BIO 475. Advanced Cell Biology (3, 0). 3 credits.
This seminar-style course covers topics in advanced cell and molecular biology. Class format will be discussions from assigned review articles, followed by student-led presentations of assigned primary literature. Students write a research grant proposal and give an oral presentation of their proposal in class. Prerequisite: BIO 224.

BIO 477. The Genetics of Cancer (3, 0). 3 credits.
Exploration of the genetic and epigenetic factors that drive the evolution of cancer cells, taking into account both inherited and environmental contributions to this process. The cellular mechanisms debilitated or subverted during cancer development will be studied, and student teams will demonstrate their understanding of the material through the diagnosis, genetic characterization and treatment of a hypothetical cancer patient. Prerequisite: BIO 224.

BIO 480. Advanced Molecular Biology (3, 4). 4 credits.
Cellular constituents and genetics are emphasized at the molecular level. Credit may not be earned in both BIO 480 and BIO 580. Prerequisite: BIO 224, and CHEM 241 or CHEM 342.

BIO 481. Genomics (3, 3). 4 credits.
An advanced biology course designed for students to learn about the structure and function of genomes, to develop facility in web-based tools and resources, and to appreciate the power and limitations of current resources and knowledge. Focus is on the biological questions that genomics can help to answer. Laboratory exercises will be sequencing and analyzing genomic DNA. Prerequisite: BIO 224.

BIO 482. Human Histology (3, 3). 4 credits.
Microscopic structure of cells, tissues and major organs of the body. Basic anatomical and physiological function is presented to emphasize the histological significance of the examined organ systems. Prerequisite: BIO 270, BIO 290 or equivalent.

BIO 483. Bioinformatics (3, 3). 4 credits.
Focuses on building databases and computer programs to manage and analyze biological sequence data, and secondarily on theoretical aspects. The overall objective is to learn current information about the interaction of information science and biology, to develop facility in the many web-based tools and resources for further studies and research in genomics/bioinformatics, and to appreciate the power and limitations of current resources and knowledge. Prerequisite: BIO 224.

BIO 486. Systematics of Vascular Plants (2, 4). 4 credits.
Study of systematic theory and an overview of the classification and evolution of higher plants with particular attention to flowering plant families. Techniques for plant identification and collection and for construction of phylogenies will be taught in lab. Prerequisite: BIO 124 or permission of the instructor.

The interactions of organisms with their physical environment. Concepts from fluid and solid mechanics are applied to biological form and function. Prerequisite: BIO 114 or permission of the instructor.

BIO 492. Mentored Biology Course Assistant (0, 4). 1 credit.
Students are trained and participate in teaching undergraduate biology laboratories. Students must contact and make arrangements with the supervising instructor in the term prior to registration. May be repeated for a maximum of two credits when course content changes. Prerequisite: GPA of 2.5 or higher and permission of the instructor.

BIO 493. Pre-Veterinary Student Internship (0, 7). 2 credits.
Students are supervised by veterinarians and lab technicians in diagnostic lab activities at a regional animal health laboratory. A proposal and final presentation are required. Enrollment is limited to 1-2 individuals per term and students are advised to contact the Pre-Veterinary coordinator to be well prepared. Prerequisite: completion of BIO 224, GPA of 2.5 or higher and permission of the instructor.

BIO 494. Internship in Biology (0, 4-8). 1-2 credits.
Students participate in research or applied biology outside of this university. Students must contact and obtain approval of a supervising instructor at the off-campus location and with the department internship coordinator in the term prior to registration. A proposal must be approved by the department and a final paper or presentation will be completed. Prerequisites: Biology or biotechnology major with a minimum of eight biology credit hours and a GPA of 2.5 or greater.

BIO 495. Biotechniques (0, 4). 1 credit.
Students are trained in research theory and techniques. Students must contact and make arrangements with a supervising instructor in the term prior to registration. May be repeated for a maximum of two credits when course content changes. Prerequisite: GPA of 2.5 or greater.

BIO 496. Research Literature (0, 4). 1 credit.
Students pursue literature research in a selected area of biology. Students must contact and make arrangements with a supervising instructor in the term prior to registration. May be repeated for a maximum of 2 credits when course content changes. Prerequisite: GPA of 2.5 or greater.

BIO 497. Biological Research (0, 4-8). 1-2 credits.
Students pursue a lab or field research project in a selected area of biology. Students must contact and make arrangements with a supervising instructor in the term prior to registration and complete a 2-3 page proposal no later than five weeks after the start of the course. Course may be repeated. Prerequisite: GPA of 2.5 or greater.

BIO 499. Senior Project (0, 8). 2 credits.
Three semester courses taken as Parts A, B and C; 2 credits each. Expectations, requirements and prerequisites are defined in the department senior project policy. Students must contact and make arrangements with a supervising instructor in the term prior to registration.

Biotechnology

College of Science and Mathematics and College of Integrated Science and Technology

BIOT 260. Biotechnology Seminar. 1 credit.
An introduction to biotechnology. Topics will include research opportunities, careers and current topics in biotechnology. Not available for biology major or minor credit.

Business Analytics

College of Business

BSAN 391. Quantitative Business Modeling. 3 credits.
This course addresses a wide range of complex business problems through quantitative modeling and appropriate computer applications, especially spreadsheets. Approaches include optimization and sensitivity analysis, multi-objective decision making and risk analysis. Prerequisites: COB 291 or equivalent with a grade of “B-” or higher and junior or senior standing.

BSAN/CIS 392. Descriptive and Predictive Analytic Methods. 3 credits.
This course integrates advanced analytical methods from statistics and management science for enhanced understanding of business performance and improved predictive capabilities. The emphasis is on applying computer applications for statistical modeling and analysis of data from a variety of business processes to support managerial decision-making. Prerequisites: COB 291 or equivalent with a grade of “B-” or higher and junior or senior standing.

BSAN/CIS 393. Predictive Analytics and Data Mining. 3 credits.
This course focuses on quantitative techniques and computer applications that allow the extraction of useful, previously unrecognized information from large data sets for predictive purposes. Effectively sifting through databases such as those generated by many businesses, data mining allows the analyst to recognize potentially important patterns and to target business opportunities. Prerequisites: COB 291 or equivalent with a grade of “B-” or higher and junior or senior standing.

BSAN/CIS 490. Special Studies in Computer Information Systems or Business Analytics. 1-3 credits.
An advanced course in information and/or business analytics designed to give qualified students an opportunity to complete independent study under faculty supervision. Prerequisites: Senior standing, recommendation of the instructor and written approval of the department head prior to registration.

BSAN 498. Special Topics in Business Analytics. 3 credits.
An advanced course designed to allow exploration of current topics in business analytics. Course content will vary. See adviser for current content. Prerequisite: Permission of the instructor.

Business Law

College of Business

BLAW 314. Real Estate Law. 3 credits.
A study of the principles of law-governing interests in real estate including acquisition, encumbrance, transfer, rights and obligations of parties, and state and federal regulations thereof. Prerequisites: COB 218 and junior standing.

BLAW 470. Financial Products: Regulation and Protection. 3 credits.
An inquiry into the legal environment of the financial marketplace. Topics explored include the role of regulatory agencies, the design of contracts...
which minimize credit risk and maximize marketability, and methods of protecting the proprietary component of innovative financial products. Prerequisites: COB 218 and junior standing.

BLAW 494. White Collar Crime. 3 credits.
A study of white collar crime in America, a unique type of criminal activity that primarily affects businesses. The course explores the substance of white collar crime and focuses on the unique elements of various crimes through the study of actual cases. The course also examines how white collar crimes are prosecuted and defended in state and federal courts. Students are introduced to federal and state criminal procedure, substantive defenses, and the use of sentencing guidelines. Prerequisite: COB 300.

BLAW 495. Contract Law, Sales and Secured Transactions. 3 credits.
A study of the law of contracts, Article Two of the Uniform Commercial Code, product liability, legal liability of accountants, secured transactions and bankruptcy with emphasis on the role these play in professional and personal decision making. The courts, the legislature and the interaction of these two branches of government in responding to a changing society are studies throughout. Prerequisites: COB 218 and COB 300.

BLAW 496. The Law of Business Organizations, Negotiable Property Instruments and Property. 3 credits.
A study of Article Three of the Uniform Commercial Code, agency, partnerships, corporations, securities regulations, real property, trusts and decedents estates with emphasis on the role these play in professional and personal decision making. Prerequisites: COB 218 and COB 300 or permission of the instructor.

BLAW 497. Legal Aspects of International Business. 3 credits.
Survey of legal implications of international business dealings including foreign direct sales, distributorship arrangements, licensing of technology and legal aspects of the multi-national corporation. The foreign legal environment, relevant conventions and trade regulations, and the transnational reach of regulatory law will be considered. Prerequisites: COB 218 and senior standing.

BLAW 498. Special Topics in Business Law. 3 credits.
This course is designed to allow explorations of areas of current topics in business law. Course content will vary by semester and instructor. For current content, consult the adviser. Prerequisites: COB 300 and permission of the instructor.

Business and Marketing Education
College of Education

BMED 200. Introduction to Business and Marketing Education. 3 credits.
A general survey of business and marketing principles as they relate to preparation for teaching with emphasis on the history of business and marketing in America, the basic forms of business organizations, ownership, finance, management, taxes and wages, and labor relations.

BMED 230. Document Design and Production. 3 credits.
Experience in planning, designing and producing documents for the business office with focus on transferability of productivity among the genre of word processing software. Prerequisite: Keyboard in excess of 40 words per minute with at least 95 percent word accuracy without visual reference to the keyboard.

BMED 300. Data and Records Management. 3 credits.
Develops skills in managing the information of business by organizing data through the creation and use of computer spreadsheets and databases. Includes the management and organization of hard records.

BMED 376. Occupational Experience in Business. 3 credits.
Supervised internship providing business office experience for students seeking licensure as business education teachers in middle and secondary schools. A credit/no credit grade will be assigned. Prerequisite: Permission of the instructor.

BMED 377. Occupational Experience in Marketing. 3 credits.
Supervised internship providing marketing (retail, promotion, entertainment, merchandising, etc.) experience for students seeking licensure as marketing education teachers in middle and secondary schools. A credit/no credit grade will be assigned. Prerequisite: Permission of the instructor.

BMED 380. Demonstration Methods for Business and Marketing. 3 credits.
Development of an instructional model incorporating demonstrations and supervised walk-throughs in planning and directing the learning of computer-related and other complex business and marketing processes and procedures.

BMED 400. Business and Marketing Communications. 3 credits.
Develops skills in communicating effectively through formal and informal business reports, letters and memorandums. Emphasis on realistic problem solving involving collecting, organizing, analyzing, interpreting and presenting data. Prerequisites: GWRTC 103 and BMED 230 or equivalent.

BMED 430. Desktop Publishing Design and Production. 3 credits.
Experience in planning, designing and producing the publications of business and education with focus on transferability of functions among the genre of desktop publishing software.

BMED 490. Independent Study in Business and Marketing Education. 1-3 credits.
Provides opportunity to complete independent study or research on problems in business and marketing education. Prerequisite: Permission of the program coordinator.

Chemistry
Department of Chemistry and Biochemistry

CHEM 100. Chemistry Today. 3 credits.
Provides the background necessary to understand how chemistry affects our daily lives. An enriched overview of the fundamental principles of chemistry is followed by applications to topics of current interest. A high school science background is assumed. Not available for major or minor credit in chemistry.

*CHEM 120. Concepts of Chemistry. 3 credits.
A one-semester introduction to the fundamental principles, laws and applications of chemistry. Examples relating to the health sciences are emphasized. Not available for major or minor credit in chemistry.

CHEM 120L. Concepts of Chemistry Laboratory. 1 credit.
A one-semester introduction to laboratory work which illustrates the fundamental principles, laws and applications of chemistry discussed in CHEM 120. Experiments relating to the health sciences are emphasized. Prerequisite or corequisite: CHEM 120.

*CHEM 131. General Chemistry I. 3 credits.
The first of a two-course general chemistry sequence for science majors. It is designed to introduce students to basic chemical concepts including atomic structure, periodic properties of the elements, nomenclature, basic stoichiometry, theories related to reactivity and bonding, and the behavior of materials. Corequisite: CHEM 131L or CHEM 132L.

CHEM 132. General Chemistry II. 3 credits.
A course designed to examine the mechanisms by which chemists obtain information about reacting systems. Major concepts covered include: chemical reactivity, chemical equilibrium, electrochemistry, thermodynamics and kinetics. Prerequisites: Grades of “C” or higher in CHEM 131 and either CHEM 131L or CHEM 132L. Corequisite: CHEM 132L or 136L.

CHEM 131L*-132L. General Chemistry Laboratories. 1 credit each semester.
These laboratory courses are designed to complement and supplement the CHEM 131-132 lecture courses. Chemistry majors take CHEM 135L and 136L. Prerequisites for CHEM 135L: Grades of “C” or higher in CHEM 131 and either CHEM 131L or CHEM 132L.

CHEM 133E. General Chemistry for Engineers. 4 credits.
A calculus-based introduction to chemical concepts for engineering students designed to introduce students to basic chemical concepts including atomic structure, periodic properties of the elements, theories related to reactivity and bonding, the behavior or properties f the elements, theories related to activity and bonding, the behavior of materials, chemical reactivity, chemical equilibrium, electrochemistry, thermodynamics and kinetics. Familiarity with chemical stoichiometry and dimensional analysis is assumed.

CHEM 133ELE. General Chemistry for Engineers Laboratory. 1 credit.
A calculus-based introduction to chemical concepts for engineering students designed to introduce students to basic chemical concepts including atomic structure, periodic properties of the elements, theories related to reactivity and bonding, the behavior or properties f the elements, theories related to activity and bonding, the behavior of materials, chemical reactivity, chemical equilibrium, electrochemistry, thermodynamics and kinetics. Familiarity with chemical stoichiometry and dimensional analysis is assumed. Prerequisite or corequisite: CHEM 133E.

CHEM 135L. Special General Chemistry Laboratory. 1 credit.
An enriched laboratory course designed primarily for chemistry majors. Corequisite: CHEM 131.

CHEM 136L. Special General Chemistry Laboratory. 2 credits.
An enriched laboratory course that includes special topics and experiments not presented in the regular CHEM 132 laboratory. Prerequisites: Grades of “C” or higher in CHEM 131 and either CHEM 131L or 135L. Corequisite or prerequisite: CHEM 132.