BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE PILANI-HYDERABAD CAMPUS

SECOND SEMESTER 2019-2020

Course Handout (Part II)

06/01/2019

In addition to part-I (general handout for all courses in the time table) this handout provides the specific details regarding the course.

Course No.: **ME F242**
Course Title: **IC Engines**
Instructor-in-charge: **SANDIP DESHMUKH**
Instructors: **P Ankamma Rao, Sama Sanghamitra, Shaik Ayub Mohiddin & Sandip Deshmukh**

Course Description:

Working cycles and operation of two strokes, four stroke SI and CI engine cycles. Ignition, combustion, alternative fuels, emission and their control.

Scope and Objective:

This course has been designed to make the students familiar with the working principles of an internal combustion engines. It deals with the principle of operations, fuels, combustion and performance of an internal combustion engines; along with working analysis and design of various systems.

Text Books:

V. Ganeshan, *Internal Combustion Engines*, Tata McGraw-Hill, 4th Edition, 2012

Reference Books:

M. L. Mathur and R. P. Sharma, A course in Internal Combustion Engines, Dhanpath Rai and Sons.
A. R. Rogowski, Elements of I. C. Engines, Tata McGraw-Hill.

Course Plan:

Lect No.	Learning Objectives	Topics to be covered	Chapter in the Text Book
1-3	Introduction to IC	Working principle, classification and	Ch 1

	Engines	performance parameters of an IC Engines	
4-6	Air standard cycles and their analysis	Auto, Diesel and Dual cycle.	Ch 2
7-9	Fuel-air cycles and their analysis	Variable specific heats, Dissociation, Comparison of air standard and fuel air cycle	Ch 4
10-11	Actual cycle and their analysis	Valve-timing diagram, Time loss factor, Heat loss factor, Exhaust blow down	Ch 5
12	Conventional and Alternative Fuels	Conventional fuel, Liquid fuels, Possible alternative fuels	Ch 6 & 7
13-14	Carburetion	Carburetion, Engine mixture requirements, Simple carburetor, Calculation of air fuel ratio	Ch 8
15-16	Mechanical and Electronic injection system	Classification, Fuel feed Pump, Injector, Nozzle, MPFI and ECU	Ch 9 & 10
17-18	Ignition	Battery ignition system, Magneto ignition system, Modern ignition systems	Ch 11
19-20	Engine friction and lubrication	Mechanical friction. Lubrication, Properties of lubricant	Ch 13
21-22	Heat rejection and cooling	Temperature distribution, Liquid and Air cooling system	Ch 14
23	Engine Emissions and their control	Hydrocarbon and other emissions, Converter	Ch 15
24-25	Measurement and Testing, Performance parameters and characteristics	Measurement of IP, BP, etc, Efficiency and heat balance sheet	Ch 16 & 17
26	Supercharging	Supercharger, Supercharging methods	Ch 19
27-28	To know the engines	All the systems of an IC engines	Lab Visit

Evaluation Scheme:

Sr. No.	Evaluation Component	Duration	Weightage (%)	Date, Time and Venue	Nature of Component
01	Mid Semester Test	90 min.	25	4/3 1.30 -3.00 PM	Closed Book
02	Surprise Lecture Class Quiz/Test	10 min	15	Best 5 out of 6	Open Book

03	Tutorial Class Quiz/Test	10 min	20	Best 8 out of 10	Open Book
04	Compre.	3 hrs	40	08/05 FN	Close Book

Chamber Consultation Hours:

To be announced in the class.

Notices:

All notices related to this course will be put on the Mechanical Engineering Group Notice Board.

Make-up Policy:

Make-up will be given to extremely genuine student, but prior permission is required. No make-up will be given for the surprise tests. Surprise tests may be conducted in either lecture hour or tutorial/common hour.

Academic Honesty and Integrity Policy: Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor-in-charge
ME F242