Community College of Skill Development

Lesson Plan: Engineering Science

Program: B.Voc AutomobileSemester: 1st Course Code: AM-102/AMV-103-VCredits: 3

Course Objectives: The main objective of studying this course is to understand the different system of units and their measurement. In this course students will know the different types of laws of motion, basics of thermodynamics, fuels and their classification and pollutants and its types.

Course Outcomes:

CO1. To understand the need for measurement, different systems of units, and the concept ofaccuracy and precision in measurements.

CO2. To analyze and apply Newton's laws of motion to solve problems related to equilibrium,friction, and circular motion. Apply the different methodologies for analysis of water and techniques involved in waste water treatment.

CO3. To synthesize knowledge of atomic structure, chemical bonding, and properties of elements and compounds.

CO4. To evaluate the characteristics of different types of fuels, the sources and effects of pollution, and methods for pollution control.

Equipment required in Classroom/ Laboratory/ Workshop

i. LCD/Projector
ii. Whiteboard/ Black Marker

Assessment Scheme

S.No.	Criteria	Marks
1	End Term Examination	75
2	Internal Evaluation Scheme	25
2a	Class Tests	15
2a (i)	Class Test-I	7.5
2a (ii)	Class Test-II	7.5

2(b)	Teacher Assessment (Continuous Evaluation)	10
2b (i)	Attendance	5
2b (ii)	Assignment / Presentation	5

Lecture No.	Topic Covered	Pedagogy	Date of Implementation	Course Outcomes Covered	Faculty Sign
1	Introduction to Engineering Science. Need for measurement. Importance in engineering.	Chalk & Talk, Discussion	28.07.2025	CO1	
2	Units of measurement. MKS, CGS, FPS systems.	Chalk & Talk, Discussion	29.07.2025	CO1	
3	SI units: Fundamental and derived units. Examples.	Chalk & Talk, Discussion, Q&A	29.07.2025	CO1	
4	Length, mass, and time measurements.	Chalk & Talk, Discussion	04.08.2025	CO1	
5	Accuracy and precision in measuring instruments.	Chalk & Talk, Discussion	05.08.2025	CO1	
6	Errors in measurement: random, systematic. Minimizing errors.	Problem-solving, Q&A	05.08.2025	CO1	
7	Significant figures: rules, application in calculations.	Chalk & Talk	12.08.2025	CO1	
8	Dimensions, dimensional analysis, consistency of equations.	Chalk & Talk, Discussion Exercise	12.08.2025	CO1	
9	Revision and Doubts	Chalk & Talk, Discussion	18.08.2025		
10	Force, Inertia. Everyday examples.	Discussion, Chalk & Talk	19.08.2025	CO2	
11	Newton's First Law: Law of inertia, applications.	Chalk & Talk,, Problem-solving	19.08.2025	CO2	
12	Momentum, Newton's Second Law (F=ma). Derivation, problems.	Chalk & Talk, Discussion, Q&A	25.08.2025	CO2	
13	Impulse, impulse-momentum theorem, applications.	Chalk & Talk, Discussion& problem solving	26.08.2025	CO2	

14	Newton's Third Law: Action-reaction pairs.	Discussion, Examples	26.08.2025	CO2	
15	Conservation of linear momentum: collisions, applications.	Chalk & Talk, Exercise	01.09.2025	CO2	
16	Equilibrium of concurrent forces: Lami’s theorem, resolution of forces.	Chalk & Talk	02.09.2025	CO2	
17	Static and kinetic friction, laws of friction, coefficients.	Chalk & Talk, Discussion	02.09.2025	CO2	
18	Rolling friction, lubrication, reducing friction.	Chalk & Talk, Discussion	08.09.2025	CO2	
19	Dynamics of uniform circular motion, centripetal force, derivation.	Chalk & Talk, Discussion	09.09.2025	CO2	
20	Circular motion: banking of roads, vertical circle.	Chalk & Talk, Discussion	09.09.2025	CO2	
21	Revision and Doubts	Chalk & Talk, Discussion	15.09.2025		
22	Introduction to Basic Chemistry, importance in engineering.	Chalk & Talk, Discussion	16.09.2025	CO3	
23	Atomic structure: protons, neutrons, electrons, atomic number, mass number.	PPT, Chalk & Talk, Discussion	16.09.2025	CO3	
24	Periodic classification of elements, properties.	PPT, Chalk & Talk, Discussion	06.10.2025	CO3	
25	Chemical bonding: ionic, covalent bonding, examples.	PPT& Discussion	13.10.2025	CO3	
26	Acids, bases, salts: definitions, properties, examples. pH scale.	Chalk & Talk, Discussion	14.10.2025	CO3	
27	Class test		14.10.2025		
28	Carbon and its compounds: hydrocarbons overview.	Chalk & Talk, Discussion, Q&A	27.10.2025	CO3	
29	Metals and non-metals: properties and uses.	Chalk & Talk, Discussion	28.10.2025	CO3	
30	Man-made substances: polymers, ceramics, composites.	Chalk & Talk, Discussion	28.10.2025	CO3	

31	Revision and Doubts	Chalk & Talk, Discussion	03.11.2025		
32	Fuel: definition, characteristics, types (solid, liquid, gas).	Chalk & Talk, Example	04.11.2025	CO4	
33	Petroleum: refining, fractions, characteristics, uses.	Chalk & Talk, Discussion	04.11.2025	CO4	
34	Calorific value: HHV, LHV, gaseous fuels, producer gas, water/oil gas.	Chalk & Talk, Calculation	10.11.2025	CO4	
35	Air pollution: types, sources, effects, control, CO, NOx, HC, SOx, particulates.	Chalk & Talk, Discussion	11.11.2025	CO4	
36	Effects of pollution: humans, environment, smog, acid rain.	PPT, Chalk & Talk, Discussion	11.11.2025	CO4	
37	Water pollution: classification, sources, wastewater treatment (domestic, industrial).	PPT, Chalk & Talk, Discussion	17.11.2025	CO2, CO4	
38	Soil pollution: composition, effects, control.	PPT, Chalk & Talk, Discussion	18.11.2025	CO4	
39	Hazardous wastes: classification, disposal techniques (physical, chemical, biological).	Chalk & Talk, Discussion	18.11.2025	CO4	
40	Revision and Doubts	Chalk & Talk, Discussion	24.11.2025		
41	Class Test	Question Answer	25.11.2025		

Suggested Readings:

1. Thermodynamics by P K Nag
2. Environmental pollution and control engineering: C. S. Rao
3. Basic Science by S. Chand.