

Title <b>Inverse problems in mechanics of materials</b>	Code <b>10102122210102103243</b>
Field <b>Mechanical Engineering</b>	Year / Semester <b>1 / 2</b>
Specialty <b>Mechanics of materials and structures</b>	Course <b>elective</b>
Hours Lectures: <b>1</b> Classes: <b>1</b> Laboratory: <b>-</b> Projects / seminars: <b>-</b>	Number of credits <b>2</b>
	Language <b>polish</b>

**Lecturer:**

- Prof. dr hab. inż. Jan Adam Kołodziej  
tel. +48(61) 6652321  
e-mail: jan.kolodziej@put.poznan.pl

**Faculty:**

Faculty of Mechanical Engineering and Management  
ul. Piotrowo 3  
60-965 Poznań  
tel. (061) 665-2361, fax. (061) 665-2363  
e-mail: office\_dmef@put.poznan.pl

**Status of the course in the study program:**

- Optional course at the Mechanical Engineering Faculty to second degree studies.

**Assumptions and objectives of the course:**

- The student should obtain knowledge about inverse problems.

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

- Essence of inverse problems in thermomechanics. Numerical experiment in computational mechanics. Sensitivity analysis in structural mechanics. Damage identification using modal analysis. Examples for beams and plates. Detection of cavities and corrosion damage using method of fundamental solutions. Determination of elastic--plastic model of material by inverse torsion problem. The determination temperature-dependent thermal conductivity as inverse steady heat conduction problem. Application of method fundamental solutions and radial basis functions for inverse heat source problem.

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

- Knowledge of applied mechanic and mechanics of materials.

**Courses form and teaching methods:**

- Lectures and computer laboratory lectures.

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

- Written test from lectures and practical lectures.

**Basic Bibliography:**

-

**Additional Bibliography:**

-