

B.E Semester: 6 Automobile Engineering

Subject Name: Transport Management, Laws & Pollution Control (AE604-N)

A. Course Objective:

The course should enable the students to :

- Understand the effect of various types of emissions.
- Know about the formation of various types of pollutants from SI and CI engines.
- Understand the significance of emission control techniques.
- Understand the construction and working of emission measuring instruments.
- Learn the various emission standards and test procedures.
- To present a problem oriented in depth knowledge of transport management and laws

B. Teaching / Examination Scheme:

Teaching Scheme				Total Credit	Evaluation Scheme					Total
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract.	
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	
4	0	2	6	5	4	70	30	20	30	150

C. Detailed Syllabus:

Unit No.	Details
1	Transport Management: Elements of Mass Transportation: History of transport, modes of transport, types of transport. Transport organization structure, operations, General set up, transport industry, government / (STU) State Government Undertakings and private Bus transport organizations. Bus depot organisation structure. Truck fleet operators' organization. Economics of Road Transport: Theory of fares and cost of services, fare charging, costing and statistics of operating cost.
2	Planning for New Transport Organization: Geographical considerations, economic factors, vehicles used, planning of trips. Concept of BRTS operations. Organisation of Transport Services: Records and fleet management, vehicles schedule, booking and reservation, statistical records and shipment centre, recording of goods transport.
3	Motor Vehicle Act: Acts & definitions, Licensing of drivers and conductors , registration of vehicles, control of transport, RTO and other regulations , offences, penalties and procedures, types of form and procedures, licensing of taxis and buses, rules and regulations, testing and passing of vehicles.
4	Taxation: Structure, method of laying taxation, goods vehicle taxation, passenger vehicle taxation, mode of payment, tax exemption, one / life time taxation. Service Life of vehicles. Toll tax reasons & operational management. Build Operate Transfer arrangement.

	<p>Accident & Prevention Vehicle accident, laws, injury, safety precautions, road transport regulations.</p> <p>Insurance & Finance Classes/types of insurance, accident claims and settlements, duty of driver in case of accident, hire purchase.</p>
5	<p>Laws Related to Pollution Under Control (PUC): Pollution Under control certification agency, Authority & procedure for PUC certification agency. Harmful exhaust gas constituents, permissible limits, Euro / Bharat Stage -I, II, III, IV, VI norms and implementation, testing and measurements.</p> <p>Measurement Techniques Emission Standards and Test Procedure NDIR,FID, Chemiluminescent analysers, Gas Chromatograph, smoke meters, emission standards, driving cycles – USA, Japan, Euro and India. Test procedures – ECE, FTP Tests</p>
6	<p>Pollutant Formation in Engines: Pollutant formation in SI Engine, mechanism of HC , CO and NO in SI engine, exhaust emission and factors affecting the emission, evaporative emission, crankcase emission, lead emission CI engine emissions: formation of smoke, factors affecting the smoke formation, diesel odour, unburned hydrocarbons, carbon monoxide, oxides of nitrogen, smog and comparison of diesel and petrol emissions. Two stroke engine pollution.</p>
7	<p>Control of Emissions from Engines : Design strategies to control emission from engines, effect of design and operating parameters on emission concentrations, modification in the engine design, modifying the fuel used, exhaust gas treatment devices, crankcase emission control, evaporative emission control, exhaust emission control, air injection system, second generation air injection system, spark timing emission control system, thermal reactor package, catalytic convertor package, NOx emission control, control of smoke, odour control, and pollution from gas turbine and its control</p>
8	<p>Noise Pollution from Automobiles : Noise, Vibration And Harshness, Sources of Noise, Measurement of Noise -Engine combustion noise, Inlet And Exhaust Noise, Traffic Noise, Vehicle Body Noise - control of noise, control devices and noise proof materials.</p>

Total hours (Theory):64

Total hours (Practical):32

Total hours:96

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	20%	6
5	13 th , 14 th ,15 th ,16 th	Unit 5	20%	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, 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 to equivalent 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 overall internal evaluation.
7	The course includes a laboratory, where students have an opportunity to build an appreciation for the concept being taught in lectures. Suggested list of experiment is given below

F. List of Practical:

1	To review Emission standards.
2	An experiment on SI engine emissions.
3	An experiment on CI engine emissions.
4	An experiment on Measurement of HC, CO, CO ₂ , O ₂ using exhaust gas analyzer for SI engine.
5	An experiment on Measurement of HC, CO, CO ₂ , O ₂ using exhaust gas analyzer for CI engine.
6	An experiment on Diesel smoke measurement.
7	An experiment on of NDIR Gas Analyser and FID.

G. Text Books & Reference Books:

	A. Text Books:
1	Motor Vehicles Acts, Law Publishers
	B. Reference Books:
1	Schumer ,Economics of transport, TMH
2	Fair and Williams, Economics of transportation, East West Press.
3	Hudson, Motor transportation, TMH.
4	M.V. Act 1988-RTO rules and regulation manual
5	Fuel Economy of Motor Vehicle, Allied Publishers.
6	National Research Council, Automotive Fuel Economy, National Academic Press.
7	CIRT Journal of Transport Management.
8	Paul Degobert – Automobiles and Pollution – SAE International ISBN-1-56091-563- 3, 1991.
9	Ganesan, V- “Internal Combustion Engines”- Tata McGraw-Hill Co.- 2003.
10	Beranek.L.L. “ Noise Reduction”, McGraw Hill Book co., Inc, New York, 1993.
11	SAE Transactions- “Vehicle Emission”- 1982 (3 volumes) .
12	Marco Nute- “ Emissions from two stroke engines, SAE Publication-1998
13	Internal combustion engine by domkundwar
14	Obert.E.F.- “Internal Combustion Engines”- 1988