



COURSE TITLE: Thermodynamics

Number of contact hours: 45

Duration: 1 semester (fall)

ECTS credits: 4

Programme description: In the Thermodynamics course, students will be introduced to the basic concepts and laws of thermal phenomena and processes. Topics that will be covered in class include: the thermodynamic system; thermodynamic equilibrium; basic physical quantities such as mass, force, temperature, pressure, energy; the zeroth law of thermodynamics; the behaviour of pure substances: an ideal gas and vapour-liquid-solid phase equilibrium; energy transfer: work and heat; the first law of thermodynamics for closed and open thermodynamic systems; internal energy; enthalpy; specific heat; thermodynamic processes; thermodynamic cycles; the second law of thermodynamics; entropy; the Carnot cycle. Students will learn how to use the concepts and laws of thermodynamics in engineering applications. The issues discussed in the lectures will be analysed in the exercise classes, where thermodynamics tasks will be solved. A better understanding of selected topics will be obtained in laboratory classes, where the following tasks will be carried out: determination of the characteristics of a resistance thermometer, measurement of air velocity with a Pitot tube, investigation of condensation and evaporation, determination of the heat capacity ratio, determination of the specific heat of a solid or liquid.

Course type: lectures (15), exercises (15), laboratory (15)

Literature:

1. Borgnakke C., Sonntag R. E., Fundamentals of Thermodynamics. Wiley, 2009.
2. Moran M.J., Shapiro H.N., Munson B.R., DeWitt D.P., Introduction to Thermals Systems Engineering: Thermodynamics, Fluid Mechanics and Heat Transfer. Wiley, 2003.

Assessment method: written assessment and reports from laboratory

Lecturer: Prof. Magdalena Jaremkiwicz

Contact person: Prof. Magdalena Jaremkiwicz (e-mail: magdalena.jaremkiwicz@pk.edu.pl)