

Study programmes: PhD – Mathematics				
Course name: Geometric modeling and design in industry				
Lecturers: Srđan N. Vukmirović				
Status: Optional				
ECTS: 9				
Attendance prerequisites: -				
Course aims: Acquisition of general and specific knowledge about applications geometric methods in design and industry (This is very useful for students whose aim is to work in companies which require the knowledge needed to master this course).				
Course outcome: Upon completion of the course, the student has necessary knowledge about: parametrization of curves and surfaces, convex hull algorithms, Bézier curves, interpolation of curves by polynomials and splines, rational Bézier curves, B-spline of curve and surface, NURBS curves and surfaces. Student is qualified to individual understanding basic examples and solving problems from this area.				
Course content: Parametrization of curves and surfaces. Examples of parameterized curves and surfaces. Barycentric coordinates. Convex hull. De Casteljaou algorithm. Bézier curves. Interpolation by polynomials. Interpolation by splines. Cubic spline. Homogeneous coordinates. Rational Bézier curves. B-spline of curve and surface. NURBS curves and surfaces.				
Literature:				
<ol style="list-style-type: none"> 1. J. Gallier, Curves and Surfaces in Geometric Modeling: Theory and Algorithms, 2000, Morgan Kaufmann. 2. P. J. Schneider, D. H. Eberly, Geometric tools for computer graphics, 2000, Morgan Kaufmann. 3. G. Farin, Curves and surfaces for computer-aided geometric design, 1997, Academic Press, San Diego etc., Fourth Edition. 				
Number of hours: 10	Lectures: 4	Tutorials: -	Laboratory: -	Research: 6
Teaching and learning methods: Lectures/ Tutorials				
Assessment (maximal 100 points)				
Course assignments	points	Final exam	points	
Lectures	-	Written exam	-	
Exercises / Tutorials	20	Oral exam	60	
Colloquia	-	Written-oral exam	-	
Essay / Project	20			