

<b>Study programmes:</b> PhD studies – Mathematics, Applied Mathematics				
<b>Course name:</b> Pontryagin maximum principle				
<b>Lecturers:</b> Sandra Živanović, Aleksandra Delić				
<b>Status:</b> Optional				
<b>ECTS:</b> 9				
<b>Attendance prerequisites:</b> Optimal Control				
<b>Course aims:</b> Introduction to the techniques of proving theorems of a type Pontryagin maximum principle.				
<b>Course outcome:</b> After completing this course, the student should know how to construct needle variation and how Pontryagin's principle of maximum is proved by means of it.				
<b>Course content:</b> <b>Differential equations.</b> Local theorem on the existence and uniqueness of the solution. The concept and basic properties of the maximum solution. Continuity of the maximum solution. <b>Linear differential equations.</b> The theorem of existence of a solution. The concept and basic properties of the resolvent.				
<b>Differentiability of the maximum solution.</b> Partial derivatives of the maximum solution of the differential equation in all its variables.				
<b>The problem of optimal control.</b> The Pontryagin function. Maximum principle (with proof) as a necessary condition of optimum.				
<b>Literature:</b>				
1. А.Д. Иоффе, В.М. Тихомиров, <i>Теория экстремальных задач</i> , Москва, 1974.				
2. В.М. Алексеев, В.М. Тихомиров, С.В. Фомин, <i>Оптимальное управление</i> , Москва, 1979.				
<b>Number of hours:</b> 10	<b>Lectures:</b> 4	<b>Tutorials:</b> 6	<b>Laboratory:</b> -	<b>Research:</b> -
<b>Teaching and learning methods:</b> Frontal / Individual / Interactive / Tutorials / Lectures / Exercises				
<b>Assessment (maximal 100 points)</b>				
<b>Course assignments</b>	<b>points</b>	<b>Final exam</b>	<b>points</b>	
Lectures	-	Written exam	-	
Exercises / Tutorials	-	Oral exam	70	
Colloquia	30	Written-oral exam	-	
Essay / Project	-			