


APPLIED THERMODYNAMICS

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COURSE OUTLINE :

“Applied Thermodynamics” is a topic of fundamental interest to Mechanical Engineering and Energy Engineering disciplines. This course provides theoretical and thermodynamic background for steam and gas power cycle, refrigeration cycle, psychometric principles, internal combustion engine and gas turbine engine cycles, aircraft and rocket propulsion cycles. Prior to these topic, few lectures are devoted towards basic engineering thermodynamic fundamentals. The syllabus is framed with respect to guidelines of “Mechanical/Energy Engineering” UG course curriculum for respective engineering disciplines across the country. The methodical online teaching, problem solving approach and online evaluation will help the candidate for credit transfer for their course curriculum.

ABOUT INSTRUCTOR :

Prof. Niranjan Sahoo is affiliated as “Professor” in the Department of Mechanical Engineering, Indian Institute of Technology Guwahati. Having B. Tech Degree in Mechanical Engineering, he has received PhD Degree (in the year 2004) from Department of Aerospace Engineering, Indian Institute of Science Bangalore. Till May 2020, he has 15 years of teaching and research experience at different capacity in Department of Mechanical Engineering, Indian Institute of Technology Guwahati. He has taught several courses at undergraduate and postgraduate level in the area of Fluid and Thermal Engineering, such as Fluid Mechanics, Basic and Applied Thermodynamics, Heat and Mass Transfer, Refrigeration and Air Conditioning, Combustion, Gas Dynamics and Aircraft Propulsion. Besides, he has developed interdisciplinary courses under NPTEL platform, participated in virtual laboratory courses and organized TEQIP Short Term Courses with respect to National mission projects apart from several sponsored research projects. He has more than 100 research publications in peer reviewed journals and conferences. Until date, he has achieved 13 PhD guidance with ongoing research scholars of similar number.

Prof. Pranab K. Mondal is an Assistant Professor in the department of Mechanical Engineering at Indian Institute of Dr. Pranab K. Mondal is an Associate 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. He worked as a Research Associate at IIT Khargpur for nearly one year before joining IIT Guwahati. He has taught several courses, including Fluid Mechanics, Applied Thermodynamics, Thermodynamics, Fundamentals of Microfluidics, Experimental Methods in Fluid Mechanics to both undergraduate and post graduate students at IIT Guwahati. Among His principal research interest, encompassing the broad area of Microfluidics has covered various facets of microscale multiphase transport, electrokinetics, microscale transport of heat and experimental microfluidics. He is currently working on droplet-based microfluidics, magnetofluidics, experimental investigations of capillary filling of bio-fluids. He has co-authored more than 140 referred journal and conference publications. He is a regular reviewer of many reputed international journals and also associated with several sponsored projects pertaining to microscale phenomena.

COURSE PLAN :

Week 1: Review of Basic Thermodynamics

Week 2: Steam Power System

Week 3: Steam Power System

Week 4: Steam Power System

Week 5: Internal Combustion (IC) Engines

Week 6: Internal Combustion (IC) Engines

Week 7: Internal Combustion (IC) Engines

Week 8: Gas Turbine Engines

Week 9: Gas Turbine Engines

Week 10: Refrigeration and Air-conditioning System

Week 11: Refrigeration and Air-conditioning System

Week 12: Reciprocating Air Compressor