5. Mechanics of Structure Vol. I S. B. Junnarkar & H. J. Shah, Charotar Publishing House, Anand
6. Mechanics of Materials Beer and Johnston, TMH, N.D.
7. Mechanics of solids: Abdul Mubeen

| PANDIT DEENDAYAL PETROLEUM UNIVERSITY GANDHINAGAR | | | | | | | | | | | |
|---|---|---|---|----------|--------------------|----|----|-----------|---------|-------------|--|
| SCHOOL OF TECHNOLOGY | | | | | | | | | | | |
| CE 101P Applied Mechanics | | | | | | | | | | | |
| Teaching Scheme | | | | | Examination Scheme | | | | | | |
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total marks | |
| | | | | | MS | ES | IA | LW | LE/Viva | | |
| - | - | 2 | 1 | 2 | - | - | - | 25 | 25 | 50 | |

List of Experiments:

- 1 To verify the polygon law of forces for a coplanar-concurrent force system in equilibrium.
- 2 To determine the weight of a plate by equilibrium of coplanar, non-concurrent, non- parallel forces.
- 3 To verify the principle of moment.
- 4 To calculate the stresses in various member of the jib crane and find the percentage (%) error between the calculated and the observed values.
- 5 To determine the co-efficient of static friction between glass and wood; wood and cloth; and wood and aluminum.
- 6 To determine various machine parameters of given wheel and differential axles.
- 7 To determine various machine parameters of given single purchase crab.
- 8 To determine various machine parameters of given double purchase crab.
- 9 To determine various machine parameters of given Screw Jack.
- 10 To determine the reactions at supports and verify the condition of equilibrium for a beam simply supported at ends.

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| PANDIT DEENDAYAL PETROLEUM UNIVERSITY GANDHINAGAR | | | | | | | | | | | |
| SCHOOL OF TECHNOLOGY | | | | | | | | | | | |
| CE102T Elements of Civil Engineering | | | | | | | | | | | |
| Teaching Scheme | | | | | Examination Scheme | | | | | | |
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total marks | |
| | | | | | MS | ES | IA | LW | LE/Viva | | |
| 2 | 1 | - | 5 | 3 | 30 | 60 | 10 | - | - | 100 | |

UNIT I **0**

Introduction to Civil Engineering **2**

Civil engineering and basic human needs, Role of civil engineer, Branches of civil engineering

UNIT II **1**

Basics of Surveying **0**

Linear Measurement /direction Measurement, Elevation Measurement, Leveling, and Measurement of Area and volume

UNIT III **0**

Elements of building construction **6**

(A) Principles, basic requirement, Building Planning, Drawing, lay-out.

(B) Construction Material, purpose of Various Material, Brick, cement, concrete, timber, ceramic & Glazed

UNIT IV **0**

Water Resources Development **6**

Hydrological cycle, Source of water, Water conveyance system, water requirement.

Transportation engineering

Necessarily of Transportation, Suitability and requirement of Different modes of transport, Highway and traffic engineering, traffic control and transport project including PPP's

Approximate Total : 24 Hrs

Reference Books:

1. Surveying Vol .I & II, B. C. Punamia, Laxmi Publication, Delhi
2. Surveying Vol. I and II, S. K. Duggal, Tata Macgraw Hill Publication, New Delhi
3. Civil Engineering Drawing, S. C. Rangwala, Charotar Publishing House, Anand
4. Building Construction, Dr. B. C. Punamia, Laxmi Publication, Delhi
5. Building Construction -Bindra Arora; Dhanpat Rai publication.
6. Engineering Material, Dr. S.C. Rangwala, Charotar Publishing House, Anand
7. Building Materials, Dr. S.K. Duggal, New Age International Publishing House, Delhi
8. Civil Engineering Material, Jakson and Dhir, ELBS Publishing, London
9. Highway Engineering, Khanna S. K. and Justo C. Publisher: Nemchand and Brothers
10. Irrigation Engineering and Hydraulic Structures, Santoshkumar Garg, Khanna Publishers Delhi

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| PANDIT DEENDAYAL PETROLEUM UNIVERSITY GANDHINAGAR | | | | | | | | | | |
| SCHOOL OF TECHNOLOGY | | | | | | | | | | |
| CE102P Elements of Civil Engineering | | | | | | | | | | |
| Teaching Scheme | | | | | Examination Scheme | | | | | |
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| - | - | 2 | 1 | 2 | - | - | - | 25 | 25 | 50 |

List of Experiments:

1. Distance Measuring Instruments
2. Chaining and offsetting
3. Compass Survey
4. Chain and Compass Survey
5. Leveling Instrument
6. To Determine Reduced Level

SC 101T CHEMISTRY

| Teaching Scheme | | | | | Examination Scheme | | | | | |
|-----------------|---|----|---|----------|--------------------|----|----------|-----------|----------------|-----|
| L | T | P | C | Hrs/Week | Theory | | Tutorial | Term Work | Practical/Viva | T M |
| 3 | 0 | -- | 6 | 3 | 40 | 60 | -- | -- | -- | 1 |

UNIT I

Water and its Treatment: Introduction, sources of water Impurities in water, hard and soft water, Degree of hardness, Types of hardness, Scale and sludge formation in boiler, Priming and Foaming, Softening of water.

UNIT II

Corrosion and its Control: Introduction, Theories of corrosion, Types of corrosion, Protection of materials from corrosion – organic and inorganic materials, Inhibitors, Cathodic protection.

Chemistry of Fuels: Origin, Classification and properties of Solid, Liquid, Gaseous Fuels, Proximate and Ultimate analysis, Petroleum- Distillation and Uses, Calorific Value, Determination of Calorific Value of solid and liquid fuels, Fuel Cell and Fuel Cell technology

UNIT III

Cements: Introduction, Manufacturing of Portland cement, chemical composition of cement, Properties and application of different types of cement, Setting and hardening of cement, Heat of hydration, Environmental impact of cement manufacturing.

Green Chemistry: Principles of Green Chemistry, Acid rain, Green house effect, Depletion of ozone layer, Green chemical technology

UNIT IV

Polymers: Classification, Types of polymerization reactions, Preparation of some common important polymers, Resins- Phenol formaldehyde Resins, Urea formaldehyde resin, Epoxy resins. Aspects of supramolecular chemistry

Total: 44 Hrs

Texts and References

1. Jain and Jain, Engineering Chemistry, Dhanpat Rai Publication
2. James G. Speight, The Chemistry and Technology of Petroleum, CRC Press, New York.
3. Vasily Simanzhenkov & Raphael Idem, Crude Oil Chemistry, Marcel Dekker, New York.
4. James G. Speight, Fuel Science and Technology Hand Book, Marcel Dekker, New York.
5. M.A. Famin, T.A. Al-Sahhaf, A.S. Elkilani, Fundamental of Petroleum Refining, Elsevier
6. S. N. Banerjee, An introduction to science of corrosion and its inhibition, Oxonian Press 1985
7. Mars Guy Fontana, *Corrosion Engineering*, 3/E, Tata McGraw-Hill Education

SC101P CHEMISTRY PRACTICAL

| Teaching Scheme | | | | | Examination Scheme | | | | |
|-----------------|----|---|---|----------|--------------------|----|----------|-----------|---------------|
| L | T | P | C | Hrs/Week | Theory | | Tutorial | Term Work | Practical/Viv |
| -- | -- | 2 | 1 | 2 | -- | -- | -- | | 25 |

List of Experiments:

1. To determine the strength of given solution of ferrous ammonium sulphate by titrating against standard $K_2Cr_2O_7$ using potassium ferricyanide as an external indicator
2. To determine the strength of given copper sulphate solution by titrating against N/20 sodium thio (hypo) solution
3. To prepare phenol formaldehyde resin (Bakelite)
4. To prepare p-nitro acetanilide from acetanilide
5. To determine the total, permanent and temporary hardness of given water by complexometric titration using standard 0.01M EDTA solution
6. To determine the strength of given HCl solution using a standard NaOH solution by performing a pH titration
7. To determine the strength of given HCl solution using a standard NaOH solution by performing a conductometric titration
8. To determine the strength of given ascorbic acid by titrating against standard N/10 iodine solution
9. To study the kinetics of decomposition of sodium thiosulphate by a mineral acid
10. Determination of Chloride in the given water sample by Mohr Method
11. To determine the smoke point of the given oil sample.
12. To determine the viscosity of sucrose solutions of different concentrations by Ostwald viscometer concentration of an unknown solution.
13. To evaluate the saponification value of given oil sample.
14. To determine the acid value of given oil samples.
15. To Prepare Soap by Hot Process.
16. To determine the viscosity of the given petroleum products and to study the variation of viscosity to temperature and concentration.

| HS-104 ENVIRONMENTAL STUDIES | | | | | | | | | | |
|------------------------------|---|---|---|----------|--------------------|----|----|-----------|---------|--------|
| Teaching Scheme | | | | | Examination Scheme | | | | | |
| L | T | P | C | Hrs/Week | Theory | | | Practical | | T M |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| 1 | - | - | 2 | 1 | 30 | 60 | 10 | | -- | 1 |

UNIT-1

1. Multidisciplinary nature of environmental studies, Ecosystems, Biodiversity and conservation, Indicators of environmental pollution, Environment and human health

UNIT-2

2. Consumption of natural resources and environmental degradation (forests, water, minerals, energy, and land), Sustainable development, Environmental policy and legislation, Environmental impact assessment.

UNIT-3

3. Pollution of lakes, rivers, ground water, coasts, and oceans, Science and technology for drinking water and wastewater treatment and issues in management of systems, Solid and hazardous waste management (causes, effects and control measures)

UNIT-4

4. Air and noise pollution (science and engineering of pollution control), Global Issues including climate change, global warming, acid rain, ozone layer depletion, nuclear hazards, Disaster management (industrial accidents, floods, earthquakes, cyclones and landslides),

Approximate Total : 14 Hrs

Reference Books:

1. Principles of Environmental Science, Cunningham W.P. and Cunningham M.A. (2006) Tata McGraw-Hill Publishing Company, New Delhi.
2. Basic Environmental Technology, Nathanson, J.A. (2002), Prentice Hall of India, New Delhi.
3. Wastewater Treatment for Pollution Control and Reuse, Arceivala, S.J. and Asolekar S.R. (2006), 3rd Edition, Tata McGraw Publishing Co. Ltd., New Delhi.
4. Preventive Environmental Management – An Indian Perspective, Asolekar, S.R. and Gopichandran, R. Foundation Books Pvt. Ltd., New Delhi, 2005.
5. Environmental Studies: R. Rajagopalan, Oxford University Press

SC 102T Physics

| Teaching Scheme | | | | | Examination Scheme | | | | | |
|-----------------|---|----|---|----------|--------------------|----|----------|-----------|----------------|-------------|
| L | T | P | C | Hrs/Week | Theory | | Tutorial | Term Work | Practical/Viva | Total Marks |
| | | | | | MS | ES | | | | |
| 3 | 1 | -- | 7 | 4 | 40 | 60 | 25 | -- | -- | 125 |

UNIT I

Vector concepts & applications in Physics: [6]

Introduction to vector algebra, Physical concepts in vector fields and Scalar fields with examples, Physical and mathematical concepts of gradient, divergence and curl, Green's theorem, Gauss theorem, applications in gravitation and electrostatics. Stokes' theorem and its applications.

Electrostatics and Electrodynamics: [7]

Gauss's law in dielectric medium, Equation of continuity, Biot Savart law – Ampere's law – magnetization and magnetic intensity, Faraday's law of induction – generalization of Ampere's law, displacement current, Maxwell's equations, wave equation for electromagnetic radiation, electromagnetic wave propagation in free space and isotropic dielectric medium, Poynting theorem & Poynting vector.

UNIT II

Waves and oscillations: [4]

Types of waves, Simple harmonic motion, Damped simple harmonic motion, types of damping, Forced oscillation, resonance, , Energy Transport in Wave motion.

Acoustics & Ultrasonic: [3]

Introduction to Sound, Sabine's reverberation theory, Acoustical defects and their remedies, Doppler Effect. Ultrasonic waves, methods of their generation and detection, properties and application of ultrasonic waves.

UNIT III

Optics: [8]

Interference: Types of interferences, Thin film interference, Anti-reflecting films; wedge shape films; Newton's rings and its applications,. **Diffraction:** Diffraction of light waves, Fraunhofer diffraction at a single slit, Two slit Fraunhofer Diffraction Pattern, N- Slit Fraunhofer Diffraction Pattern, diffraction grating, resolving power, Rayleigh Criterion, Fresnel diffraction (Introduction). **Polarization:** Polarization of light, production of polarized light, types of polarization and their representation, Malus's law, polarizer and analyser, Double refraction, Interference of Polarized light: Quarter wave plates and Half wave plates

UNIT IV

Laser & Fibre Optics: [8]

Concepts of maser and laser, Interaction of radiation of matter-quantum mechanical view, Einstein coefficients spontaneous and stimulated emission, principles involves in laser, Meta stable state,

Population inversion, three and four level laser system, and optical amplification and optical resonance characteristics of laser, Ruby, He-Ne and semiconductor lasers, Application of lasers, Optical Fiber physical structure and basic theory, modes in optical fibers, step index and graded index fibers, loss in optical fibers, applications of optical fibers in communication.

Nuclear Science and Engineering:

Basics of Nuclear Physics, activation analysis, Q –Value, Carbon dating, fission and fusion; principle effect of nuclear radiation on materials, radiation protection and environment.

Total: 40 Hrs

Texts Books

1. Resnick, Halliday and Krane, *Physics part I and II*, 5th Edition John Wiley (2002).
2. A. Ghatak, *Optics*, 3rd edition, Tata McGraw Hill (2005).

References books:

3. Kittel C., Knight W.O. and Ruderman M.A., *Mechanics - Berkeley Physics Course, Vol. 1*, Tata McGraw-Hill.
4. Purcell E.M. *Electricity and Magnetism - Berkeley Physics Course, Vol.2*, Tata McGraw-Hill.
5. Crawford F.S. - *Waves and Oscillations, Berkeley Physics Course, Vol. 3*, McGraw-Hill.
6. Feynman R.P., Leighton R.B. and Sands M. *The Feynman Lectures on Physics, Vol. 1.*, Narosa Publication
7. Feynman R.P., Leighton R.B. and Sands M. *The Feynman Lectures on Physics, Vol. 2.* Narosa Publication
8. Griffith D.J.H., *Introduction to Electrodynamics* - Prentice Hall, India.
9. M. N. Avadhanulu, *A text book of engineering Physics*, S. Chand & Company, Ltd.
10. Brij Lal, N. Subrahmanyam, *Heat and Thermodynamics*, S. Chand & Company, Ltd.

SC 102P Physics Practical

| Teaching Scheme | | | | | Examination Scheme | | | | | |
|-----------------|----|---|---|----------|--------------------|----|----------|-----------|--------------------|-------------|
| L | T | P | C | Hrs/Week | Theory | | Tutorial | Term Work | Practical/ Viva | Total Marks |
| | | | | | MS | ES | | | | |
| -- | -- | 2 | 1 | 2 | -- | - | -- | -- | 100 | 100 |

List of Experiments

1. Study of Interference using Michelson's Interferometer.
2. Introduction to Oscilloscope.
3. Study of Interference using Newton's Ring experiment.
4. Experiment to determine volumetric coefficient of expansion of liquids.
5. Experiment to determine thermal conductivity of different solid bodies.
6. Experiment with solar collector.
7. Measurement of vapor pressure.
8. Experimental to determine linear thermal expansion coefficient of solid bodies.
9. Experiment on reflection of Ultrasonic waves.
10. Experiment to determine heat capacities.
11. Experiment to determine critical temperature.
12. Study of effect of electric force.
13. Experiments with hot air engine.
14. Experiments with heat pump.
15. Study of conducting electricity by means of electrolysis.
16. Measurement of viscosity.
17. Determining Plank's constant and Inverse square law.
18. Experiments on diffraction with He-Ne Laser Kit.
19. Study of Hall Effect.
20. Determining semiconductor energy band gap using four probe method.
21. Experiment to study forced oscillations.
22. Study of charging and discharging of capacitive plates.
23. Study of Bio-Savart's Law
24. Study of Kerr Effect.
25. Experiments on spectroscopy.
26. Experiments on Fiber Optics.
27. Study of Photoconductivity.
28. Study of Interference using ultrasonic Interferometer.
29. Determining e/m by Thomson's method.
30. Study of Polarization of light using LASER.
31. Millikan's oil drop experiment.
32. Study of Holography.

| MA 103T MATHAMETICS-II | | | | | | | | | | |
|--|---|----|---|----------|--------------------|----|----|-----------|---------|-------------|
| Teaching Scheme | | | | | Examination Scheme | | | | | |
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total Marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| 3 | 1 | -- | 7 | 3 | 30 | 60 | 10 | -- | -- | 100 |
| <p>UNIT I 10 Hours Complex Analysis: Complex numbers, Function of a Complex variable, Analytic function, Cauchy-Riemann equations, Conformal mapping and its type, Some standard & special conformal mappings, Definition of a Complex line integral, Cauchy's integral theorem, Cauchy's Integral formula, Residue theorem, Calculation of residues, Evaluation of real definite integrals.</p> <p>UNIT II 10 Hours Ordinary Differential Equations: Differential equations of first order and higher degree, Linear independence and dependence of functions. Higher order differential equations with constant coefficient, Rules for finding C.F. and P.I., Method of variation of parameter, and method of undermined coefficients, Cauchy and Legendre's linear equations, Linear differential equations of second order with variable coefficients; Simultaneous linear equations with constant coefficients. Various applications of higher order differential equations in solution of engineering problems, Orthogonal trajectories.</p> <p>UNIT III 10 Hours Partial Differential Equations: Formation of P.D.E, Equations solvable by direct integration, Linear and non-linear equations of first order, Lagrange's equations. Homogeneous and non-homogeneous linear P.D.E. with constant coefficients. Rules for finding C.F. & P.I.</p> <p>UNIT IV 09 Hours Laplace Transforms: Piecewise continuous functions and exponential order functions, Definition, Existence and Properties of Laplace transform, unit step function and Heavyside function, Inverse Laplace transform, Laplace transform of derivative, Convolution theorem, Applications for solving differential equations</p> <p style="text-align: right;">APPROXIMATE TOTAL 39 Hours</p> | | | | | | | | | | |
| Texts and References | | | | | | | | | | |
| 1. Complex variables and applications (7thEdition), R.V.Churchill and J.W.Brown, McGraw-Hill (2003) 2. Complex analysis, J.M.Howie, Springer-Verlag (2004) 2. Higher Engineering Mathematics, R. K. Jain & S. R. K. Iyernagar. 3. E.Kreyszig, Advanced engineering mathematics (8th Ed.), John Wiley (1999) | | | | | | | | | | |

4. W.E.Boyce and R. DiPrima, Elementary Differential Equations (8th Ed.) John Wiley (2005)
5. Ordinary and Partial Differential Equations by M.D. Raisinghania, 8th edition, S. Chand Publication (2010)
6. Introduction to Partial Differential Equations, K Sankara Rao, PHI Learning pvt ltd.

| EE 101T ELEMENTS OF ELECTRICAL ENGINEERING | | | | | | | | | | |
|---|---|----|---|----------|--------------------|----|----|-----------|---------|-------------|
| Teaching Scheme | | | | | Examination Scheme | | | | | |
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total Marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| 2 | 1 | -- | 5 | 3 | 30 | 60 | 10 | -- | -- | 100 |
| <p>UNIT I 10</p> <p>General: Concepts of E.M.F., P.D. and current, resistance, effect of temperature on resistance. Resistance temperature coefficient, insulation resistance. S.I. units of work, power and energy. Conversion of energy from one form to another in electrical, mechanical and thermal systems. batteries and cells, their types, primary cells and secondary cells, Lead Acid, Ni-Cd and Ni-MH batteries, current capacity and cell ratings. Charging, methods and maintenance procedure. D.C. Circuits: Classification of electrical networks, Ohm's law, Kirchhoff's law and their applications for network solutions. Simplifications of networks using series and parallel combinations and star-delta conversions.</p> <p>UNIT II 10</p> <p>Electromagnetism: Magnetic effect of an electric current, cross and dot conventions, right hand thumb rule and cork screw rule, nature of magnetic field of long straight conductor, solenoid and toroid. Concept of m.m.f., flux, flux density, reluctance, permeability and field strength, their units and relationships. Simple series and parallel magnetic circuits, comparison of electrical and magnetic circuit, force on current carrying conductors placed in magnetic field, Fleming's left hand rule. Faradays laws of electromagnetic induction, statically and dynamically induced E.M.F., self and mutual inductance, coefficient of couplings. Energy stored in magnetic field. Charging and discharging of inductor and time constant. Electrostatics and AC fundamentals: A) Electrostatics field, electric flux density, electric field strength, absolute permittivity, relative permittivity, capacitance and capacitor, composite dielectric capacitors, capacitors in series and parallel, energy stored in capacitors, charging and discharging of capacitors and time constant. B) Sinusoidal voltages and currents, their mathematical and graphical representation, Concept of instantaneous, peak (maximum), average and R.M.S. values, frequency, cycle, period, peak factor and form factor, phase difference, lagging, leading and in phase quantities and phasor representation. Rectangular and polar representation of phasors.</p> <p>UNIT III 9</p> <p>Single phase A.C. Circuits: Study of A.C. circuits consisting of pure resistance, pure inductance, pure capacitance and corresponding voltage-current phasor diagrams and waveforms. Development of concept of reactance, study of series R-L, R-C, R-L-C circuit and resonance, study of parallel R-L, R-C and R-LC circuit, concept of impedance, admittance, conductance and susceptance in case of above combinations and relevant voltage-current phasor diagrams, concept of active, reactive and apparent power and power factor. Polyphase A.C. Circuits and Single phase Transformers: A) Polyphase A.C. Circuits: Concept of three-phase supply and phase sequence. Voltages, currents and power relations in three phase balanced star-connected loads and delta-connected loads along with phasor diagrams. B) Single phase transformers: Construction, principle of working, E.M.F. equation, voltage and current ratios. Losses, definition of regulation and efficiency, determination of these by direct loading</p> | | | | | | | | | | |

method. Descriptive treatment of autotransformers and dimmer stats.

UNIT IV

10

Electrical Wiring: Connectors & switches, system of wiring, domestic wiring installation, sub circuits in domestic wiring, simple control circuit in domestic installation, industrial electrification. **Illumination:** Types of lamps, fixtures & reflectors, illumination schemes for domestic, industrial & commercial premises, Lumen requirements for different categories. **Safety & protection:** Safety, electric shock, first aid for electric shock other hazards of electrical laboratories & safety rules, use of multi-meters, grounding, importance of grounding, equipment of grounding for safety. Circuit protection devices, fuses, MCB, ELCB & relays.

APPROXIMATE TOTAL

39 Hours

Texts and References

1. Electrical Technology Vol.1, B.L.Theraja, S.Chand Publication, New Delhi
2. Basic Electrical Engineering, V.N.Mittal, TMH Publication, New Delhi
3. Electrical Estimating & Costing, Surjitsingh, Dhanpat Rai & Co.
4. Basic Electrical Engineering, V.K.Mehta, S.Chand and Company Ltd., New Delhi
5. Electrical Technolgy- Edward Hughes, Seventh Edition, Pearson Education
6. Elements of Electrical Technology- H.Cotton, C.B.S. Publications
7. Basic Circuits Analysis by John Omalley Shawn, Mc Graw Hill.
8. Principles of Electrical Engineering by Del. Toro, PHI

EE 101P ELEMENTS OF ELECTRICAL ENGINEERING

| Teaching Scheme | | | | | Examination Scheme | | | | | |
|-----------------|----|---|---|----------|--------------------|----|----|-----------|---------|-------------|
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total Marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| -- | -- | 2 | 1 | 2 | -- | -- | -- | 25 | 25 | 50 |

List of Experiments:

1. To study Symbols used in electrical Engineering
2. To study and verify about
 - a. Series and Parallel connection of Resistance
 - b. OHM's Law
3. Study of the voltage and current flowing into the circuit
4. Study of the Kirchhoff's laws for Electrical circuits
5. Study of the R-C circuit and find out the behavior of capacitor in a R-C network and study the phase shift due to capacitor
6. (A) Understanding Faradays law of Electromagnetic Induction
(B) Study of behavior of current when inductance is introduced to circuit
(C) Study of Lenz's law and effect of eddy current
7. Study of Phenomena of Mutual Induction
8. Study of Polarity test on a single phase Transformer
9. Study of Transformation Ratio of a Single Phase Transformer
10. To Study & Verify
 - a. The connection of Energy Meter, MCB and Consumer Unit(CU)
 - b. The connection procedure for Tube Light wiring section
 - c. The connection procedure for Two-Way Switch wiring section
 - d. Short Circuit Fault and verify the connection procedure for short circuit fault section
 - e. Study of switch board wiring
11. Study of importance and mechanism of fuse

| MA 102T Computer Programming | | | | | | | | | | |
|--|----|---|---|----------|-----------------------------------|----|----|-----------|---------|-------------|
| Teaching Scheme | | | | | Examination Scheme | | | | | |
| L | T | P | C | Hrs/Week | Theory | | | Practical | | Total Marks |
| | | | | | MS | ES | IA | LW | LE/Viva | |
| 2 | -- | 1 | 4 | 4 | 25 | 25 | 10 | -- | -- | 60 |
| UNIT I | | | | | 12 Hours | | | | | |
| How does computer executes a program?,Number Systems, Algorithm, Flowchart, Writing Simple C programs | | | | | | | | | | |
| UNIT II | | | | | 15 Hours | | | | | |
| Program requiring decisions, Writing Functions in various ways, Programs having loop, Recursive Functions, Array | | | | | | | | | | |
| UNIT III | | | | | 8 Hours | | | | | |
| Pointer, String Handling, Bit Level Programming, Managing Files | | | | | | | | | | |
| UNIT IV | | | | | 5 Hours | | | | | |
| Introduction to C++ | | | | | | | | | | |
| | | | | | APPROXIMATE TOTAL 40 Hours | | | | | |
| Texts and References | | | | | | | | | | |
| 1. Let Us C, Yashavant Kanetkar, BPB Publication,9 th Edition | | | | | | | | | | |
| 2. Object Oriented Programming with C++, E. Balaguruswami, TMH, 3 rd Edition | | | | | | | | | | |
| 3. C: The Complete Reference, Herbert Schildt | | | | | | | | | | |