Study programmes: BACHELOR STUDIES – Astronomy and Astrophysics	
Course name: Mathematics 3	
Lecturers: Vladimir Grujić, Đorđe Krtinić and other lecturers	
Status: Compulsory	
ECTS: 9	
Attendance prerequisites: Mathematics 1	
Course aims: Introduction to basic concepts of series, with special emphasis on Fourier series, which are very important in physics, as well as methods of solving differential equations with emphasis on equations of second order.	
Course outcome: Ability to use series and solve differential equations which occur in undergraduate physics and meteorology studies.	

Course content:

1. Series: general Cauchy convergence criterion, criteria from comparative to Gauss, integral, Leibniz, Abel and Dirichlet criterion, absolute convergence, uniform convergence and criteria for uniform convergence (Cauchy, Weierstrass, Abel and Dirihlet), properties of the sum of uniform convergent series, Cauchy-Hadamard formula, decomposition of the function in power series with examples, Fourier series, Dirichlet theorem.

2. Differential equations: Picard theorem, linear equation of n-th order, method of variation of constants, boundary problems (Green's function), systems, linear partial equations of the first order. Solving of equations using series expansion. Partial differential equations of the second order which occur in physics: Schrödinger, Poisson, Laplace, wave equation. Solving of those equations using the method of separating variables.

Computational exercises: elaboration of concepts intorduced in lectures, solving problems and examples, especially examples important for physics.

Literature:

1. M. Krasnov, A. Kiselev, G. Makarenko I E. Shikin " Mathematical Analysis for Engineers", volume I-II, Mir Publishers Moscow 1990, textbook with selected problems.
2. Mary L. Boas, "Mathematical Methods in Physical Sciences", Wiley , 2006, textbook with selected problems.
3. Ляшко И.И., Боярчук А.К., Гай Я.,Г., Головач Г.П. "Математический анализ в примерах и задачах 2", problem book.
4. Svetlana Janković, Julka Knežević-Miljanović „Diferencijalne jednačine, zadaci sa elementima teorije", Математички факултет 2007.

Number of hours: 8	**Lectures**: 4	**Tutorials**: 4	**Laboratory**: -	**Research**: -

Teaching and learning methods:

Lectures (theoretical representation of thematic units and examples), computational exercises (solving problems, homework), colloquiums.

Assessment (maximal 100 points)				
Course assignments	**points**	**Final exam**	**points**	
Lectures	5	Written exam	20	
Exercises / Tutorials	15	Oral exam	40	
Colloquia	-	Written-oral exam	-	
Essay / Project	20			