SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Department of Automobile Engineering	LP: AE22308 Rev. No: 00 Date: 02.08.2023
B.E/B.Tech/M.E/M.Tech : Automobile Engineering Regulation: 2022 PG Specialisation : NA Sub. Code / Sub. Name : AE22308/Automotive Fuels And Lubricants: Theory And Practices Unit : I	

Unit Syllabus: **UNIT I Manufacture Of Fuels And Lubricants**

Types of Fuel, Chemical structure of petroleum, refining process, thermal cracking, catalytic cracking, polymerization, reforming, alkylation, isomerisation, blending, products of refining process. Manufacture of lubricating oil base stocks, manufacture of finished automotive lubricants.

Objective: To understand the extraction process of fuels and lubricants from crude oil.

Session No *	Topics to be covered	Ref	Teaching Aids
01	Types Of Fuel.	1-Ch.1; Pg. 16-17	PPT
02	Explanation Of Chemical Structure Of Petroleum.	1-Ch.5; Pg. 148-149	PPT
03	Different Methods Of Petroleum Refining Process.	1-Ch.5; Pg. 148-154	PPT
04	Thermal Cracking, Catalytic Cracking.	1-Ch.5; Pg. 148-154	PPT
05	Polymerization, Reforming, Alkylation.	1-Ch.5; Pg. 148-154	PPT
06	Isomerisation, Blending.	1-Ch.5; Pg. 148-154	PPT
07	Products Of Refining Process.	1-Ch.5; Pg. 148-154	PPT
08	Manufacture Of Lubricating Oil Base Stocks.	1-Ch.12; Pg. 361-362	PPT
09	Manufacture Of Finished Automotive Lubricants.	1-Ch.12; Pg. 388-389	PPT
10	ASTM distillation test of liquid fuels.	Lab Manual	Black board
11	ASTM distillation test of liquid fuels.	Lab Manual	Black board

Content beyond syllabus covered (if any): Formation of Crude oil

* Session duration: 50 minutes

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Sub. Code / Sub. Name: **AE22308/Automotive Fuels And Lubricants: Theory And Practices**

Unit : II

Unit Syllabus : **UNIT II THEORY OF LUBRICATION**

Engine friction: introduction, total engine friction, effect of engine variables on friction, hydrodynamic lubrication, elasto-hydrodynamic lubrication, boundary lubrication, bearing lubrication, functions of the lubrication system.

Objective: To explore the importance of friction and in automotive engines.

Session No *	Topics to be covered	Ref	Teaching Aids
12	Introduction On Engine Friction.	1- Ch. 13; Pg 367-368	PPT
13	Total Engine Friction.	1- Ch. 13; Pg 361-362	PPT
14	Effect Of Engine Variables On Friction.	1- Ch. 13; Pg 366-367	PPT
15	Hydrodynamic Lubrication.	1- Ch. 13; Pg 366-367	PPT
16	Elasto-Hydrodynamic Lubrication.	1- Ch. 13; Pg 371-375	PPT
17	Boundary Lubrication.	1- Ch. 13; Pg 371-375	PPT
18	Bearing Lubrication.	1- Ch. 13; Pg 371-375	PPT
19	Functions Of The Lubrication System.	1- Ch. 13; Pg 377-388	PPT
20	Types Of Lubrication System.	1- Ch. 13; Pg 377-388	PPT

Content beyond syllabus covered (if any):

Determination of Engine Friction

Types of lubricating System

* Session duration: 50 mins

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Sub. Code / Sub. Name: **AE22308/Automotive Fuels And Lubricants: Theory And Practices**

Unit : III

Unit Syllabus : LUBRICANTS

Specific requirements for automotive lubricants, oxidation deterioration and degradation of lubricants, additives and additive mechanism, synthetic lubricants, lubricating oils. Grease-classification and properties. Practical – Flash & Fire point tests of lubricating oil, Testing of Grease - Drop point test and Mechanical penetration test.

Objective: To familiarize the requirements and properties of automotive lubricants.

Session No *	Topics to be covered	Ref	Teaching Aids
21	Functions And Specific Requirements For Automotive Lubricants.	1- Ch. 13; Pg 368-375	PPT
22	Oxidation Deterioration And Degradation of Lubricants.	1- Ch. 13; Pg 368-375	PPT
23	Additives And Additive Mechanism.	1- Ch. 13; Pg 388-390	PPT
24	Function Of Lubricating Oil.	1- Ch. 13; Pg 368-375	PPT
25	Synthetic Lubricants.	1- Ch. 13; Pg 368-375	PPT
26	Classification Of Lubricating Oils.	2- Ch. 14; Pg 504-508	PPT
27	Grease And Properties.	1- Ch. 13; Pg 439-440	PPT
28	Grease-Classification And Properties.	1- Ch. 13; Pg 439-440	PPT
29	Automotive Applications Of Grease.	1- Ch. 13; Pg 439-440	PPT
30	Determination of Consistency of grease.	Lab Manual	Black board
31	Determination of Consistency of grease.	Lab Manual	Black board
32	Determination of Drop point of grease.	Lab Manual	Black board
33	Determination of Drop point of grease.	Lab Manual	Black board
34	Determination of Flash and Fire points of fuels and lubricating oil	Lab Manual	Black board
35	Determination of Flash and Fire points of fuels and lubricating oil	Lab Manual	Black board

Content beyond syllabus covered (if any):

* Session duration: 50 mins

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Sub. Code / Sub. **Name: AE22308/Automotive Fuels And Lubricants: Theory And Practices**

Unit : IV

Unit Syllabus : UNIT IV PROPERTIES AND TESTING OF FUELS

Thermo-chemistry of fuels, properties of fuels - relative density, flash point, fire point, distillation, vapour pressure, spontaneous ignition temperature, viscosity, pour point, flammability, ignitability, diesel index, API gravity, aniline point, carbon residue, copper strip corrosion etc. Practical - Testing of liquid fuels - Aniline Point test, Ash content and Carbon residue test, Cloud & Pour point tests, Copper strip corrosion test, Flash & Fire point tests, Reid vapour pressure test, Viscosity index measurement by Redwood Viscometer and Saybolt Viscometer.

Objective: To explore the properties and testing of automotive fuels.

Session No *	Topics to be covered	Ref	Teaching Aids
36	Thermo-Chemistry Of Fuels.	2- Ch. 8; Pg 263-296	PPT
37	Properties Of Fuels - Relative Density, Flash Point.	2- Ch. 8; Pg 296-298	PPT
38	Fire Point, Distillation.	2- Ch. 8; Pg 296-298	PPT
39	Vapour Pressure, Spontaneous Ignition Temperature.	2- Ch. 8; Pg 296-298	PPT
40	Viscosity, Pour Point.	1- Ch. 8; Pg 384-386	PPT
41	Flammability, Ignitability.	1- Ch. 8; Pg 384-386	PPT
42	Diesel Index, API Gravity.	2- Ch. 8; Pg 303-304	PPT
43	Aniline Point, Carbon Residue.	2- Ch. 8; Pg 279-280	PPT
44	Copper Strip Corrosion.	2- Ch. 8; Pg 296-298	PPT
45	Determination of Viscosity using Saybolt Viscometer.	Lab Manual	Black Board
46	Determination of Viscosity using Saybolt Viscometer.	Lab Manual	Black Board
47	Determination of Viscosity using RedwoodViscometer.	Lab Manual	Black Board
48	Determination of Viscosity using RedwoodViscometer.	Lab Manual	Black Board
49	Determination Of Amount Of Carbon Residue And Ash	Lab Manual	Black Board
50	Determination Of Amount Of Carbon Residue And Ash	Lab Manual	Black Board
51	Copper Strip Corrosion test.	Lab Manual	Black Board
52	Copper Strip Corrosion test.	Lab Manual	Black Board
53	Determination Of Reid Vapour Pressure.	Lab Manual	Black Board
54	Determination Of Reid Vapour Pressure.	Lab Manual	Black Board
55	Determination of Aniline Point of diesel.	Lab Manual	Black Board
56	Determination of Aniline Point of diesel.	Lab Manual	Black Board
57	Determination of Aniline Point of diesel.	Lab Manual	Black Board
58	Determination of Cloud and Pour point of petroleum fuels.	Lab Manual	Black Board
59	Determination of Cloud and Pour point of petroleum fuels.	Lab Manual	Black Board
60	Determination of Cloud and Pour point of petroleum fuels.	Lab Manual	Black Board

Content beyond syllabus covered (if any):

* Session duration: 50 mins

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Unit : V

Unit Syllabus : **UNIT V FUEL RATING AND ADDITIVES**

Specifications of fuels, fuel rating - octane number – motor octane number and research octane number, cetane number, calorific value, Additives - requirements of an additive, mechanism, petrol fuel additivesand diesel fuel additives.

Objective: To understand the importance choosing the fuel rating and additives.

Session No *	Topics to be covered	Ref	Teaching Aids
61	Specifications Of Fuels.	2- Ch. 8; Pg 283-287	PPT
62	Fuel Rating - Octane Number.	2- Ch. 8; Pg 283-287	PPT
63	Motor Octane Number.	2- Ch. 8; Pg 285-296	PPT
64	Research Octane Number.	2- Ch. 8; Pg 285-296	PPT
65	Cetane Number.	2- Ch. 8; Pg 228-231	PPT
66	Calorific Value.	2- Ch. 8; Pg 228-231	PPT
67	Additives - Requirements of an Additive.	2- Ch. 8; Pg 310-314	PPT
68	Additive Mechanism.	2- Ch. 8; Pg 310-314	PPT
69	Petrol Fuel Additives And Diesel Fuel Additives.	2- Ch. 8; Pg 310-314	PPT
70	Determination of Calorific value of gaseous fuels..	Lab Manual	Black Board
71	Determination of Calorific value of gaseous fuels.	Lab Manual	Black Board
72	Determination of Calorific value of liquid fuels.	Lab Manual	Black Board
73	Determination of Calorific value of liquid fuels.	Lab Manual	Black Board
74	Study of Octane and Cetane Number of fuels.	Lab Manual	Black Board
75	Study of Octane and Cetane Number of fuels.	Lab Manual	Black Board

Content beyond syllabus covered (if any):

* Session duration: 50 mins

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3. Obert.E.F "Internal Combustion Engineering and Air Pollution", International book Co., 1988.
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5. Francis, W, "Fuels and Fuel Technology", Vol. I & II, Pergamon, 1965.
6. Hobson, G.D. & Pohl.W, "Modern Petroleum Technology", 1974.
7. Lansdown. A.R., Lubrication, "A practical guide to lubricant selection", Pergamon press, 1982.
8. Raymond. C. Gunther, "Lubrication", Chilton Book Co., 1971.

	Prepared by	Approved by
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Date	2-8-2023	02-8-2023
Remarks *:		
Remarks *:		

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD