

Course Unit Descriptor

Study Programme: MSc in Applied Mathematics			
Course Unit Title: Differential Geometry			
Course Unit Code: MA61			
Name of Lecturer(s): Sanja Konjik			
Type and Level of Studies: Master Academic Degree			
Course Status (compulsory/elective): Elective			
Semester (winter/summer): Summer			
Language of instruction: English			
Mode of course unit delivery (face-to-face/distance learning): Face-to-face			
Number of ECTS Allocated: 5			
Prerequisites: None			
Course Aims: The acquisition of knowledge and skills in the selected topics of differential geometry and analysis on manifolds.			
Learning Outcomes: Student capable of applying the acquired knowledge and skills to specific problems.			
Syllabus: <i>Theory</i> Submanifolds of \mathbb{R}^n , differentiable manifolds, partition of unity, tangent space, tangent vector, differentiation, tangent bundle, vector bundles, vector field, tensors in vector spaces, tensor bundle and tensor fields, exterior algebra, differential forms, exterior derivative, orientation, integration, the Stokes theorem, hypersurfaces, curvature, covariant derivative, geodesics. <i>Practice</i> The application of knowledge gained in the theoretical classes in solving practical problems (exercises).			
Required Reading: - Kunzinger, M., Differential Geometry 1, Lecture notes, University of Vienna, 2008. -Abraham, R., Marsden, J.E., Foundations of Mechanics, 2nd edition, Addison-Wesley Publishing Company, Inc., USA, 1978. -Abraham, R., Marsden, J.E., Ratiu, T., Manifolds, Tensor Analysis, and Applications, 2nd edition, Springer-Verlag, New York, 1988. -Boothby, W.M., An Introduction to Differentiable Manifolds and Riemannian Geometry, Revised 2nd edition, Elsevier Science, USA, 2003. - Dragović, V., Milinković, D., Analiza na mnogostrukostima, Matematički fakultet, Beograd, 2003.			
Weekly Contact Hours: 4	Lectures: 3	Practical work: 1	
Teaching Methods: Lecture by teacher, discussion, practical work (exercise assignment and problem solving), seminar work.			
Knowledge Assessment (maximum of 100 points):			
Pre-exam obligations	points	Final exam	points
Preliminary exam(s)	30	oral exam	70
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			