MKTG 440. Retail Strategy and Buying. 3 credits.
This course examines merchandising as a major element in the marketing of consumer goods. The student will learn the software tools and formulas for merchandising strategy in a computer mediated environment and the basics of market centers and global sourcing. Prerequisite: COB 300 or MKTG 380.

MKTG 450. Business Marketing. 3 credits.
An analysis of the policies and procedures in marketing to business buyers. The course provides emphasis on special problems connected with the segmentation and target marketing, purchase, distribution, promotion and development of business-to-business goods and services. Prerequisite: COB 300 or MKTG 380.

MKTG 460. Global Marketing. 3 credits.
Examines marketing in international environments, including foreign entry, local marketing in individual countries and global or standardized marketing across many countries. Emphasis is placed on cultural, economic and strategic variables in deciding how to enter and compete in various markets. Prerequisite: COB 300 or MKTG 380.

MKTG 465. CRM Technology for Sales Professionals. 3 credits.
The objective of this course is to introduce students to customer relationship management (CRM) technologies used in professional selling. Students will investigate sources of customer data, data management technology, and the use of customer information for professional selling. The course develops technology skills applicable in carrying out sales strategies. Prerequisite: MKTG 430. Prerequisite or corequisite: MKTG 450.

MKTG 466. Advanced Professional Selling. 3 credits.
The purpose of this class is to build on the selling skills first learned in MKTG 430. It will focus on enhancing existing skills and learning new ones in order to even better prepare students for a successful career in sales. In addition, students may be selected to compete in regional or national sales competition during the summer. Prerequisite or corequisite: MKTG 460. Prerequisite: MKTG 430.

MKTG 470. Strategic Internet Marketing. 3 credits.
Students will examine demographics of the Internet and examines online business strategies. Students will learn the hardware and software tools necessary for Internet commerce, identify appropriate target segments, develop product opportunities, price structures and distribution channels over the Internet and execute marketing strategy in computer mediated environments. Prerequisites: COB 300 or MKTG 380 and MKTG 394 or permission of the instructor.

MKTG 477. Internet Marketing Practicum. 3 credits.
With an applied focus, this course introduces students to some of the most important and fastest growing sectors in online marketing. Students apply marketing theories in a uniquely applied manner as they become active learners involved in an online marketing campaign, facing real pressures similar to those in the professional workplace (i.e., account management, client relationships, financial constraints, market competition, time limitations, technology, etc.). Student teams will work with actual clients on online marketing campaigns. Throughout their campaigns, students continually make finance, advertising and marketing decisions. Students gather real world data using online marketing dashboards to gain a strong understanding of real market conditions. Students experience traditional advertising concepts such as copy writing, cost per thousand (CPM), return on investment, as well as online marketing concepts such as click-through-rates (CTR), cost-per-click (CPC), conversion rates, landing page strategies, and optimization techniques. Prerequisite: MKTG 470 and permission of the instructor.

MKTG 480. Product Development and Management. 3 credits.
The process of developing new products will be developed and explored. The marketing tasks which are unique to this operation will be investigated. An understanding of the marketing management of products throughout their life cycles will complete the course. Prerequisite: COB 300 or MKTG 380 or permission of the instructor.

MKTG 482. Marketing Analytics. 3 credits.
This course focuses on the use of information technology and marketing metrics to increase marketing productivity. Students learn how to evaluate marketing strategies and performance using database queries and statistical analysis. Information technologies are applied in market segmentation and target marketing, lifetime value analysis and RPM (recency, frequency and monetary value) analysis. Prerequisites: COB 300 or MKTG 380 and admission to the marketing major.

MKTG 485. Marketing Management. 3 credits.
Case studies are used to develop analytical and decision-making skills. Knowledge gained from previous course work is applied to actual circumstances faced by marketing managers in private, public, profit and not-for-profit organizations. Extensive preparation of case materials outside of class provides the basis for case presentations and discussion of case situations in class. Prerequisites: COB 300, MKTG 384, MKTG 385 and senior standing.

MKTG 490. Special Studies in Marketing. 1-3 credits.
Designed to give capable students in marketing an opportunity to complete independent study under faculty supervision. Prerequisites: GPA of 2.8, instructor recommendation and director approval prior to registration.

MKTG 494. Marketing Internship. 3-6 credits.
A course providing an opportunity to work in and deal with industry to gain insight into the realities of modern business. Prerequisites: COB 300 or MKTG 398, minimum cumulative GPA of 2.83, senior standing, recommendation of the internship coordinator and approval of the director prior to registration.

MKTG 498. Special Topics in Marketing. 3 credits.
This course is designed to allow explorations of areas of current topical concern or to exploit special situations. Course content will vary. For current course content consult your adviser. Prerequisite: Permission of the instructor.

MKTG 499. Honors. 6 credits.
Year course. See catalog section “Graduation with Honors.”

Materials Science

Materials Science

MATS/PHYS 275. An Introduction to Materials Science. 3 credits.
An introduction to materials science with emphasis on general properties of materials. Topics will include crystal structure, extended and point defects, and mechanical, electrical, thermal and magnetic properties of metals, ceramics, electronic materials, composites and organic materials. Prerequisite: CHEM 131, PHYS 150 or PHYS 250, ISAT 212 or permission of the instructor.

MATS/PHYS 337. Solid State Physics. 3 credits.
A study of the forces between atoms, crystal structure, lattice vibrations and thermal properties of solids, free electron theory of metals, band theory of solids, semiconductors and dielectrics. Prerequisite: PHYS 270 or consent of the instructor.

MATS/PHYS 381. Materials Characterization (Lecture/Lab Course). 3 credits.
A review of the common analytical techniques used in materials science related industries today, including the evaluation of electrical, optical, structural and mechanical properties. Typical techniques may include Hall Effect, scanning probe microscopy, scanning electron microscopy, ellipsometry and x-ray diffraction. Prerequisite: MATS/PHYS 275, MATS/ISAT 431 or MATS/GEOL 395.

MATS 382. Materials Microfabrication Laboratory. 3 credits.
A materials processing course that examines the design and fabrication of micro- and nano-devices using standard technologies and new lithography techniques. Topics will include laboratory safety and protocol, substrate cleaning, thermal oxidation, photolithography, diffusion, metallization, process integration, and device testing. Prerequisite: MATS 381 or permission of the instructor.

MATS/GEOL 395. Geologic Perspectives in Materials Science. 3 credits.
A one-semester course which emphasizes the commonalities between the geological sciences and materials science. Course includes topics from mineralogy, crystallography, petrology and structural geology, which are also important in metallurgy and ceramics. Prerequisites: An introductory course in any physical science or integrated science and technology (i.e., GEOL 110, CHEM 131, PHYS 140 or ISAT 141) and at least one additional advanced course in the major.

MATS/GEOL 396. X-ray Characterization of Solid Materials. 3 credits.
Covers fundamental principles and theory behind the powerful, X-ray based, technologies: X-ray Diffraction and Energy Dispersive Analysis of X-rays (EDS). Students will collect and analyze data from a single crystal Gandolfi X-ray camera, automated powder diffraction system (focusing gonimeter), and EDAX system (EDS). Prerequisite: GEOL 280, MATS/PHYS 275 or ISAT 300.

MATS/ISAT 430. Materials Science in Manufacturing. 3 credits.
This course is the study of engineering materials used in the fabrication of products including metals, polymers, ceramics, composites and elastomers. Topics include physical, mechanical and electrical properties of materials, elements of strength of materials, failure criteria, and materials selection. Prerequisites: ISAT 211 and ISAT 142 or permission of the instructor.
MATH/ISAT 431. Manufacturing Processes. 3 credits.
This course provides an introduction to the processes used for fabricating parts, such as machining, grinding, and casting and sheet-metal fabrication, including both traditional and nontraditional processes. Topics include interaction of materials, processing and design, economics of manufacturing, design for improved processing. Manufacturing processes for metals, plastics and composites are addressed. Prerequisite: ISAT 430 or permission of the instructor.
MATH/ISAT 432. Selection and Use of Engineering Materials. 3 credits.
This course deals with the interplay between engineering product specification, design, economics, environment, energy, materials selection, fabrication route, manufacturing cost and product service requirements. Students will be taught how to perform design projects that involve understanding of the behavior of materials and selection of materials for a specific function. Prerequisite: ISAT 211 or permission of the instructor.
MATH/ISAT 436. Micro-Nanofabrication and Applications. 3 credits.
This course examines processes used in the manufacture of microelectronic devices (VLSI integrated circuits, optoelectronic devices, flat panel displays), microelectromechanical devices (micromotors, microactuators), data storage media (magnetic and optical disks, including CDs), optical fibers and some sensors and transducers. Principles of operation of semi-conductor and other devices are also studied. Prerequisite: Junior standing in ISAT; PHYS 150, PHYS 250 or permission of the instructor.
MATH 498R. Undergraduate Materials Science Research. 1-3 credits, repeatable to 6 credits.
Research in a selected area of materials science arranged with and approved by a faculty research adviser. Prerequisite: Study proposal must be approved by research adviser and director of Center for Materials Science prior to registration.

Mathematics

Department of Mathematics and Statistics

*MATH 103. The Nature of Mathematics. 3 credits. Offered fall and spring.
Topics such as geometry, computing, algebra, number theory, history of mathematics, logic, probability, statistics, modeling and problem solving intended to give students insight into what mathematics is, what it attempts to accomplish and how mathematicians think.

*MATH 105. Quantitative Literacy and Reasoning. 3 credits. Offered fall and spring.
Applications and interpretation of numerical information in context. Selection and use of appropriate tools: scientific notation, percentages, descriptive summaries, absolute and relative changes, graphs, normal and exponential population models, and interpretations of bivariate models. Making informed decisions and effectively communicating them. Identifying limitations of information sources, assessing reasonableness of results, and basic concepts of confidence amid uncertainty. Not open to majors in mathematics or statistics. Not open to students who have previously earned credit in MATH 220 except with the consent of the department head.

MATH 106. Fundamentals of Mathematics I-II. 3 credits each semester. Offered fall and spring.
These courses, along with MATH 207, form a sequence that covers the topics of sets, logic, numeration systems, development of real numbers, number operations, number theory, geometry, measurement, algebra, functions, probability and data analysis. Sequence is required for early childhood, elementary or middle school teacher licensure. Prerequisite for MATH 107: MATH 106 or sufficient score on the Mathematics Placement Exam. Prerequisite for MATH 108: MATH 107 with a grade of “C-” or better.

MATH 135. Elementary Functions. 4 credits. Offered spring.
Algebraic, exponential, logarithmic and trigonometric functions, matrices and matrix solutions to systems of linear equations; vectors. Not open to students who have previously earned credit in MATH 155, 156, 255 or 235, except with the consent of the department head.

MATH 155. College Algebra. 3 credits. Offered fall and spring.
Polynomial, rational, exponential and logarithmic functions and applications, systems of equations and inequalities, sequences. Prerequisite: Demonstration of proficiency in algebra at an intermediate level. A test is required to determine placement in MATH 155 or MATH 156. Not open to students who have previously earned credit in MATH 135, 156, 205, 231, 232 or 235.

MATH 156. College Algebra. 3 credits. Offered fall and spring.
Covers same topics as MATH 155. MATH 156 will meet five times a week for students requiring more instructional time. Prerequisites: Demonstration of proficiency in algebra at an intermediate level. A test is required to determine placement in MATH 155 or MATH 156. Not open to students who have previously earned credit in MATH 135, 155, 205, 231, 232 or 235.

MATH 167. Topics in Mathematics. 1-3 credits. Offered on demand.
Topics or projects in mathematics which are of interest to the lower-division student. May be repeated for credit when course content changes. Topics or projects selected may dictate prerequisites. Students should consult the instructor prior to enrolling for this course.

*MATH 205. Introductory Calculus I. 3 credits. Offered fall and spring.
Topics from differential and integral calculus with applications to the social, behavioral or life sciences and business or management. Prerequisite: One of MATH 135, MATH 155, MATH 156 or sufficient score on the mathematics placement exam. Not open to mathematics or physics majors or to students who have already earned credit in MATH 232 or MATH 235. Not recommended for chemistry majors.

*MATH 206. Introductory Calculus I with Laboratory. 4 credits. Offered on demand.
Topics from differential and integral calculus, including a laboratory component stressing data collection, data analysis, and applications to environmental issues. Prerequisite: Demonstration of strong preparation in algebra. Not open to mathematics or physics majors or to students who have already earned credit in MATH 205, MATH 231 or MATH 235. Not recommended for chemistry majors. Sufficient score on the Mathematics Placement Exam.

MATH 260. Introductory Calculus II. 3 credits. Offered on demand.
Topics from integral calculus with applications to the social, behavioral or life sciences and business or management. Prerequisite: MATH 205. Not open to mathematics or physics majors or to students who have already earned credit in MATH 236. Not recommended for chemistry majors.

MATH 207. Fundamentals of Mathematics III. 3 credits. Offered fall and spring.
A continuation of topics listed in the MATH 107-108 description will be covered. The MATH 107-108-207 sequence fulfills the requirements for licensure of prospective early childhood, elementary or middle school teachers. Prerequisite: “C-” or better in both MATH 107 and MATH 108.

*MATH 220. Elementary Statistics. 3 credits. Offered fall and spring.
Descriptive statistics, frequency distributions, sampling, estimation and testing of hypotheses, regression, correlation and an introduction to statistical analysis using computers. Prerequisite: MATH 105 or sufficient score on the Mathematics Placement Exam.

MATH/CS 227-228. Discrete Structures I-II. 3 credits each semester. Offered fall and spring.
An introduction to discrete mathematical structures including functions, relations, sets, logic, matrices, elementary number theory, proof techniques, basics of counting, graphic theory, discrete probability, digital logic, finite state machines, integer and floating point representations. Prerequisite for MATH/CS 227: MATH 155, MATH 156 or sufficient score on the Mathematics Placement Exam. Prerequisite for MATH/CS 228: MATH/CS 227.

*MATH 231. Calculus with Functions I. 4 credits. Offered fall and spring.
MATH 231 and MATH 232 form a sequence that combines first-semester calculus with algebra and trigonometry. The sequence is designed for students whose pre-calculus skills are not strong enough for MATH 235. Calculus material in MATH 231 includes limits and derivatives of algebraic functions and their applications. Prerequisite: MATH 155, MATH 156 or sufficient score on the Mathematics Placement Exam. MATH 231-232 together are equivalent to MATH 235 for all prerequisites. Not open to students who have already earned credit in MATH 235.

MATH 232. Calculus with Functions II. 4 credits. Offered fall and spring.
A continuation of MATH 231. Calculus topics include limits and derivatives of transcendental functions, the theory of integration and basic integration techniques. Prerequisite: MATH 231 with a grade of “C-” or better. MATH 231-232 together are equivalent to MATH 235 for all prerequisites. Not open to students who have already earned credit in MATH 235.

MATH 235*. 236. Calculus I-II. 4 credits each semester. Offered fall and spring.
Differential and integral calculus of functions of one variable. Sequences and infinite series. Prerequisite for MATH 235: Sufficient score on the Mathematics Placement Exam. Prerequisite for MATH 236. MATH 232 or MATH 235 with grade of “C-” or better. MATH 235 is not open to students who have already earned credit in MATH 232.

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