Thermodynamics

Programme Overview

ME209x Thermodynamics is a basic course in thermodynamics, designed for students of mechanical engineering. The three laws of thermodynamics (zeroth, first, and second) will be explored in detail, and the properties of materials will be studied. Many useful relations will be derived.

There will be emphasis on problem-solving. Students will need to spend significant effort on solving exercises.

The course is designed for students in mechanical engineering. However, others (both engineers and scientists) are likely to find it useful. The course has also been found to be useful to teachers of thermodynamics.

The course will be conducted in a self-paced mode, i.e. all the lecture videos, slides, reading materials, activities, and graded assignments will be released when the course starts. This gives you the flexibility of progressing and completing the graded assignments at your own pace. However, one would need to complete them before the course ends. At normal pace, this course requires 12 weeks of study, about 8-10 hours a week.

This course content will be offered in bilingual language, English, and Hindi. Whereas, the assignments and activities will be available only in English.

Course content

The topics covered in this course:

- Basic concepts and definitions
- The work interaction
- The first law, energy and the heat interaction
- The zeroth law, temperature and scales of temperature
- Properties of gases and liquids, equations of state
- The second law, thermodynamic temperature scales and entropy
- Relations between properties
- Open thermodynamic systems

Teaching Faculty

Prof. (Retired) Uday N Gaitonde, Department of Mechanical Engineering, IIT Bombay

Prof. U. V. Bhandarkar, Department of Mechanical Engineering, IIT Bombay

Prof. Milind Atrey, Department of Mechanical Engineering, IIT Bombay

Duration and Venue

Registration Opens	August 3, 2020
Registration Ends	October 16, 2020
Course Starts	August 3, 2020
Course Ends	November 25, 2020
Total Duration	12 Weeks

Who Should Attend

Anyone, who has the basic knowledge of high-school Physics and Chemistry; the ability to do college calculus (differentiation, integration, partial derivatives, and exact differentials) is required to attend this course.

Course Fee and Certification

The registration fee for the course is **Rs. 575/-**. However, register before 25 August 2020 for **Rs. 475/-** to avail the early bird registration discount. Please note that the registration fee once paid is neither refundable nor adjustable under any circumstances.

Important payment instructions:

In case of a course fee transaction failure, the participant will get an auto-generated mail with instructions for further process. Please go through the mail carefully. If the amount is already debited to your account, please do not make another payment. In case of a double payment (or more than once), please send a mail to dbpaccounts@cse.iitb.ac.in requesting for a refund. The participant will also have to check the following link for his/her vendor creation in order to get a refund. IIT Bombay will not be able to process the refund (for any reason) if the vendor creation, as per IIT Bombay's requirement, is not completed by the participant. **Link**:- https://portal.iitb.ac.in/vrp/index.jsp

Honor Code e-Certificates will be issued on successful completion of the course based on the grading policy mentioned in the course. Please note that all e-certificates will be issued online after the course ends on 25 November 2020. No hard copies will be given.

How to Apply

Enrollment will be strictly online, and no other mode of application will be entertained. The online registration for the course will start on **3 August 2020**. It will remain open till **16 October 2020**.

Registration process for the Program: Flowchart of registration process

- Sign up using your valid email id on the website: https://www.it.iitb.ac.in/lakshya/signup.html
- After verification, your account will be created
- Log in on the website with the verified account
- Go to Announcements, select the program and register
- After successful registration, you will receive an automated email. Your name will be listed in the "**List of Participants page"**
- Thereafter register on IITBombayX site (https://courses.iitbombayx.in/register) using the same email id to access the course content

Note

The course content is released under Open Source License. All participants must agree that the content contributed by them in any form, (assignments, questions, etc.) would be released under Open Source Licence, by accepting the terms mentioned under 'No Objection Certificate'. All contributors will be acknowledged.