

Title <b>(Podstawy inżynierii chemicznej i procesowej)</b>	Code <b>1010701341010720572</b>
Field <b>Environmental Protection Technologies</b>	Year / Semester <b>2 / 4</b>
Specialty -	Course <b>core</b>
Hours Lectures: <b>2</b> Classes: -    Laboratory: <b>3</b> Projects / seminars: -	Number of credits <b>6</b>
	Language <b>polish</b>

**Lecturer:**

-): prof. dr hab. inż. Stefan Jan Kowalski  
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**Status of the course in the study program:**

-Fundamentals of chemical and process engineering

**Assumptions and objectives of the course:**

-The student should acquire the knowledge on modelling and designing of the flow, thermal, and diffusive processes as well as the theory of designing of heat and mass transfer equip-ment.

**Contents of the course (course description):**

-The fundamentals of chemical and process engineering are lectured. The matter in hand is divided into the flow, thermal, and diffusive processes. The flow processes comprise the problems of gas and liquid flow using methods and notions of fluid mechanics. The basic equations of balances of mass, momentum and energy, the equations describing the flow, thermal and diffusive processes are presented, and the skill of application of these equations for designing of chemical engineering processes in laboratory conditions and scaling of the obtained results to prototype dimensions is illustrated. Fundamentals of designing of heat and mass transfer equipment are given. The scope of this subject contains the mechanics of compressible and the viscous fluid. The thermal processes concern three modes of energy transfer: conduction, convection, and radiation. Knowledge of an engineering nature such as designing of heat transfer equipment requires both an acquaintance of the basic mechanisms of heat transfer and the ability of evaluating quantitatively these mechanisms and associated quantities. The goal is to learn the basic laws of heat transfer and the fundamental equations for evaluating the rate of heat transfer. The diffusive processes refer to systems containing two or more components whose concentration vary from point to point, as for example, multicomponent gas or liquid. The stationary and non-stationary problems of diffusion as well as the mechanisms of convective mass transfer and the principles of designing of mass transfer equipment are presented. The problems of simultaneous heat and mass transfer by drying, filter theory, and other important industrial processes as well as some mathematical methods and the dimensional analysis are also lec-tured

**Introductory courses and the required pre-knowledge:**

-The classical mechanics in the range of physics, the fundamentals of chemical physics and classical thermodynamics, the acquaintance with differential and integral calculus, and the skill in solution of ordinary differential equations

**Courses form and teaching methods:**

-lectures, fundamentals of designing (exercises), laboratory exercises

**Form and terms of complete the course - requirements and assessment methods:**

-carent control of preparation to laboratory excercises, valuation of the tests concerning designing of processes, valuation of the final examination.

**Basic Bibliography:**

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**Additional Bibliography:**

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