

B.E Semester: 8 Automobile Engineering
Subject Name: Special Purpose Vehicles (AE804-N-E)
[Dept. Elect.-6]

A. Course Objective:

- To present a problem oriented in depth knowledge of Special Purpose Vehicles.
- To address the underlying concepts and methods behind Special Purpose Vehicles.

B. Teaching / Examination Scheme:

Teaching Scheme				Total Credit	Evaluation Scheme					
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	Total
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
3	0	0	3	3	3	70	30	20	00	120

C. Detailed Syllabus:

Unit No.	Details
1	Introduction: Classification of Special Purpose Vehicles: based on applications, wheel types & track type.
2	Principles & Design Consideration: Study of working principles & design considerations of different systems involved like power system, transmission, final drive, lubrication, electrical, braking, steering, pneumatic & hydraulic control circuits.
3	Constructional & Working Features & Instrumentation: Constructional & working features of different types of earth moving machinery such as rippers, shovels, loaders, Excavators, Dumpers, Dozers, Fork Lift truck, Road rollers.
4	Farm Tractor: Classification of Tractors, Layout, Load distribution, Engine, Transmission & Drive line, Steering, Braking system, Wheels & Tyres, Hydraulic system, Auxiliary Systems, Draw bar, PTO Shaft. Different types of Implements, accessories and attachments, Tractor trolley.
5	Mobile Cranes: Basic characteristics of truck cranes, stability & design features, control systems & safety devices.
6	Features of SPV: Tracked Vehicles, Articulated Vehicles, Multi-axle Vehicles, fifth wheel mechanism. Semi-trailer & Prime mover brakes & electrical systems. Dead Axles, Features of oil-Tanker, Features of Ambulance
7	Solar & Electric Vehicles: Special Purpose Electric Vehicles, Solar Vehicles and Hybrid Vehicles. Types, architecture and parameters of design considerations.

8	Ergonomic Applications: Human factors in special purpose vehicle design with reference to comfort, convenience and safety, effects of noise, vibration and thermal stresses on human performance. Economics of special purpose vehicle utilization.
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Total hours (Theory):48
Total hours (Practical):00
Total hours:48

D. Lesson Planning:

Sr. No.	Date/Week	Unit	Weight age	Topic No
1	1 st ,2 nd ,3 rd	Unit 1	20%	1,2
2	4 th ,5 th ,6 th	Unit 2	20%	3
3	7 th , 8 th ,9 th	Unit 3	20%	4,5
4	10 th .11 th . 12 th	Unit 4	15%	6
5	13 th , 14 th ,15 th ,16 th	Unit 5	25%	7,8

E. Instructional Method & Pedagogy

1	At the start of course, the course delivery pattern , prerequisite of the subject will be discussed
2	Lecture may be conducted with the aid of multi-media projector, black board, OHP etc. & equal Weight age should be given to all topics while teaching and conduction of all examinations.
3	Attendance is compulsory in lectures and laboratory, which may carries five marks in overall evaluation.
4	One/Two internal exams may be conducted and total/average/best of the same may be converted toequivalent of 30 marks as a part of internal theory evaluation.
5	Assignment based on course content will be given to the student for each unit/topic and will be evaluated at regular interval. It may carry an importance of ten marks in the overall internal evaluation.
6	Surprise tests/Quizzes/Seminar/Tutorial may be conducted and having share of five marks in the overallinternal evaluation.

F. Students Learning Outcomes:

1	The student can identify different areas of Special Purpose Vehicles.
2	Can find the applications of all the areas in day to day life.

G. Text Books & Reference Books:

1	“Construction Equipment Operation & Maintenance” by Y. Pokras and M. Tushnyakov, MIR
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	Hand book of Earth Moving Machinery - Central Water & Power Commission (Govt. of India)