



Lok Jagruti Kendra University
University with a Difference

Diploma in Automobile Engineering



Course Code: 025010507
Special Purpose Vehicle

Programme / Branch Name			Diploma in Automobile Engineering			
Course Name	Special Purpose Vehicle				Course Code	025010507
Course Type	HSSC	BSC	ESC	PCC	OEC	PEC

Legends: HSSC: Humanities and Social Sciences Courses
 ESC: Engineering Science Courses
 OEC: Open Elective Courses

BSC: Basic Science Courses
 PCC: Program Core Courses
 PEC: Program Elective Courses

1. Teaching and Evaluation Scheme

Teaching Hours / Week					Evaluation Scheme				
L	T	P	Total Teaching Hours	Total Credit	CA	CCE	SEE (TH)	SEE (PR)	Total
3	2	0	5	5	10	40	50	-	100

Legends: L: Lectures T: Tutorial P: Practical
 CA: Continuous Assessment (Attendance + Activity)
 CCE: Continuous & Comprehensive Evaluation
 SEE (Th): Semester End Evaluation (Theory)
 SEE (Pr): Semester End Evaluation (Practical)

2. Prerequisite

- ✓ Internal Combustion Engine, Automobile Transmission and Automobile System
- ✓ Fundamentals of Automobile Electrical and Electronics
- ✓ Body and Chassis Engineering.

3. Rationale

The subject of Special Purpose Vehicle (SPV) in Automobile Engineering is important because it provides students with an understanding of the design and development of specialized vehicles for specific purposes. The rationale for offering a course on SPV in Automobile Engineering are:

Increasing demand for specialized vehicles - With the growth of technology and new businesses, there is an increasing demand for specialized vehicles for various purposes, such as defence, agriculture, and mining, among others. Therefore, there is a need for skilled engineers who can design and develop specialized vehicles to meet these specific requirements.

Provides students with specialized knowledge - The course on SPV in Automobile Engineering will provide students with specialized knowledge in the design and development of specialized vehicles. Students will learn about the various components of an SPV, including the chassis, body, suspension, and engine, among others.

Enhances employability - Students who complete this course will have an added advantage in the job market. They will be able to work in various sectors, including defense, agriculture, and mining, among others.

Complements other automobile-related courses - The course on SPV in Automobile Engineering complements other automobile-related courses such as vehicle design, manufacturing, and maintenance, among others. This will help students to develop a broader understanding of automobile engineering.



Promotes innovation - The course will encourage students to think creatively and develop innovative solutions for specialized vehicles. This will help students to become entrepreneurs and contribute to the development of the automobile industry.

Overall, the course on Special Purpose Vehicle in Automobile Engineering is important because it provides students with specialized knowledge and skills needed to design and develop specialized vehicles for specific purposes. This will help them to meet the increasing demand for specialized vehicles in various sectors and enhance their employability in the automobile industry.

4. Objectives

- ✓ Understand function and applications of special purpose vehicles in Automobile Industry.
- ✓ Identify and learn importance of All Terrain Vehicles.
- ✓ Explain additional features and technologies in Special Purpose Vehicles.
- ✓ Understand the necessity of peripheral systems of Special Purpose Vehicles.

5. Contents

Unit No.	Unit Name	Topics	Learning Outcome	% Weightage	Hours
1.	Introduction to Special Purpose Vehicle	1.1 Classification of Special Purpose Vehicles 1.2 Wheel Type Special Purpose Vehicle 1.3 Track Type Special Purpose Vehicle	<ul style="list-style-type: none"> Understanding of different Special Purpose Vehicles in Automobile. 	20	08
2.	Constructional Working features of different Earth Movers	2.1 Features of Oil tankers. 2.2 Features of Ambulance 2.3 Features of Fire Fighting 2.4 Features of Tipper 2.5 Features of Loaders 2.6 Features of Excavators 2.7 Features of Dumpers 2.8 Features of Bulldozers and Road Roller	<ul style="list-style-type: none"> Detailing of various features of different earth moving machinery. 	30	13
3.	Tractors	3.1 Classification of tractors-lay out of wheeled tractor. 3.2 Power Transmission system of Tractor. 3.3 Steering system of Tractor. 3.4 Braking system of Tractor. 3.5 Hydraulic Systems of Tractor. 3.6 P. T. O Unit of Tractor.	<ul style="list-style-type: none"> Steering, Suspension system, Braking System and Wheels and Tyres for Tractors. 	20	08
4.	Cranes	4.1 Basic characteristics of truck cranes. 4.2 Stability and design features for Lifting equipment of cranes. 4.3 Control systems and safety devices of Cranes.	<ul style="list-style-type: none"> Understanding different characteristics, design consideration and control system for mobility cranes. 	15	7

		4.4 Hydraulic Steering System for Hydra.			
5.	Hydraulic and Pneumatics System for Special Purpose Vehicles	5.1 Types of Pumps used in Hydraulic System. 5.2 Hydraulic Control Actuation for Tipper 5.3 Pneumatic Control Actuation for Braking System. 5.4 Common Maintenance in Hydraulic and Pneumatic System.	<ul style="list-style-type: none"> Understanding of Hydraulic and Pneumatic Systems used in SPV's along with its maintenance criteria. 	15	6

Total Hours **42**

6. Suggested Specification Table for Evaluation Scheme

Unit No.	Unit Name	Distribution of Topics According to Bloom's Taxonomy					
		R %	U %	App %	C %	E %	An %
1.	Introduction to Special Purpose Vehicle	40	40	10	0	10	0
2.	Constructional Working features of different Earth Movers	35	45	10	0	10	0
3.	Tractors	30	50	10	0	10	0
4.	Cranes	30	50	10	0	10	0
5.	Hydraulic and Pneumatics System for Special Purpose Vehicles	40	40	10	0	10	0

Legends: R: Remembering U: Understanding
 App: Applying C: Creating
 E: Evaluating An: Analyzing

7. Reference Books

- 1) Y. Pokras and M. Tushnyakov, "Construction Equipment Operation & Maintenance", MIR, Moscow.
- 2) A. Astskhov, "Truck Cranes", MIR, Moscow.
- 3) E.G. Poninson, "Motor Graders", MIR, Moscow.
- 4) Hand book of Earth Moving Machinery - Central Water & Power Commission (Govt. of India)
- 5) N. Rudenko, "Material Handling Equipment", M.R. Publishers.
- 6) Sheldon, R.Shacket, "Electric Vehicles", Domus Books, New York
- 7) David A. Day, Neal B. H. Benjamin, "Construction Equipment Guide", Wiley;
- 8) C.P. Nakra, "Farm Machines and Equipment", Dhanpat Rai Publications, New Delhi
- 9) Donnell hunt and L .W.garver - Farm machinery and mechanism - Iowa state university press
- 10) J.Y Wong - Theory of Ground vehicles - John Wiley and Sons

8. Open Sources (Website, Video, Movie)

- 1) <https://www.youtube.com/c/TheAutomotives>
- 2) <https://www.youtube.com/channel/UC4la8Cf7-DxaxsMhaWp1tQ>
- 3) <https://theautomobileengineers.blogspot.com/>
- 4) <https://www.youtube.com/c/LearnEngineering>

