



Course title:	Calculus of Variations
Department:	Department of Mathematics, Faculty of Computer Science and Telecommunications
Course code:	F2-CalVar
Erasmus subject code:	11.1Mathematics
Number of contact hours:	45 hours
Course duration:	1 semester
ECTS credits:	6
Course description:	Integral functionals, weak and strong local extrema. The Euler-Lagrange equation as a necessary condition for a weak local extremum. Higher dimensional problems. Variational problems with higher-order derivatives. Problems with variable endpoints, natural boundary conditions, transversality conditions. Isoperimetric problems, Lagrange multipliers. Jacobi's equation, a sufficient condition for a weak local extremum. Variational problems with integrals involving more than one independent variable. An introduction to the optimal control theory.
Literature:	L. Komzsik — Applied Calculus of Variations for Engineers, Boca Raton, 2009, CRC Press L. Elsgolts — Differential Equations and the Calculus of Variations, Moscow, 1977, Mir Publishers H. Sagan — Introduction to the Calculus of Variations, New York, 1992, Dover Publications
Course type:	Lectures and problems classes
Assessment method:	Practical tests (each one will be announced two weeks in advance), the final exam.
Prerequisites:	Basic results from calculus of one and several variables, ordinary differential equations.
Primary target group:	2-nd – 4-th year technical university students
Lecturer:	Wacław Pielichowski, PhD
Contact person:	Wacław Pielichowski, e-mail: wpielich@pk.edu.pl
Deadline for application:	15 th of January
Remarks:	