

**B Tech (Full Time) – 1st Year
Curriculum & Syllabus
2015 – 2016**

**(Common to All the B Tech Branches)
(1st and 2nd Semester)**

**SCHOOL OF ENGINEERING AND TECHNOLOGY
JAGRAN LAKECITY UNIVERSITY, BHOPAL**

1st Year – Curriculum

Semester-wise Curriculum

B.Tech 1st Year Common to all Branches

SET A- I Sem(Mech/Computer Science)/II Sem(Civil/EEE/EC)

Course Code	Course Name	L	T	P	C	Category
MA101	Mathematics – I (Calculus & Solid Geometry)	3	0	0	3	BSC
PH101	Physics	3	0	0	3	BSC
ME 102	Engineering Graphics	1	0	4	4	ESC
EE101	Basic Electrical& Electronics Engineering	3	0	0	3	ESC
CY103	Principles of Environmental Studies	3	0	0	3	BSC
CS101	Prob. Solving and Computer Programming	3	0	0	3	ESC
PH102	Physics Laboratory	0	0	2	1	BSC
EE102	Basic Electrical& Electronics Engineering Laboratory	0	0	2	1	ESC
CS102	Prob. Solving and Computer Programming Laboratory	0	0	2	1	ESC
LE103	Language and soft skill Laboratory	0	0	2	1	HSC
	Total	16	0	12	23	

SET B – I Sem (Civil/EEE/EC)/II Sem (Mech/Computer Science)

Course Code	Course Name	L	T	P	C	Category
MA102	Mathematics – II(Advance Calculus & Complex Analysis)	3	0	0	3	BSC
LE101	Technical Communication	3	0	0	3	HSC
CY101	Chemistry	3	0	0	3	BSC
CE 101	Basic Civil Engineering	3	0	0	3	ESC
ME101	Basic Mechanical & Engineering Mechanics	4	0	0	4	ESC
LE102	Technical Communication Laboratory	0	0	2	1	HSC
CY102	Chemistry Laboratory	0	0	2	1	BSC
CE102	Basic civil Engineering Laboratory	0	0	2	1	ESC
ME103	Basic Mechanical & Engineering Mechanics Laboratory	0	0	2	1	ESC
ME 104	Workshop Practice	0	0	4	3	ESC
	Total	16	0	12	23	

SEMESTER II/ SET A

MA101	CALCULUS AND SOLID GEOMETRY	L	T	P	C
	Total Contact Hours – 60	3	0	0	3
	(Prerequisite)				
	Nil				
PURPOSE					
To impart analytical ability in solving mathematical problems as applied to the respective branches of Engineering.					
INSTRUCTIONAL OBJECTIVES					
1	To apply advanced matrix knowledge to Engineering problems.				
2	To equip themselves familiar with the functions of several variables.				
3	To familiarize with the applications of differential equations.				
4	To improve their ability in solving geometrical applications of differential calculus problems				
5	To expose to the concept of three dimensional analytical geometry.				

UNIT I - MATRICES

(12 hours)

Characteristic equation – Eigen values and Eigen vectors of a real matrix – Properties of Eigen values – Cayley – Hamilton theorem orthogonal reduction of a symmetric matrix to diagonal form – Orthogonal matrices – Reduction of quadratic form to canonical form by orthogonal transformations.

UNIT II - FUNCTIONS OF SEVERAL VARIABLES

(12 hours)

Function of two variables – Partial derivatives – Total differential – Taylor's expansion – Maxima and Minima – Constrained Maxima and Minima by Lagrangian Multiplier method – Jacobians – Euler's theorem for homogeneous function.

UNIT III - ORDINARY DIFFERENTIAL EQUATIONS

(12 hours)

Linear equations of second order with constant and variable coefficients – Homogeneous equation of Euler type – Equations reducible to homogeneous form – Variation of parameter – Simultaneous first order with constant co-efficient.

UNIT IV - GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS

(12 hours)

Curvature – Cartesian and polar coordinates – Circle of curvature – Involute and Evolute – Envelopes – Properties of envelopes.

UNIT V - THREE DIMENSIONAL ANALYTICAL GEOMETRY

(12 hours)

Equation of a sphere – Plane section of a sphere – Tangent Plane – Orthogonal Sphere - Equation of a cone – Right circular cone – Equation of a cylinder – Right circular cylinder.

TEXT BOOKS

1. Kreyszig, E., "Advanced Engineering Mathematics", John Wiley & Sons. Singapore, 10th

edition, 2012.

2. Ganesan .K, Sundarammal Kesavan, Ganapathy Subramanian .K.S & Srinivasan .V, “*Engineering Mathematics*”, Gamma publications, Revised Edition, 2013.

REFERENCES

1. Grewal .B.S, “*Higher Engineering Mathematics*”, Khanna Publications, 42nd Edition, 2012.
2. Veerajan. T, “*Engineering Mathematics I*”, Tata McGraw Hill Publishing Co, New Delhi, 5th edition, 2006.
3. Kandasamy P etal. “*Engineering Mathematics*”, Vol.I (4th revised edition), Chand .S &Co., New Delhi, 2000.
4. Narayanan .S, Manicavachagom Pillay .T.K, Ramanaiah .G, “*Advanced Mathematics for Engineering students*”, Volume I (2nd edition), S.Viswanathan Printers and Publishers, 1992.
5. Venkataraman .M.K., “*Engineering Mathematics*” – First Year (2nd edition), National Publishing Co., Chennai, 2000.

PH101	PHYSICS	L	T	P	C
	Total Contact Hours – 45	3	0	0	3
	(Prerequisite)				
	Nil				
PURPOSE					
The purpose of this course is to provide an understanding of physical concepts and underlying various engineering and technological applications. In addition, the course is expected to develop scientific temperament and analytical skill in students, to enable them logically tackle complex engineering problems in their chosen area of application.					
INSTRUCTIONAL OBJECTIVES					
1	To understand the general scientific concepts required for technology.				
2	To apply the Physics concepts in solving engineering problems.				
3	To educate scientifically the new developments in engineering and technology				
4	To emphasize the significance of Green technology through Physics principles				

UNIT I – MECHANICAL PROPERTIES OF SOLIDS AND ACOUSTICS (9 hours)

Introduction of Properties, Stress-strain relationship – Hooke's law, Torsional Pendulum, Young's modulus by cantilever, Uniform and non-uniform bending, Stress-strain diagram for various engineering materials, Tensile strength, Hardness, Fatigue, Impact strength, Creep) – Fracture – Types of fracture, Intensity – Loudness – Absorption coefficient and its determination, Reverberation – Reverberation time – Factors affecting acoustics of buildings and their remedies, Ultrasonic waves and properties – Methods of Ultrasonic production (Magnetostriiction and Piezoelectric), Applications of Ultrasonics in Engineering and medicine.

UNIT II – ELECTRONIC AND PHOTONIC MATERIALS (9 hours)

Fermi energy and Fermi–Dirac distribution function, Variation of Fermi level with temperature in intrinsic and extrinsic semiconductors, Hall effect, Dilute Magnetic Semiconductors (DMS) and their applications, Normal and High temperature superconductivity –Applications. LED, LCD Photo conducting materials, Photonic crystals and applications.

UNIT III – LASERS AND FIBER OPTICS (9 hours)

Characteristics of Lasers, Einstein's coefficients and their relations, Lasing action, Working principle and components of Nd-YAG Laser, CO₂ Laser, Applications in Remote sensing, holography and optical switching, Principle of Optical fiber, Acceptance angle and acceptance cone, Numerical aperture, V-number, Types of optical fibers (Material, Refractive index and mode) – Photonic crystal fibers, Fiber optic communication –various losses in optical fibers.

UNIT IV – QUANTUM MECHANICS AND CRYSTAL PHYSICS (9 hours)

De Broglie hypothesis for matter waves, Heisenberg's uncertainty principle, Group and particle velocities & their relationship, Compton scattering. Wave function and its properties, energy and momentum operators, time dependent and time independent Schrödinger wave Schrödinger's

wave equation, equation. Crystal directions , Planes and Miller indices, Diffraction of X-rays by crystal planes, Laue method and powder method, Imperfections in crystals.

UNIT V – NON CONVENTIONAL ENERGY

(9 hours)

Introduction, Solar Cell, Energy conversion by photovoltaic principle , Solar cells – Wind energy Basic components and principle of wind energy conversion systems – Ocean energy, Wave energy – Wave energy conversion devices Tidal energy – single and double basin tidal power plants, Ocean Thermal Electric Conversion (OTEC), Geothermal energy: Geothermal sources (hydrothermal, geo-pressurized hot dry rocks, magma), Biomass: Biomass and bio-fuels – bio-energies from wastages, Fuel cells: H₂O₂ – Futuristic Energy: Hydrogen – Methane Hydrates – Carbon capture and storage (CCS).

TEXT BOOKS

1. Dattu R.Joshi, “*Engineering Physics*”, Tata McGraw- Hill, New Delhi, 2010
2. Thiruvadigal .J. D, Ponnusamy .S, Sudha.D and Krishnamohan .M, “*Physics for Technologists*”, Vibrant Publication, Chennai, 2013.
3. Charles Kittel, “*Introduction to Solid State Physics*”, Wiley India Pvt. Ltd, 7th ed., 2007
4. V. Rajendran and A. Marikani, Material Science, Tata McGraw-Hill(2004)
5. Thiruvadiga .J.D, Ponnusamy .S, Sudha.D and Krishnamohan .M, “*Materials Sciences*”, Vibrant Publication, Chennai, 2013.
6. R K Gaur, Engineering Physics, Dhanpat Rai Publications

REFERENCES

1. Wole Soboyejo, “*Mechanical Properties of Engineered Materials*”, MarcelDekker Inc., 2003.
2. Frank Fahy, “*Foundations of Engineering Acoustics*”, Elsevier Academic Press, 2005.
3. Alberto Sona, “*Lasers and their applications*”, Gordon and Breach Science Publishers Ltd., 1976.
4. David J. Griffiths, “*Introduction to electrodynamics*”, 3rd ed., Prentice Hall, 1999.
5. Leonard. I. Schiff, “*Quantum Mechanics*”, Third Edition, Tata McGraw Hill, 2010.
6. Charles Kittel, “*Introduction to Solid State Physics*”, Wiley India Pvt. Ltd, 7th ed., 2007.
7. Godfrey Boyle, “*Renewable Energy: Power sustainable future*”, 2nd edition, Oxford University Press, UK, 2004.

ME102	ENGINEERING GRAPHICS	L	T	P	C
	Total contact hours – 60	1	0	4	4
	Prerequisite				
	Nil				
First Angle Projection is to be followed - Practice with Computer Aided Drafting tools					
PURPOSE					
1.	To draw and interpret various projections of 1D, 2D and 3D objects				
2.	To prepare and interpret the drawings of buildings.				
INSTRUCTIONAL OBJECTIVES					
1	To familiarize with the construction of geometrical figures				
2.	To familiarize with the projection of 1D, 2D and 3D elements				
3.	To familiarize with the sectioning of solids and development of surfaces				
4.	To familiarize with the Preparation and interpretation of building drawing				

UNIT I (12hours)

Scales: Representative factor, plain scales, diagonal scales, scale of chords. Conic sections: Construction of ellipse, parabola, hyperbola by different methods; Normal and Tangent. Special Curves: Cycloid, Epi-cycloid, Hypo-cycloid, Involute, Archimedean and logarithmic spirals.

UNIT II (12hours)

Projection: Types of projection, orthographic projection, first and third angle projection, Projection of points and lines, Line inclined to one plane, inclined with both the plane, True Length and True Inclination, Traces of straight lines.

UNIT III (12hours)

Projection of planes and solids: Projection of Planes like circle and polygons in different positions; Projection of polyhedrons like prisms, pyramids and solids of revolutions like cylinder, cones in different positions.

UNIT IV (12hours)

Section of Solids: Section of right solids by normal and inclined planes; Intersection of cylinders. Development of Surfaces: Parallel line and radial - line method for right solids.

UNIT V (12hours)

Isometric Projections: Isometric scale, Isometric axes, Isometric Projection from orthographic drawing.

Computer Aided Drafting (CAD): Introduction, benefit, software's basic commands of drafting entities like line, circle, polygon, polyhedron, cylinders; transformations and editing commands like move, rotate, mirror, array; Benefit, software's, Wire frame, Surface and Solid Model, Basic commands of drafting entities like line, circle, polygon, polyhedron, cylinders. Modification and editing commands like offset, Fillet, Chamfer, trim Extend, mirror, array etc. Solution of projection problems on CAD.

REFERENCE

1. ND BHATT LAXMI PUBLICATION 2013 Edition .

2. Dr. C.M. Agarwal TMH 2012-13 PUBLICATION .
3. VENUGOPAL –Engineering Drawing Latest version. (With AutoCAD)
Jeyopooan. T, Engineering Drawing , Vikas Publication.
4. John K.C, Engineering Graphics for Degree , PHI.
5. Agrawal & Agrawal ,Engineering Graphics, TMH.
6. Dhawan RK ,Engineering Drawing, S Chand & Co.
7. A Premier on Computer Aided Engg drawing-Visvesvaraya Technological University (VTU), Belgaum.

EE101	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	L	T	P	C
	Total Contact Hours – 45	3	0	0	3
	(Prerequisite)				
	Nil				
PURPOSE					
This course provides comprehensive idea about working principle, operation and characteristics of basic electrical and electronic devices					
INSTRUCTIONAL OBJECTIVES					
At the end of the course students will be able to gain knowledge about the					
1	Fundamentals of electrical and electronic components, devices,				
2	Principles of electrical and electronics				

Unit I (9 hours)

Electrical circuit analysis- Voltage and current sources, dependent and independent sources, Ohm's law, limitations of Ohm's law, Kirchhoff's laws and their applications to circuits, source conversion, DC circuits analysis using mesh & nodal method, Thevenin's & superposition theorem, star-delta transformation. 1-phase AC circuits under sinusoidal steady state, active, reactive and apparent power, physical meaning of reactive power

Unit II (9 hours)

Transformers- Review of laws of electromagnetism, mmf, flux, and their relation, analysis of magnetic circuits. Single-phase transformer, Principle of operation and construction of single phase transformers (core and shell types), EMF equation, voltage, current and impedance transformation, equivalent circuits, phasor diagram, voltage regulation, losses and efficiency, OC and SC test.

Unit III (9 hours)

Rotating Electric machines- Constructional details of DC machine, induction machine and synchronous machine, Working principle of 3-Phase induction motor, Emf equation of 3-Phase induction motor, Concept of slip in 3-Phase induction motor, Explanation of Torque-slip characteristics of 3-Phase induction motor, Classification of self excited DC motor and generator.

Unit IV**(9 hours)**

Digital Electronics-Number systems used in digital electronics, decimal, binary, octal, hexadecimal, their complements, operation and conversion, floating point and signed numbers, Demorgan's theorem, Introduction and study of logic gates AND, OR, NOT, NOR, NAND, EX-NOR, EX-OR and their representation, truth table, half and full adder circuits, R-S flip flop, J-K flip flop.

Unit V**(9 hours)**

ELECTRONIC COMPONENTS AND CIRCUITS- Introduction to Semiconductors, Diodes, V-I characteristics, application as a rectifier. Bipolar junction transistors (BJT) and their working, introduction to CC, CB & CE transistor configurations characteristics, different configurations and modes of operation of BJT, DC biasing of BJT.

References:

1. Vincent Del Toro, Electrical Engineering Fundamentals, PHI Learning, II Edition
2. S.Ghosh, Fundamentals of Electrical and Electronics Engineering, PHI, II Edition.
3. Millman, Halkias & Parikh, Integrated Electronic, Mc Graw Hill, II Edition
4. Nagrath & Kothari, Basic Electrical Engineering, III Edition TMH.
5. J.S. Katre, Basic Electronics Engg, Max Pub. Pune.
6. Hughes, Electrical and Electronic Technology, Pearson Education IX Edition

CY103	PRINCIPLES OF ENVIRONMENTAL STUDIES	L	T	P	C
	Total Contact Hours – 40	3	0	0	3
	(Prerequisite)				
	Nil				
PURPOSE					
The course provides a comprehensive knowledge in environmental science, environmental issues and the management.					
INSTRUCTIONAL OBJECTIVES					
1	To gain knowledge on the importance of environmental education and ecosystem.				
2	To acquire knowledge about environmental pollution- sources, effects and control measures of environmental pollution				
3	To understand the treatment of wastewater and solid waste management				
4	To acquire knowledge with respect to biodiversity, its threats and its conservation and appreciate the concept of interdependence				
5	To be aware of the national and international concern for environment for protecting the environment				

UNIT I - ENVIRONMENTAL EDUCATION AND ECOSYSTEMS (8 hours)

Environmental education: Definition and objective. Structure and function of an ecosystem – ecological succession –primary and secondary succession - ecological pyramids – pyramid of number, pyramid of energy and pyramid of biomass.

UNIT II - ENVIRONMENTAL POLLUTION (8 hours)

Environmental segments – structure and composition of atmosphere - Pollution –Air, water, soil , thermal and radiation – Effects – acid rain, ozone layer depletion and green house effect – control measures – determination of BOD, COD, TDS and trace metals.

UNIT III - WASTE MANAGEMENT (8 hours)

Waste water treatment (general) – primary, secondary and tertiary stages. Solid waste management: sources and effects of municipal waste, bio medical waste - process of waste management.

UNIT IV - BIODIVERSITY AND ITS CONSERVATION (8 hours)

Introduction: definition - genetic, species and ecosystem diversity – bio diversity hot spots - values of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - threats to biodiversity: habitat loss, poaching of wildlife – endangered and endemic species of India, Conservation of biodiversity: in-situ and ex-situ conservations.

UNIT V - ENVIRONMENTAL PROTECTION (8 hours)

National concern for environment: Important environmental protection acts in India – water, air (prevention and control of pollution) act, wild life conservation and forest act – functions of central and state pollution control boards - international effort – key initiatives of Rio declaration, Vienna convention, Kyoto protocol and Johannesburg summit.

TEXT BOOKS

1. Shashi Chawla “ A Text Book of Environmental Studies” Tata McGraw Hills – New Delhi – 2012
2. Sharma. B.K. and Kaur, “*Environmental Chemistry*”, Goel Publishing House, Meerut, 1994.
3. De. A.K, “*Environmental Chemistry*”, New Age International, New Delhi, 1996.

CS101	PROBLEM SOLVING & COMPUTER PROGRAMMING	L	T	P	C
	Total Contact Hours – 40	3	0	0	3
	(Prerequisite)				
	Nil				
PURPOSE					
The course provides a comprehensive knowledge in computer science and programming					
INSTRUCTIONAL OBJECTIVES					
1	To gain knowledge on the importance of computer programming.				
2	To acquire knowledge about computers and programming languages (C programming)				

UNIT – I
(12 hours)

Algorithm / pseudo code, flowchart, program development steps, structure of C program, A Simple C program, identifiers, basic data types and sizes, Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bit-wise operators, assignment operators, expressions, type conversions, conditional expressions, precedence and order of evaluation. Input-output statements, statements and blocks, if and switch statements, loops- while, do-while and for statements, break, continue, goto and labels, programming examples.

UNIT – II
(6 hours)

Designing structured programs, Functions, basics, parameter passing storage classes- extern, auto, register, static, scope rules, block structure, user defined functions, standard library functions, recursive functions, header files, C preprocessor, example c programs.

UNIT – III
(12 hours)

Arrays- concepts, declaration, definition, accessing elements, storing elements, arrays and functions, two-dimensional and multi-dimensional arrays, applications of arrays.
pointers- concepts, initialization of pointer variables, pointers and function arguments, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays. Strings-arrays of Strings- String Manipulation functions. Dynamic memory management's functions, command line arguments, c program examples.

UNIT – IV**(6 hours)**

Derived types- structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bitfields, C program examples.

UNIT – V**(6 hours)**

Input and output - concept of a file, text files and binary files, streams, standard I/o, Formatted I/o, file I/o operations, error handling, C program examples.

TEXT BOOKS

1. Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.
2. Yashvant Kanetker, “Let Us C” 10th Edition, BPB publications.
3. E Balagurusami “Programming in ANSI C” Tata McGraw-Hill Education, 2008

REFERENCES

1. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/Pearson Education
2. C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press
3. Programming in C - Stephen G. Kochan, III Edition, Pearson Eductaion.

PH102	PHYSICS LABORATORY	L	T	P	C
	Total Contact Hours – 30	0	0	2	1
	(Prerequisite)				
	Nil				
PURPOSE					
The purpose of this course is to develop scientific temper in experimental techniques and to reinforce the physics concepts among the engineering students					
INSTRUCTIONAL OBJECTIVES					
1	To gain knowledge in the scientific methods and learn the process of measuring different Physical variables				
2	Develop the skills in arranging and handling different measuring instruments				
3	Get familiarized with experimental errors in various physical measurements and to plan / suggest on how the contributions could be made of the same order, so as to minimize the errors.				

List of Experiments

1. To study the diffraction pattern formed by diffraction grating and to determine the wavelength of a laser beam
2. To study the number of lines in a transmission grating by using Diode laser.
3. To Determine the Angular Divergence of a Laser Beam.
4. To determine the (i) moment of inertia of the disc and (ii) the rigidity modulus of the material of the wire by torsional oscillations
5. To determine the wave lengths of main spectral lines of mercury lamp with the help of plane transmission grating.
6. To calculate the Young's modulus of a given material using searl's apparatus
7. To find angle of prism and angle of minimum deviation by using spectrometer.
8. To study I-V Characteristic of Solar Cell.
9. To study I-V characteristics of P-N junction diode
10. To study I-V characteristics of Zener diode.
11. To study Hall Effect and Calculation of Hall voltage.
12. To determine the energy band gap in a semiconductor with the help of a Junction diode.
13. To find the Resistivity of semiconductor by Four Probe Method at different temperature.

TEXT BOOKS

1. Shukla .R.K and Anchal Srivastava, “*Practical Physics*”, 1st Edition, New Age International (P) Ltd, New Delhi, 2006.
2. Thiruvadigal .J. D, Ponnusamy .S, Sudha.D and Krishnamohan .M, “*Physics for Technologists*”, Vibrant Publication, Chennai, 2013

REFERENCES

1. Souires .G.L, “*Practical Physics:*”, 4th Edition, Cambridge University, UK, 2001.
2. Chattopadhyay .D, Rakshit .P.C and Saha .B, “*An Advanced Course in Practical Physics*”, 2nd ed., Books & Allied Ltd., Calcutta, 1990.

EE102	BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LABORATORY	L	T	P	C
	Total Contact Hours – 45	0	0	2	1
	(Prerequisite)				
	Nil				
PURPOSE					
This course provides comprehensive idea about working principle, operation and characteristics of basic electrical and electronic devices					
INSTRUCTIONAL OBJECTIVES					
At the end of the course students will be able to gain knowledge about the					
1	Fundamentals of electrical and electronic components, devices,				
2	Principles of electrical and electronics				

List of Experiments

1. Verification of KCL and KVL theorem.
2. Verifications of Thevenin's Superposition theorem.
3. Study of Transformer, name plate rating, determination of ratio and polarity.
4. Determination of equivalent circuit parameters of a single phase transformer by O.C. and S.C. tests and estimation of voltage regulation and efficiency at various loading conditions and verification by load test.
5. Separation of resistance and inductance of choke coil.
6. Measurement of various line & phase quantities for a 3-phase circuit.
7. Identification of different Electronics components.
8. Observing input and output waveforms of rectifiers.
9. Transistor application as amplifier and switch.
10. Verification of truth table for various gates.

REFERENCE:

Basic electrical and electronics Lab Manual

CS102	PROBLEM SOLVING & COMPUTER PROGRAMMING LAB	L	T	P	C
	Total Contact Hours – 30	0	0	2	1
	(Prerequisite)				
	Nil				
PURPOSE					
The course provides a comprehensive knowledge in computer science and programming					
INSTRUCTIONAL OBJECTIVES					
1	To gain knowledge on the importance of computer programming.				
2	To acquire knowledge about computers and programming languages (C programming)				

LIST OF EXPERIMENTS (30 hours)

1. Program to understand the basic data types.
2. Program for looping and decision statements.
3. Program for finding Fibonacci series.
4. Finding a factorial for a given number.
5. Programs using library functions.
6. Programs using built-in math functions.
7. Programs on functions.
8. Programs on arrays.
9. Programs on string manipulations.
10. Programs on structures and unions.
11. Programs on pointers.
12. Programs on basic file operations.

TEXT BOOKS

1. Yashwant Kanetker, “Let Us C”, 10th Edition, BPB publications.
2. E Balagurusami “Programming in ANSI C” Tata McGraw-Hill Education, 2008
3. Seyed H Roosta, “Foundations of programming languages design & implementation”, Cengage Learning, 2009.

REFERENCES

1. Ashok N. Kamthane, “Programming with ANSI and Turbo C”, Pearson Education, 2007
2. Pradip Dey, Manas Ghosh, “Programming in C”, second edition, Oxford University Press, 2011.
3. Ravi Sethi, “Programming Language Concepts and Constructs”, Pearson Education, 2006.

LE103	LANGUAGE AND SOFT SKILL LABORATORY	L	T	P	C
	Total Contact Hours-30	0	0	2	1
	Prerequisite				
	Nil				
PURPOSE					
To help students achieve proficiency in English and develop their professional communication skills to meet the demand in the field of global communication to enable them to acquire placement anywhere with ease and confidence.					
INFRASTRUCTURE OBJECTIVES					
1	To enable students improve their lexical, grammatical and communicative competence.				
2	To enhance their communicative skills in real life situations				
3	To assist students understand the role of thinking in all forms of communication.				
4	To equip students with oral and appropriate written communication skills.				
5	To assist students with employability and job search skills.				

LIST OF EXPERIMENTS

- 1 GROUP DISCUSSION
- 2 INTERPERSONAL SKILLS
- 3 TEAM WORK
- 4 LEADERSHIP
- 5 CHANGE MANAGEMENT
- 6 STRESS MANAGEMENT
- 7 EMOTIONAL INTELLIGENCE
- 8 CONFLICT RESOLUTION
- 9 DECISION MAKING

REFERENCES

1. Covey Sean, *Seven Habit of Highly Effective Teens*, New York, Fireside Publishers, 1998.
2. Carnegie Dale, *How to win Friends and Influence People*, New York: Simon & Schuster, 1998.
3. Thomas A .Harris, *I am ok, You are ok* , New York-Harper and Row, 1972
4. Daniel Coleman, *Emotional Intelligence*, Bantam Book, 2006

SEMESTER II/ SET B

MA102	ADVANCED CALCULUS AND COMPLEX ANALYSIS	L	T	P	C
	Total Contact Hours -60	3	0	0	3
	(Common to all Branches of Engineering except Bio group)				
PURPOSE					
To impart analytical ability in solving mathematical problems as applied to the respective branches of Engineering.					
INSTRUCTIONAL OBJECTIVES					
1.	To have knowledge in multiple calculus				
2.	To improve their ability in Vector calculus				
3.	To equip themselves familiar with Laplace transform				
4.	To expose to the concept of Analytical function				
5.	To familiarize with Complex integration				

UNIT I - MULTIPLE INTEGRALS

(12 hours)

Double integration in Cartesian and polar coordinates – Change of order of integration – Area as a double integral – Triple integration in Cartesian coordinates – Conversion from Cartesian to polar – Volume as a Triple Integral.

UNIT II - VECTOR CALCULUS

(12 hours)

Gradient, divergence, curl – Solenoidal and irrotational fields – Vector identities (without proof) – Directional derivatives – Line, surface and volume integrals – Green's, Gauss divergence and Stoke's theorems (without proof) – Verification and applications to cubes and parallelopeds only.

UNIT III - LAPLACE TRANSFORMS

(12 hours)

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 up to second order with constant coefficients only.

UNIT IV - ANALYTIC FUNCTIONS

(12 hours)

Definition of Analytic Function – Cauchy Riemann equations – Properties of analytic functions – Determination of harmonic conjugate – Milne-Thomson's method – Conformal mappings: $1/z$, az , $az+b$ and bilinear transformation.

UNIT V - COMPLEX INTEGRATION

(12 hours)

Line integral – Cauchy's integral theorem (without proof) – Cauchy's integral formulae and its applications – Taylor's and Laurent's expansions (statements only) – Singularities – Poles and Residues – Cauchy's residue theorem – Contour integration – Unit circle and semi circular contour.

TEXT BOOKS

1. Kreyszig.E, “*Advanced Engineering Mathematics*”, 10th edition, John Wiley & Sons. Singapore, 2012.
2. Ganesan .K, Sundarammal Kesavan, Ganapathy Subramanian .K.S & Srinivasan .V, “*Engineering Mathematics*”, Gamma publications, Revised Edition, 2013.

REFERENCES

1. Grewal .B.S, “*Higher Engg Maths*”, Khanna Publications, 42nd Edition, 2012.
2. Veerajan .T, “*Engineering Mathematics I*”, Tata McGraw Hill Publishing Co., New Delhi, 5th edition, 2006.
3. Kandasamy P etal. “*Engineering Mathematics*”, Vol.I (4th revised edition), S.Chand &Co., New Delhi, 2000.
4. Narayanan .S, Manicavachagom Pillay .T.K, Ramanaiah .G, “*Advanced Mathematics*” for Engineering students, Volume I (2nd edition), S.Viswanathan Printers and Publishers, 1992.
5. Venkataraman .M.K, “*Engineering Mathematics*” – First Year (2nd edition), National Publishing Co., Chennai, 2000.

LE101	TECHNOLOGICAL COMMUNICATION	L	T	P	C
	Total Contact Hours-45	3	0	0	3
	Prerequisite				
	Nil				
PURPOSE					
To help students achieve proficiency in English and develop their professional communication skills to meet the demand in the field of global communication to enable them to acquire placement anywhere with ease and confidence.					
INFRASTRUCTURE OBJECTIVES					
1	To enable students improve their lexical, grammatical and communicative competence.				
2	To enhance their communicative skills in real life situations				
3	To assist students understand the role of thinking in all forms of communication.				
4	To equip students with oral and appropriate written communication skills.				
5	To assist students with employability and job search skills.				

UNIT I

(9 hours)

Listening - Introducing learners to GIE - Types of listening - Listening to audio (verbal & sounds); Speaking - Speaking about one's place, important festivals etc. – Introducing oneself, one's family / friend; Reading - Skimming a reading passage – Scanning for specific information - Note-making; Writing - Free writing on any given topic (My favourite place / Hobbies / School life, etc.) - Sentence completion - Autobiographical writing (writing about one's leisure time activities, hometown, etc.); Grammar - Prepositions - Reference words - Wh-questions - Tenses (Simple); Vocabulary - Word formation - Word expansion (root words / etymology); E-materials - Interactive exercises for Grammar & Vocabulary - Reading comprehension exercises - Listening to audio files and answering questions.

UNIT II

(9 hours)

Listening - Listening and responding to video lectures / talks; Speaking - Describing a simple process (filling a form, etc.) - Asking and answering questions - Telephone skills – Telephone etiquette; Reading – Critical reading - Finding key information in a given text - Sifting facts from opinions; Writing - Biographical writing (place, people) - Process descriptions (general/specific) - Definitions - Recommendations – Instructions; Grammar - Use of imperatives - Subject-verb agreement; Vocabulary - Compound words - Word Association (connotation); E-materials - Interactive exercises for Grammar and Vocabulary - Listening exercises with sample telephone conversations / lectures – Picture-based activities.

UNIT III

(9 hours)

Listening - Listening to specific task - focused audio tracks; Speaking - Role-play – Simulation - Group interaction - Speaking in formal situations (teachers, officials, foreigners); Reading - Reading and interpreting visual material; Writing - Jumbled sentences - Coherence and cohesion in writing - Channel conversion (flowchart into process) - Types of paragraph (cause and effect /

compare and contrast / narrative / analytical) - Informal writing (letter/e-mail/blogs) - Paraphrasing; Grammar - Tenses (Past) - Use of sequence words - Adjectives; Vocabulary - Different forms and uses of words, Cause and effect words; E-materials - Interactive exercises for Grammar and Vocabulary - Excerpts from films related to the theme and follow up exercises - Pictures of flow charts and tables for interpretations.

UNIT IV

(9 hours)

Listening - Watching videos / documentaries and responding to questions based on them; Speaking - Responding to questions - Different forms of interviews - Speaking at different types of interviews; Reading - Making inference from the reading passage - Predicting the content of a reading passage; Writing - Interpreting visual materials (line graphs, pie charts etc.) - Essay writing – Different types of essays; Grammar - Adverbs – Tenses – future time reference; Vocabulary - Single word substitutes - Use of abbreviations and acronyms; E-materials - Interactive exercises for Grammar and Vocabulary - Sample interviews - film scenes - dialogue writing.

UNIT V

(9 hours)

Listening - Listening to different accents, Listening to Speeches/Presentations, Listening to broadcast and telecast from Radio and TV; Speaking - Giving impromptu talks, Making presentations on given topics; Reading - Email communication - Reading the attachment files having a poem/joke/proverb - Sending their responses through email; Writing - Creative writing, Poster making; Grammar - Direct and indirect speech; Vocabulary - Lexical items (fixed / semi fixed expressions); E-materials - Interactive exercises for Grammar and Vocabulary - Sending emails with attachment – Audio / video excerpts of different accents - Interpreting posters

REFERENCES:

1. Dhanavel, S.P. English and Communication Skills for Students of Science and Engineering. Orient Blackswan, Chennai. 2011
2. Raman, Meenakshi & Sangeetha Sharma. Technical Communication: Principles and Practice. Oxford University Press, New Delhi. 2011.
3. Regional Institute of English. English for Engineers. Cambridge University Press, New Delhi. 2006.
4. Rizvi, Ashraf. M. Effective Technical Communication. Tata McGraw-Hill, New Delhi. 2005
5. Rutherford, Andrea. J Basic Communication Skills for Technology. Pearson, New Delhi. 2001.
6. Viswamohan, Aysha. English for Technical Communication. Tata McGraw-Hill, New Delhi. 2008.

CY101	CHEMISTRY	L	T	P	C
	Total Contact Hours - 45	3	0	0	3
	Prerequisite				
	Nil				
PURPOSE					
To enable the students to acquire knowledge in the principles of chemistry for engineering applications					
INSTRUCTIONAL OBJECTIVES					
1	The quality of water and its treatment methods for domestic and industrial applications.				
2	The classification of polymers, different types of polymerizations, preparation, properties and applications of important polymers and FRPs.				
3	The phase rule and its application to one and two component systems.				
4.	The principle, types and mechanism of corrosion and protective coatings.				
5.	The classification and selection of lubricants and their applications.				
6.	The basic principles, instrumentation and applications of analytical Techniques				

UNIT I - WATER TREATMENT

(9 hours)

Water quality parameters: Physical, Chemical & Biological significance -Hardness of water - disadvantages of using hard water in boilers: Scale, sludge formation - disadvantages – prevention - treatment: Internal conditioning - phosphate, carbon and carbonate conditioning methods - External: Zeolite, ion exchange methods - desalination – reverse osmosis and electrodialysis - domestic water treatment.

UNIT II - POLYMERS AND REINFORCED PLASTICS

(9 hours)

Polymers – Types – Polymerization – Addition and condensation polymerization –mechanism – Plastics – classification- preparation, properties and uses of PVC, Teflon, Polyurethane, Nylon 6:6, PET, Bakelite, and Epoxy resin – Compounding of Plastics- Compression moulding – Injection moulding – Composites – definition – types of Polymer matrix composites – FRP - Carbon and Glass- applications.

UNIT III – LUBRICANTS, CEMENTS AND REFRACTORIES

(9 hours)

Lubricants: Classification –solid, semi solid, liquid, emulsion- properties – selection of lubricants for different purposes, Refractories – Classification-(acidic, basic and neutral) – Properties (refractoriness, refractoriness under load, porosity, dimensional stability, thermal spalling) – manufacture of alumina, magnesite and Zirconia bricks – Abrasives – Natural abrasives – (Quartz, corundum, emery, garnet, diamond) – Artificial abrasives (silicon carbide, boron carbide)

UNIT IV - CORROSION AND ITS CONTROL

(9 hours)

Corrosion: Basic concepts - mechanism of chemical, electrochemical corrosion - Types of Electrochemical corrosion - galvanic corrosion - differential aeration corrosion - pitting corrosion - stress corrosion – factors influencing corrosion. Corrosion control: Cathodic

protection - sacrificial anodic method – corrosion inhibitors. Protective coatings: surface preparation for metallic coatings – electro plating (copper plating) and electroless plating (Nickel plating) – chemical conversion coatings - anodizing, phosphating & chromate coating.

UNIT V - INSTRUMENTAL METHODS OF ANALYSIS (9 hours)

Basic principles, instrumentation and applications of potentiometry, UV – visible spectroscopy, infrared spectroscopy, atomic absorption spectroscopy and flame photometry .

TEXT BOOKS

1. Dara .S.S, “*A Text book of Engineering Chemistry*”, 10th Edition, S.Chand & Company Ltd., New Delhi, 2003.
2. Jain.P.C and Monika Jain, "*Engineering Chemistry*", Danpat Rai publishing company (P) Ltd, New Delhi, 2010

REFERENCE

1. J.C. Kuriacose and J. Rajaram “ *Chemistry in Engineering and Technology*” Tata McGraw Hills (P) Ltd. New Delhi

	BASIC CIVIL ENGINEERING	L	T	P	C
CE101	Total Contact Hours – 45	3	0	0	3
	(Prerequisite)				
	Nil				
PURPOSE					
To understand civil engineering material, instrument, structural concept					
INSTRUCTIONAL OBJECTIVES					
1	To understand material behaviour for civil Engineering				
2	Student can approach building plan.				
3	Trusses ,beam				

Unit I

(9 hours)

Building Materials & Construction Stones, bricks, cement, lime, timber-types, properties, test & uses, laboratory tests concrete and mortar Materials: Workability, Strength properties of Concrete, Nominal proportion of Concrete preparation of concrete, compaction, curing. Elements of Building Construction, Foundations conventional spread footings, RCC footings, brick masonry walls, plastering and pointing, floors, roofs, Doors, windows, lintels, staircases – types and their suitability Surveying & Positioning:.

UNIT – II

(9 hours)

Mapping & Sensing: Mapping details and contouring, Profile Cross sectioning and measurement of areas, volumes, application of measurements in quantity computations, Survey stations, Introduction of remote sensing and its applications.

Engineering Mechanics

UNIT - III

(9 hours)

Introduction to surveying Instruments – levels, theodolites, plane tables and related devices. Electronic surveying instruments etc. Measurement of distances – conventional and EDM methods, measurement of directions by different methods, measurement of elevations by different methods. Reciprocal leveling

UNIT –I V

(9 hours)

Centre of Gravity and moment of Inertia: Centroid and Centre of Gravity, Moment Inertia of Area and Mass, Radius of Gyration, Introduction to product of Inertia and Principle Axes.Support Reactions, Shear force and bending moment Diagram for Cantilever & simply supported beam with concentrated, distributed load and Couple.

UNIT –V

(9 hours)

Analysis of statically determinate plane trusses Stability and equilibrium of plane frames ;perfect frames ;Type of trusses ;Analysis of forces in truss member ;method of joints ;method of section ,Graphical method.

Reference book-

1. Punamia B.C (laxmi publication)
2. N.H.DUBEY TMH 2013 & R.K RAJPUT
3. A.NELSON TMH 2012
4. R.K RAJPUT LAXMI PUBLICATION 2013
5. J.B GUPTA TMH (BASIC CIVIL ENGINEERING)

ME101	BASIC MECHANICAL & ENGINEERING MECHANICS	L	T	P	C
	Total Contact Hours – 45	4	0	0	4
	(Prerequisite)				
	Nil				
PURPOSE					
To understand mechanical Engineering Basics for engineering student					
INSTRUCTIONAL OBJECTIVES					
1	student can learn so many things like material				
2	Student can understand stress strain				

Unit I: (9 hours)

Materials: Classification of engineering material, Composition of Cast iron and Carbon steels, alloy steels their applications. Mechanical properties like strength, hardness, toughness, ductility, brittleness, malleability etc. of materials, Tensile test- Stress-strain diagram of ductile and brittle materials, Hooks law and modulus of elasticity. Hardness and Impact testing of materials. Thermodynamics: Thermodynamic system, properties, state, process, Zeroth, First and second law of thermodynamics, thermodynamic processes at constant pressure, volume, enthalpy & entropy. Steam Engineering: Classification and working of boilers, mountings and accessories of boilers, natural and artificial draught, steam properties, use of steam tables, working principle of steam Engine.

Unit II: (9 hours)

Measurement: Temperature, pressure, velocity, flow, strain & torque measurement, concept of measurement error & uncertainty analysis, Micrometre, Dial gauge, Slip gauge, Sine-bar and Combination set. Production Engineering: Introduction to Lathe and Drilling machines and their various operations. Fluids: Fluid properties pressure, density and viscosity. Types of fluids, Newton's law of viscosity, Pascal's law, Pressure variation with depth, Bernoulli's equation for incompressible fluids, Introduction to Laminar and Turbulent flow, working principle of Hydraulic machines, pumps, turbines, Reciprocating pumps, Torque Converter.

Unit –III**(9 hours)**

IC Engine : Working of Two stroke & Four stroke Petrol & Diesel Engine, Otto and Diesel cycles ,P-V & T-S diagrams .Refrigeration: Methods of Refrigeration , Reverse Carnot cycle , Working principle of simple vapour Compression Refrigeration System , coefficient of perform (COP), Unit of Refrigeration.

UNIT –IV**(9 hours)**

Concept of particle and rigid body ; Concept of forces: Coplanar Forces, moment of force; free body diagram , laws of mechanics ,condition of equilibrium, lami's theorem ,composition of force ,resolution of force ,moment of force and varignon's theorem ,couple and resultant of system of coplanar forces, Friction Force: Law of Friction. Free Body Diagram and Equilibrium: Graphical and Analytical Treatment of Concurrent and non- concurrent free BODY Diagram,

UNIT-V**(9 hours)**

Basics of Deformation, stress, strain & Equilibrium of system of forces. Rigid bodies and deformation solid –tension ,compression and shear stresses ;strain lateral strain poisson's ratio ,concept of stress ,different types of stress , ,type of beam types of load ,problem on support reaction of beams Equilibrium of system of coplanar Forces & Forces in Space.

Reference

1. Kothandaraman & Rudramoorthy, Fluid Mechanics & Machinery, New Age .
2. Nakra & Chaudhary , Instrumentation and Measurements, TMH.
3. Nag P.K, Engineering Thermodynamics , TMH .
4. Ganesan , Internal Combustion Engines, TMH .
5. Agrawal C M, Basic Mechanical Engineering ,Wiley Publication.
6. Achuthan M , , Engineering Thermodynamics ,PHI.

LE102	TECHNICAL COMMUNICATION LABORATORY	L	T	P	C
	Total Contact Hours-30	0	0	2	1
	Prerequisite				
	Nil				
PURPOSE					
To help students achieve proficiency in English and develop their professional communication skills to meet the demand in the field of global communication to enable them to acquire placement anywhere with ease and confidence.					
INFRASTRUCTURE OBJECTIVES					
1	To enable students improve their lexical, grammatical and communicative competence.				
2	To enhance their communicative skills in real life situations				
3	To assist students understand the role of thinking in all forms of communication.				
4	To equip students with oral and appropriate written communication skills.				
5	To assist students with employability and job search skills.				

LIST OF EXPERIMENTS

1. Listening and Speaking – Common errors in Pronunciation (Individual sounds); Process description, Conducting Meetings, Group Discussion, Presentation techniques
2. Writing – Interpretation of data (Flow chart, Bar chart), Definitions and Essay writing, Academic Report Writing and Project Proposal
3. Reading -- (Reading Comprehension -- Answering questions)

TEXTBOOK

1. Dhanavel .S.P, “*English and Communication Skills for Students of Science and Engineering*”, Orient Blackswan Ltd., 2009

REFERENCES

1. Meenakshi Raman and Sangeetha Sharma. “*Technical Communication- Principles and Practice*”, Oxford University Press, 2009.
2. Day .R.A, Scientific English: “*A Guide for Scientists and Other Professionals*”, 2nd ed. Hyderabad: Universities Press, 2000.

CY102	CHEMISTRY LABORATORY	L	T	P	C
	Total Contact Hours – 30	0	0	2	1
	Prerequisite				
	Nil				
PURPOSE					
To apply the concepts of chemistry and develop analytical skills for applications in engineering.					
INSTRUCTIONAL OBJECTIVES					
1	To enable the students to understand the basic concepts involved in the analyses.				

LIST OF EXPERIMENTS

1. Estimation of total, permanent and temporary hardness by EDTA method
3. Conductometric titration - determination of strength of an acid
4. Estimation of iron by potentiometry.
5. pH titration (acid and base)
6. Estimation of alkalinity of water sample
7. Estimation of acidity of water sample
8. Determination of dissolved oxygen in a water sample by Winkler's method
9. Determination of Na / K in water sample by Flame photometry (Demonstration)

REFERENCES

1. Mohan Raja “*Chemistry Laboratory Manual*”, Department of Chemistry, Jagran Lakecity University, Bhopal

CE102	BASIC CIVIL ENGINEERING LABORATORY	L	T	P	C
	Total Contact Hours – 30	0	0	2	1
	(Prerequisite)				
	Nil				
PURPOSE					
To find out practical output for student in surveying, building material etc.					
INSTRUCTIONAL OBJECTIVES					

List of suggestive core Experiments

1. To perform traverse surveying with prismatic compass, check for local attraction and determine corrected bearings and to balance the traverse by Bowditch's rule.
2. To perform levelling exercise by height of instrument of Rise and fall method.
3. To measure horizontal and vertical angles in the field by using Theodolite.
4. To determine (a) normal consistency (b) Initial and Final Setting time of a cement Sample.
5. To determine the workability of fresh concrete of given proportions by slump test or compaction factor test.
6. To determine the Compressive Strength of Brick.
7. To determine particle size distribution and fineness modulus of coarse and fine Aggregate.
8. To find the support reactions of a given truss and verify analytically.
9. To determine support reaction and shear force at a given section of a simply Supported beam and verify in analytically using parallel beam apparatus.
10. To determine the moment of inertia of fly wheel by falling weight method.

REFERENCE BOOKS

1. Punamia B.C (laxmi publication)
2. A.NELSON TMH 2012
3. R.K RAJPUT LAXMI PUBLICATION 2013
4. J.B GUPTA TMH (BASIC CIVIL ENGINEERING)
5. N.H.DUBEY TMH 2013 & R.K RAJPUT

ME103	BASIC MECHANICAL & ENGINEERING MECHANICS LABORATORY	L	T	P	C
	Total Contact Hours –30	0	0	2	1
	(Prerequisite)				
	Nil				
PURPOSE					
Practical approach to understand mechanical Engineering Basics					
INSTRUCTIONAL OBJECTIVES					
1	can learn so many things testing material, cycles; IC engines basics models				
2	can understand stress strain, forces, equilibrium				

List of Experiments

1. Tensile testing of standard Mild Steel specimen.
2. Verification of Bernoulli's Theorem.
3. Linear and Angular measurement using, Micrometre, Slip Gauges, Dial Gauge and Sine-bar.
4. Study of different types of Boilers and Mountings.
5. To find COP of a Refrigeration unit .
6. Study of different IC Engines .
7. To verify the law of Triangle of forces or Lami's theorem.
8. To verify the law of parallelogram of forces.
9. To verify law of polygon of forces.
10. To verify bending moment at a given section of a simply supported beam.

Reference – As per manual &

1. Kothandaraman & Rudramoorthy, Fluid Mechanics & Machinery, New Age .
2. Nakra & Chaudhary , Instrumentation and Measurements, TMH.
3. Nag P.K, Engineering Thermodynamics , TMH .
4. Ganesan , Internal Combustion Engines, TMH .
5. Agrawal C M, Basic Mechanical Engineering ,Wiley Publication.
6. Achuthan M , , Engineering Thermodynamics ,PHI.

ME104	WORKSHOP PRACTICE	L	T	P	C
	Total contact hours - 45	0	0	4	3
	Prerequisite				
	Nil				
PURPOSE					
To provide the students with hands on experience on different trades of engineering like fitting, carpentry, smithy, welding and sheet metal.					
INSTRUCTIONAL OBJECTIVES					
1	To familiarize with the basics of tools and equipments used in fitting, carpentry, sheet metal, welding and smithy.				
2.	To familiarize with the production of simple models in the above trades.				

UNIT I - FITTING

(9 hours)

Tools & Equipments – Practice in filing. Making Vee Joints, Square, Dovetail joints and Key making - plumbing. Mini project – Assembly of simple I.C. engines.

UNIT II - CARPENTRY

(9 hours)

Tools and Equipments- Planning practice. Making Half Lap, Dovetail, Mortise & Tenon joints. Mini project - model of a single door window frame.

UNIT III - SHEET METAL

(9 hours)

Tools and equipments– practice. Making rectangular tray, hopper, scoop, etc. Mini project - Fabrication of a small cabinet, dust bin, etc.

UNIT IV - WELDING

(9 hours)

Tools and equipments -Arc welding of butt joint, Lap joint, Tee fillet. Demonstration of gas welding, TIG & MIG welding.

UNIT V – SMITHY

(9 hours)

Tools and Equipments – Making simple parts like hexagonal headed bolt, chisel.

TEXT BOOKS:

1. Gopal .T.V, Kumar .T, and Murali .G, “A first course on workshop practice – Theory, Practice and Work Book”, Suma Publications, Chennai, 2005.

REFERENCE BOOKS:

1. Kannaiah .P, and Narayanan .K. C., “Manual on Workshop Practice”, Scitech Publications, Chennai, 1999.
2. Venkatachalapathy .V.S, “First year Engineering Workshop Practice”, Ramalinga Publications, Madurai, 1999.

