

Study: Mathematics (doctoral study)			
Subject Rings and Modules (AJI-04)			
Teacher: Siniša Crvenković			
Type (core or optional subject): optional			
Credit: ECTS 10			
Prerequisite: none			
Aim of course: To become acquainted with basic concepts, results and techniques of Theory of rings and modules.			
Results of subject: Learning basic methods and notions which enable research activities in algebra.			
Subject contents Introduction to Ring Theory. Quotient rings. Commutative rings. Ideals of commutative rings. Euclid domains. Domains of principal ideals and domains of unique factorization. Polynomial rings and their factorization. Irreducibility of polynomials. Skew fields. Finite skew fields and theorem of Wedderburn. Noetherian and Artinian rings. Varieties of rings and associative algebras, algorithmic problems. Introduction to module theory. Basic definitions and examples. Quotient modules and homomorphisms. Direct sums and free modules. Tensor product of modules. Projective, injective and flat modules.			
References:			
<ol style="list-style-type: none"> 1. N.H.McCoy, <i>The Theory of Rings</i>, Chelsea Publishing Co., New York, 1973. 2. J.Lambek, <i>Lectures on Rings and Modules</i>, Chelsea Publishing Co., New York, 1976. 3. I.Kaplansky, <i>Fields and Rings</i>, The University of Chicago Press, 1969. 4. N.Jacobson, <i>Structure of Rings</i>, AMS Colloq. Publications, Vol. 37, AMS, Providence, 1956. 5. L.H.Rowen, <i>Ring Theory</i>, Vol.I, Academic Press, 1988. 6. S.Crvenković, I.Dolinka, R.S.Madaras, <i>Odabrane teme opšte algebre</i>, Univerzitet u Novom Sadu, 1998. 			
number of active hours	theoretical lessons : 2	practical lessons: 6	
Methods of teaching			
Theoretical presentation with interactive communication with students			
Subject Assessment			
pre-examination obligations	points	Exam	points
colloquia	50	oral exam	50