



**C. U. SHAH UNIVERSITY**  
**Wadhwan City**

**FACULTY OF:** - Technology and Engineering  
**DEPARTMENT OF:** - Automobile Engineering  
**SEMESTER:** - VIII  
**CODE:** - 4TE08SPV1  
**NAME:** – Special Purpose Vehicles

**Teaching and Evaluation Scheme:-**

Subject Code	Name of the Subject	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
		Th	Tu	Pr	Total		Theory				Practical (Marks)			Total
							Sessional Exam		University Exam		Internal		University	
							Marks	Hrs	Marks	Hrs	Pr/Viva	TW	Pr	
4TE07SPV1	Special Purpose Vehicles	4	0	2	6	5	30	1.5	70	3	---	20	30	150

**Objectives:**

The main objective of this course is to introduce the concept and principle of operation of special vehicles such as Bulldozers, Ditchers, Bucket excavators, farm equipment's, military vehicles etc. At the end of the course, the students can have a better understanding of the application of the special types of vehicles in the excavation of earth.

**Prerequisite:**

- Basic knowledge of Automobile Systems.

**Course Outline:**

Sr. No.	Course Content	Hours
1	<b>Introduction:</b> Classification of special purpose vehicles based on applications, wheel types & Truck type.	05
2	<b>Study of working principles &amp; design considerations:</b> of power system, lubrication System, electrical system, braking system, steering system, pneumatic & hydraulic control system.	8
3	<b>Constructional &amp; working features:</b> of different types of earth moving machinery such as Tippers, shovels, Loaders, Excavators, Dumpers, Dozers, Fork Lift truck, Road rollers	10
4	<b>Farm Tractor:</b> Layout, Load distribution, Engine, Transmission & Drive line, Steering system, Braking system, Wheels & Tyrese, Hydraulic system, Auxiliary Systems, Draw bar, PTO Shaft. Different types of Implements, accessories and attachments. Tractor trolley.	10
5	<b>Mobile Cranes:</b> Basic characteristics of truck cranes, stability & design features, control systems & safety devices.	4
6	<b>Power Train Concepts</b> Engine – converter match curves. Epicyclical type transmissions. Selection criteria for universal joints. Constructional details of steerable and drive axles of dumper.	9
7	Tracked Vehicles, Articulated Vehicles, Multi-axle Vehicles, fifth wheel mechanism. Semi-trailer & Prime mover brakes & electrical systems. Dead Axles.	8
8	Special Purpose Electric Vehicles, Solar Vehicles and Hybrid Vehicles. Types, architecture and parameters of design considerations.	6

**Learning Outcomes:**

- Describe the working of drive line in earth moving vehicles compared with commercial vehicle.
- Analyse the ride characteristics & different components of tractor.
- Describe the construction of farm equipment and the working of power trains in heavy vehicles.
- Understand the construction and working of bulldozers, dumpers and loaders.
- Understand the feature of vehicles used for construction purpose, excavators, road rollers and mobile cranes.

**Text Books:**

1. Construction Equipment Operation & Maintenance by **Y. Pokras and M. Tushnyakov**, MIR, Moscow.
2. Truck Cranes, by **A. Astskhov**, MIR, Moscow.
3. Motor Graders by **E.G. Poninson**, MIR, Moscow.
4. Material Handling Equipment by **N. Rudenko**, MIR Publishers.
5. Electric Vehicles by **Sheldon, R. Shacket, Domus Books**, New York.
6. Industrial Hydraulics by **Pipenger**, McGraw Hill, Tokyo, 1979.

**Reference Books:**

1. Hand book of Earth Moving Machinery - Central Water & Power Commission (Govt. of India).
2. SAE Handbook – Vol III, 1995.