IC ENGINES AND GAS TURBINES

MECHANICAL ENGINEERING

PROF. PRANAB K. MONDAL
Department of Mechanical Engineering
IIT Guwahati

TYPE OF COURSE : New | Core | UG/PG
INTENDED AUDIENCE : Undergraduate students of Mechanical/ Chemical/Aerospace engg. etc
COURSE DURATION : 12 weeks (28 Jan'19 - 19 Apr'19)
EXAM DATE : 27 April 2019
PRE-REQUISITES : Basic UG-level Fluid Mechanics & Thermodynamics

PROF. VINAYAK N. KULKARNI
Department of Mechanical Engineering
IIT Guwahati

INDUSTRIES APPLICABLE TO : Tata Motors, Ashok Leyland, General Electric

COURSE OUTLINE :

This course deals with the gas power cycles. One part of the course is on IC engines and it focuses on the thermodynamic cycles for different fuels suitable for automobiles. Other part of the course has emphasis on thermodynamic cycle of aircraft engines and the components of the aircraft engine. Thus this course would provide an understanding on electricity generation or transportation application using gas as working medium.

ABOUT INSTRUCTOR :

Dr. Pranab K. Mondal is an Assistant Professor in the department of Mechanical Engineering at Indian Institute of Technology Guwahati since May 2015. He received his undergraduate and postgraduate degree from Jadavpur University, Kolkata, and completed his Ph.D. from Indian Institute of Technology Kharagpur in 2015. His principal research interest, encompassing the broad area of Microfluidics, has covered various facets of micro scale multiphase transport, electro kinetics and micro scale transport of heat. He is currently working on stability analysis of flows with free-surfaces, capillary filling of bio-fluids. He has co-authored more than 65 referred journals conference publications.

Dr. Vinayak N. Kulkarni is an Associate Professor in the Department of Mechanical Engineering of Indian Institute of Technology Guwahati since January 2015. He completed his undergraduate studies in Mechanical Engineering in the Shivaji University, Maharashtra, India. His post-graduation and PhD is from Aerospace Engineering Department of Indian Institute of Science Bangalore. His teaching interests are basic and applied thermodynamics, gas dynamics, aircraft propulsion and fluid mechanics. His research interests are experimental and computational compressible flows, IC engines and non-conventional energy.

COURSE PLAN :

Week 01 : Engine
Week 02 : IC engines
Week 03 : Air-standard cycles
Week 04 : Carburation
Week 05 : Fuel injection systems
Week 06 : Combustion in S.I. and C.I. engines
Week 07 : Introduction to Gas Turbines
Week 08 : Performance analysis of Bryton Cycle
Week 09 : Aircraft propulsion
Week 10 : Compressors
Week 11 : Compressors and Turbines
Week 12 : Nozzles and Diffusers