Course: Microlocal Analysis

Course instructors: Stevan Pilipović, Nenad Teofanov

Course type: elective

Credit points ECTS: 12

Prerequisites: -

Course objectives:

To adopt basic notions and techniques of microlocal analysis. To understand basic principles of propagation of singularities, hypoellipticity and applications to qualitative analysis of partial differential equations and pseudo-differential equations.

Learning outcomes:

Understanding the basic principles and techniques of localization and microlocalization. Examples and properties of wave-front sets. Adopting the proofs of basic theorems and understanding of relationship between the classical wave-front sets and its variations. Application to theorems of propagation of singularities.

Course description (outline):

Theoretical classes

Wave-front sets, generalizations and characterizations, propagation of singularities. Hypoellipticity and application to pseudo-differential operators. Wave front sets and time-frequency analysis.

References:

- 1. G. B. Folland. *Harmonic Analysis in Phase Space*. Princeton Univ. Press, Princeton, NJ, 1989
- 2. L. Hormander, "*The Analysis of Linear Partial Differential Operators, vol I*, SpringerVerlag, Berlin, 1983.
- 3. G. Friedlander, M. Joshi, Introduction to The Theory of distributions, 2nd edition, Cambridge University Press, 1998

Active teaching hours: 5	Theoretical classes: 5	Practice classes:	
Methods of teaching:			
Lectures, discussions and regular consultations			
Grading structure (100 points)			
Solving selected homework: 50 points, oral exam: 50 points			