I B.TECH-II SEMESTER

DIFFERENTIAL EQUATIONS AND VECTORCALCULUS

(Common to All Branches)

Subject Code: 23BS2T01   **L   T   P   C**

                                                              3   0   0   3

Course Objectives:

- To enlighten the learners in the concept of differential equations and multivariable calculus.
- To furnish the learners with basic concepts and techniques at plus two level to lead them in to advanced level by handling various real-world applications.

Course Outcomes:

At the end of the course, the student will be able to:

CO1: Solve the differential equations related to various engineering fields.
CO2: Identify solution methods for partial differential equations that model physical processes.
CO3: Interpret the physical meaning of different operators such as gradient, Curl and divergence.

CO4: Estimate the work done against a field, circulation and flux using vector calculus.

UNITI   Differential Equations of First Order and First Degree

Linear differential equations – Bernoulli's equations- Exact equations and equations reducible to exact form. Applications: Orthogonal Trajectories Newton's Law of cooling – Law of natural growth and deca

UNITII   Linear differential equations of higher order (Constant Coefficients)

Definitions, homogenous and non-homogenous, complimentary function, Particular integral, General solution, Wronskian, Method of variation of parameters,

Simultaneous linear equations, Applications to L-C-R Circuit problems.

UNITIII   Partial Differential Equations

Introduction and formation of Partial Differential Equations by elimination of arbitrary constants and arbitrary functions, solutions of first order linear equations using Lagrange's method. Homogeneous Linear Partial differential equations with constant coefficients - Non homogeneous terms of the type e^{ax+by}, $\sin(ax+by)$,

$\cos(ax+by)$

UNITIV   Vector differentiation

Scalar and vector point functions, vector operator Del, Del applies to scalar point functions - Gradient, Directional derivative, del applied to vector point functions-Divergence and Curl, Solenoidal, Irrotational vectors, Scalar Potential Function - Vector identities.

UNITV   Vector Integration

Line integral- circulation – work done, surface integral-flux, Green's theorem in the plane (with out proof), Stoke's theorem (with out proof), volume integral, Divergence theorem (with out proof) and related problems.

Text books:

1. **Higher Engineering Mathematics**, B.S.Grewal, KhannaPublishers,2017,44thEdition
2. **Advanced Engineering Mathematics**, Erwin Kreyszig, John Wiley & Sons, 2018,10thEdition.

Reference Books:

1. **Thomas Calculus**, George B.Thomas, Maurice D.Weir and Joel Hass, Pearson Publishers, 2018, 14th Edition.
2. **Advanced Engineering Mathematics**, Dennis G.Zill and Warren S.Wright, Jones and Bartlett, 2018.
3. **Advanced Modern Engineering Mathematics**, Glyn James, Pearson publishers, 2018, 5th Edition.
4. **Advanced Engineering Mathematics**, R.K.Jain and S.R.K.Iyengar, Alpha Science International Ltd., 2021 5thEdition (9th reprint).
5. **Higher Engineering Mathematics**, B.V.Ramana, McGraw HillEducation,2017

I YEAR I SEM	**Course Code:23ES1T01** (*for CSE & Allied Branches*) **Course Code: 23ES2T01** (*for CE, EEE, ME & ECE Branches*)	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

BASIC CIVIL AND MECHANICAL ENGINEERING
(Common to All branches of Engineering)

PART A: BASIC CIVIL ENGINEERING

Course Objectives:

- Get familiarized with the scope and importance of Civil Engineering sub-divisions.
- Introduce the preliminary concepts of surveying.
- Acquire preliminary knowledge on Transportation and its importance in nation'seconomy.
- Get familiarized with the importance of quality, conveyance and storage of water.

Introduction to basic civil engineering materials and construction techniques

course Outcomes: On completion of the course, the student should be able to:

CO1: Understand various sub-divisions of Civil Engineering and to appreciate their role inensuring better society.

CO2: Know the concepts of surveying and to understand the measurement of distances, anglesand levels through surveying.

CO3: Realize the importance of Transportation in nation's economy and the engineeringmeasures related to Transportation.

CO4: Understand the importance of Water Storage and Conveyance Structures so that the socialresponsibilities of water conservation will be appreciated.

CO5: Understand the basic characteristics of Civil Engineering Materials and attain knowledgeon prefabricated technology.

UNIT I

Basics of Civil Engineering: Role of Civil Engineers in Society- Introduction to Civil Engineering Construction Materials-Cement - Aggregate - Bricks- Cement concrete- Steel- Bitumen-Building Planning & Construction Techniques-Introduction to Prefabricated Construction Techniques

UNIT II

Geotechnical Engineering: Introduction to Properties of soils- Permeability &Seepage- Shear strength-Compaction and Consolidation-Soil exploration-Shallow and Deep Foundations

Structural Engineering: Introduction to Different types of structures-Framed structures- Arches-Suspension bridges-Trusses, Reinforced Concrete Structures-Steel Structures-

Design philosophies-Prestressed concrete structures- Surveying: Introduction to Objectives of Surveying-Horizontal Measurements- AngularMeasurements- Bearings- Levelling- Instruments used for levelling -Contour mapping

UNIT III
Transportation Engineering Importance of Transportation in Nation's economic development-Introduction to Types of Highway Pavements- Flexible Pavements and Rigid Pavements - Simple Differences. Basics of Harbour, Tunnel, Airport, and Railway Engineering.

Water Resources and Environmental Engineering: Introduction to Sources of water- Hydrology–Rainwater Harvesting-Water Storage and Conveyance Structures.

Introduction to Qualityof water- Specifications- Treatment-Sewage-Disposal

Textbooks:
1. Basic Civil Engineering, M.S.Palanisamy, , Tata Mcgraw Hill publications(India) Pvt.Ltd. Fourth Edition.
2. Introduction to Civil Engineering, S.S. Bhavikatti, New Age International Publishers.2022. First Edition.
3. Basic Civil Engineering, Satheesh Gopi, Pearson Publications, 2009, FirstEdition.

Reference Books:
1. Surveying, Vol- I and Vol-II, S.K. Duggal, Tata McGraw Hill Publishers2019. FifthEdition.
2. Hydrology and Water Resources Engineering, Santosh Kumar Garg, KhannaPublishers, Delhi. 2016
3. Irrigation Engineering and Hydraulic Structures - Santosh Kumar Garg, KhannaPublishers, Delhi 2023. 38th Edition.
4. Highway Engineering, S.K.Khanna, C.E.G. Justo and Veeraraghavan,Nemchand

andBrothers Publications 2019. 10th Edition.
5. Indian Standard DRINKING WATER — SPECIFICATION IS 10500-2012.

PART B: BASIC MECHANICAL ENGINEERING

Course Objectives: The students after completing the course are expected to

COB1: Get familiarize with the scope and importance of Mechanical Engineering in different sectors & industries.

COB2: Explain different engineering materials and different manufacturing processes.

COB3: Provide an overview of different thermal and mechanical transmission systems and introduce basics of robotics and its applications.

course Outcomes On completion of the course, the student should be able to

CO1: Understand the different manufacturing processes.

CO2: Explain the basics of thermal engineering and its applications.

CO3: Describe the working of different mechanical power transmission systems and power plants.

CO4: Describe the basics of robotics and its applications

UNIT I

UNIT I Introduction to Mechanical Engineering: Role of Mechanical Engineering in Industries and Society-Technologies in different sectors such as Energy, Manufacturing, Automotive, Aerospace, and Marine sectors. Engineering Materials - Metals-Ferrous and Non-ferrous, Ceramics, Composites, Smart materials

UNIT II

Thermal Engineering – Basic Laws of Thermodynamics, working principle of Boilers, Otto cycle, Diesel cycle, Refrigeration and air-conditioning cycles: Air Refrigeration and Vapour Compression Refrigeration-Working Principles only. Introduction to Pumps and Compressors (Basics, Classification and Applications only), IC engines, 2-Stroke and 4-Stroke engines, SI/CI Engines, Components of Electric and Hybrid Vehicles. Power plants – working principle of Steam, Diesel, Hydro, Nuclear and Combined Cycle power plants (Layout, Working)

UNIT III.

Manufacturing Processes: Principles of Casting, Forming, joining processes, Machining, Introduction to CNC machines, 3D printing, and Smart manufacturing.

Mechanical Power Transmission - Belt Drives, Chain, Rope drives, Gear Drives and their applications. Introduction to Robotics - Joints & links, configurations, and applications of robotics

(NOTE: The subject covers only the basic principles of Civil and Mechanical Engineering systems. The evaluation shall be intended to test only the fundamentals of the subject)

Textbooks:

1. Internal Combustion Engines by V.Ganesan, By Tata McGraw Hill publications (India) Pvt. Ltd.

2. A Tear book of Theory of Machines by S.S. Rattan, Tata McGraw Hill Publications, (India) Pvt. Ltd.

3. An introduction to Mechanical Engg by Jonathan Wicker and Kemper Lewis, Cengage learning India Pvt. Ltd.

Reference Books:

1. AppuuKuttan KK, Robotics, I.K. International Publishing House Pvt. Ltd. Volume-I

2. 3D printing & Additive Manufacturing Technology- L. Jyothish Kumar, Pulak M Pandey, Springer publications

3. Thermal Engineering by Mahesh M Rathore Tata McGraw Hill publications (India) Pvt. Ltd.

4. G. Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, Tata McGraw Hill publications (India) Pvt. Ltd.

L   T   P   C

3   0   0   3

ENGINEERING CHEMISTRY

(Common to Civil, Chemical and Mechanical Engineering)

Course code : 23BS2T04 (CE,ME)

Course Objectives:

- To familiarize engineering chemistry and its applications
- To impart the concept of soft and hard waters, softening methods of hard water

- To train the students on the principles and applications of electrochemistry, polymers, surface chemistry, and cement

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

- Demonstrate the corrosion prevention methods and factors affecting corrosion.
- Explain the preparation, properties, and applications of thermoplastics & thermosetting, elastomers & conducting polymers.
- Explain calorific values, octane number, refining of petroleum and cracking of oils.
- Explain the setting and hardening of cement.
- Summarize the concepts of colloids, micelle and nanomaterials.

UNIT I Water Technology   12 Hours

Soft and hardwater, Estimation of hardness of water by EDTA Method,Estimation of dissolved Oxygen - Boiler troubles –Priming, foaming**,** scale and sludge, Caustic embrittlement, Industrial water treatment – Specifications for drinking water, Bureau of Indian Standards(BIS) and World health organization(WHO) standards, Ion-exchange processes - desalination of brackish water, reverse osmosis (RO) and electrodialysis.

UNIT II Electrochemistry and Applications   12 Hours

Electrodes –electrochemical cell, Nernst equation, cell potential calculations.

Primary cells – Zinc-air battery, Secondary cells – Nickel-Cadmium (NiCad),and lithium ion batteries- working principle of the batteries including cell reactions; Fuel cells-Basic Concepts, the principle and working of hydrogen-oxygen Fuel cell.

Corrosion: Introduction to corrosion, electrochemical theory of corrosion, differential aeration cell corrosion, galvanic corrosion, metal oxide formation by dry electrochemical corrosion, Pilling Bedworth ratios and uses, Factors affecting the corrosion**,** cathodic protection,and anodic protection, electroplating and electro less plating (Nickel and Copper).

UNIT III Polymers and Fuel Chemistry   12 Hours

Introduction to polymers, functionality of monomers, Mechanism of chain growth, step growth polymerization.

Thermoplastics and Thermo-setting plastics-: Preparation, properties and applications of poly styrene. PVC Nylon 6,6 and Bakelite.

Elastomers – Preparation, properties and applications of Buna S, Buna N, Thiokol rubbers.

Fuels – Types of fuels, calorific value of fuels, numerical problems based on calorific value; Analysis of coal (Proximate and Ultimate analysis), Liquid Fuels, refining of petroleum, Octane and Cetane number- alternative fuels- propane, methanol, ethanol and bio fuel-bio diesel.

UNIT IV   Modern Engineering Materials   12 Hours

Composites- Definition, Constituents, Classification- Particle, Fibre and Structural reinforced composites, properties and Engineering applications

Refractories- Classification, Properties, Factors affecting the refractory materials and Applications.

Lubricants- Classification, Functions of lubricants, Mechanism, Properties of lubricating oils – Viscosity, Viscosity Index, Flash point, Fire point, Cloud point, saponification and Applications.

Building materials- Portland Cement, constituents, Setting and Hardening of cement.

UNIT V   Surface Chemistry and Nanomaterials   12 Hours

Introduction to surface chemistry, colloids, nanometals and nanometal oxides, micelle formation, synthesis of colloids (Braggs Method), chemical and biological methods of preparation of nanometals and metal oxides, stabilization of colloids and nanomaterials by stabilizing agents, adsorption isotherm (Freundlich and Longmuir), BET equation (no derivation) applications of colloids and nanomaterials – catalysis, medicine, sensors, etc.

 Textbooks:

1. Jain and Jain, Engineering Chemistry, 16/e, DhanpatRai, 2013.
2. Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.

Reference Books:

1. H.F.W. Taylor, Cement Chemistry, 2/e, Thomas Telford Publications, 1997.
2. D.J. Shaw, Introduction to Colloids and Surface Chemistry, Butterworth-Heineman,1992.

I YEAR I SEM / I YEAR II SEM	Course Code : 23ES1T03	L	T	P	C
	(*for CSE & Allied Branches*)				
	Course Code : 23ES2T03	1	0	4	3
	(*for CE, EEE, ME & ECE Branches*)				

ENGINEERING GRAPHICS

UNIT I

Introduction: Lines, Lettering and Dimensioning, Geometrical Constructions and constructing regular polygons by general methods only.

Curves: construction of ellipse, parabola and hyperbola by general method only, Cycloids, Involutes, Normal and tangent to Curves.

Scales: Plain scales, diagonal scales

UNIT II

Orthographic Projections: Reference plane, importance of reference lines or Plane, Projections of a point situated in any one of the four quadrants.

Projections of Straight Lines: Projections of straight lines parallel to both reference planes, perpendicular to one reference plane and parallel to other reference plane, inclined to one reference plane and parallel to the other reference plane. Projections of Straight Line Inclined to both the reference planes

Projections of Planes: regular planes Perpendicular to both reference planes, parallel to one reference plane and inclined to the other reference plane; plane inclined to both the reference planes.

UNIT III

Projections of Solids: Types of solids: Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to horizontal plane, Axis perpendicular to vertical plane and Axis parallel to both the reference planes, Projection of Solids with axis inclined to one reference plane and parallel to another plane.

UNIT IV

Basic Concept of Sections of Solids: Sections of Solids in simple positions (Cone, Prism, Pyramid)

Development of Surfaces: Methods of Development: Parallel line development and radial line development. Development of a cube, prism, cylinder, pyramid and cone.

UNIT V

Conversion of Views: Conversion of isometric views to orthographic views; Conversion of orthographic views to isometric views.

Computer graphics: Creating 2D & 3D drawings of objects including PCB and Transformations using Auto CAD (**Not for end examination**).

Text Books:

1. N. D. Bhatt, Engineering Drawing, Charotar Publishing House, 2016.

Reference Books:

1. Engineering Drawing, K.L. Narayana and P. Kannaiah, Tata McGraw Hill, 2013.
2. Engineering Drawing, M.B.Shah and B.C. Rana, Pearson Education Inc, 2009.
3. Engineering Drawing with an Introduction to AutoCAD, Dhananjay Jolhe, Tata McGraw Hill, 2017.

I YEAR II SEM	Course Code : 23CE2T01	L	T	P	C
		3	0	0	3

ENGINEERING MECHANICS

(Common to CE & ME)

UNIT I

 Introduction to Engineering Mechanics– Basic Concepts. Scope and Applications
Systems of Forces: Coplanar Concurrent Forces– Components in Space–Resultant–Moment of Force and its Application – Couples and Resultant of Force Systems.

Friction: Introduction**,** limiting friction and impending motion, Coulomb's laws of dry friction, coefficient of friction

UNIT II

Equilibrium of Systems of Forces: Free Body Diagrams, Lami's Theorm, Equations of Equilibrium of Coplanar Systems, Graphical method for the equilibrium, Triangle law of forces, converse of the law of polygon of forces condition of equilibrium, Equations of Equilibrium for Spatial System of forces, Numerical examples on spatial system of forces.

UNIT III

Centroid: Centroids of simple figures (from basic principles)–Centroids of Composite Figures.

Centre of Gravity: Centre of gravity of simple body (from basic principles), Centre of gravity of composite bodies, Pappus theorems.

Area Moments of Inertia: Definition– Polar Moment of Inertia, Transfer Theorem, Moments of Inertia of Composite Figures, Products of Inertia, Transfer Formula for Product of Inertia.

Mass Moment of Inertia: Moment of Inertia of Masses, Transfer Formula for Mass Moments of Inertia, Mass Moment of Inertia of composite bodies.

UNIT IV

Rectilinear and Curvilinear motion of a particle: Kinematics and Kinetics –D'Alembert's Principle - Work Energy method   and applications to particle motion-Impulse Momentum method.

UNIT V

Rigid body Motion: Kinematics and Kinetics of translation, Rotation about fixed axis and plane motion, Work Energy method and Impulse Momentum method.

Text Books:

1. Engineering Mechanics, S. Timoshenko, D. H. Young, J.V. Rao, S. Pati., , McGraw Hill Education 2017. 5th Edition.
2. Engineering Mechanics, P.C.Dumir- S.Sengupta and Srinivas V veeravalli , University press. 2020. First Edition.
3. A Textbook of Engineering Mechanics, S.S Bhavikatti. New age international publications 2018. 4th Edition.

Reference Books:

1. Engineering Mechanics, Statics and Dynamics, Rogers and M A. Nelson., McGraw Hill Education. 2017. First Edition.
2. Engineering Mechanics, Statics and Dynamics, I.H. Shames., PHI, 2002. 4th Edition.
3. Engineering Mechanics, Volume-I: Statics, Volume-II: Dynamics, J. L. Meriam and L. G. Kraige., John Wiley, 2008. 6th Edition.
4. Introduction to Statics and Dynamics, Basudev Battachatia, Oxford University Press, 2014. Second Edition
5. Engineering Mechanics: Statics and Dynamics, Hibbeler R.C., Pearson Education, Inc., New Delhi, 2022, 14th Edition

ENGINEERING CHEMISTRY LAB

(Common to Civil, Chemical and Mechanical Engineering)

Course code:23BS2L03 (CE, ME)

Course Objectives:

To Verify the fundamental concepts with experiments

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

- Determine the cell constant and conductance of solutions.
- Prepare advanced polymer materials.
- Determine the physical properties like surface tension, adsorption and viscosity.
- Estimate the Iron and Calcium in cement.
- Calculatethe hardness of water.

List of Experiments:

1. Determination of Hardness of a groundwater sample.
2. Estimation of Dissolved Oxygen by Winkler's method
3. Determination of Strength of an acid in Pb-Acid battery
4. Preparation of a polymer (Bakelite)
5. Determination of percentage of Iron in Cement sample by colorimetry
6. Estimation of Calcium in port land Cement
7. Preparation of nanomaterials by precipitation method.
8. Adsorption of acetic acid by charcoal
9. Determination of percentage Moisture content in a coal sample
10. Determination of Viscosity of lubricating oil by Redwood Viscometer 1
11. Determination of Viscosity of lubricating oil by Redwood Viscometer 2
12. Determination of Calorific value of gases by Junker's gas Calorimeter
13. Determination of $KMnO_4$ using standard oxalic acid solution.

14. Determination of alkalinity of a sample containing Na_2CO_3 and $NaHCO_3$

15. Determination of copper using standard K2Cr2O7 Solution.

16. To determine the available chlorine in bleaching powder.

Reference:

- "Vogel's Quantitative Chemical Analysis 6th Edition 6th Edition" Pearson Publications by J. Mendham, R.C.Denney, J.D.Barnes and B. Sivasankar

I YEAR II SEM	**Course Code : 23ME1L01**	L	T	P	C
		0	0	3	1.5
	ENGINEERING MECANICS LAB				

Course Objectives: The students completing the course are expected to:

COB1: Verify the Law of Parallelogram and Triangle of Forces.

COB2: Determine the coefficients of friction of Static and Rolling friction and Centre of gravity of different plane Lamina.

COB3: Analyse the system of Pulleys and Moment of Inertia of Compound Pendulum and Flywheel.

Course Outcomes:

CO1: Evaluate the coefficient of friction between two different surfaces and between the inclined plane and the roller.

CO2: Verify Law of Polygon of forces and Law of Moment using force polygon and bell crank lever.

CO3: Determine the Centre of gravity and Moment of Inertia of different configurations.

CO4: Verify the equilibrium conditions of a rigid body under the action of different force systems.

Students have to perform any 10 of the following Experiments:

List of Experiments:

1. Verification of Law of Parallelogram of Forces.

2. Verification of Law of Triangle of Forces.

3. Verification of the Law of polygon for coplanar-concurrent forces acting on a particle in equilibrium and to find the value of unknown forces considering particle to be in equilibrium using universal force table.

4. Determination of coefficient of Static and Rolling Frictions

5. Determination of Centre of Gravity of different shaped Plane Lamina.

6. Verification of the conditions of equilibrium of a rigid body under the action of coplanar nonconcurrent, parallel force system with the help of a simply supported beam.

7. Study of the systems of pulleys and draw the free body diagram of the system.

8. Determine the acceleration due to gravity using a compound pendulum.

9. Determine the Moment of Inertia of the compound pendulum about an axis perpendicular to the plane of oscillation and passing through its centre of mass.

10. Determine the Moment of Inertia of a Flywheel.

11. Verification of Law of Moment using Rotation Disc Apparatus and Bell Crank Lever.

References:

1. S. Timoshenko, D. H. Young, J.V. Rao, S. Pati., Engineering Mechanics, 5th Edition, McGraw Hill Education.

2. Hibbeler R.C., Engineering Mechanics: Statics and Dynamics, 14th Edition, Pearson Education, Inc., New Delhi, 2022

I YEAR I SEM / I YEAR II SEM	Course Code : 23ES1L02 (*for CSE & Allied Branches*) Course Code : 23ES2L02 (*for CE, EEE, ME & ECE Branches*)	L	T	P	C
		0	0	3	1.5

ENGINEERING WORKSHOP

(Common to All branches of Engineering)

1. Demonstration: Safety practices and precautions to be observed in workshop.

2. Wood Working: Familiarity with different types of woods and tools used in wood working and make following joints:

a) Half – Lap joint b) Mortise and Tenon joint and c) Corner Dovetail joint or Bridle joint

3. Sheet Metal Working: Familiarity with different types of tools used in sheet metal working, Developments of following sheet metal jobs from GI sheets:

a) Tapered tray b) Elbow pipe c) Brazing

4. Fitting: Familiarity with different types of tools used in fitting and do the following fitting exercises:

a) V-fit b) Semi-circular fit c) Bicycle tyre puncture and change of two-wheeler tyre.

5. Electrical Wiring: Familiarity with different types of basic electrical circuits and make the following connections:

a) Parallel and series b) Two-way switch c) Godown lighting d) Tube Light   e) Soldering of wires
6. Foundry Trade: Demonstration and practice on Moulding tools and processes, Preparation of Green Sand Moulds for given Pattern.
7. Welding Shop: Demonstration and practice on Arc Welding and Gas welding. Preparation of Lap joint and Butt joint.
8. Plumbing: Demonstration and practice of Plumbing tools, Preparation of Pipe joints with coupling for same diameter and with reducer for different diameters

Text Books:

1. Basic Workshop Technology: Manufacturing Process, Felix W.; Independently Published,2019.

2. Workshop Processes, Practices and Materials; Bruce J. Black, Routledge publishers, 5th Edn. 2015.

3. A Course in Workshop Technology Vol I. & II, B.S. Raghuwanshi, Dhanpath Rai & Co., 2015 & 2017.

Reference Books:

1. Elements of Workshop Technology, Vol. I by S. K. Hajra Choudhury & Others, Media Promoters and Publishers, Mumbai. 2007, 14th edition
2. Workshop Practice by H. S. Bawa, Tata-McGraw Hill, 2004.

3. Wiring Estimating, Costing and Contracting; Soni P.M. & Upadhyay P.A.; Atul Prakashan, 2021-22

I YEAR I SEM / I YEAR II SEM	Course Code : 23ES1L02 (*for CSE & Allied Branches)* Course Code : 23ES2L02 (*for CE, EEE, ME & ECE Branches)*	L	T	P	C
		0	0	3	1.5

ENGINEERING WORKSHOP

(Common to All branches of Engineering)

1. Demonstration: Safety practices and precautions to be observed in workshop.

2. Wood Working: Familiarity with different types of woods and tools used in wood working and make following joints:

a) Half – Lap joint b) Mortise and Tenon joint and c) Corner Dovetail joint or Bridle joint

3. Sheet Metal Working: Familiarity with different types of tools used in sheet metal working, Developments of following sheet metal jobs from GI sheets:

a) Tapered tray b) Elbow pipe c) Brazing

4. Fitting: Familiarity with different types of tools used in fitting and do the following fitting exercises:

a) V-fit b) Semi-circular fit c) Bicycle tyre puncture and change of two-wheeler tyre.

5. Electrical Wiring: Familiarity with different types of basic electrical circuits and make the following connections:

a) Parallel and series b) Two-way switch c) Godown lighting d) Tube Light   e) Soldering of wires
6. Foundry Trade: Demonstration and practice on Moulding tools and processes, Preparation of Green Sand Moulds for given Pattern.
7. Welding Shop: Demonstration and practice on Arc Welding and Gas welding. Preparation of Lap joint and Butt joint.
8. Plumbing: Demonstration and practice of Plumbing tools, Preparation of Pipe joints with coupling for same diameter and with reducer for different diameters

Text Books:

1. Basic Workshop Technology: Manufacturing Process, Felix W.; Independently Published,2019.

2. Workshop Processes, Practices and Materials; Bruce J. Black, Routledge publishers, 5th Edn. 2015.

3. A Course in Workshop Technology Vol I. & II, B.S. Raghuwanshi, Dhanpath Rai & Co., 2015 & 2017.

Reference Books:

1. Elements of Workshop Technology, Vol. I by S. K. Hajra Choudhury & Others, Media Promoters and Publishers, Mumbai. 2007, 14th edition
2. Workshop Practice by H. S. Bawa, Tata-McGraw Hill, 2004.

3. Wiring Estimating, Costing and Contracting; Soni P.M. & Upadhyay P.A.; Atul Prakashan, 2021-22

NSS/NCC/SCOUTS & GUIDES/COMMUNITY SERVICE

(Common to All branches of Engineering)

23BS1L05((CSE,AIDS,AIML,CSE(AIML))

23BS2L05 (CE,EEE,MEC,ECE)

Course Objectives:

The objective of introducing this course is to impart discipline, character, fraternity, teamwork,social consciousness among the students and engaging them in selfless service.

Course Outcomes: After completion of the course the students will be able to

CO1: Understand the importance of discipline, character and service motto.

CO2: Solve some societal issues by applying acquired knowledge, facts, and techniques.

CO3: Explore human relationships by analyzing social problems.

CO4: Determine to extend their help for the fellow beings and downtrodden people.

CO5: Develop leadership skills and civic responsibilities.

UNIT I   Orientation

General Orientation on NSS/NCC/ Scouts & Guides/Community Service activities, careerguidance.

Activities:
i) Conducting –ice breaking sessions-expectations from the course-knowing personaltalents and skills
ii) Conducting orientations programs for the students –future plans-activities-releasingroad map etc.
iii) Displaying success stories-motivational biopics- award winning movies on

societalissues etc.

iv) Conducting talent show in singing patriotic songs-paintings- any other contribution.

UNIT II   Nature & CareActivities:

i) Best out of waste competition.
ii) Poster and signs making competition to spread environmental awareness.
iii) Recycling and environmental pollution article writing competition.
iv) Organising Zero-waste day.
v) Digital Environmental awareness activity via various social media platforms.
vi) Virtual demonstration of different eco-friendly approaches for sustainable living.
vii) Write a summary on any book related to environmental issues.

UNIT III   Community ServiceActivities:

i) Conducting One Day Special Camp in a village contacting village-area leaders- Survey in the village, identification of problems- helping them to solve via media- authorities-experts-etc.

ii) Conducting awareness programs on Health-related issues such as General Health,Mental health, Spiritual Health, HIV/AIDS,

iii) Conducting consumer Awareness. Explaining various legal provisions etc.

iv) Women Empowerment Programmes- Sexual Abuse, Adolescent Health and PopulationEducation.

v) Any other programmes in collaboration with local charities, NGOs etc.

Reference Books:

1. Nirmalya Kumar Sinha & Surajit Majumder, *A Text Book of National Service Scheme*

   Vol;.I, Vidya Kutir Publication, 2021 (ISBN 978-81-952368-8-6)

2. *Red Book - National Cadet Corps* – Standing Instructions Vol I & II, DirectorateGeneral of NCC, Ministry of Defence, New Delhi
3. Davis M. L. and Cornwell D. A., "Introduction to Environmental Engineering",McGraw Hill, New York 4/e 2008
4. Masters G. M., Joseph K. and Nagendran R. "Introduction to EnvironmentalEngineering and Science", Pearson Education, New Delhi. 2/e 2007

5. Ram Ahuja. *Social Problems in India*, Rawat Publications, New Delhi.

General Guidelines:

1. Institutes must assign slots in the Timetable for the activities.
2. Institutes are required to provide instructor to mentor the students.

Evaluation Guidelines:

- Evaluated for a total of 100 marks.
- A student can select 6 activities of his/her choice with a minimum of 01 activity per unit. Each activity shall be evaluated by the concerned teacher for 15 marks, totalling to 90 marks.
- A student shall be evaluated by the concerned teacher for 10 marks by conducting vivavoce on the subject.