

Studijski program	Vrste studija (ciklus)		III ciklus			
	Naziv studijskog programa		Matematičke nauke u jugoistočnoj Evropi			
PREDMET						
Naziv predmeta	Spektralna teorija automorfnih formi					
Šifra predmeta	Semestar	Status predmeta	ECTS	Kontakt sati		
PMAT 665	II	izborni	10	30		
Cilj predmeta	<p>The main goal of the course is to introduce basic aspects of spectral theory of automorphic forms on Fuchsian groups. To be precise, the goal is to describe spectral expansion of the space of cusp forms and the space of incomplete Eisenstein series and then to derive the Selberg trace formula on noncompact Riemannian surfaces of finite volume. Then, using the trace formula we will introduce the Selberg zeta function and describe its basic properties. As an application of the methods introduced, we will derive the Weyl law for the distribution of eigenvalues of the Laplacian on non-compact Riemannian surfaces of finite volume.</p>					
SADRŽAJ PREDMETA						
<p>Harmonic analysis on hyperbolic plane: hyperbolic coordinates, classification of isometries, eigenfunctions of the Laplace operator, invariant integral operators, Selberg/Harish-Chandra transform. Fuchsian groups: definition of a Fuchsian group and its fundamental domain, classification of elements of Fuchsian groups, classification of Fuchsian groups, some special arithmetic Fuchsian groups.</p> <p>Automorphic forms: definition, definition of a cusp form and Eisenstein series, Kloosterman sums and Fourier expansion of Eisenstein series.</p> <p>Green's function on the upper half-plane and spectral expansion of the space of cusp forms (as Δ-invariant subspaces). Automorphic Green function and analytic continuation of Eisenstein series.</p> <p>Functional equation, poles and residues of Eisenstein series.</p> <p>Spectral expansion of the space of incomplete Eisenstein series (as Δ-invariant subspaces).</p> <p>The Selberg trace formula.</p> <p>The Selberg zeta function, its basic properties and functional equation.</p> <p>The Weyl law.</p>						
LITERATURA			OCJENJIVANJE			
<p>[1] H. Iwaniec, Spectral Methods of Automorphic Forms, Graduate Studies in Mathematics, Vol. 53, American Mathematical Society, 2002.</p> <p>[2] H. Iwaniec, E. Kowalski, Analytic Number Theory, AMS Colloquium Publications, Vol. 53, American Mathematical Society, 2004.</p> <p>[3] D. A. Hejhal, The Selberg Trace formula for $PSL(2, \mathbb{R})$, Vol. I, Lecture Notes in Mathematics 548, Springer Verlag, 1976.</p> <p>[4] D. A. Hejhal, The Selberg Trace formula for $PSL(2, \mathbb{R})$, Vol. II, Lecture Notes in Mathematics 1001, Springer Verlag, 1983.</p> <p>[5] J. Fischer, An Approach to the Selberg Trace Formula via the Selberg Zeta Function, Lecture Notes in Mathematics 1253, Springer Verlag, 1987.</p>			Kriterij		Poeni	Uslov
			1.	Zadaće	20	11
			2.	Projekt	40	22
			3.	Završni ispit	40	22
			Ukupno		100	55