

Bio-robotics			
Credits: 5 Semester 3 (WUT) Compulsory: No			
Format	Lectures 20h	Project /lab.20h	Private study 85 h
Lecturers: T. Zielinska, A. Chmielniak (WUT)			
<p>Objectives: This course presents the fundamentals of bio-inspired robotics. The topics include the biological motion properties, motion planning and biological sensors. It will be presented how the knowledge of biological motion properties is transformed into robotics.</p> <p>Contents:</p> <p>The following subjects will be discussed:</p> <ul style="list-style-type: none"> • historical background,, • motion properties of simple animals and their body build • motion properties of complex animals and their body build, • summary of biological motion principles • robotics motion rules using biological inspirations, • design solutions inspired by biology, • discussion of the autonomy and adaptability observed in living world and autonomy obtained in robotics, • guided project on biologically inspired motion synthesis of mobile robots or on the novel kinematic structures of autonomous moving robots. <p>Practical Work: includes project elaboration using real mobile robots or professional design software.</p> <p>Abilities: After completing this course, the students will be able to:</p> <ul style="list-style-type: none"> • understand the aim of the use of biological patterns in robotics • understand the fundamentals of biologically inspired motion synthesis, • introduce novel kinematic structures using biological inspirations, • synthesise the movements behaviours basis on the biological reactions/reflexes • implement it in the simple biologically inspired robot <p>Assessment: 30% class work, 70% end-semester exam</p> <p>Recommended texts:</p> <ul style="list-style-type: none"> - T.Zielinska, <i>Biological Aspects of Locomotion</i>, (In F.Pfeiffer, T.Zielinska eds. Walking: Biological and Technological Aspects), Springer 2004, ISBN 3-211-22134-4 -T.Zielinska, <i>Motion Synthesis</i> (In: F.Pfeiffer, T.Zielinska eds. Walking: Biological and Technological Aspects), Springer 2004, ISBN 3-211-22134-4 <p>Further readings: will be provided by lecturers</p>			