

COURSE TITLE: HEATING ENGINEERING

Institute/Division: Institute of Process and Power Engineering / Division of Power Engineering

Erasmus subject code: 06.1

Number of contact hours: 30

Course duration: 1 semestr

ECTS credits: 2

Course description: Basic heat transfer modes. Hygrothermal performance of building components and building elements - Internal surface temperature to avoid critical surface humidity and interstitial condensation. Heating systems in buildings. Heat transmission in building structures. Method for calculation of the design heat load. Heating and district heating. Protection of open water heating installations. Protection of closed water heating installations with diaphragm pressure expansion vessels. Duct and pipe sizing. Moist air properties. Basic HVAC (Heating, Ventilating and Air Conditioning) systems calculations. Heating or cooling of air. Heating and humidifying air. Adiabatic mixing of two streams of air. Heat recovery systems. Heat pump systems. Steam heating systems.

Literature: F.C. McQuiston, J.D. Parker, J.D. Spitler, *Heating, Ventilating and Air Conditioning. Analysis and Design*, John Wiley & Sons, USA 2000.
R.H. Howell, H.J. Sauer, W.J. Coad, *Principles of Heating, Ventilating and Air Conditioning*, American Society of Heating, Refrigerating and Air-Conditioning Engineers 1998.

Course type: Lectures, classes and computer laboratory

Assessment method: Test.

Prerequisites:

Primary target group: 2nd year postgraduate Mechanical Engineering students

Lecturer: Zima Wiesław, PhD, DSc

Contact person: Zima Wiesław, PhD, DSc, phone: +48 12 628 3653, e-mail: zima@mech.pk.edu.pl

Deadline for application: May 31

COURSE TITLE: ANALYSIS, MODELLING AND DESIGN OF ENERGY SYSTEMS

Institute/Division: Institute of Process and Power Engineering / Division of Power Engineering

Erasmus subject code: 06.1

Number of contact hours: 60

Course duration: 1 semestr

ECTS credits: 6

Course description: Head-loss representation. Piping networks. Series piping systems. Parallel systems. Hardy Cross method. Generalized Hardy Cross method. Heat exchangers – method of analysis. Shell-and tube heat exchangers. Number of transfer units method. Pumps in series and parallel. Pump system operation. Pump placement to avoid cavitation. Additional system considerations.

Literature: B.K. Hodge, Robert P. Taylor, *Analysis and design of energy systems*, Prentice-Hall, Inc., Simon & Schuster / A Viacom Company 1999.

Course type: Lectures, classes and computer laboratory

Assessment method: Final test

Prerequisites:

Primary target group: 2nd year postgraduate Mechanical Engineering students

Lecturer: Zima Wiesław, PhD

Contact person: Zima Wiesław, PhD, phone: +48 12 628 3653, e-mail: zima@mech.pk.edu.pl

Deadline for application: June 30