<table>
<tr><td>Course code</td><td></td></tr>
<tr><td>Type and description</td><td>Elective Course</td></tr>
<tr><td>ECTS credit</td><td>1</td></tr>
<tr><td>Course name</td><td>Fixed Point Theory with Applications 1</td></tr>
<tr><td>Course name in Polish</td><td>Teoria punktów stałych z zastosowaniami 1</td></tr>
<tr><td>Language of instruction</td><td>English</td></tr>
<tr><td>Course level</td><td>8 PRK</td></tr>
<tr><td>Course coordinator</td><td>Jacek Jachymski</td></tr>
<tr><td>Course instructors</td><td>Jacek Jachymski</td></tr>
<tr><td>Delivery methods and course duration</td><td>
<table>
<tr><th></th><th>Lecture</th><th>Tutorials</th><th>Laboratory</th><th>Project</th><th>Seminar</th><th>Other</th><th>Total of teaching hours during semester</th></tr>
<tr><td>Contact hours</td><td>0</td><td>0</td><td>0</td><td>15</td><td>0</td><td>0</td><td>15</td></tr>
<tr><td>E-learning</td><td>No</td><td>No</td><td>No</td><td>No</td><td>No</td><td>No</td><td></td></tr>
<tr><td>Assessment criteria (weightage)</td><td>0,00</td><td></td><td></td><td></td><td></td><td>0,00</td><td></td></tr>
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<tr><td>Course objective</td><td>1. Acquiring knowledge in the field of fundamental theorems of fixed point theory.

2. Acquiring knowledge on applications of methods of fixed point theory.</td></tr>
<tr><td>Learning outcomes</td><td>After the course a student is able to:

1. Verify if a given selfmapping of a metric space is Lipschitzian, construct sequences of successive approximations - outcomes W4, K1.

2. Solve some differential and integral equations using methods of fixed point theory - outcomes W4, U4, K1.</td></tr>
<tr><td>Assessment methods</td><td>Outcomes W4 – oral exam

U4, K1 - project seminar presentation

W4, U4 - written project

The final grade: Oral exam - 50%; Presentation - 20%; Project evaluation– 30%</td></tr>
<tr><td>Prerequisites</td><td>Knowledge of functional analysis and topology</td></tr>
<tr><td>Course content with delivery methods</td><td>LECTURE

1. Fixed point theorems for non-expansive self-mappings of metric spaces and some subsets of Banach spaces.

2. Brouwer and Schauder fixed point theorems for continuous mappings on compact sets.

3. Applications of fixed point theory to differential and integral equations.</td></tr>
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	PROJECT Presentation of concrete applications with the use of methods of metric fixed point theory
Basic reference materials	Lecturer's materials 1. K. Goebel, W. A. Kirk, Topics in metric fixed point theory, Cambridge University Press, 1990. 2. A. Granas, J. Dugundji, Fixed Point Theory, Springer, 2003.
Other reference materials	E. Zeidler, Nonlinear Functional Analysis and its Applications. Fixed Point Theorems, Springer, 1986.
Average student workload outside classroom	10h
Comments	
Last update	11.05.2023