

analysis, or portfolio development. Arranged with a supervising faculty member from the School of Management. Staff.

MGMT 390 Senior Seminar (F-1,2; S-1,2)

4 sem. hrs. Prereq.: MGMT 111, MGMT 321, MGMT 325, MGMT 340, and senior standing.

Builds upon the cross-functional strategic theory presented in MGMT 340. Requires and applies advanced knowledge of analytical, behavioral, and conceptual areas of management. Involves work in project groups throughout the semester to develop a business proposal, conduct an industry analysis, perform market research, and develop a business plan. Gupta, Betters-Reed.

Department of Mathematics

David Browder, *Chair and Professor*

*Donna Beers, *Professor*

Michael Brown, *Professor*

Robert Goldman, *Professor*

Margaret Menzin, *Professor*

David Novak, *Professor*

Joanne Saro, *Administrative Assistant*

* *On leave fall semester 2006*

The Department of Mathematics offers a major in mathematics, as well as joint majors in financial mathematics and in economics and mathematics. It also offers minors in mathematics and in statistics.

Major in Mathematics

The increasing complexity of society has made the mathematical sciences important for solving problems in the social sciences and management as well as in the sciences. In addition, the pure mathematical areas continue to appeal to many as an intellectual discipline, art form, or game.

The major in mathematics is designed to provide a strong background in various mathematical areas and their applications. Through her choice of courses, a student may prepare for graduate work or a career in statistics, biostatistics, mathematical finance, bioinformatics, actuarial science, or teaching.

There are many opportunities for students who are interested in combining mathematics with other disciplines. Joint or double majors are available with biology, chemistry, computer science, economics, education, management and psychology. Other fields may also be fruitfully combined with mathematics. Students interested in such majors should consult with the chairs of the departments involved.

Requirements: The major in mathematics begins with the calculus sequence: MATH 120, 121, and 220. Other required courses are MATH



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210 and 211 (normally taken in the sophomore year), MATH 238 (sophomore or junior year), MATH 310 (junior or senior year), MATH 320 and 321 (junior or senior year), and CS 112 (may be taken as early as the first year; with approval of the department, another programming course may be substituted for CS 112). In addition, mathematics majors must take either MATH 339 or MATH 343 as an elective. Finally, at least four semester hours of independent learning must be completed in mathematics. It is departmental policy that courses required for a major or minor should not be taken pass/fail.

Joint Major in Economics and Mathematics

This specialization affords students interested in careers in business, the financial services, government, and the nonprofit sector the opportunity to pursue an area of applied mathematics. The joint major in economics and mathematics provides students with the mathematical and statistical tools and concepts needed for economic analysis. For complete information about this major, see page 105.

Joint Major in Financial Mathematics

Offered jointly with the departments of economics and management, this major serves students interested in applying the principles of mathematical and economic analysis in the financial services industry. Courses required for the financial mathematics major are:

ECON 100	Principles of Microeconomics
ECON 101	Principles of Macroeconomics
MATH 120	Calculus I
MATH 121	Calculus II
MATH 220	Multivariable Calculus
ECON 231	Money and Banking
ECON 220	International Monetary Systems
ECON 393	Econometrics
MATH 238	Applied Statistical Research
MATH 319	Financial Mathematics
MATH 339	Probability and Mathematical Statistics

MATH 343	Mathematical Modeling
MGMT 110	Principles of Financial Accounting
MGMT 260	Principles of Finance
MGMT 311	Investments (or another 300-level finance course in management)
Independent learning (eight semester hours)	

Minor in Mathematics

A mathematics minor consists of MATH 211, MATH 220, and three additional MATH courses numbered 120 or higher.

Minor in Statistics

The minor in statistics consists of either MATH 238 or 118, MATH 218, MATH 339, and two of the following:

MATH 319	Financial Mathematics
MATH 343	Mathematical Modeling
ECON 393	Econometrics
PSYC 203	Research Methods in Psychology
SOCI 239	Introduction to Social Research
SOCI 339	Qualitative Research Workshop
GSHS 410	Concepts in Research Methods and Statistics

Integrated BS/MS Programs

Two integrated programs permit students to obtain their BS and MS degrees in less time than it would take to do the programs separately. Students begin the MS degree program during their junior year. The integrated program in education is described under the Department of General Education on page 114. Information about the integrated program in mathematics and library and information science is available from the Department of Mathematics or from the Graduate School of Library and Information Science.

All-College Requirement of Competency in Basic Mathematics

See page 20 for information about the all-College requirement of competency in basic mathematics. Satisfaction of the mathematics

competency requirement is prerequisite to all MATH courses except MATH 101 and MATH 102.

COURSES

MATH 101 Introduction to Mathematics: Level I (F-1,2; S-1,2)

4 sem. hrs. Prereq.: Recommendation of the department.

Reviews arithmetic, including percents, proportion, and geometric formulae. Covers equations, polynomials, rational expressions, and problem solving. Staff.

MATH 102 Introduction to Mathematics: Level II (F-1,2)

4 sem. hrs. Prereq.: Recommendation of the department.

Reviews topics from algebra, including equations, polynomials, graphing, systems of equations, rational expressions, inequalities, functions, and problem-solving. Staff.

Please note: The competency in basic mathematics requirement may be fulfilled by the satisfactory completion of either MATH 101 or MATH 102. However, since there is considerable overlap in MATH 101 and 102, students may not receive credit for both courses. Placement into MATH 101 or 102 will be determined through the mathematics competency test (see page 20).

MATH 103 Real-Life Math (M3) (S-1,2)

4 sem. hrs. Prereq.: Completion of the competency in basic mathematics requirement.

Covers mathematical ideas and tools for “real life”: logic and number systems, consumer math (interest rates, credit card debt, investment math), math in business (decision-making), probability and statistics, and problem-solving. Browder.

MATH 106 Precalculus (M3) (S-1,2)

4 sem. hrs. Prereq.: Recommendation of the department or completion of the competency in basic mathematics requirement.

Provides a study of algebra and functions in preparation for calculus. Covers the real number system, algebraic manipulation of polynomials and rational functions, functions and their graphs, trigonometry, and applications. Staff.

MATH 115 Mathematics for Elementary School Teachers (M3) (S-1,2)

4 sem. hrs. Prereq.: Completion of the competency in basic mathematics requirement.

Covers topics that elementary school teachers will be teaching, including numeration systems, elementary number theory, rational number arithmetic, geometry concepts, data collection and interpretation, and probability. Staff.

MATH 118 Introductory Statistics (M3) (F-1,2; S-1,2)

4 sem. hrs. Prereq.: High school algebra and completion of the competency in basic mathematics requirement.

Intended primarily for students in the health, behavioral, or social sciences. Covers univariate and bivariate data analysis, surveys and experiments, elementary probability, sampling distributions, statistical inference for proportions and means. Extensive use is made of the software Minitab. The course will include a significant data analysis project. This course does not count toward the mathematics major. Staff.

MATH 120 Calculus I (M3) (F-1,2)

4 sem. hrs. Prereq.: MATH 106 or recommendation of the department and completion of the competency in basic mathematics requirement.

Covers analytic geometry, functions, limits and continuity, and differential calculus. Includes applications to extrema, physical problems, etc. Staff.

MATH 121 Calculus II (M3) (S-1,2)

4 sem. hrs. Prereq.: MATH 120 or equivalent.

Covers integral calculus and applications to area, volume, etc.; transcendental functions; techniques of integration; polar coordinates; and improper integrals. Staff.

MATH 210 Discrete Mathematics (M3) (F-1,2)

4 sem. hrs. Prereq.: Sophomore standing or consent of the instructor.

Covers combinatorial problem-solving and graph theory. Includes the following topics: permutations, combinations, trees, binomial and multinomial coefficients, elementary probability, inclusion/exclusion recurrence relations, basic graph theory, chains, paths, connectedness circuits, models and applications. Staff.

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MATH 211 Linear Algebra (M3) (S-1,2)

4 sem. hrs. Prereq.: MATH 121 or equivalent or consent of the instructor and completion of the competency in basic mathematics requirement.

Covers real vector spaces, linear transformations, inner products, matrix theory and determinants, and applications. Includes selected topics from complex vector spaces, dual spaces, differential operators, etc. Staff.

MATH 218 Biostatistics (S-1)

4 sem. hrs. Prereq.: MATH 118 and junior standing or consent of the instructor.

Covers modern statistical techniques, including simple and multiple regression, analysis of variance, contingency tables, and experimental and quasi-experimental designs. Includes sampling plans. Makes use of a statistical computer package. Does not fulfill requirements of the mathematics major. Goldman.

MATH 220 Multivariable Calculus (M3) (F-1,2)

4 sem. hrs. Prereq.: MATH 121 or equivalent.

Covers vectors and analytic geometry in three dimensions; functions of several variables; and partial derivatives, multiple integration, and applications. Browder.

MATH 238 Applied Statistical Models (M3) (F-1,2)

4 sem. hrs. Prereq.: MATH 121 or equivalent or consent of the instructor.

Serves as a first course in applied statistics for mathematics majors and other well-prepared students. Covers univariate and bivariate data analysis, surveys and experiments, elementary probability, sampling distributions, statistical inference for proportions and means, chi-square tests, and multiple regression. Extensive use is made of statistical software. Includes a significant data analysis project. Goldman.

Please note: MATH 238 is an appropriate substitute for MATH 118 for students majoring in sociology, psychology, physical therapy, or other areas that require MATH 118 or MATH 118M.

MATH 310 Modern Algebra (S-2)

4 sem. hrs. Prereq.: MATH 210 and MATH 211.

Reviews set theory; groups and group homomorphism; rings and ring homomorphisms and examples; Euclidean division algorithm; prime factorization and Chinese remainder theorem with applications to cryptography; Peano's postulates, leading to a description of the integer, rational, real, and complex number systems; Fermat's Little Theorem; Euler phi function; and linear and quadratic residues. Staff.

MATH 319 Financial Mathematics (S-1)

4 sem. hrs. Prereq.: MATH 118 or 238 and MGMT 311 or ECON 231 or consent of the instructor.

Covers Bayesian statistics, methods of examining risk, and models for financial decision-making, complex present value computation, risk management, and pricing of financial instruments such as options. Does not count toward the mathematics major. Menzin.

MATH 320 Introduction to Real Analysis I (F-1)

4 sem. hrs. Prereq.: MATH 220 and MATH 211.

Provides preliminary discussion of set theory: the set of real numbers, sequences and series, and completeness of the real line. Browder.

MATH 321 Introduction to Real Analysis II (S-1)

4 sem. hrs. Prereq.: MATH 320.

Covers topology of the real line, continuity and differentiability of functions of a real variable, and complete spaces of continuous functions. Browder.

MATH 339 Probability and Mathematical Statistics (S-2)

4 sem. hrs. Prereq.: MATH 238.

Covers assigning probabilities, random variables, moment generating functions, probability distributions, addition theorems, point and interval estimates, elements of hypothesis testing, two sample problems, goodness of fit, and regressions. Makes use of Minitab and SAS. Goldman.

MATH 343 Mathematical Modeling (S-1)

4 sem. hrs. Prereq.: MATH 220 and either MATH 319, MATH 210, or MATH 238.

Covers topics chosen from the following: graphs (traffic control, social groups, transportation),

simulation, stochastic models, game theory, differential equation models, linear programming, input/output models, queues, epidemics, and population growth. Staff.

MATH 349 Directed Study (F-1,2; S-1,2)

4 sem. hrs. Prereq.: Consent of the department. Directed study addresses coursework required for the major or degree not being offered formally that semester. Students work under the close supervision of a faculty member. Consent is required for a directed study, which does not count toward the independent learning requirement. Staff.

MATH 350 Independent Study (F-1,2; S-1,2)

4 sem. hrs. Staff.

MATH 370 Internship (F-1,2; S-1,2)

8 sem. hrs. Prereq.: Consent of the department. Staff.

MATH 390 Senior Seminar (S-2)

4 sem. hrs. Prereq.: MATH 120 or recommendation of the department. Investigates an advanced topic in mathematics, with emphasis on developing research skills. Staff.

MATH 400 Special Topics in Mathematics (F-2)

4 sem. hrs. Prereq.: MATH 120 or equivalent. Intended for MAT students who are preparing to become teachers of mathematics. Topic varies from year to year according to the interests and needs of students. Draws possible topics from the required competency areas for mathematics teachers: algebra, geometry, number theory, and discrete mathematics. Staff.

Department of Modern Languages and Literatures

Dolores Peláez-Benítez, *Chair and Associate Professor*

Raquel María Halty, *Professor and Director, Graduate Program in Spanish*

Louise Cohen, *Associate Professor*

Zhigang Liu, *Associate Professor*

Florence Ciret-Strecker, *Assistant Professor*

Eduardo Febles, *Assistant Professor*

Alister Inglis, *Assistant Professor*

Walter Shaw, *Assistant Professor*

Tulio Campos, *Spanish Preceptor*

Marta Villar, *Spanish Preceptor*

Melissa Poehner, *Administrative Assistant*

The Department of Modern Languages and Literatures offers Chinese, French, Italian, Japanese, and Spanish at various levels, enabling students to strengthen their command of a language they have already studied or to begin study of a new language. In these courses, students learn to speak and understand as well as to read and write with increasing facility and accuracy.

As students become familiar with a particular language and its literature and culture, they develop a knowledge of the intellectual and social history of the people who speak that language. Moreover, the knowledge and experience gained in the critical reading of foreign literature broadens students' perspectives and provides a foundation for further study and travel.

Students may elect courses in modern languages and literatures as a part of a liberal education or choose a modern language major with a career objective in mind. The study of a modern language can be combined with diverse career areas, for example, in social sciences, in science, in other fields within the humanities, or in professional fields. A major in French or Spanish, when combined with a major in the

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