

- John Duffield, Adjunct Research Professor
- Peter Golubtsov, Adjunct Professor
- Solomon Harrar, Adjunct Research Professor
- Daniel Johnston, Visiting Assistant Professor
- Richard Lane, Adjunct Instructor
- N'Djekornom Dara Laobeul, Adjunct Instructor
- Louis Lutz, Adjunct Instructor
- Justin Lynd, Visiting Assistant Professor
- Michael Olear, Adjunct Instructor
- Joyce Schlieter, Adjunct Instructor
- Mickey Smith, Lecturer
- Grant Swicegood, Postdoctoral Lecturer

## Lecturers

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- Lauren Fern, Lecturer
- Cindy Leary, Lecturer
- Regina Souza, Lecturer

## Emeritus Professors

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- Richard Billstein, Emeritus
- James Hirstein, Professor Emeritus
- George McRae, Professor Emeritus

## Course Descriptions

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### Mathematics

#### M 104 - Numbers as News

Credits: 3. Offered spring. Prereq., M 090 with a grade of B- or better, or M 095, or ALEKS placement  $\geq 3$ . An exploration of mathematics and statistics as used in the popular media. For students in the School of Journalism only.

#### M 105 - Contemporary Mathematics

Credits: 3. Offered every term. Prereq., M 090 with a grade of B- or better, or M 095, or ALEKS placement  $\geq 3$ . An introduction to mathematical ideas and their impact on society. Intended for students wishing to satisfy the general education mathematics requirement.

#### M 115 - Probability and Linear Mathematics

Credits: 3. Offered every term. Prereq., M 090 with a grade of B- or better, or M 095, or ALEKS placement  $\geq 3$ . Systems of linear equations and matrix algebra. Introduction to probability with emphasis on models and probabilistic reasoning. Examples of applications of the material in many fields. Course Attributes: Practical Nursing Prog Rqrmnt Registered Nursing Prog Rqrmnt

#### M 118 - 118 Mathematics for Music Enthusiasts

Credits: 3. Offered autumn and/or spring. Prereq. M 090 with a grade of B- or better, or M 095, or ALEKS placement  $\geq 3$ ; and elementary music background. An introduction to the interplay between mathematics and music. Course intended for Music majors/minors, and others with musical backgrounds/interests, who wish to satisfy the general education mathematics requirement.

#### M 121 - College Algebra

Credits: 3. Offered autumn and spring. Prereq., M 095 or ALEKS placement  $\geq 4$ . Intended to strengthen algebra skills. The study of functions and their inverses; polynomial, rational, exponential, and logarithmic functions. Credit not allowed for both M 121, and M 151. Course Attributes: Practical Nursing Prog Rqrmnt Registered Nursing Prog Rqrmnt

#### M 122 - College Trigonometry

Credits: 3. Offered autumn and spring. Prereq., M 121 or ALEKS placement  $\geq 4$ . Preparation for calculus based on college algebra. Review of functions and their inverses. Trigonometric functions and identities, polar coordinates and an optional topic such as complex numbers, vectors or parametric equations. Credit not allowed for both M 122 and M 151.

#### M 132 - Numbers and Operations for Elementary School Teachers

Credits: 3. Offered autumn and spring. Prereq., M 095 or M 115, or ALEKS placement  $\geq 4$ . The study of number and operations for prospective elementary and middle school teachers, including whole numbers, decimals, fractions, percent, integers, operations, numeration systems, and problem solving.

#### M 133 - Geometry and Measurement for Elementary School Teachers

Credits: 3. Offered autumn and spring. Prereq., M 132. The study of geometry and geometric measurement for prospective elementary and middle school teachers, including synthetic, transformational, and coordinate geometry, constructions, congruence and similarity, 2-dimensional and 3-dimensional measurement, and problem solving.

#### M 135 - Mathematics for K-8 Teachers I

Credits: 5. Offered autumn and spring. Prereq., M 095, M 115, or ALEKS placement  $\geq 4$ . Open only to elementary education majors. Topics include problem-solving, sets and logic, functions, whole numbers, integers, rational numbers, real numbers, number theory, probability and statistics.

#### M 136 - Mathematics for K-8 Teachers II

Credits: 4. Offered autumn and spring. Prereq., M 135. Topics include introductory geometry, geometric constructions, congruence, similarity, measurement, coordinate geometry and an introduction to computer geometry.

#### M 151 - Precalculus

Credits: 4. Offered autumn and spring. Prereq., ALEKS placement  $\geq 4$ . A one semester preparation for calculus (as an alternative to M 121-122). Functions of one real variable are introduced in general and then applied to the usual elementary functions, namely polynomial and rational functions, exponential and logarithmic functions, trigonometric functions, and miscellaneous others. Inverse functions, polar coordinates and trigonometric identities are included. Credit not allowed for both M 151 and M 121 or 122. Course Attributes: Practical Nursing Prog Rqrmnt Registered Nursing Prog Rqrmnt

#### M 162 - Applied Calculus

Credits: 4. Offered autumn and spring. Prereq., ALEKS placement  $\geq 5$  or one of M 121, 122 or 151. Introductory course surveying the principal ideas of differential and integral calculus with emphasis on applications and computer software. Mathematical modeling in discrete and continuous settings. Intended primarily for students who do not plan to take higher calculus.

#### M 171 - Calculus I

Credits: 4. Offered autumn and spring. Prereq., M 122 or 151 or ALEKS placement  $\geq 5$ . Differential calculus, including limits, continuous functions, Intermediate Value Theorem, tangents, linear approximation, inverse functions, implicit differentiation, extreme values and the Mean Value Theorem. Integral Calculus including antiderivatives, definite integrals, and the Fundamental Theorem of Calculus. Course Attributes: Practical Nursing Prog Rqrmnt Registered Nursing Prog Rqrmnt

#### M 172 - Calculus II

Credits: 4. Offered autumn and spring. Prereq., M 171 or 181. Techniques of Integration. Area computations. Improper integrals. Infinite series and various convergence tests. Power series. Taylor's Formula. Polar coordinates. Parametric curves.

#### M 181 - Honors Calculus I

Credits: 4. Offered autumn. Prereq., consent of instr. Coreq., Honors Calculus Seminar, a section of M 294. Honors version of M 171. Course Attributes: Honors Course

#### M 182 - Honors Calculus II

Credits: 4. Offered spring. Prereq., M 181 or consent of instr. Coreq., Honors Calculus Seminar, a section of M 294. Honors version of M 172. Course Attributes: Honors Course

#### M 191 - Special Topics

Credits: 1 TO 6. (R-6) Offered autumn and spring. Prereq., consent of instr. Experimental offerings of visiting professors, experimental offerings of new courses, or one time offerings of current topics.

#### M 192 - Independent Study

Credits: 1 TO 6. (R-6) Offered intermittently. Course material appropriate to the needs and objectives of the individual student.

#### M 210 - Introduction to Mathematical Software

Credits: 3. Offered spring. Prereq., one of M 162, 171, or 181, or consent of instr. Software packages useful for doing and writing mathematics. Introduction to a computer algebra system (such as Maple or Mathematica), a numerical package (such as MATLAB or R), and elementary programming. Writing and communicating mathematics using the mathematical typesetting system LaTeX.

#### M 221 - Introduction to Linear Algebra

Credits: 4. Offered autumn and spring. Prereq., M 172 or 182. Vectors in the plane and space, systems of linear equations and Gauss–Jordan elimination, matrices, determinants, eigenvalues and eigenvectors, vector spaces, linear transformations. Calculators and/or computers used where appropriate.

#### M 225 - Introduction to Discrete Mathematics

Credits: 3. Offered autumn. Prereq., one of M 162, 171, or 181 or consent of instr. Mathematical concepts used in computer science with an emphasis on mathematical reasoning and proof techniques. Elementary logic, sets, functions and relations, combinatorics, mathematical induction, recursion and algorithms. Mathematics majors should take M 307 instead of 225.

#### M 231 - Topics in Geometry

Credits: 3. Offered intermittently. Prereq., M 136 or consent of instr. Geometry topics for teaching grades 6–12 mathematics. Intended primarily for students in elementary education who plan to teach middle school mathematics.

#### M 234 - Higher Mathematics for Elementary School Teachers

Credits: 3. Offered autumn and spring. Prereq., M 132. The study of algebra, number theory, probability and statistics for prospective elementary and middle school teachers, including proportional reasoning, functions, elementary number theory, statistical modeling and inference, and elementary probability theory.

#### M 273 - Multivariable Calculus

Credits: 4. Offered autumn and spring. Prereq., M 172 or 182. Calculus of functions of several variables; differentiation and elementary integration. Vectors in the plane and space.

#### M 274 - Introduction to Differential Equations

Credits: 3. Offered spring. Prereq., one of M 162, 171 or 181 and knowledge of basic trigonometry. Solution of ordinary differential equations and systems with emphasis on applications, numerical methods and computer software.

#### M 291 - Special Topics

Credits: 1 TO 3. (R-9) Offered autumn and spring. Prereq., consent of instr. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

#### M 292 - Independent Study

Credits: 1 TO 9. (R-9) Offered autumn and spring. Prereq., consent of instr. Guidance of an individual student in doing independent study on material not offered in a regular course.

#### M 294 - Seminar

Credits: 1 TO 9. (R-9) Offered autumn and spring. Prereq., consent of instr.

#### M 300 - Undergraduate Mathematics Seminar

Credits: 1. (R-6) Offered every semester. Prereq., M 171 or 181. Discussion seminar focused on topics and issues of interest to students in the mathematical sciences.

#### M 301 - Mathematics Technology for Teachers

Credits: 3. Offered autumn. Prereq., M 221. Discrete and continuous mathematical models from a variety of disciplines using appropriate technology.

#### M 307 - Introduction to Abstract Mathematics

Credits: 3. Offered autumn and spring. Prereq., M 172 or 182. Designed to prepare students for upper-division proof-based mathematics courses. Topics include proof techniques, logic, sets, relations, functions and axiomatic methods. Students planning to take both M 221 and 307 are encouraged to take M 221 first.

#### M 311 - Ordinary Differential Equations and Systems

Credits: 3. Offered autumn. Prereq., M 273. Ordinary differential equations. Systems of linear differential equations from a matrix viewpoint. Series solutions. Existence and uniqueness for initial value problems. Numerical methods. Stability and selected topics. M 317 computer lab recommended.

#### M 317 - Ordinary Differential Equations Computer Lab

Credits: 1. Offered autumn. Coreq., M 311 or consent of instr. Intended primarily for student in M 311.

#### M 325 - Discrete Mathematics

Credits: 3. Offered spring. Prereq., M 171 and 225 or 307. Continuation of 225 and topics from graph theory, Boolean algebras, automata theory, coding theory, computability and formal languages.

#### M 326 - Number Theory

Credits: 3. Offered spring. Prereq., M 225 or 307. Congruences, Diophantine equations, properties of primes, quadratic residues, continued fractions, algebraic numbers.

#### M 361 - Discrete Optimization

Credits: 3. Offered spring. Prereq., one of M 162, 172 or 182 (221 or 225 recommended). Intended for non-mathematics majors as well as mathematics majors. Introduction to discrete optimization and modeling techniques with applications. Topics from combinatorics and graph theory, including enumeration, graph algorithms, matching problems and networks.

#### M 362 - Linear Optimization

Credits: 3. Offered autumn. Prereq., one of M 162, 172 or 182 (221 recommended). Coreq., M 363 recommended. Intended for non-mathematics majors as well as majors. Introduction to linear programming and modeling techniques with applications. Topics include the simplex method, duality, sensitivity analysis and network models.

#### M 363 - Linear Optimization Laboratory

Credits: 1. Offered autumn. Coreq., M 362. Introduction to linear optimization software.

#### M 381 - Advanced Calculus I

Credits: 3. Offered autumn. Prereq., M 307. Rigorous development of single-variable calculus with formal proof. Functions, sequences, limits, continuity, differentiation, and integration.

#### M 391 - Special Topics

Credits: 1 TO 9. (R-9) Offered autumn and spring. Prereq., consent of instr. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

#### M 392 - Independent Study

Credits: 1 TO 9. (R-9) Offered autumn and spring. Prereq., consent of instr. Guidance of an individual student in doing independent study on material not offered in a regular course.

#### M 394 - Seminar

Credits: 1 TO 9. (R-9) Offered autumn and spring. Prereq., consent of instr.

#### M 398 - Internship

Credits: 1 TO 6. Offered autumn and spring. Prereq., consent of instructor. Extended classroom experience which provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation. Course Attributes: Internships/Practicums

#### M 412 - Partial Differential Equations

Credits: 3. Offered spring. Prereq., M 311. Fourier series, Sturm-Liouville and boundary value problems. Partial differential equations: Cauchy problems and the method of characteristics, separation of variables and Laplace transform methods. Numerical methods and selected topics. M 418 computer lab recommended.

#### M 414 - Deterministic Models

Credits: 3. Offered autumn or spring. Prereq., M 274 or 311 or consent of instr. Linear and nonlinear difference and differential equations: stability, phase-plane analysis, oscillatory behavior, limit cycles, and chaos. Eigenvalues and eigenfunctions. Emphasis on models in biology.

M 418 - Partial Differential Equations Computer Lab

Credits: 1. Offered spring. Coreq., M 412 or consent of instr. Intended primarily for students in M 412.

M 429 - History of Mathematics

Credits: 3. Offered spring. Prereq., M307. Historical study of the development of mathematics from the Egyptian and Babylonian eras to the 20th century. Course Attributes: Writing Course-Advanced

M 431 - Abstract Algebra I

Credits: 4. Offered autumn. Prereq., M 221 and 307 or consent of instr. An introduction to modern ideas of algebra through the study of groups, rings, and fields.

M 432 - Abstract Algebra II

Credits: 4. Offered spring. Prereq., M 431. Continues the investigation of groups, rings, and fields begun in M 431. Further topics include vector spaces and field extensions.

M 439 - Euclidean and Non-Euclidean Geometry

Credits: 3. Offered autumn. Prereq., M 307; M 231 recommended. Euclidean geometry from a rigorous, axiomatic viewpoint and Non-Euclidean geometries chosen from Lobachevskian, projective, finite and Riemannian.

M 440 - Numerical Analysis

Credits: 4. Offered intermittently. Prereq., M 307, 311, one computer language. Error analysis; approximation and interpolation, numerical solution of linear and non-linear equations, numerical integration of ordinary and partial differential equations.

M 445 - Statistical, Dynamical, and Computational Modeling

Credits: 4. Offered autumn odd-numbered years. Prereq., consent of instr. An interdisciplinary course on the integration of statistical and dynamical models with applications to biological problems. Linear and nonlinear models, estimation, systems of ordinary differential equations, numerical integration, bootstrapping, MCMC methods. Intended both for students in mathematics and the natural sciences.

M 461 - Practical Big Data Analytics

Credits: 3. Offered autumn. Prereq., STAT 341, and one of M 221 or M 273, or consent of instructor. This is a methods course supporting the Big Data Certificate Program. The course provides the students with the essential tools for the analysis of big data. The content consists of map reduce and canonical information methods for analyzing massively large data sets, windowing methods for the analysis of streaming data, an introduction to predictive analytics, and an introduction to data visualization methods.

M 462 - Theoretical Basics of Big Data Analytics and Real Time Computation Algorithms

Credits: 3. Offered spring. Prereq., M 221 and two other Mathematics / Statistics classes at the 200-level or above, or consent of instr. The main goal of this course is to provide students with a unique opportunity to acquire conceptual knowledge and theoretical background behind mathematical tools applicable to Big Data Analytics and Real Time Computations. Specific challenges of Big Data Analytics, e.g., problems of extracting, unifying, updating, and merging information, and processing of highly parallel and distributed data, will be reviewed. The tools for Big Data Analytics, such as regression analysis, linear estimation, calibration problems, real time processing of incoming (potentially infinite) data, will be studied in more detail. It will be shown how these approaches can be transformed to conform to the Big Data demands.

M 467 - Big Data Analytic Projects

Credits: 3. Offered spring. Prereq., two courses chosen from STAT 341, M 221 and M 273, and one of M 461 or M 462, or consent of instructor. This course is a practicum course aimed at developing skills needed to solve big data problems facing industry and academics. Problems are brought to the class by local technology-oriented businesses and university researchers. Lecture topics include project management, interacting with clients, and written and oral presentation of results. Additional lecture topics will be selected to address the specific problems brought to the class and may cover data reduction methods, algorithm design and predictive analytics.

M 472 - Introduction to Complex Analysis

Credits: 4. Offered spring. Prereq., M 273, M 307. Analytic functions, complex integration, singularities and application to contour integration, harmonic functions, spaces of analytic functions.

M 473 - Introduction to Real Analysis

Credits: 4. Offered autumn odd-numbered years. Prereq., M 273, M 307. Theory of metric spaces and point set topology, Riemann-Stieltjes integral, sequences and series of functions. Stone-Weierstrass theorem, theorem of Arzela-Ascoli, introduction to Lebesgue integration.

#### M 485 - Graph Theory

Credits: 3. Offered autumn. Prereq., M 325, or M 307 and M 361, or consent of instr. Theory and applications of graphs. Topics chosen from trees, matchings, connectivity, coloring, planarity, Ramsey theory, random graphs, combinatorial designs and matroid theory.

#### M 490 - Undergraduate Research

Credits: 1 TO 4. (R-12) Offered every term. Prereq., consent of instr. Undergraduate research in the mathematical sciences under the direction of a faculty member. Graded credit/no credit.

#### M 491 - Special Topics

Credits: 1 TO 9. (R-9) Offered autumn and spring. Prereq., consent of instr. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

#### M 492 - Independent Study

Credits: 1 TO 9. (R-9) Offered autumn and spring. Prereq., consent of instr. Guidance of an individual student in doing independent study on material not offered in a regular course

#### M 494 - Seminar

Credits: 1 TO 9. (R-9) Offered autumn and spring. Prereq., consent of instr.

#### M 498 - Internship

Credits: 1 TO 6. Offered autumn and spring. Prereq., consent of instr. Extended classroom experience which provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation. Course Attributes: Internships/Practicums

#### M 499 - Senior Thesis

Credits: 1 TO 12. (R-12) Offered autumn and spring. Prereq., consent of instr. Senior thesis for mathematics majors and/or Watkins Scholars. Course Attributes: Writing Course-Advanced

#### M 500 - Current Mathematical Curricula

Credits: 3. Offered intermittently. Prereq., teacher certification or consent of instructor. Analysis of contemporary materials for secondary school mathematics: the goals, the mathematical content, alternative methodologies, and curriculum evaluation. Level: Graduate

#### M 501 - Technology in Mathematics for Teachers

Credits: 3. Offered intermittently. Prereq., teacher certification or consent of instructor. Technology usage when it is appropriate and when it is not. Experience is provided with scientific calculators, graphing utilities, computers, and identification of exemplary software. Level: Graduate

#### M 504 - Topics in Math Education

Credits: 1 TO 12. (R-12) Offered intermittently. Prereq., teacher certification. Topics of current interest which may include calculus, number theory, probability and statistics, geometry, or algebra, at a level suitable for teachers.

Level: Graduate

#### M 510 - Problem Solving for Teachers

Credits: 3. Offered intermittently. Prereq., teacher certification or consent of instructor. Strategies for problem solving, problem posing in a variety of situations, modeling and applications. Problems are selected from various areas of mathematics. Level: Graduate

#### M 511 - Advanced Mathematical Methods I

Credits: 3. Offered autumn odd-numbered years. Prereq., M 311, and 412 or 414. Methods in applied mathematics related to the qualitative and quantitative solution of nonlinear and differential integral equations, dynamical systems, and perturbation methods. Applications of these methods to other sciences. Level: Graduate

#### M 512 - Advanced Mathematical Methods II

Credits: 3. Offered spring even-numbered years. Prereq., M 511. Continuation of M 511. Level: Graduate

#### M 514 - Topics in Applied Mathematics

Credits: 1 TO 12. (R–12) Offered autumn even–numbered years. Prereq., consent of instr. or M 511-512. Topics of current interest in applied mathematics, mathematical modeling, dynamic modeling, and optimal management in stochastic or deterministic environments. Level: Graduate

M 521 - Advanced Algebra I

Credits: 3. Offered alternate years. Prereq., M 432 or consent of instr. Topics covered include group theory, field theory and Galois theory. Level: Graduate

M 522 - Advanced Algebra II

Credits: 3. Offered alternate years. Prereq., M 521 or consent of instr. Continuation of 521; rings, modules, commutative algebra, and further topics. Level: Graduate

M 524 - Topics in Algebra

Credits: 3. (R-12) Offered alternate years in fall and spring. Prereq., consent of instr. Topics chosen from algebra and related areas, for example from commutative algebra, algebraic geometry, linear algebra, group theory, ring theory, or number theory. Level: Graduate

M 530 - Geometries for Teachers

Credits: 3. Offered intermittently in summer. Prereq., M 439 or equiv. Comparison of synthetic, analytic, vector, and transformational approaches to geometry. Includes classification of geometries, geometric representations, axiomatics, and the applications of modern geometries. Level: Graduate

M 531 - Topology

Credits: 3. Offered autumn even–numbered years. Prereq., M 473 or consent of instr. Set theory, topological spaces, metrizable, continuous mappings and selected topics. Level: Graduate

M 532 - Algebraic Topology

Credits: 3. Offered spring alternate years. Prereq., M 431 and M 531 or consent of instr. Introduction to algebraic topology through one or more topics chosen from the fundamental group and higher homotopy groups, singular homology, and simplicial homology. Level: Graduate

M 551 - Real Analysis

Credits: 3. Offered spring even–numbered years. Prereq., M 473 or 472 or consent of instr. Measure theory, abstract integration theory, theory of  $L_p$ -spaces. Level: Graduate

M 555 - Functional Analysis

Credits: 3. Offered spring odd–numbered years. Prereq., M 473 or 472 or consent of instr. Normed linear spaces, linear functionals, separation theorems, topological linear spaces, weak topologies, dualities. Level: Graduate

M 564 - Topics in Analysis

Credits: 3. (R–12) Offered autumn odd–numbered years. Prereq., consent of instr. Research projects or topics in analysis. May include but not restricted to Banach algebras, Fourier analysis, Harmonic analysis, Hilbert space theory, integral equations, or operator theory. Level: Graduate

M 570 - Calculus for Middle School Teachers

Credits: 3. Offered online in full-year format. Prereq., teacher certification or consent of instr. A first course in differential and integral calculus. Concepts, definitions, properties, and elementary applications of the calculus of single-valued real variables. Level: Graduate

M 572 - Algebra for Middle School Teachers

Credits: 3. Offered intermittently in summer. Prereq., teacher certification or consent of instr. Topics include algebraic number fields, linear algebra topics, polynomials, and applications appropriate for teachers of middle school mathematics. Level: Graduate

M 573 - Geometry for Middle School Teachers

Credits: 3. Offered intermittently in summer. Prereq., teacher certification or consent of instr. Introduction to synthetic, analytic, vector, and transformational approaches to geometry. Includes topics in 2- and 3-dimensional geometry and measurement appropriate for teachers of middle school mathematics. Level: Graduate

M 574 - Probability and Statistics for Middle School Teachers

Credits: 3. Offered intermittently in summer. Prereq., teacher certification or consent of instr. A survey of topics in probability and statistics appropriate for teachers of middle school mathematics. Level: Graduate

M 578 - Discrete Mathematics for Middle School Teachers

Credits: 3. Offered intermittently. Prereq., teacher certification or consent of instr. Elements and operations of finite structures, combinatorics, recursion, graphs, matrices, and finite models appropriate for teachers of middle school mathematics. Level: Graduate  
M 581 - Combinatorics

Credits: 3. Offered autumn odd-numbered years. Prereq., consent of instr. Theory and applications of discrete mathematics. Topics chosen from enumeration, combinatorial analysis, and graph theory. Level: Graduate  
M 582 - Optimization

Credits: 3. Offered autumn even-numbered years. Prereq., consent of instr. Theory and applications of optimization. Topics chosen from linear, non-linear, and discrete optimization, including duality theory, convexity and networks. Level: Graduate  
M 584 - Topics in Combinatorics and Optimization

Credits: 3. (R-12) Offered spring odd-numbered years. Prereq., consent of instr. Topics chosen from the areas of combinatorics and optimization. May include classical problems, current trends, research interests or other topics chosen by the instructor. Level: Graduate  
M 593 - Professional Project

Credits: 1 TO 6. (R-6) Offered autumn and spring. Prereq., consent of advisor. Preparation of a professional paper appropriate to the needs and objectives of the individual student. Level: Graduate Course Attributes: Faculty-Led Study Abroad  
M 595 - Special Topics

Credits: 1 TO 12. (R-12) Offered autumn and spring. Prereq., consent of instr. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Level: Graduate Course Attributes: Internships/Practicums  
M 596 - Independent Study

Credits: 1 TO 12. (R-12) Offered autumn and spring. Prereq., consent of instr. Course material appropriate to the needs and objectives of the individual student. Level: Graduate Course Attributes: Service Learning/Volunteer  
M 597 - Research

Credits: 1 TO 12. (R-12) Offered autumn and spring. Prereq., consent of instr. Directed individual research and study appropriate to the back ground and objectives of the student. Level: Graduate  
M 598 - Internship

Credits: 1 TO 12. (R-12) Offered autumn and spring. Prereq., consent of department. Extended classroom experience which provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. Level: Graduate Course Attributes: Internships/Practicums  
M 599 - Thesis

Credits: 1 TO 6. (R-6) Offered autumn and spring. Prereq., consent of instr. Preparation of a thesis or manuscript based on research for presentation and/or publication. Level: Graduate  
M 600 - Mathematics Colloquium

Credits: 1 TO 3. (R-3) Offered autumn and spring. Prereq., consent of advisor. Presentations of research topics in mathematics and related fields. Level: Graduate  
M 602 - Teaching College Mathematics

Credits: 3. Prereq., second year standing in graduate school. Topics include publishing, grant writing, writing in mathematics classes, media use in mathematics, evaluation and assessment of curricular materials and programs, instructional methods in university mathematics courses, and other selected topics. Level: Graduate  
M 605 - Learning Theories in Mathematics

Credits: 3. Prereq., graduate status. How children learn mathematical content and processes. Models of mental development, concept formation, problem solving, reasoning, and creative thinking. Level: Graduate  
M 606 - Current Topics in the History of Mathematics

Credits: 3. Examination of mathematical history topics from the latter part of the 20th century. Discussions may focus on the impact of Hilbert's Problems. Research on current mathematics. Level: Graduate  
M 609 - Research Methods in Mathematics Education



Credits: 3. Prereq., Consent of instr. Resources for learning of reported research, critical reviews of research, quantitative and qualitative processes. Level: Graduate

M 610 - Graduate Seminar in Applied Mathematics

Credits: 1 TO 12. (R-12) Offered autumn and spring. Prereq., consent of instr. A review and discussion of current research. Level: Graduate

M 620 - Graduate Seminar in Algebra

Credits: 1 TO 12. (R-12) Offered autumn and spring. Prereq., consent of instr. Level: Graduate

M 630 - Graduate Seminar in Geometry/Topology

Credits: 1 TO 12. (R-12) Offered autumn and spring. Prereq., consent of instr. A review and discussion of current research. Level: Graduate

M 650 - Graduate Seminar in Analysis

Credits: 1 TO 12. (R-12) Offered autumn and spring. Prereq., consent of instr. A review and discussion of current research. Level: Graduate

M 680 - Graduate Seminar in Combinatorics and Optimization

Credits: 1 TO 12. (R-12) Offered autumn and spring. Prereq., consent of instr. A review and discussion of current research. Level: Graduate

M 690 - Supervised Internship

Credits: 1 TO 12. (R-6) Offered autumn and spring. Prereq., consent of department. Supervised Teaching Internship. Level: Graduate Course Attributes: Research & Creative Schlrshp

M 691 - Practicum

Credits: 3. Prereq., consent of instr. Resources for learning of reported research, critical reviews of research, quantitative and qualitative processes. Level: Graduate

M 694 - Seminar

Credits: 1 TO 12. (R-12) Offered autumn and spring. Prereq., consent of instr. A review and discussion of current research. Topics vary. Level: Graduate

M 699 - Dissertation

Credits: 1 TO 9. (R-9) Offered autumn and spring. Level: Graduate

## Mathematics-Statistics

STAT 216 - Introduction to Statistics

Credits: 4. Offered autumn and spring. Prereq., M 115 (preferred), or one of M 121, 135, 151, 162 or 171, or ALEKS placement  $\geq 4$ . Introduction to major ideas of statistical inference. Emphasis is on statistical reasoning and uses of statistics.

STAT 341 - Introduction to Probability and Statistics

Credits: 3. Offered autumn and spring. Prereq., one of M 162, 172 or 182. Probability, probability models and simulation, random variables, density functions, special distributions, and a brief survey of estimation and hypothesis testing. Computer use integrated throughout.

STAT 421 - Probability Theory

Credits: 3. Offered autumn. Prereq., M 273 and STAT 341 or consent of instr. An introduction to probability, random variables and their probability distributions, estimation and hypothesis testing. This course is the foundation on which more advanced statistics courses build.

STAT 422 - Mathematical Statistics

Credits: 3. Offered spring. Prereq., STAT 421. Continuation of 421.

STAT 451 - Statistical Methods I

Credits: 3. Offered autumn. Prereq., one year of college mathematics including M 115 or equiv. course in probability or consent of instr. May not be counted toward a major in mathematics. Intended primarily for non-mathematics majors who will be analyzing data. Graphical and numerical summaries of data, elementary sampling, designing experiments, probability as a model for random phenomena and as a tool for making statistical inferences, random variables, basic ideas of inference and hypothesis testing.

STAT 452 - Statistical Methods II

Credits: 3. Offered spring. Prereq., STAT 451. Continuation of STAT 451. May not be counted toward a major in mathematics. Multiple regression, experimental design, analysis of variance, other statistical models.

#### STAT 457 - Computer Data Analysis I

Credits: 1. Offered autumn. Coreq., STAT 451 or consent of instr. An introduction to software for doing statistical analyses. Intended primarily for students in STAT 451.

#### STAT 458 - Computer Data Analysis II

Credits: 1. Offered spring. Coreq., STAT 452 or consent of instr. Continuation of STAT 457. Intended primarily for students in STAT 452.

#### STAT 491 - Special Topics

Credits: 1 TO 9. (R 9) Offered autumn and spring. Prereq., consent of instr. Experimental offerings of visiting professors, experimental offerings of new courses, or one time offerings of current topics.

#### STAT 540 - Probability and Statistics for Teachers

Credits: 3. Offered intermittently in summer. Prereq., STAT 341 or equiv. A survey of modern topics in probability and statistics. Emphasis will be on applications of statistics in real situations. Level: Graduate

#### STAT 541 - Advanced Mathematical Statistics

Credits: 3. Offered intermittently. Prereq., STAT 422. Advanced theory of estimation and hypothesis testing including large sample theory. Level: Graduate

#### STAT 542 - Applied Linear Models

Credits: 3. Offered autumn even-numbered years. Prereq., STAT 422 or consent of instr. Numerical and graphical data summaries, simple linear and multiple regression and analysis of variance, including estimation, hypothesis testing, residual analysis, diagnostics, and model-building strategies. Use of the computer and real data sets integrated throughout. Level: Graduate

#### STAT 543 - Applied Multivariate Statistical Analysis

Credits: 4. Offered spring even-numbered years. Prereq., STAT 452 or 422, or consent of instr. Introduction to multivariate statistical methods and applications. Includes appropriate linear algebra, random vectors, multivariate normal distribution, multivariate ANOVA, principal components, clustering, discriminant analysis, and related topics. Use of the computer and real data sets integrated throughout. Intended for students in mathematics and in other fields. Level: Graduate

#### STAT 544 - Topics in Probability and Statistics

Credits: 3. (R-12) Offered intermittently. Prereq., STAT 422 and consent of instr. May include theory of nonparametric statistics, generalized linear models, stochastic processes or other topics chosen by the instructor. Level: Graduate

#### STAT 545 - Theory of Linear Models

Credits: 3. Offered autumn odd-numbered years. Prereq., STAT 422. Multivariate normal distribution, distribution of quadratic forms, estimation and hypothesis testing in the full rank and less than full rank general linear models. Level: Graduate

#### STAT 547 - Applied Nonparametric Statistics

Credits: 3. Offered autumn odd-numbered years. Prereq., STAT 421 or 452 or consent of instr. Statistical estimation and inference based on ranks and elementary counting methods. Applications to a variety of situations including one- and two-sample, correlation, regression, analysis of variance, and goodness-of-fit problems. Use of the computer and real data sets integrated throughout. Intended for students in mathematics and in other fields. Level: Graduate

#### STAT 549 - Applied Sampling

Credits: 3. Offered autumn even-numbered years. Theory and application of methods for selecting samples from populations in order to efficiently estimate parameters of interest. Includes simple random, systematic, cluster, stratified, multistage, line transect, distance and adaptive sampling. Use of the computer and real data sets integrated throughout. Intended for students in mathematics and in other fields. Level: Graduate

#### STAT 640 - Graduate Seminar in Probability and Statistics

Credits: 1 TO 12. (R-12) Offered autumn and spring. Prereq., consent of instr. A review and discussion of current research. Level: Graduate

# Military Science

## **Reserve Officers Training Corps, Chad Carlson, Chair**

Army ROTC (Reserve Officers' Training Corps) offers college students the opportunity to serve as commissioned officers in the U.S. Army, the Army National Guard, or the U.S. Army Reserve upon graduation. ROTC enhances a student's education by providing unique leadership and management training along with practical leadership experience. Students develop many of the qualities basic to success while earning a college degree and an officer's commission at the same time.

**The Margin of Difference.** Army ROTC cadets learn to be leaders and receive hands-on experience in managing physical, financial, and human resources. They develop self-confidence and superior decision-making skills. Employers value these leadership qualities and recognize the associated potential in ROTC graduates.

**Four-Year Program.** The four-year Army ROTC program consists of two parts: the Basic Course and the Advanced Course.

**Basic Course.** The basic course is normally taken during the first two years of college and may be taken without incurring any military obligation. This course covers such subjects as management principles, national defense, military history, and leadership development. Basic course classes include adventure training such as squad tactics and small arms marksmanship. Additional opportunities are also available to conduct small unit training exercises throughout Western Montana. In addition, a variety of outside social and professional enrichment activities are available. All necessary ROTC textbooks, uniforms, and other essential materials for the basic course are furnished to students at no cost. After completing the basic course, students who have demonstrated the potential to become officers and who have met the physical and scholastic standards are eligible to enroll in the Advanced Course. Compression of the Basic Course into two semesters may be arranged for those students who did not take military science courses during their Freshman year.

**Advanced Course.** The Advanced Course is usually taken during the final two years of college. Instruction includes organization and management, tactics, ethics, critical thinking, creative problem solving and further leadership development. Uniforms and equipment in the Advanced Course are furnished to students at no cost. During the summer between their junior and senior years of college, Advanced Course cadets attend Cadet Summer Training (CST), a fully paid four-week leadership practicum. LDAC gives cadets the chance to apply what they have learned in the classroom and introduces them to Army life while also receiving academic credit. Completion of the Advanced Course requires two years of study. Each cadet in the Advanced Course receives a subsistence allowance of up to \$4,500 for each year of attendance.

**Two-Year Program.** The two-year program applies to incoming juniors and community college graduates, students at four-year colleges who did not take ROTC during their first two years of school, and students entering a two-year postgraduate course of study. To enter the two-year program, students must attend a fully paid four-week Leader's Training Course (LTC), normally held during the summer between their sophomore and junior years of

college. At LTC, students learn to challenge themselves physically and mentally, and to build their confidence and leadership skills. After successfully completing LTC, students who meet all the necessary enrollment requirements may participate in the Advanced Course.

**Scholarships and Financial Assistance.** Army ROTC scholarships are offered for four, three and two years and are awarded on a competitive basis. Each scholarship pays 100% of student's tuition and fees, \$1200 a year for textbooks and supplies, and a monthly stipend totaling up to \$4,500 per year while the scholarship is in effect. Four-year scholarships are awarded to students who will be entering college as freshmen. Two and three-year scholarships are awarded to students already enrolled in college and to Army enlisted personnel on active duty. Additionally, students who attend LTC (see two-year program) may compete for two-year scholarships while at the course. Scholarship recipients can pursue degrees in any accredited four year program at the University of Montana. Students who receive scholarships are required to attain undergraduate degrees in the fields in which their scholarships were awarded.

**Veterans.** Veterans may apply their military experience as credit toward the ROTC Basic Course. If eligible, a veteran may enroll directly into the Advanced Course.

**Simultaneous Membership Program.** This program allows students to be members of the Army National Guard or the Army Reserve and to enroll in Army ROTC at the same time. Students participating in the Simultaneous Membership Program receive up to \$4,000 per year in tuition assistance, \$4,500 per year in monthly stipends and an additional \$20,000 per year in other benefits. There are also scholarships available for students participating in the Simultaneous Membership Program that are interested in staying in the Army National Guard or the Army Reserve upon graduation that pay up to \$8,500 per year for living expenses and \$1,200 per year for textbooks, supplies and other equipment. These scholarships are in addition to many of the current benefits students receive as part of the Simultaneous Membership Program.

**Service Obligation.** There is no military service obligation for basic course students, unless on scholarship. Advanced course and scholarship (contracted) students incur an obligation to serve in the active Army, Army Reserve or National Guard.

**Commission Requirements.** In order to earn a commission as a Second Lieutenant in the United States Army, each student must:

1. Complete all required Military Science instruction while attending college as a full-time student, and obtain a baccalaureate or higher degree.
2. Complete a PMS approved US History course.
3. Meet medical and physical fitness standards.
4. Be a U.S. citizen.
5. Successfully complete Cadet Summer Training.
6. Be recommended by the Professor of Military Science.

## **College Humanities & Sciences Catalog Year: 20152016**

Degree Type: Minor

Level: Minor

Subject: **Military Studies (Minor)**

Total Credits: 33 Cumulative GPA Required: 2.5

Lower Division Core

Category Name: Lower Core Courses

Rule: Must complete all of the following:

Criterion: C

Number of Credits 12

Course Listing

MSL 101 Leadership and Personal Dev 3

MSL 102 Intro to Tactical Leadership 3

MSL 201 Innovative Team Leadership 3

Commentary: The department may waive the Basic Course requirements for following situation courses: prior military service, Advanced Individual Training (AIT),

Leader's Training Course (LTC) or Accelerated Cadet Commissioning Training (ACCT).

Commentary:

Upper Division Core

Category Name: Upper Core Courses

Rule: Must complete all of the following:

Criterion: C Number of Credits 12

Course Listing

MSL 301 Adaptive Team Leadership 3

MSL 302 Applied Team Leadership 3

MSL 401 Adaptive Leadership 3

MSL 402 Officership and Ethics 3

Commentary:

Upper Division Core

Category Name: War History Requirement

Rule: Must complete 1 of the following

Criterion: C Number of Credits 3

Course Listing

HSTA 316 American Civil War Era 3

HSTA 333 Key Events in American Militar 3

Commentary:

Major Electives

Category Name: History/Political Science Requirement

Rule: Must complete six credits from the following:

Criterion: C Number of Credits 6

Course Listing

HSTA 316 American Civil War Era 3

HSTA 333 Key Events in American Militar 3

HSTR 272E Terrorism:Viol Mod Wrld 3

HSTR 374 War, Peace, & Society 3

PSCI 230X Intro to International Rel 3

Commentary: Students must complete at least 3 credits from each discipline with at least 3 credits of upper division coursework in addition to the required history course. Student can also take HSTR 301 Political Ancient Greek Social History or HSTR 304 Ancient Rome to satisfy the History requirement.

Degree Commentary

A total of 24 credits of MSL (Military Science Leadership) courses are allowed toward the bachelor degree for contracted students. A total of 12 credits are allowed toward the bachelor degree for noncontracted students. Obtain a grade of "C" or better in all courses used toward the minor, and a cumulative GPA of 2.5 for Military Science courses.

# Department Faculty

## Professors

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- Chad Carlson, Lieutenant Colonel

## Assistant Professors

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- CPT Patrick Beckwith, Assistant Operation Officer
- MSG Travis Hambrick, Senior Military Science Advisor & MS III Advisor
- CPT Tracy Mitchell, Instructor/ROTC Recruiter
- CPT Kris Pyette, Operation Officer & MSII Advisor
- CPT Sean Thornton
- SFC Bradley Watson

## Affiliates

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- Richard Reeves, Supplies manager

## Course Descriptions

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### Military Science Leadership

#### MSL 101 - Leadership and Personal Dev

Credits: 3. Offered autumn. The Constitutional role of the military, military tradition, current defense posture, service roles and missions. An introduction to issues and competencies that are central to a commissioned officer's responsibilities. Establishes framework for understanding officership, leadership and army values.

Course Attributes: ROTC Course

#### MSL 102 - Intro to Tactical Leadership

Credits: 3. Offered spring. Establishes foundation of basic leadership fundamentals such as problem-solving, communications, goal setting and improving listening techniques. Introduction to the principles of military leadership and organizational values through discussion, observation and practice exercises. Course Attributes:

ROTC Course

#### MSL 106 - Army Physical Fitness

Credits: 1. (R-4) Offered autumn and spring. The study and application of military drill and ceremony: formation, ceremonies, and marching; the study of the fundamentals of the military physical conditioning program, and the practical application of skills learned. Physical education activity course; a maximum of four credits of activity courses may be counted toward graduation. Course Attributes: ROTC Course

#### MSL 195 - Special Topics

Credits: 1 TO 6. (R-6) Offered autumn and spring. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Course Attributes: ROTC Course

#### MSL 201 - Innovative Team Leadership

Credits: 3. Offered autumn. Demonstration and practice of individual military leadership skills with emphasis on communication and observation through experiential learning exercises. Establishes framework for

understanding of “life skills” such as physical fitness and time management. Examination and practical application of tasks training and military style briefings. Course Attributes: ROTC Course

#### MSL 202 - Found of Tactical Leadership

Credits: 3. Offered spring. Building successful teams through influencing actions and effective communication in setting and achieving goals. Use of creativity in the problem solving process. Introduction of individual and team aspects of military tactics in small unit operations. Practical exercises in techniques for training others as an aspect of continued leadership development. Course Attributes: ROTC Course

#### MSL 203 - Ranger Challenge

Credits: 2. (R–4) Offered autumn. Practical hands–on training in one rope bridge, land navigation, military weapons assembly/disassembly and physical conditioning. A team selected from this class will represent the University in competition against four other colleges and universities within the Big Sky Task Force. Students may include up to, but not more than, four credits earned in the HHP 100–179 and DANC 325 activity courses and MSL 203 and 315 in the total number of credits required for graduation. Students must be physically qualified and enrolled in an additional MSL academic class. Course Attributes: ROTC Course

#### MSL 204 - Leader's Training Course

Credits: 3. (R–4) Offered autumn and spring. Prereq., consent of instr. Intensive supervised study in applied leadership and management development in an organizational setting. Course Attributes: ROTC Course

#### MSL 295 - Special Topics

Credits: 1 TO 6. (R–6) Offered spring. Experimental offerings of visiting professors, experimental offerings of new courses, or one–time offerings of current topics. Course Attributes: ROTC Course

#### MSL 296 - Leadership Practicum

Credits: 1 TO 4. (R–4) Offered autumn and spring. Prereq., consent of instr. Intensive supervised study in applied leadership and management development in an organizational setting. Course Attributes: Service

Learning/Volunteer ROTC Course

#### MSL 301 - Adaptive Team Leadership

Credits: 3. Offered autumn. Prereq., consent of instr. Coreq., MSL 303. Developing personal leadership principles through the learning and application of various small unit leadership procedures. Fundamentals of leadership development, land navigation, troop leading, small units tactics, rappelling, rifle marksmanship and physical fitness. Study of the organization and operation of the U.S. Army as a profession. Students are required to attend one weekend field exercise during the semester. Restricted to contracted Military Science students. Course Attributes: ROTC Course

#### MSL 302 - Applied Team Leadership

Credits: 3. Offered spring. Prereq., consent of instr. Coreq., MSL 303. Continuation of the study and application of small unit leadership tasks. Advanced leadership skills taught including medical evacuation procedures, radio procedures, and increased involvement in planning and executing military operations in preparation for attendance at the Leader Development and Assessment Course at Fort Lewis, Washington. Students participate in rifle marksmanship instruction including qualification with the M16A2 rifle, rappelling, and attend one weekend exercise with students from regional universities in the area and the Montana Army National Guard. Restricted to contracted Military Science students. Course Attributes: ROTC Course

#### MSL 303 - Leadership Laboratory

Credits: 1. (R–4) Offered autumn and spring. Prereq., consent of instr. Coreq., MSL 301, 302, 401, or 402. Practical application of skills learned in the classroom. Course Attributes: ROTC Course

#### MSL 305 - Leadership Development and Assessment Course

Credits: 3. Offered every term. Prereq., consent of instr. Required study and internship in military tactics, leadership and organizational behavior. Supervised by active duty military officers. Participants attend course of study at Fort Knox, KY for four weeks of intense evaluation and training to assess their ability to serve as a 2nd LT in the US Army, US Army Reserves, or the National Guard.

#### MSL 391 - Special Topics

Credits: 1 TO 9. (R-9) Offered autumn and spring. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics. Course Attributes: ROTC Course

#### MSL 401 - Adaptive Leadership

Credits: 3. Offered autumn. Prereq., consent of instr.; coreq., MSL 303. The application of leadership principles and techniques involved in leading young men and women in today's Army. Students explore training management. methods of effective staff collaboration and developmental counseling techniques. Develops student proficiency in planning and executing complex operations, functioning as a member of a staff and mentoring subordinates. Restricted to contracted Military Science students. Course Attributes: ROTC Course

#### MSL 402 - Leadership in a Complex World

Credits: 3. Offered spring. Prereq., consent of instr., coreq., MSL 303. Study includes case study of military law and practical exercises on establishing an ethical command climate. Examines the role communications, values and ethics play in effective leadership. Students complete a semester long Senior Leadership Project that requires them to plan, organize, collaborate, analyze and demonstrate their leadership skills. Restricted to contracted Military Science students. Course Attributes: ROTC Course

#### MSL 492 - Coop Education/Internship

Credits: 1 TO 4. (R-4) Offered every term. Prereq., consent of instr. Required study and internship in military tactics, leadership and organizational behavior. Supervised by active duty military officers. Course Attributes: ROTC Course.

# Modern and Classical Languages Literatures Department

## **Elizabeth Ametsbichler and Jannine Montauban, Co-Chairs**

Instruction is offered in the following languages and literatures: Arabic, Chinese, French, German, Classical Greek, Italian, Japanese, Latin, Russian and Spanish, as well as in linguistics, foreign literatures in English translation, film, and the study of foreign cultures. Undergraduate courses have been planned to meet the needs of students who began studying a language in high school as well as those who undertake such study for the first time at the University.

The courses are intended to serve several purposes: (1) Contribute to the general education of students by giving them an opportunity to gain insight into patterns of living and thinking which are different from their own; (2) Enable students to gain proficiency in the language; (3) Prepare candidates for careers in research and college teaching by providing a solid basis for graduate studies in the various languages; (4) Prepare future teachers of foreign languages; (5) Provide language training requisite to careers in government, foreign commerce, and library work; (6) Enable students to read foreign publications and to meet graduate foreign language requirements in their field.



The Department of Modern and Classical Languages and Literatures offers undergraduate majors in Classics (Greek and Latin), French, German, Japanese, Russian, and Spanish. Within Classics, it is possible to elect options in Classical Languages (Latin and Greek), Classical Civilization, and Latin. There are undergraduate minors in Arabic and Chinese. The Master of Arts degree in Modern Languages and Literatures is offered with options in French, German, and Spanish. A master's degree with a concentration in any of the languages in which we offer a major may be obtained by means of the Master of Interdisciplinary Studies program.

**High School Preparation:** Credit is automatically granted for Advanced Placement scores of 3, 4, or 5. At each UM Orientation, the department offers a computerized placement/assessment examination in French, German, and Spanish. Students also can arrange individually to take the CLEP exam, administered by Testing Services in French, German, or Spanish.

These exams are not required, but serve one or more of three purposes:

1. **Exemption from the General Education Competency Requirement in Foreign Language:** if the student achieves a score that indicates a competence equivalent to the completion of French, German, or Spanish 102 (second semester). (See the General Education Requirements section of this catalog.)
2. **Placement for further study in the language:** the score achieved on this test is an accurate indicator of the course level at which language study should be resumed at the University (e.g. 102, 201, 202).
3. **Credit by examination:** A student with extensive language study may score high enough on the placement exam to qualify for University credits if she or he places into 202 or 301. By taking the course into which she or he placed (202 or 301) and receiving a B (3.00) or better, the student may then receive four by-pass credits (Pass grade only) for the preceding course (201 or 202).

Students who elect not to take this exam may:

1. Satisfy the General Education Competency Requirement in Foreign Language by successfully completing a University foreign language 102 (second semester) course.
2. Estimate their placement level for further study by the approximate equating of one year of high school study to one semester of university study. Students should consult with the department in making this estimate.

**Foreign Study Programs** The Department of Modern and Classical Languages and Literatures offers programs of accredited study in Austria, China, Germany, Italy, Spain, Mexico, and Russia. Each program is supervised by a departmental faculty member, and is open to any student who meets the respective foreign language prerequisites. (There is no language prerequisite for the Study Abroad in Italy, but Italian is recommended.) Details concerning individual programs are available from the Department of Modern and Classical Languages and Literatures. The department also sponsors student exchanges with universities in France as well as work/study internships abroad for students in Japanese.

### **College Humanities & Sciences Catalog Year: 2015-2016**

Degree Type: Bachelor of Arts Level: Major Subject: **Classics** Option: **Classical Languages**

Total Credits: 59 Cumulative GPA Required: 2.5

Lower Division Core

Category Name: Required Lower Division Classes Rule: Complete 3 of the following courses

Criterion: C- Number of Credits 9

Course Listing

CLAS 155L Survey of Greek and Roman Lit 3

CLAS 160L Classical Mythology 3

CLAS 251L The Epic 3

CLAS 252L Greek Drama: Politics on Stage 3

Commentary: Must select either CLAS 251L or 252L. Only 1 will be accepted toward the fulfillment of the required major credits.

Commentary: Upper Division Core

Category Name: Degree Electives

Rule: Complete 6 credits from the following courses

Criterion: C- Number of Credits 6

Course Listing

ARTH 407 Roman and Early Christian Art 3

CLAS 320 Women in Antiquity 3

CLAS 360H Ancient Greek Civ and Culture 3

CLAS 365E The Roots of Western Ethics 3

HSTR 301H Ancient Greek Social Hist 3

HSTR 302H Ancient Greece 3

HSTR 304H Ancient Rome 3

PHL 363 Ancient Greek and Roman Phil 3

Commentary: Other Courses

Category Name: Language Emphasis Requirements Rule: Must complete the following subcategories

Criterion: Number of Credits 38

Course Listing Commentary:

Subcategory Name: Language Emphasis Core Rule: All courses are required

Criterion: C- Number of Credits 20

Course Listing

GRK 101 Elementary Greek I 5

GRK 102 Elementary Greek II 5

LATN 101 Elementary Latin I 5

LATN 102 Elementary Latin II 5

Commentary:

Subcategory Name: Language Emphasis Electives

Rule: For a Latin emphasis: complete 12 credits in Latin beyond LATN 102 plus 3 credits in Greek beyond GRK 102. For a Greek emphasis: complete 12 credits in Greek beyond GRK 102 plus 3 credits in Latin beyond LATN 102.

Criterion: C-

Course Listing	Number of Credits	18
GRK 191	Special Topics	1 To 6
GRK 201	Intermediate Greek I	3
GRK 202	Intermediate Greek II	3
GRK 292	Independent Study	1 To 6
GRK 300	Major Greek Writers	3
GRK 391	Special Topics	1 To 9
GRK 392	Independent Study	1 To 9
GRK 492	Independent Study	1 To 9
LATN 191	Special Topics	1 To 6
LATN 201	Intermediate Latin I	4
LATN 202	Intermediate Latin II	3
LATN 292	Independent Study	1 To 6
LATN 311	Major Latin Authors	3
LATN 391	Special Topics	1 To 9
LATN 392	Independent Study	1 To 6
LATN 402	Advanced Prose Composition	3
LATN 492	Independent Study	1 To 12

Commentary: Degree Commentary

Degree requires 59-62 credits to complete.

## College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Bachelor of Arts Level: Major Subject: **Classics** Option: **Latin**

Total Credits: 50 Cumulative GPA Required: 2.5

Lower Division Core

Category Name: Lower Division Core Rule: Complete all of the following:

Criterion: C- Number of Credits 9

Course Listing

CLAS 155L	Survey of Greek and Roman Lit	3
CLAS 160L	Classical Mythology	3
CLAS 251L	The Epic	3
CLAS 252L	Greek Drama: Politics on Stage	3

Commentary: Must select either CLAS 251L or 252L. Only 1 will be accepted toward the fulfillment of the required major credits.

Upper Division Core

Category Name: Upper Division Core Rule: Complete all of the following courses

Criterion: C- Number of Credits 6

Course Listing

ARTH 407	Roman and Early Christian Art	3
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HSTR 304H Ancient Rome 3

Commentary: Major Electives

Category Name: Degree Electives

Rule: Complete 9 credits from the following courses

Criterion: C- Number of Credits 9

Course Listing

CLAS 320 Women in Antiquity 3

CLAS 360H Ancient Greek Civ and Culture 3

CLAS 365E The Roots of Western Ethics 3

HSTR 301H Ancient Greek Social Hist 3

HSTR 302H Ancient Greece 3

PHL 363 Ancient Greek and Roman Phil 3

PHL 465 Plato 3

PHL 466 Aristotle 3

Commentary: Other Courses

Category Name: Language Requirements

Rule: Must complete the following subcategories

Criterion: Number of Credits 26

Course Listing Commentary:

Subcategory Name: Language Core

Rule: Must complete all of the following courses

Criterion: C- Number of Credits 17

Course Listing

LATN 101 Elementary Latin I 5

LATN 102 Elementary Latin II 5

LATN 201 Intermediate Latin I 4

LATN 202 Intermediate Latin II 3

Commentary: Proficiency at the level of LATN 201 substitutes for LATN 101 and 102.

Subcategory Name: Language Electives

Rule: Must complete 9 credits in Latin beyond LATN 202

Criterion: C- Number of Credits 9

Course Listing

LATN 292 Independent Study 1 To 6

LATN 311 Major Latin Authors 3

LATN 391 Special Topics 1 To 9

LATN 392 Independent Study 1 To 6

LATN 402 Advanced Prose Composition 3

LATN 492 Independent Study 1 To 12

Commentary: GRK 101-102 may be substituted for 4 of the 15 additional credits beyond LATN 202.

Commentary: Degree Commentary

Degree requires 50-62 credits to complete.

## **College Humanities & Sciences Catalog Year: 2015-2016**

Degree Type: Bachelor of Arts Level: Major Subject: **Classics** Option: **Classical Civilization**

Total Credits: 43 Cumulative GPA Required: 2.5

Lower Division Core

Category Name: Lower Division Core Courses Rule: Must complete 9 credits from the following:

Criterion: C- Number of Credits 9

Course Listing

CLAS 155L Survey of Greek and Roman Lit 3

CLAS 160L Classical Mythology 3

CLAS 251L The Epic 3

CLAS 252L Greek Drama: Politics on Stage 3

Commentary: Must select either CLAS 251L or 252L. Only 1 will be accepted toward the fulfillment of the required major credits.

Commentary: Upper Division Core

Category Name: Degree Electives I

Rule: Must complete 12 credits from the following courses

Criterion: C- Number of Credits 12

Course Listing

ARTH 407 Roman and Early Christian Art 3

CLAS 320 Women in Antiquity 3

CLAS 360H Ancient Greek Civ and Culture 3

CLAS 365E The Roots of Western Ethics 3

HSTR 301H Ancient Greek Social Hist 3

HSTR 302H Ancient Greece 3

HSTR 304H Ancient Rome 3

PHL 363 Ancient Greek and Roman Phil 3

Major Electives

Category Name: Degree Electives II

Rule: Must complete additional credits from the following courses to total 21 credits when added to the 9 credits from Degree Electives II. Criterion: C- Number of Credits 9

Course Listing

CLAS 309 Reading the City: Rome 3

CLAS 319 UM Students in Rome 1

CLAS 365E The Roots of Western Ethics 3

GRK 202 Intermediate Greek II 3

GRK 300 Major Greek Writers 3

GRK 392	Independent Study	1 To 9
LATN 202	Intermediate Latin II	3
LATN 311	Major Latin Authors	3
PHL 465	Plato	3
PHL 466	Aristotle	3

Commentary: If both CLAS 309 and CLAS 319 are taken, only 1 will count toward degree requirements. 21 total credits required from Degree Electives I + II.

Commentary: Other Courses

Category Name: Language Component

Rule: Student must complete one of the following options:

Criterion: Number of Credits 13-20

Course Listing Commentary:

Subcategory Name: Option One: Latin Rule: May complete all of the following:

Criterion: C- Number of Credits 14

Course Listing

LATN 101	Elementary Latin I	5	F
LATN 102	Elementary Latin II	5	S
LATN 201	Intermediate Latin I	4	F

Subcategory Name: Option Two: Greek

GRK 101	Elementary Greek I	5	F
GRK 102	Elementary Greek II	5	S
GRK 201	Intermediate Greek I	3	F

Subcategory Name: Option Three: Latin and Greek Rule: May complete all of the following:

Criterion: C- Number of Credits 20

Course Listing

GRK 101	Elementary Greek I	5	F
GRK 102	Elementary Greek II	5	S
LATN 101	Elementary Latin I	5	F
LATN 102	Elementary Latin II	5	S

Commentary: Degree Commentary

Degree requires 43-53 credits to complete.

## College Humanities & Sciences Catalog Year: 2015-2016

Degree Type: Bachelor of Arts Level: **Major** Subject: **French**

Total Credits: 30 Cumulative GPA Required: 2.5

Upper Division Core

Category Name: Upper Division Core

Rule: Must complete all of the following courses:

Criterion: C- Number of Credits 9

Course Listing

FRCH 301	Adv Grammar/Oral Writ Exprsn	3
FRCH 350	French Civ & Culture	3
FRCH 421	Adv Stylistics & Oral Arg	3

Commentary: Major Electives

Rule: Must complete 3 of the following courses

Criterion: C- Number of Credits 9

Course Listing

FRCH 310	Fr. Lit. Cult. Mid. Age Renass	3
FRCH 311	Fr. Lit. Cult. 17th 18th Cent.	3
FRCH 312	Fr. Lit. Cult. Long 19th Cent.	3
FRCH 313	Literature and Culture III	3

Upper Division Electives

Category Name: Degree Electives

Rule: Must complete at least 6 credits from the following courses

Criterion: C-

Course Listing	Number of Credits	
FRCH 300	Into to Literature in French	3
FRCH 338	The French Cinema	3
FRCH 339	Surv African Cinema	3
FRCH 355	Spec Topcs:Fren Lang,Lit,Cultr	1 To 3
FRCH 391	Special Topics	1 To 9
FRCH 392	Independent Study	1 To 3
FRCH 400	French: Applied Linguistics	3
FRCH 492	Independent Study	1 To 9
FRCH 494	Seminar/Workshop	1 To 12
FRCH 594	Graduate Seminar	3
FRCH 595	Special Topics	1 To 6
FRCH 596	Independent Study	1 To 6

Commentary: Other Courses

Category Name: Literature and/or Culture Courses

Rule: Must complete 6 credits from the following courses

Criterion: C- Number of Credits 6

Course Listing

FRCH 400	French: Applied Linguistics	3
FRCH 420	Studies in French Prose	3
FRCH 421	Adv Stylistics & Oral Arg	3
FRCH 430	Studies in French Drama	3
FRCH 440	Studies in French Poetry	3

FRCH 491 Special Topics 1 To 9  
FRCH 492 Independent Study 1 To 9  
FRCH 494 Seminar/Workshop 1 To 12

Commentary: Degree Commentary

Students are required to maintain a minimum overall GPA of 2.5 in all upper-division French courses presented in fulfillment of requirements for the French major. Must complete a minimum of 30 French upper division credits.

French 101 through 202, or equivalent, are a prerequisite for this major.

## **College Humanities & Sciences Catalog Year: 2015-2016**

Degree Type: Bachelor of Arts Level: **Major** Subject: **German**

Total Credits: 48 Cumulative GPA Required: 2.5

Lower Division Core

Category Name: Language Core

Rule: Must complete all of the following courses:

Criterion: C- Number of Credits 18

Course Listing

GRMN 101 Elementary German I 5

GRMN 102 Elementary German II 5

GRMN 201 Intermediate German I 4

GRMN 202 Intermediate German II 4

Commentary: Upper Division Core

Category Name: Upper Division Core Courses

Rule: Must complete all of the following subcategories

Criterion: C- Number of Credits 21-22

Course Listing Commentary:

Subcategory Name: Subcategory 1

Rule: Must complete all of the following courses

Course Listing

GRMN 301 German: Oral and Written Exp 3

GRMN 311 Intro German Lit: Prose 3

Subcategory Name: Subcategory 2

Rule: Must complete 1 of the following courses

Criterion: C- Number of Credits 3-4

Course Listing

GRMN 302 German Oral & Written Expr II 3

GRMN 305 Practicum in Germ Lang 4

Subcategory Name: Subcategory 3

Rule: Must complete 1 of the following courses

Criterion: C- Number of Credits 3



#### Course Listing

GRMN 312 Intro German Lit: Dram/Poetry 3

GRMN 318 Intro to Germ & Aust Theat 3

Subcategory Name: Subcategory 4

Rule: Must complete 1 of the following courses

Criterion: C- Number of Credits 3

#### Course Listing

GRMN 400 Intro Linguistics of German 3

LING 270 Intro to Ling 3

Subcategory Name: Subcategory 5

Rule: Must complete at least 2 3-credit courses in literature at the 400 level. Criterion: C- Number of Credits 6

Course Listing Commentary:

Commentary: Major Electives

Category Name: German Culture, Film, and Literature Electives Rule: Must complete 3 of the following courses

Criterion: C- Number of Credits 9

GRMN 317L Intro Multicultural Lit German 3

GRMN 322L Survey of German Cinema 3

GRMN 340L Nature Environ German Lit Film 3

GRMN 350 German Culture & Civilization 3

GRMN 351H German Culture to 1900 3

GRMN 352H Germ Cult 1900-Pres 3

Commentary: The upper-division writing expectation must be met by successfully completing either GRMN 351H or GRMN 352H. Degree Commentary

Students are required to maintain a minimum overall GPA of 2.5 in all upper-division GRMN courses presented in fulfillment of requirements for the German major.

### **College Humanities & Sciences Catalog Year: 2015-2016**

Degree Type: Bachelor of Arts Level: **Major** Subject: **Japanese**

Total Credits: 55 Cumulative GPA Required: 2.5

Lower Division Core

Category Name: Lower Division Core Courses

Rule: Complete the following subcategories of courses:

Criterion: Number of Credits 29

Course Listing Commentary:

Subcategory Name: Language Core

Rule: Must complete all of the following courses:

Criterion: C- Number of Credits 20

#### Course Listing

JPNS 101 Elementary Japanese I5