

Aplikim per Doktorature ne Matematike nga
Universiteti Ismail Qemali
Vlores

Lenda: Programet e lendeve

Drejtuar: Agjensise se Akreditimit

Per dijeni: Provostit te Universitetit te Vlores, Prof. Engjell Licaj
Dekanes se Fakultetit te Shkencave Teknike, Prof. Mira Shehu
Shefit te Departamentit te Matematikes, Dr. M. Ramosaco

Programet e lendeve per programin e doktoratures ne Universitetin e
Vlores jane si me poshte:

MAT 421, Analysis I (8): Lebesgue measure, measurable functions and the Lebesgue integral; convergence theorems; monotone functions, bounded variation and absolute continuity. Prerequisite: MAT 351.

MAT 422, Analysis II (8): The L_p spaces; product measures and Fubini's theorem; the Radon-Nikodym theorem. Prerequisite: MAT 421.

MAT 433: Numerical Methods (8): Propagation of errors, approximation and interpolation, numerical integration, methods for the solution of equations, Runge-Kutta and predictor-corrector methods. Prerequisite: MAT 275, MAT 155 and MAT 250

MAT 462: Geometric Structures (8): A study of topics from Euclidean geometry, projective geometry, non-Euclidean geometry and transformation geometry. Offered every fall.

MAT 472: Number Theory with Cryptography (8): Structure of the integers, prime factorization, congruences, multiplicative functions, primitive roots and quadratic reciprocity, and selected applications including cryptography. Prerequisite: MAT 155.

MAT 475 Abstract Algebra (8): Groups, subgroups, cosets, and homomorphisms, rings and ideals, integral domains, and fields and field extensions. Applications. Offered every winter.

MAT 451, Introduction to Algebra I, 8: This is an introduction to the graduate algebra. Groups, normal and simple groups, permutation groups, Abelian groups, Sylow theorem, Jordan-Holder theorem.

MAT 452, Introduction to Algebra II, 8:An introduction to rings and ideals; integral domains; and field and field extensions. Geometric constructions and an introduction to galois theory.

MAT 472, Number Theory, 8: Structure of the integers, prime factorization, congruences, multiplicative functions, primitive roots and quadratic reciprocity.

MAT 551, Algebra I (8): Groups, Sylow theorems, solvable and simple groups, computation in permutation groups. GAP will be used to perform computations with groups. Free groups, finitely generated abelian groups, semi-direct products, extension of groups. Introduction to rings, Euclidean domains, PID's, UFD's, polynomial rings, irreducibility criteria for polynomials.

MAT 552, Algebra II (8): A detailed study of module theory, decomposition theorems, linear algebra. Theory of fields, field extensions, finite fields, geometric constructions, Galois theory, solvability by radicals, computing Galois groups of polynomials.

STAT 551, Introduction to Mathematical Statistics, 8: The distribution of random variables, conditional probability and stochastic independence, special distributions, functions of random variables, interval estimation, sufficient statistics and completeness, point estimation, tests of hypothesis and analysis of variance. Prerequisites: MAT 421

MAT 481, Cryptography (8): Elementary concepts in cryptography; classical cryptosystems; modern symmetric cryptography; public key cryptography; digital signatures, authentication schemes; modular arithmetic, primitive roots, primality testing. At least one mathematics course at or above the 3000 level and facility with either a programming language or a computer algebra system is required. 4176: Discrete logs; pseudoprime tests; Pollard rho factoring; groups; quadratic residues; elliptic curve cryptosystems and factoring; coding theory; quantum cryptography.

MAT 631 Complex Analysis (8): Rapid survey of properties of complex numbers, linear transformations, geometric forms and necessary concepts from topology. Complex integration. Cauchy's theorem and its corollaries. Taylor series and the implicit function theorem in complex form. Conformality and the Riemann-Caratheodory mapping theorem. Theorems of Bloch, Schottky, and the big and little theorems of Picard. Harmonicity and Dirichlet's problems.

MAT 632 Riemann Surfaces (8): An introduction to Riemann Surfaces from both the algebraic and function-theoretic points of view. Topics include projective algebraic curves, differential forms, integration, divisors of poles and zeroes, linear systems, the Riemann-Roch theorem, Serre duality, and applications. Prerequisites: MAT 421, MAT 451.

MAT 641 Computational Algebra I (8): A study of the mathematics and algorithms which are used in symbolic algebraic manipulation packages. Topics include computer representation of symbolic

mathematics, polynomial ring theory, field theory and algebraic extensions, modular and p-adic methods, subresultant algorithm for polynomial GCD's.

MAT 642 Computational Algebra II (8): Groebner bases for polynomial ideals and Buchberger's algorithm, factorization and zeros of polynomials. Prerequisite: MTH 256 and knowledge of a scientific programming language or permission of instructor.

MAT 651, Commutative Algebra I (8): Rings and ideals, modules, exact sequences, tensor products, integral dependence and valuations, the going-up and going -down theorem, chain conditions,

MAT 652, Commutative Algebra II (8): Notherian rings, discrete valuation rings, Dedekind domains. Basic knowledge of commutative ring theory, field theory, Galois theory, and group theory will be assumed.

MAT 655 Computational Group Theory, 8: An introduction to computational group theory using computer algebra packages such as GAP.

MAT 657, MAT 658, Coding Theory I (8): We will be focusing on channel coding theory. In the first part of the course, a brief introduction will be given to information and coding theory in order to see what is the best one should expect from a good code. Introduction to the basic algebra concepts needed in coding theory.

MAT 658, Coding Theory II (8): The approach that we will follow will be more on the computational aspects of groups, finite fields, polynomials, etc other than the rigorous mathematical approach. We will use software to do many computational problems (see below). These concepts will be utilized for the construction of polynomial and cyclic codes. BCH codes and Reed-Solomon (RS) codes will be covered in detail.

MAT 661, Mathematics of Communications I (8): An introduction to mathematical concepts of digital communications. Random processes, Shannon's theorem, communication channels, antenna theory, source coding, etc.

MAT 662, Mathematics of Communications II (8): A continuation of MAT 661, algebraic coding, turbo codes, LDPC codes, new developments in digital communications.

MAT 771, Algebraic Number Theory I (8): Algebraic number fields, integrality and Notherian properties, Dedekind Domains,

MAT 772, Algebraic Number Theory II (8): Extensions, ramified and non-ramified extensions, ramification in Galois extensions, class groups and units, cyclotomic fields, L-functions, Dedekind zeta-function, Brauer relations.

MAT 773, Special topics (8): This course is offered every winter and is open only to students who are accepted in the Phd program. Special research topics are discussed. Permission of instructor is needed to enroll.

MAT 851, MAT 852, Algebraic Geometry I - II: Introduction to affine and projective spaces, algebraic varieties, maps between varieties, Hilbert's Nullstellensatz, Zariski topology, abelian varieties, the Riemann-Roch theorem, Jacobians of curves, sheaves and cohomology. Prerequisites MAT 652.

MAT 870: Independent Research (8): Open only to students who have passed the PhD qualifying exams. Students are expected to complete a research projects at the end of this course.

Rektori
Prof. Dr. Tanush Shaska

