Course: Lattice theory

Course instructors: Andreja P. Tepavčević

Course type: Elective

Credit points ECTS: 12

Prerequisites: No

Course objectives:

Introducing students to classical lattice theory, its properties and applications in mathematics. Mastering some special classes of lattices and applications.

Learning outcomes:

Minimum: Adoption of fundamental concepts and properties of lattices.
Desirable: Ability to independently and creatively solve complex problems in lattice theory and its applications in mathe-matics.

Course description (outline):

Ordered sets and lattices. Lattices as algebras.
Complete lattices, algebraic lattices, closure operators. Completion.
Modular lattices. Distributive lattices. Complemented and Boolean lattices. Representation theorems.
Free lattices. Varieties of lattices. Semimodular and geometric lattices.
Continuous lattices. Complete distributivity. Irreducibility. Algebraic lattices. Scott topology.

References:

4. B. Šešelja, Lattice Theory (in Serbian), Departman za matematiku i informatiku, PMF Novi Sad, 2006.
5. B.A. Davey, H.A. Priestley, Introduction to lattices and order. Cambridge Mathematical Textbooks, Cambridge University Press, Cambridge, 1990.
6. G. Gratzer, General Lattice Theory, Second edition, Birkhauser, 2003.
7. G. Birkhoff, Lattice Theory, 3ed, AMS, 1967.
8. R. Freese, J. Jezek, J. B. Nation, Free lattices, Mathematical Surveys and Monographs, 42. American Mathematical Society, Providence, RI, 1995.
9. G. Gierz, K.H. Hofmann, K.Keimel, J. D. Lawson, M. Mislove, D.S. Scott, A compendium of continuous lattices, Springer Verlag 1980.

Active teaching hours: 5	Theoretical classes: 5	Practice classes:

Methods of teaching:

Theoretical classes with constant interaction with students.

Grading structure (100 points)

Colloquia: *40 points*; oral exam: *60 points*.