ENGINEERING THERMODYNAMICS

CHEMICAL ENGINEERING

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TYPE OF COURSE : Rerun | Core | UG
COURSE DURATION : 8 weeks (28 Jan'19 - 22 Mar'19)
INTENDED AUDIENCE : BE
EXAM DATE : 31 Mar 2019
PRE-REQUISITES : An introductory background in chemistry, physics and maths (calculus) will be needed. Thus, the course is ideal for first or second year engineering students.
INDUSTRIES APPLICABLE TO : All engineering based industry

COURSE OUTLINE :

This course provides an introduction to the most powerful engineering principles -Thermodynamics: the science of energy and its transformation from one form to another form. The subject is widely applicable in several branches of engineering and science. The objective of this course is to introduce different tools needed to analyze energy systems from various daily lives to large scale engineering applications. More specifically, we will cover the topics of mass and energy conservation principles; first law analysis of closed and open systems; understanding second law of thermodynamics and entropy; exergy; properties of pure substances; power generation and refrigeration on thermodynamic cycles; thermodynamic relation, combustion and reaction.

ABOUT INSTRUCTOR :

Dr. Jayant K. Singh received his B.Tech from IIT Kanpur in Chemical engineering in 1997. He subsequently completed his Masters degree in computer science and engineering and Ph.D. in Chemical engineering in the area of molecular simulation from SUNY Buffalo, USA in 2004. Dr. Singh is currently a professor in the department of Chemical engineering at IIT Kanpur. Dr. Singh's current research interest is in thermodynamics and statistical mechanics, material modeling, confined fluids and development of molecular simulation tools. Dr Singh has co-authored more than 100 peer reviewed articles in international journals of repute. He is a recipient of prestigious awards such as Humboldt Fellow for experienced researcher, Young Engineers of Indian National Academy of Engineers, Amar-Dye Chem award and BRNS Young Scientist Award. He is also an elected member of National Academy of Sciences, Allahabad.

COURSE PLAN :

Week 01 : Introduction to Energy and Energy transfer
Week 02 : Properties of Pure Substances
Week 03 : Energy analysis of closed system
Week 04 : Mass and Energy analysis of open systems
Week 05 : The second law of thermodynamics and entropy
Week 06 : Energy Analysis
Week 07 : Power & Refrigeration cycles
Week 08 : Thermodynamic Potentials I Law application to Chemical Reacting Systems.