COURSE DETAIL

ENGINEERING THERMODYNAMICS II
Country Ireland
Host Institution University College Dublin
Program(s) Irish Universities,University College Dublin
UCEAP Course Level Upper Division
UCEAP Subject Area(s) Mechanical Engineering
UCEAP Course Number 104
UCEAP Course Suffix
UCEAP Official Title ENGINEERING THERMODYNAMICS II
UCEAP Transcript Title ENGR THERMODYNMC II
UCEAP Quarter Units 4.00
UCEAP Semester Units 2.70

Course Description
This course deepens and broadens the students' understanding of thermodynamic foundations and describes and analyzes common engineering components and power-generation cycles. The course begins with a review of the 1st Law of Thermodynamics and an introduction to the 2nd Law that emphasizes the distinction between heat and work. These laws are then applied to the analysis of Otto, Diesel, Brayton-Joule, and Rankine cycle heat engines, representative of petrol, diesel, jet engines, and steam-powered electricity generation plants respectively. The course then introduces the combined-cycle gas turbine (CCGT) plant. The concept of exergy is introduced and used to derive 2nd Law efficiency metrics for components (e.g. nozzles, diffuses, and compressors) and cycles. The course concludes with a brief look at the thermodynamics of gas mixtures and of combustion. In addition to the formal lectures, students each complete three laboratory practicals, related to engine operation, compression processes, and refrigeration. These laboratory sessions deepen the students' engagement with the subject, develop their ability to work as a team, improve their engineering communication skills, and enhance their capacity to conduct experiments and to analyze and interpret data.

Language(s) of Instruction
English

Host Institution Course Number
MEEN30100

Host Institution Course Title
ENGINEERING THERMODYNAMICS II

Host Institution Campus
UC Dublin

Host Institution Faculty

Host Institution Degree

Host Institution Department
Mechanical Engineering

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