MGT 120 Collaborative Management 3(2,2) Provides a model for successfully working with persons from the marketing, operations, accounting/finance, and engineering functions. Students operate on a cross-functional team and explore concepts and tasks associated with managing effectively for high performance. Preq: Pre-Business major, ECON 211, consent of the instructor.

MGT 218 Management Personal Computer Applications 3(0,6) Personal computer applications that support managers. Students learn from hands-on work rather than lecture. To be taken Pass/Fail only. Preq: CP SC 120 or consent of instructor.

MGT 301, H301 Principles of Management 3(3,0) Management's role as a factor of economic production. Functions of management, principles of organization, and behavior in organizations.

MGT 305 Economics of Transportation 3(3,0) Topics include history and structure of transportation systems in the United States, the nature of transportation costs and rates, transportation systems as factors in industrial location, transportation policy, and transportation's role in national security. Preq: Junior standing.

MGT (ECON) 306 Managerial Economics 3(3,0) See ECON 306.

MGT 307, H307 Personnel Management 3(3,0) Principles, concepts, and techniques concerned with effective and efficient utilization of personnel. Emphasizes motivation, leadership, and human behavior related to employer-employee relations. Topics include personnel recruitment, classification, selection, training, development, and performance evaluation. Preq: Junior standing; one of the following: MTH SC 203, 301, 302, EX ST 301.

MGT 310, H 310 Intermediate Business Statistics 3(3,0) Quantitative methods of the management scientist with applications to business and industrial problems. Topics include regression analysis, correlation analysis, analysis of variance, sampling, and nonparametric methods. Credit toward a degree will be given for only one of MGT 310 or EX ST 311. Preq: EX ST 301 or MTH SC 301.

MGT 312, H 312 Decision Models for Management 3(3,0) Exploration of ways in which management science decision models can help in making sound managerial decisions. Problem solving is Excel-based. Topics include linear programming, project scheduling, and simulation.

MGT (E E L E) 315 New Venture Creation II 3(3,0) Second of a two-part series examining entrepreneurship. Using opportunity analysis developed in MGT (E L E) 314, course focuses on designing and managing an organization capable of effectively pursuing the opportunity. Topics include organization strategy and design, start-up capital, operations and sourcing issues, leadership, team building, and management of rapid growth. Preq: MGT (E L E) 314.

MGT 317 Logistics Management 3(3,0) Management of physical distribution and supply systems with emphasis on design concepts, cost determinants, and control. Preq: Junior standing.

MGT 318 Management Information Systems 3(3,0) Introduction to information systems concepts and applications in business. Topics include software, hardware, decision support and knowledge-based systems, database, information systems design and implementation, and the management of information systems. Preq: MGT 218 or consent of instructor.

MGT 390 Operations Management 3(3,0) Examines the role of operations management in both manufacturing and service organizations. Discusses the concepts, tools, and techniques for managing the operations function. Topics include operations strategy, design, planning, and control. Preq: MTH SC 301 or equivalent.

MGT 400 Management of Organizational Behavior 3(3,0) Provides management students with a framework for understanding how behavior within business organizations is managed. Particular emphasis is on integrating management theory with recent developments in the behavioral sciences with distinct management applications. Theory, research, and business applications are considered. Preq: MGT 301 with a C or better.

MGT 402, H 402 Operations Planning and Control 3(3,0) Managing, planning, and controlling production and service operations with emphasis on demand forecasting, aggregate planning, production scheduling, and inventory management. Preq: MGT 310, 312, 390.

MGT 403 Special Problems 1-3(1-3,0) Planning, developing, and executing a research project related to the field of management and defense studies. May be repeated for a maximum of six credits. Preq: Senior standing in Industrial Management or Management, consent of instructor.

MGT 404 Advanced Statistical Quality Control 3(3,0) Statistical quality control techniques as applied to all areas of quality control: process control, process capability, acceptance sampling, and economic aspects of quality decisions. Preq: MGT 310, 390.

MGT 408 Design of Production Systems 3(3,0) Examines the design of systems for production and delivery of goods and services. Emphasizes the impact of alternative designs on the competitive posture of the firm. Discusses the concepts, tools, and techniques for designing facilities and jobs and systems for continuous performance improvement. Preq: MGT 310, 312, 390.

MGT 411 Project Management 3(3,0) Examination and application of the project management body of knowledge. This consists of theory, tools, and techniques to organize, plan, and control individuals, teams, quality, and operations while conducting a project. Preq: EX ST 301 or MTH SC 301 or equivalent.

MGT 414 Statistical Analysis 3(3,0) A application of statistics in management decision making. Emphasis is on the proper design, analysis, and interpretation of planned experiments. Topics include single factor through fractional factorial experiments. Preq: MGT 310 or equivalent.

MGT 415, H 415 Business Strategy 3(3,0) Capstone course for seniors. Various methods are used in analyzing complex business problems, requiring students to integrate their knowledge of all areas of business. Student participation and written and oral communications are stressed. Preq: FIN 306 or 311; MGT 301; MGT 311; Senior standing.

MGT 416 Management of Human Resources 3(3,0) Recent developments in the management of human resources with emphasis on results of research into the motivation, development of potential, and full utilization of the human resources. Preq: MGT 307 and 400 with a C or better; consent of instructor.

MGT 422 Small Business Management 3(3,0) Study of management of the small, independently owned and operated business. Emphasizes analyzing new business opportunities, planning and establishing a growing concern, and managing the contemporary small business. Field experience in consulting with small businesses enhances students' understanding of the unique opportunities and problems of small business organizations. Preq: MGT 301 or consent of instructor.

MGT 423 International Business Management 3(3,0) Survey of theoretical and institutional complexities of international business operations. Topics include exporting, importing, foreign investment, multinational corporations, and international payment system. Preq: Junior standing.

MGT 424 International Transportation and Logistics 3(3,0) Examination and analysis of international transportation systems and logistics support systems. Topics include ocean shipping, international air transportation, port management, and EEC and Soviet-block transport systems. International transport legislation and policies are also analyzed. Preq: Senior standing or consent of instructor.

MGT 425 Compensation Management 3(3,0) Examination of compensation employees seek in exchange for their efforts and contributions. Topics include government and union influences; job content analysis, description, and evaluation; developing pay structures; measuring and paying for performance; employee benefits; administration of the compensation plan; executive, managerial, professional, and sales. Preq: MGT 307, 400 with a C or better.

MGT 426 Industrial Traffic Management 3(3,0) Surveys the responsibilities and functions of industrial traffic management in manufacturing and distribution. Emphasizes the role of the industrial traffic manager in optimizing the logistics system of the firm (i.e., the materials management of its inbound supplies and the distribution of its finished products). Preq: MGT 305 or 317.
Courses of Instruction

MGT 427 Managing Continuous Improvement 3(3,0) Examination of issues related to continuous improvement, including a systematic approach to selecting improvement areas, determining how to improve, plan, and manage the improvement process. Topics include selecting performance measurements, using teams to achieve breakthrough change, identifying root causes of problems, and developing and implementing solutions to problems. Preq: MGT 390 or consent of instructor.

MGT 430 Senior Seminar in Management 3(3,0) In-depth study of current business topics; allows senior Management students to relate their academic studies to real-world problems. Senior paper is required. Preq: Senior standing.

MGT 431 Employee Diversity, Rights, and Responsibilities 3(3,0) Focuses on employee and organizational rights and responsibilities. Topics include various types of discrimination (race, sex, religious, national origin, age, and disability status); drug and alcohol testing; AID's in the workplace; employee discipline and termination issues; privacy and safety concerns; and union organizing campaigns. Preq: MGT 307, 400 with a C or better.

MGT 435 Personnel Interviewing 3(3,0) Helps senior Management students to relate their academic studies to real-world problems. Senior paper is required. Preq: MGT 390 or consent of instructor.

MGT 454 Systems Implementation 3(3,0) In-depth study of the use of computer technology to automate, help manage, and improve, plan, and manage the improvement of an organization. Emphasis is on the application of these technologies to business outcomes. Preq: Junior standing.

MGT 455 Decision Support Systems 3(3,0) In-depth study of the use of computer technology to automate, help manage, and improve, plan, and manage the improvement of an organization. Emphasis is on the application of these technologies to business outcomes. Preq: Junior standing.

MGT 460 Selected Topics in Industrial Management 3(3,0) In-depth examination of advanced topics in Industrial Management. Topics may vary in keeping with developments in the management profession and interests of faculty. Emphasis is on the application of these topics to the production and operations management environment. Preq: MGT 402 or 404 or 408.

MKT 301, 401 Principles of Marketing 3(3,0) Principles and concepts involved in planning, pricing, promoting, and distributing goods and services. Preq: ECN 200 or 211 or 212; 45 credit hours completed.

MKT 302 Consumer Behavior 3(3,0) Examination of selected individual and group behavioral science concepts and their application to the understanding of consumer decision making. Preq: MKT 301.

MKT (E L E) 314 New Venture Creation I 3(3,0) First in a two-part series with MGT (E L E) 315 assessing entrepreneurial opportunities. Focuses on creativity, idea generation, market opportunity analysis, strategy, and methods of entry. Opportunity analysis may be developed into a full new venture plan in MGT (E L E) 315. Preq: Junior standing.

MKT 321 Sports Marketing 3(3,0) Exploration of the essentials of effective sports marketing. Topics include the use of computer technology to automate, help manage, and improve, plan, and manage the improvement of an organization. Emphasis is on the application of these technologies to business outcomes. Preq: MGT 301 or consent of instructor.

MKT 399 Marketing Internship 3(0,9) Pre-approved, pre-approved, faculty-supervised marketing internships. Credit will only be given for internships of at least ten full-time, consecutive weeks with the same internship provider. Restricted to students with a major in Marketing. To be taken Pass/Fail only. Preq: MGT 301 and consent of instructor.

MKT 420 Professional Selling 3(3,0) Current theories about the selling of goods and services to organizational buyers in the context of long-term relationships. Role playing, video-taped presentations, and other techniques are generally employed to enhance interpersonal communication skills. Preq: Junior standing, MKT 301.

MKT 423, 623 Promotional Strategy 3(3,0) Emphasizes promotion as the communication function of marketing. A tention is given to communication theory and promotion's relation to mass and interpersonal communication. Factors affecting promotional decision-making processes are explored, and promotion as a competitive tool is examined. Preq: MKT 301 or consent of instructor.

MKT 424 Sales Management 3(3,0) Comprehensive examination of the planning, implementation, and control of professional sales organizations. Preq: MKT 301 or consent of instructor.

MKT 425 Retail Management 3(3,0) Retailing is studied from a decision-making approach. Topics include target market analysis, location analysis, merchandising, human resources, pricing and promotion. Preq: MKT 301 or consent of instructor.

MKT 426 Business-to-Business Marketing 3(3,0) Study and analysis of the unique aspects of marketing goods and services to organizational buyers rather than household consumers. Emphasis is on developing strategic responses to market opportunities given competitive behavior. Preq: MKT 301 or consent of instructor.

MKT 427, 627 International Marketing 3(3,0) Study of marketing from the international point of view. Emphasis is on the necessary modification of marketing thinking and practice for foreign markets due to individual environmental differences. Preq: MKT 301.

MKT 428, 628 Services Marketing 3(3,0) Exploration and study of the nature of service organizations and the principles which guide the marketing of their products. Emphasis is on a marketing mix that is fundamentally different than that found in traditional goods marketing. Preq: MKT 301 or consent of instructor.

MKT 429, 629 Public and Nonprofit Marketing 3(3,0) Examine the role and application of marketing in public and nonprofit settings. Focuses on a conceptual understanding of the marketing discipline and marketing processes and shows how basic concepts and principles of marketing are applicable to public and nonprofit organizations. Preq: MKT 301 or consent of instructor.

MKT 430, 630 Marketing Product Management 3(3,0) Management of the firm's product or service offerings. Topics include new product screening, evaluation, and development; product line and mix analysis, abandonment decisions, brand manager's role, new product development department, and others. Emphasis is on decision-making. Preq: MGT 310, MKT 301; or consent of instructor.

MKT 431, 631 Marketing Research 3(3,0) Research used in marketing decision making. Primary emphasis is on methods and techniques used in planning, collection, processing, and utilization of information. Topics include research design, sources of information, questionnaire design, sampling, data collection, and data analysis. Preq: MGT 310, MKT 301, MTH SC 301; or consent of instructor.
MKT 433 Sport Marketing Strategy 3(3,0) Provides students with basic knowledge about brand management as it applies to sport.Addresses basic principles and guiding precepts of how sport-based organizations build strong brands. Preq: MKT 321 or consent of instructor.

MKT 434 Sport Promotion 3(3,0) Emphasizes the promotional function of sport. Topics include event sponsorship, developing media relationships, endorsements, promotion objective setting and budgeting, media planning and scheduling, and utilizing the tools of promotion within a sport context. Integrated Marketing Communication provides the theoretical and managerial framework for how these factors are utilized optimally. Preq: MKT 321, 423.

MKT 435 International Sport Marketing 3(3,0) Provides working knowledge of international sport marketing. Consists of lecture and site visits. Topics include brief history of sport, sport marketing basics, building sport brands, sport strategies, and issues facing the new sporting goods industry. Preq: MKT 301.

MKT 450 Strategic Marketing Management 3(3,0) A principal of marketing constructs in the analysis and solution of marketing problems. Emphasis is placed on information systems, data analysis, and critical-thinking skills in solving marketing problems in a wide range of managerial decision areas including, but not limited to, new product development, pricing, advertising, personal selling, channels, and international marketing. Preq: MKT 301, six hours of 400-level marketing courses.

MKT 495, 695 Selected Topics 3(3,0) In-depth examination of timely topics in marketing. May be repeated for credit, but only if different topics are covered. Preq: MKT 301 or consent of instructor.

MKT 499 Independent Study 1-3(1-3,0) Directed readings or independent research in selected marketing areas. Topics must be selected and proposed by student. Proposals must be approved by instructor. May be repeated for a maximum of three credits. Preq: MKT 301 and consent of instructor.

MATERIALS SCIENCE AND ENGINEERING

MSE 450 Materials Science and Engineering Portfolio 2(2,0) Students working in groups present and discuss practical, ethical, safety, and business topics in the polymer and textile industries. Students are required to complete their electronic portfolios. To be taken Pass/Fail only.

MATHEMATICAL SCIENCES


MTHSC 101 Essential Mathematics for the Informed Society 3(3,0) Topics include logic and computers, probability and statistics, and financial mathematics. Specific topics include Boolean algebra, digital data formats, randomness, graphical representation of data, inference and estimation, interest, annuities, and amortization. Not open to students who have received credit for MTHSC 203, 301, 302, 309, or EX ST 301. Preq: Satisfactory score on the Clemson Mathematical Placement Test or consent of department.

MTHSC 102 Introduction to Mathematical Analysis 3(3,0) Intuitive approach to the concepts and applications of calculus. Topics include functions and graphing, differentiation, and integration. Applications from social, biological, and management sciences are presented. Not open to students who have received credit for MTHSC 106. Preq: Satisfactory score on the Clemson Mathematics Placement Test or consent of department.

MTHSC 103 Elementary Functions 3(3,1) Gateway course for MTHSC 106. Comprehensive treatment of functions and analytic geometry with applications including polynomial, rational, algebraic, exponential, logarithmic, and trigonometric functions. Not open to students who have received credit for MTHSC 106. Preq: Satisfactory score on the Clemson Mathematics Placement Test or consent of department.

MTHSC 104 College Algebra 3(3,1) Basic course to prepare students for subsequent courses in probability, mathematical analysis, elementary statistics, and elementary functions (precalculus). Fundamental concepts of algebra, equations, inequalities, functions, and graphs are studied. Students who have received credit for any other mathematical sciences course will not be allowed to enroll in or receive credit for MTHSC 104.

MTHSC 105 Precalculus 5(5,1) Extensive treatment of topics chosen to prepare students for the study of calculus. Special emphasis is given to polynomial, rational, exponential, logarithmic, and trigonometric functions and their graphs, as well as basic and analytic trigonometry. Students who have received credit for any other mathematical sciences course will not be allowed to enroll in or receive credit for MTHSC 105.

MTHSC 106, H 106 Calculus of One Variable I 4(4,0) Topics include analytic geometry, introduction to derivatives, computation and application of derivatives, integrals, exponential and logarithmic functions. Preq: MTHSC 103 or 105 or satisfactory score on the Clemson Mathematics Placement Test or consent of department.

MTHSC 107 Co-Calcus I 1(0,2) Recitation style course to accompany MTHSC 106. Reinforces precalculus and calculus topics covered in MTHSC 106 and provides additional instruction and practice for students. Required of students identified by the Clemson Mathematics Placement Test as being conditionally qualified for placement in calculus with supplemental instruction. To be taken Pass/Fail only. Preq: Concurrent enrollment in MTHSC 106.

MTHSC 108, H 108 Calculus of One Variable II 4(4,0) Topics include transcendental functions, applications of integration, integration techniques, indeterminate forms, improper integrals, parametric equations, polar coordinates, and infinite series. Preq: MTHSC 106.

MTHSC 109 Co-Calcus II 1(0,2) Recitation style course to accompany MTHSC 108. Reinforces precalculus and calculus topics covered in MTHSC 108 and provides additional instruction and practice. Recommendations are made to students based on their scores on a Calculus Basic Skills Quiz, given at the beginning of each semester. Preq: Concurrent enrollment in MTHSC 108.

MTHSC 115 Contemporary Mathematics for Elementary School Teachers I 3(3,0) Cooperative learning groups, manipulatives, and concrete models are used to demonstrate logical reasoning, problem-solving strategies, sets and their operations, numeration systems, properties and operations of whole numbers, number theory, prime and composite numbers, divisibility, common factors and multiples. Open to Elementary, Early Childhood, and Special Education majors only. Preq: MTHSC 104 or satisfactory score on the Clemson Mathematics Placement Test.

MTHSC 116 Contemporary Mathematics for Elementary School Teachers II 3(3,0) Continuation of MTHSC 115. Manipulatives and concrete models are used for properties, operations, and problem solving for integers, elementary fractions, rational numbers, and real numbers. Selected topics in statistics and probability are introduced with a hands-on approach to learning. Restricted to Elementary, Early Childhood, and Special Education majors. Preq: MTHSC 115 or consent of instructor.
Courses of Instruction

MTHSC 117 Mathematics for Elementary School Teachers I 4(4,0) Problem-solving strategies, logic, algebraic thinking, sets, relations, functions, numeration systems, whole numbers, integers, number theory, fractions, decimals, applications of percent, real numbers with their computational algorithms and properties are explored. Content, according to state standards, is taught with appropriate methodology for teaching K–8. Open to Elementary, Early Childhood, and Special Education majors only. Prereq: Satisfactory score on the Clemson Mathematics Placement Test or MTHSC 104.

MTHSC 118 Mathematics for Elementary School Teachers II 4(4,0) Two- and three-dimensional geometry including polygons, polyhedra, and their properties; congruence, similarity, construction, coordinate plane; standard measurement, area, surface area, volume; transformations, symmetries, and simple probability and descriptive statistics are explored. Content, according to state standards, is taught with appropriate methodology for teaching K–8. Open to Elementary, Early Childhood, and Special Education majors only. Prereq: MTHSC 117 or consent of instructor.

MTHSC 119 Introduction to Discrete Methods 3(3,0) Topics normally include elementary logic and methods of proof, sets, functions, and relations; graphs and trees; combinational circuits and Boolean Algebra. Prereq: Satisfactory score on the Clemson Mathematics Placement Test or consent of department.

MTHSC 120 Problem Solving in Discrete Mathematics 3(2,2) Problem-solving approach to learning mathematics is applied to topics in modern discrete mathematics. Typical selection of topics includes logic and proof, sets, relations, functions, mathematical induction, graphs and trees, counting techniques, recurrence equations. For Bachelor of Science and Bachelor of Arts majors in Mathematical Sciences only. Credit may not be received for both MTHSC 119 and 120. Prereq: MTHSC 106.

MTHSC 199 Problem Solving in Mathematics 3(2,2) Functions and graphs, mathematical modeling, and applications. Applications from management and life and social sciences are presented. Specific topics include linear, quadratic, polynomial, exponential, and logarithmic functions with emphasis on problem solving. Students who have received credit for any other mathematical sciences course will not be allowed to enroll in or receive credit for MTHSC 199. To be taken Pass/Fail only.

MTHSC 203 Elementary Statistical Inference 3(3,0) Data-based course in statistical methodology; collecting and summarizing data, the normal distribution, one and two sample inference on means and proportions, simple linear regression, analysis of categorical data. May not be taken for credit by students who have passed MTHSC 301, 302, 309, or EX ST 301. Prereq: Satisfactory score on the Clemson Mathematics Placement Test or MTHSC 101 or consent of department.

MTHSC 204, H204 Calculus of Several Variables 4(4,0) Topics include real valued functions of several variables, multiple integration, differential calculus of functions of several variables, vector field theory. Prereq: MTHSC 108.

MTHSC 207 Multivariable Calculus 3(3,0) Introduction to the calculus of several variables, differential calculus and optimization of several variables, multiple integrals. Topics from the management sciences are used to illustrate the above concepts. May not be taken by students who have passed MTHSC 206. Prereq: MTHSC 102, or 106 with consent of instructor.

MTHSC 208, H208 Introduction to Ordinary Differential Equations 4(4,0) Introduction to the study of differential equations and their application to physical problems. Topics include exact, series, and numerical solutions; solutions by means of Laplace transforms; and solutions of systems of differential equations. Prereq: MTHSC 206.

MTHSC 210 Applied Matrix Algebra 3(3,0) Introduction to the basic principles of matrix algebra with applications to the behavioral and managerial sciences. Major areas of application include linear programming, directed graphs, and game theory. Prereq: MTHSC 101 and 102 or 106.

MTHSC 216 Geometry for Elementary School Teachers 3(3,0) Informal treatment of the basic concepts of geometry. Open to Elementary, Early Childhood, and Special Education majors only. Prereq: MTHSC 116 or consent of instructor.

MTHSC 231 Mathematics of Life Insurance 3(3,0) Introduction to basic mathematics of finance and life insurance. Topics include compound interest, annuities certain, mortality tables, life annuities, net premiums, net level reserves, modified reserves, nonforfeiture values, and dividends.

MTHSC 250 Introduction to Mathematical Sciences I 1(1,0) Introduction to areas of study, degree options, career choices, and professional development in mathematical sciences. Includes guidelines and requirements for portfolio development and an introduction to ethical issues.

MTHSC 300, H300 Statistical Methods I 3(3,0) Principal topics include sampling distributions, point and interval estimation, maximum likelihood estimators, method of moments, least squares estimators, tests of hypotheses, likelihood ratio methods, regression and correlation analysis, introduction to analysis of variance. Prereq: MTHSC 106 or equivalent.

MTHSC 301, H301 Statistical Methods II 3(3,0) Prerequisite: MTHSC 300. Regression and time series. Approaches to empirical model building and data analysis are treated. Credit toward a degree will be given for only one of EX ST 301, MTHSC 301, 302, 309. Prereq: MTHSC 206 or 207 or 210.

MTHSC 302 Statistics for Science and Engineering 3(3,0) M theory and testing. Credit toward a degree will be given for only one of EX ST 301, MTHSC 301, 302, 309. Prereq: MTHSC 106 or 207 or 210.

MTHSC 303, H303 Linear Algebra 3(3,0) Introduction to the algebra of matrices, vector spaces, polynomials, and linear transformations. Prereq: MTHSC 108 or consent of instructor.

MTHSC 304, H304, 604 Theory of Probability 3(3,0) Principal topics include combinatorial theory, probability axioms, random variables, expected values; special discrete and continuous distributions, jointly distributed random variables, correlation, conditional expectation, law of large numbers, central limit theorem. Prereq: MTHSC 206 or consent of instructor.

MTHSC 305, H305, 605 Statistical Theory and Methods II 3(3,0) Prerequisite: MTHSC 304. Probability-based treatment of sampling distributions, point and interval estimation, maximum likelihood estimators, method of moments, lead squares estimators, tests of hypotheses, likelihood ratio methods, regression and correlation analysis, introduction to analysis of variance. Prereq: MTHSC 106 or equivalent.

MTHSC 306, H306, 606 Sampling Theory and Methods I 3(3,0) Probability-based treatment of sampling methodology. Theory and application of estimation techniques are treated using simple and stratified random sampling, cluster sampling, and systematic sampling. Prereq: MTHSC 302 and 400, or consent of instructor.

MTHSC 307, H307 Regression and Time Series Analysis 3(3,0) Theory and application of the regression and time series. Approaches to empirical model building and data analysis are treated. Credit toward a degree will be given for only one of EX ST 301, MTHSC 301, 302, 309. Prereq: MTHSC 206 or 207 or 210.

MTHSC 308 College Geometry 3(3,0) Theorems and concepts more advanced than those of high school geometry. Treatment of the various properties of the triangle, including the notable points, lines, and circles associated with it. Prereq: MTHSC 106.
MTHSC 408, 608 Topics in Geometry 3(3,0)
Introduction to topics in special geometries which include non-Euclidean space concepts such as projective geometry, finite geometries, and intuitive elementary topology. Brief introduction to vector geometry. Preq: MTHSC 206.

MTHSC 410 Number Theory 3(3,0)
Introduction to theory of integers and related number systems. Topics include historical development, principle of mathematical induction, divisibility, primes, congruences, number-theoretic functions, primitive roots, quadratic residues, and diophantine equations. Preq: MTHSC 108 or consent of instructor.

MTHSC 412, H 412, 612 Introduction to Modern Algebra 3(3,0)
Introduction to the concepts of sets, functions, binary relations, graphs, Boolean algebras, propositional logic, semigroups, groups, homomorphisms, and permutation groups to computer characterizations and design, words over a finite alphabet and concatenation, binary group codes, and other communication or computer problems. Preq: MTHSC 311.

MTHSC 411, H 411, 611 Discrete Mathematical Structures I 3(3,0)
Aplie destructive concepts of sets, functions, binary relations, graphs, Boolean algebras, propositional logic, semigroups, groups, homomorphisms, and permutation groups to computer characterizations and design, words over a finite alphabet and concatenation, binary group codes, and other communication or computer problems. Preq: MTHSC 311 or consent of instructor.

MTHSC 413 Theory of Interest 3(3,0)
Comprehensive treatment of the theory of interest including from a calculus-based continuous viewpoint. Topics include simple and compound interest, discount, nominal and effective rates, force of interest, basic and general annuities, yield rates, amortization and sinking funds, and applications to bonds, mortgages, and other securities. Preq: MTHSC 206.

MTHSC 414 Axiomatic Set Theory II 1(1,0)
Problem-solving seminar designed to prepare students for the examination on the Society of Actuaries' and Casualty Actuarial Society's Course 1 (Mathematical Foundations of Actuarial Science). Preq: MTHSC 412 or consent of instructor.

MTHSC 415 Axiomatic Set Theory I 1(1,0)
Problem-solving seminar designed to prepare students for the examination on the Society of Actuaries' and Casualty Actuarial Society's Course 1 (Mathematical Foundations of Actuarial Science). Preq: MTHSC 412 or consent of instructor.

MTHSC 416, H 416, 616 Complex Variables 3(3,0)

MTHSC 421, H 421, 621 Introduction to Stochastic Processes 3(3,0)
Introduction to stochastic processes, finite-state Markov chains, queuing, dynamic programming, Markov decision processes, reliability, decision analysis and simulation. Both theory and applications are stressed. Preq: MTHSC 400.

MTHSC 422, H 422 Undergraduate Research Seminar 3(3,0)
Independent study designed to prepare students for the examination on the Society of Actuaries' and Casualty Actuarial Society's Course 1 (Mathematical Foundations of Actuarial Science). Preq: MTHSC 412 or consent of instructor.

MTHSC 423, H 423, 623 Advanced Calculus I 3(3,0)
Introduction to the concepts of sets, functions, binary relations, graphs, Boolean algebras, propositional logic, semigroups, groups, homomorphisms, and permutation groups to computer characterizations and design, words over a finite alphabet and concatenation, binary group codes, and other communication or computer problems. Preq: MTHSC 311.

MTHSC 424, H 424, 624 Advanced Calculus II 3(3,0)
Continuation of MTHSC 423. Transformations, multivariable integrals, line and surface integrals, infinite sequences and series, and improper integrals. Preq: MTHSC 423.

MTHSC 430 Axiomatic Set Theory Seminar II 1(1,0)
Problem-solving seminar designed to prepare students for the examination on the Society of Actuaries' and Casualty Actuarial Society's Course 1 (Mathematical Foundations of Actuarial Science). Preq: MTHSC 412 or consent of instructor.
M E 301 Materials for Mechanical Engineering Applications 3(3,0) Properties and selection of materials of interest to mechanical engineers. Emphasis is on the interrelations between the microstructure, processing, and properties of materials. Preq: CH 102, M E 302 (or concurrent enrollment).  
M E 302, H 302 Mechanics of Materials 3(3,0) Relationships between external loads on solid bodies or members and the resulting internal effects and dimension changes, including the derivation of rational formulas for stresses and deformations and the identification and use of important mechanical properties of engineering materials. Preq: E M 201, M T H S C 206.  
M E 303 Thermodynamics 3(3,0) Study of the second law and entropy; applications to fixed mass systems and control volumes; vapor and gas power cycles; mixtures of gases; vapor psychrometrics; combustion and the third law. Thermomechanical equilibrium. Preq: M E 203.  
M E 304 Heat Transfer 3(3,0) Steady and transient heat conduction, free and forced convection, radiation, and multi-mode heat transfer. Emphasis is on analytical and numerical solutions to engineering heat transfer problems with a design orientation. Preq: M E 203, 308.  
M E 305 Modeling and Analysis of Dynamic Systems 3(3,0) Techniques for developing and analyzing physical and mathematical models of mechanical and electromechanical systems are presented. Transient and frequency response are determined using analytical and numerical methods. Basic feedback systems are introduced. Preq: E C E 307, E M 202, M E 205, M T H S C 208.  
M E 306 Fundamentals of Machine Design 3(3,0) Introduction to failure theory, fatigue analysis, and energy methods for deflection analysis. Integration of these topics with selected portions of mechanics of materials and application of them to the design and analysis of machine elements. Preq: M E 302.  
M E 308 Fluid Mechanics 3(3,0) Behavior of fluids at rest or in motion, including the study of fluid properties. Emphasis is on a rational, analytical approach from which are developed basic principles of broad applicability to all fields of engineering. Preq: E M 202, M E 303 (or concurrent enrollment).  
M E 310 Thermodynamics and Heat Transfer 3(3,0) Introduction to thermodynamics and heat transfer for nonmajors: properties of liquids and gases, first and second law analysis, introduction to cycles for power and refrigeration, heat flow by conduction and radiation, and convective heat flow and heat exchangers. Preq: Junior standing in an engineering curriculum.  
M E 312 Manufacturing Processes and Their Application 3(3,0) Fundamental principles associated with production processes and their application to the manufacture of products from metals, polymers, ceramics, and composites. Emphasizes the physical and quantitative aspects of processing, the selection of processes to create products, and the identification processes used to manufacture existing products. Preq: M E 301, 303, 304, 305, 306, 444.  
M E 401 Manufacturing Processes and Their Application 3(3,0) Fundamental principles associated with production processes and their application to the manufacture of products from metals, polymers, ceramics, and composites. Emphasizes the physical and quantitative aspects of processing, the selection of processes to create products, and the identification processes used to manufacture existing products. Preq: M E 301, 303, 304, 305, 306, 444.  
M E 405 Kinematics and Dynamics of Machinery 3(3,0) Graphical, analytical, and numerical techniques are used in the dynamic analysis and synthesis of machines. Emphasis is on the application of these analysis techniques to planar linkages. Preq: E M 202, 304, M E 205.  
M E 407, 607 A Applied Heat Transfer 3(3,0) Application oriented extension of M E 304, considering topics in transient conduction, flow of fluids, energy exchange by radiation, and mass transfer. A applications in heat-exchanger design with emphasis on economics and variation of operating conditions from the design point. Preq: M E 304, consent of instructor.  
M E 414, H 415 Undergraduate Research 1-3 Individual research projects conducted under the direct supervision and guidance of a faculty member. May be repeated for a maximum of six credits. Preq: Consent of instructor.  
M E 416, 616 Control of Mechanical Systems 3(3,0) Physical modeling and feedback principles are presented for control of mechanical systems. Transient response, root locus, and frequency response principles are applied to the control of basic mechanical systems such as electric motors, fluid tanks, or thermal processes. PID control laws are emphasized. Preq: M E 305.  
M E 417, 617 Mechatronics System Design 3(3,0) Mechatronics integrates control, sensors, actuators, and computers to create a variety of electromechanical products. Includes concepts of design, appropriate dynamic system modeling, analysis, sensors, actuating devices, and real-time microprocessor interfacing and control. Case studies, simulation, and projects are used to exemplify the system design principles. Preq: M E 305 or consent of instructor.  
M E 418 Finite Element Analysis in Mechanical Engineering Design 3(2,3) Introduction to the finite element method, solid modeling, finite element modeling and analysis using commercial codes, analysis strategies using finite elements: applications to heat transfer, fluid flow, and structures. Preq: M E 205, 302, 304, 308, or consent of instructor.  
M E 420, 620 Energy Sources and Their Utilization 3(3,0) Covers availability and use of energy sources such as fossil fuels, solar (direct and indirect), and nuclear; addresses energy density and constraints to use (technical and economic) for each source. Preq: M E 303, 304.  
M E 421, 621 Introduction to Compressible Flow 3(3,0) Introductory concepts to compressible flow; methods of treating one-dimensional gas dynamics including flow in nozzle and diffusers, normal shocks, moving and oblique shocks, Prandtl-Meyer flow, Fanno Flow, Rayleigh Flow, and reaction propulsion systems. Preq: M E 303, 308.  
M E 422, 622 Design of Gas Turbines 3(3,0) Guiding principles in gas turbine cycles are reviewed. Turbine and compressor design procedures and performance prediction for both axial and radial flow machines are presented. Methods of design of rotary heat-exchangers and retrofitting gas turbine for regenerative operation are presented. Design projects are used to illustrate the procedures. Preq: M E 308.
M E 444 Mechanical Engineering Laboratory III 2(1,3) Continuation of M E 322. Mecchanical engineering principles and phenomena are reinforced through student-conducted experiments. Presentation of fundamentals of instrumentation, calibration techniques, data analysis, and report writing in the context of laboratory experiments. Preq: M E 301 (or concurrent enrollment), 304 (or concurrent enrollment), 305 (or concurrent enrollment), 306 (or concurrent enrollment). M E 333, MTHSC 302 or EX ST 411.

M E 450, 650 Mechanical Vibrations 3(3,0) Mecchanical analysis of physical problems in the vibration of mechanical systems. Topics include linear-free vibrations, forced vibrations, and damping in single degree of freedom systems, transient vibrations, critical speeds and whirling of rotating shafts, dynamic balancing, and multiple degrees of freedom systems with lumped parameters. Preq: E M 302, E M 302, MTHSC 208. M E 453, 653 Dynamic Performance of Vehicles 3(3,0) Introduces techniques for analyzing the dynamic behavior of vehicles. Types of vehicles to be considered are chosen from aircraft, surface ships, automobiles and trucks, railway vehicles, and magnetically levitated vehicles. Preq: M E 205, 305, or consent of instructor. M E 454, 654 Design of Machine Elements 3(3,0) Design of common machine elements including clutches, brakes, bearings, springs, and gears. Optimization techniques and numerical methods are employed as appropriate. Preq: M E 306 or consent of instructor. M E 455, 655 Design for Computer-Automated Manufacturing 3(3,0) Concepts of product and process design for automated manufacturing are considered. Topics include product design for automated manufacturing, inspection and assembly, using automation, industrial robots, knowledge-based systems and concepts of flexible product manufacture. Preq: M E 301, 306, 404 (or concurrent enrollment), or consent of instructor.

M E (E C E) 456, 656 Fundamentals of Robotics 3(3,0) Introduction to the fundamental mechanics and control of robots, including their application to automated automation. Topics include robot geometry, kinematics, dynamics, and control. Planar machine structures are emphasized, including methods using computer analysis. A application considerations include the design and operation of robot systems for manufacturing and telerobotics. Preq: M E 305, 416 (or concurrent enrollment), or consent of instructor.

M E 471, 671 Computer-Aided Engineering Analysis and Design 3(3,0) Students are exposed to geometric and solid modeling, finite elements, optimization, and rapid prototyping. Students design an artifact, represent it on the computer, analyze it using FEA, then optimize before prototyping it. Emphasizes the use of computer-based tools for engineering design. The World Wide Web is used for reporting. Preq: Numerical methods and programming experience or consent of instructor. M E 493, 693 Selected Topics in Mechanical Engineering 1-6(1-6,0) Study of topics not found in other courses. May be repeated for a maximum of six credits, but only if different topics are covered. Preq: Consent of instructor.

MICROBIOLOGY


M ICRO 101 Microbes and Human Affairs 1(1,0) Introduces microbiology majors to University of Southern California courses. Preq: Consent of instructor. M ICRO 205 Introductory Microbiology 4(3,3) Basic concepts of microbiology, introduced through classroom and laboratory experiences. Emphasis is placed upon practical applications in various areas of microbiology. Preq: Consent of instructor. M ICRO 305 General Microbiology 4(3,3) Morphology, physiology, classification, distribution, and cultivation of microorganisms. Preq: Introductory biology, CH 101, 102. M ICRO 400, 600 Public Health Microbiology 3(3,0) Epidemiology of transmissible diseases including pathogenic characteristics of the infectious organism, modes of transmission, mechanism of infection, diagnostic aids, effective treatments, immunization procedures, and methods of preventing infection. Preq: M ICRO 305. M ICRO 401, H 401, 601 Microbial Diversity and Ecology 4(2,6) In-depth survey of microbial morphology, ecology, and diversity. Study of the interaction and adaptation of microbes in a wide range of environmental conditions, including consideration of their metabolism, nutrition, growth and the use of microbiological assays. Preq: CH 201 or 223, 227, M ICRO 305. M ICRO 403, 603 Marine Microbiology 3(2,3) Discussion of the microbes that inhabit the marine environment, their peculiar physiological traits, and contributions to the ecology of oceans. Preq: M ICRO 305, organic chemistry. M ICRO 407, H 407, 607 Food and Dairy Microbiology 4(3,3) Physical-chemical factors limiting survival and growth of microorganisms during processing and manufacturing of food and dairy products. Standard methods for enumerating and identifying indicator bacteria, yeasts, molds, and microbes producing food and foodborne illness. Starter cultures, fungal toxins, microbial cell injury and standards for food and dairy products. Preq: BIOCH 305 or CH 201 or 223, M ICRO 305. M ICRO 410, H 410, 610 Soil Microbiology 3(2,3) Role of microorganisms in the decomposition of organic substances, transformation of nitrogen and mineral substances in the soil; interrelationships between higher plants and microorganisms; importance of microorganisms in soil fertility. Preq: M ICRO 305. M ICRO 411, H 411, 611 Pathogenic Bacteriology 4(3,3) Study of pathogenic bacteria, their morphology, cultural requirements and classification; diagnostic tests, methods of differentiation, and the diseases caused. Preq: M ICRO 305.
MICRO 412, H 412, 612 Bacterial Physiology 4(3,3) Consideration of the cytolgy, physiology, metabolism, and genetics of bacteria. Includes studies of growth and death, reproduction and mutation, nutrition and metabolic pathways, regulatory mechanisms, and effects of environment. Prereq: CH 224, MICRO 305, one semester of biochemistry, or consent of instructor.

MICRO 413, H 413, 613 Industrial Microbiology 3(2,3) Microbial aspects of large-scale processes for the production of foods, antibiotics, enzymes, fine chemicals, and beverages. Topics include strain selection, culture maintenance, biosynthetic pathways, continuous cultivation and production of single cell protein. Prereq: MICRO 305.

MICRO (AVS, BIOSC) 414, H 414, 614 Basic Immunology 4(3,3) Consideration of the nature, production, and function of basic immune responses in animals. Procedures and mechanisms of antigen-antibody and other immune reactions. Prereq: MICRO 305, organic chemistry.

MICRO 415, H 415, 615 Microbial Genetics 4(3,3) Cytological basis of bacterial, fungal, and viral genetics; molecular aspects; mutations; mechanisms of genetic transfers; episomes and plasmids; and population changes. Prereq: BIOCH 301, CH 224, MICRO 305, or consent of instructor.

MICRO 416, H 416, 616 Introductory Virology 3(3,0) Introduction to the field of virology, including animal, bacterial, and plant viruses. Topics include nomenclature and classification, biochemical and biophysical characteristics, mechanisms of replication, chemotherapy, and techniques for isolation, assay, and purification. Prereq: BIOCH 301, MICRO 305, or consent of instructor.

MICRO 417, H 417, 617 Molecular Mechanisms of Carcinogenesis and Aging 3(3,0) Changes which occur at the cellular and subcellular levels during transformation and aging. A cumulated damage and “intrinsic clock” theories of aging; genetic and epigenetic theories of carcinogenesis; epidemiology of cancer; viral, radiation-induced, and chemical carcinogenesis; the immune system and cancer. Prereq: BIOCH 301, MICRO 305, or consent of instructor.

MICRO (BIOSC, GEN) 418, 618 Biotechnology I: Nucleic Acids Techniques 4(2,4) See GEN 418.

MICRO 419, 619 Selected Topics in Molecular Medicine 3(3,0) Introduction to various areas of molecular medicine. Examines the latest research and developments in molecular medicine. Designed for students interested in medicine and biomedical research. Graduate students may repeat for a maximum of six credits. Prereq: BIOCH 301, MICRO 305, or consent of instructor.

MICRO 491 Special Problems in Microbiology 1-3(0,3-9) Research problems in various areas of microbiology which introduce undergraduate students to the planning and execution of research experimentation and the presentation of research findings. May be repeated with advisor's approval.

MICRO H 491 Honors Special Problems in Microbiology 3(0,9) Research problems in various areas of microbiology which introduce undergraduate students to the planning and execution of research experimentation and the presentation of research findings. May be repeated for a maximum of six credits with consent of instructor. Prereq: Membership in Calhoun Honors College, consent of instructor.

MICRO (BIOSC) 493 Senior Seminar 2(2,0) See BIOSC 493.

MILITARY LEADERSHIP

Professor: P. E. Kaiser, Chair; Assistant Professors: D. W. Eaton, R. Giadlen, A. L. H. Hunter, B. S. Moore, W. M. Parker, G. J. Walker

M L 101 Leadership Fundamentals I 2(2,1) Study of leadership focused at the individual level. Students learn effective communicating skills, ethical decision making, small group management, and mental and physical conditioning. Skills are applied in a variety of challenging training events during laboratory, including rappelling, water survival, land navigation, and team athletics.

M L 102 Leadership Fundamentals II 2(2,1) Continued study of leadership focused at the individual and team levels. Topics include problem solving, critical thinking, leadership styles, and group cohesion. Leadership laboratory training includes small tactics and weapons firing.

M L 103 Becoming a Leader 3(3,0) Study of basic leadership, covering leadership theory and skills, organizational systems to support leaders, problem solving, values and ethics, and communication skills. Includes lecture, practical exercises, and guest speakers.

M L 201 Leadership Development I 2(2,1) Study of leadership focused at the team level. Students develop leadership skills through public speaking, managing small groups, and mentoring first-year students. Skills are applied in a variety of challenging training events during laboratory, including rappelling, water survival, land navigation, and team-building exercises.

M L 202 Leadership Development II 2(2,1) Continued study of leadership at the team and small group levels. Focusses on moral leadership, officer leadership, and the Army as a profession. Leadership laboratory training includes small unit tactics, airborne operations, and weapons firing. Students lead teams throughout the semester.

M L 210 Leaders' Training Course 4(2,6) Five-week leadership camp conducted on an Army post. Students pay and expenses are provided by the U.S. Army. Environment is rigorous and focused on leadership development. No military obligation is incurred. Completion of this course qualifies students for entry into the Army ROTC A advanced course.

M L 211 Cadet Field Leadership Training 1-6 Eight-week program of instruction conducted by the U.S. Military Academy to develop leadership skills of sophomore students. Seven weeks of the course are held at West Point with one week at Fort Knox, KY, for M ounted Maneuver Training. To be taken Pass/Fail only. Prereq: M L 202.

M L 301 A advanced Leadership I 3(2,2) Study of leadership focused on decision making, planning, communicating, and executing. A stresses motivational techniques, the role of a leader, and performance assessment. Provides additional training in leadership management tools and methodology. Students are responsible for training, developing, and mentoring Basic Course students. Students apply learned techniques in leadership laboratory. Prereq: M L 202 or 210.

M L 302 A advanced Leadership II 3(2,2) Continued study of leadership focusing on collective skills training, tactics, and small group instruction. Synthesizes various components of training, leadership, and team-building learned during the Basic Course and M L 301. Final step in students' progression prior to the National A advanced Leadership Camp. Prereq: M L 301.

M L 401 Organizational Leadership I 3(2,2) Culmination of leadership study in preparation for commissioning as Army officers. Students continue exercising leadership and management skills as senior cadet leaders. Leadership instruction focuses on coordinating activities with staffs, communicating effectively, counseling and mentoring subordinates, training management and ethics. Prereq: M L 302, National A advanced Leadership Camp.

M L 402 Organizational Leadership II 3(2,2) Continuation of M L 401. Focuses on the continued study of moral, ethical, and legal issues faced by leaders. Includes instruction in administrative and logistical management. Requires students to apply their knowledge individually and collectively to solve problems and improve the organization. Prereq: M L 401.

MUSIC


MUSIC 101 Beginning Class Piano I 1(0,2) Thorough introduction to basic keyboard skills including solo and ensemble repertoire, technique, applied keyboard theory, and performance. An applied music fee is assessed. Prereq: Consent of instructor.

MUSIC 102 Beginning Class Piano II 1(0,2) Continued work on keyboard skills, applied keyboard theory, solo and ensemble repertoire, and performance. An applied music fee is assessed. Prereq: MUSIC 101 or consent of instructor.

MUSIC 105 Music Fundamentals 3(3,0) Covers the rudiments of music theory and aural skills. Includes notation, scales, key signatures, intervals, and chord construction, as well as sight singing and ear training.
MUSIC 111 Beginning Class Guitar I 1(0,2) Introduction to basic guitar skills, including finger-style technique, strumming, and song accompaniment. Students develop skills and appreciation of the discipline through teacher-led drills, ensemble playing, and the exploration of guitar history, style, and the impact of various players and composers on the medium. A applied music fee is assessed. Prereq: Consent of instructor.

MUSIC 112 Beginning Class Guitar II 1(0,2) Continued work on guitar skills, including finger-style, strumming, pick playing, ensemble playing, and soloing. Also includes music theory for guitarists such as keys, scales, and chord building, as well as discussions of the impact of various players and composers on the medium. An applied music fee is assessed. Prereq: MUSIC 111 or consent of instructor.

MUSIC 121 Beginning Class Voice 1(0,2) Introduction to basic vocal skills, including breathing, tone production, diction, intonation, and interpretation. Includes solo and ensemble repertoire. In-class group and individual performances are required. An applied music fee is assessed. Prereq: Consent of instructor.

MUSIC 131 Beginning Instrumental Class 1(0,2) Introduction to basic instrumental skills in a class setting, including proper playing position, tone production, intonation, and ensemble playing. Includes brief history and usage of the given instruments. Different instrumental groups are taught as separate course sections; may be repeated for a maximum of six credits, but only on other instruments. An applied music fee is assessed. Prereq: Consent of instructor.

MUSIC 151 A applied music 1(0,1) Individual study in performance medium (piano, voice, strings, woodwinds, brass, percussion, guitar, organ, or carillon). One 30-minute lesson each week, for which a minimum of four hours practice is required. May be repeated for credit with departmental approval of differing performance media. An applied music fee is assessed. Prereq: Consent of instructor, based upon a qualifying audition.

MUSIC 152 A applied music 1(0,1) Continuation of MUSIC 151. May be repeated for credit with departmental approval of differing performance media. An applied music fee is assessed. Prereq: MUSIC 151.

MUSIC 153 A applied music for Majors 1(0,1) Individual study in vocal or instrumental performance (voice, woodwinds, brass, strings, percussion or keyboards). One 45-minute lesson each week. Jury required. May be repeated for credit with departmental approval of differing performance media. An applied music fee is assessed. Prereq: MUSIC 153. Consent of instructor.

MUSIC 154 A applied music for Majors 1(0,1) Continuation of MUSIC 153. Jury and performance on a recital are required. May be repeated for credit with departmental approval of differing performance media. An applied music fee is assessed. Prereq: MUSIC 153, consent of instructor.

MUSIC 180 Introduction to Music Technology 3(2,3) Introduction to music notation, sequencing, digital audio, sound reinforcement, analog and digital recording, and other current music technologies. Prereq: Performing Arts major or consent of instructor.

MUSIC 205 Music Theory I 3(3,0) Beginning analytical techniques in both the classical and popular genres, including aspects of harmony, melody, and rhythm. Prereq: MUSIC 105, satisfactory score on departmental placement exam, or consent of instructor. Coreq: MUSIC 207.

MUSIC 206 Music Theory II 3(3,0) Continuation of MUSIC 205, with added emphasis on modulation and formal structures. Prereq: MUSIC 205. Coreq: MUSIC 208.

MUSIC 207 Aural Skills I 1(0,2) Beginning studies in sight-singing and dictation (melodic, harmonic, and rhythmic). Coreq: MUSIC 205.

MUSIC 208 Aural Skills II 1(0,2) Continuation of MUSIC 207 with music of greater complexity and the use of C clefs. Coreq: MUSIC 206.

MUSIC 210, H 210 Music Appreciation: Music in the Western World 3(3,0) Deepens students' appreciation of their musical heritage through study of the elements of the musical language and its development in Western culture.

MUSIC 251 A applied music 1(0,1) Continuation of MUSIC 152. An applied music fee is assessed. Prereq: MUSIC 152, consent of instructor.

MUSIC 252 A applied music 1(0,1) Continuation of MUSIC 251. May be repeated for credit with departmental approval of differing performance media. An applied music fee is assessed. Prereq: MUSIC 251, consent of instructor.

MUSIC 253 A applied music for Majors 1(0,1) Continuation of MUSIC 154. May be repeated for credit on other performance media with departmental approval. Jury is required. An applied music fee is assessed. Prereq: MUSIC 154, consent of instructor.

MUSIC 254 A applied music for Majors 1(0,1) Continuation of MUSIC 253. May be repeated on other performance media with departmental approval. Jury and performance on a recital are required. An applied music fee is assessed. Prereq: MUSIC 253, consent of instructor.

MUSIC 279 Music Practicum 1(0,3) Practical work in music on productions designed for public presentation. Emphasis is placed on sound support, amplification, and mixing. May be repeated for a maximum of four credits. Prereq: Consent of instructor.

MUSIC 280 Sound Reinforcement 3(2,2) Theory and practice of using audio equipment for amplifying sound in venues ranging from conference rooms to concert halls and sports arenas. Prereq: Performing Arts major or consent of instructor.

MUSIC 310 Survey of Music History 3(3,0) Comprehensive survey of the Western art music tradition from the Middle Ages to the present. Prereq: MUSIC 205, Performing Arts major, or consent of instructor.

MUSIC 311 History of American Music 3(3,0) Music in America from 1620 to the present. In-depth study of the elements of the musical language and its development in Western culture.

MUSIC 312 History of Rock and Roll 3(3,0) Comprehensive survey of rock elements, styles, and artists. Emphasis is on the evolution of rock and roll including a broad examination of musical influences. Course content examines how rock and roll both reflected and influenced social issues.

MUSIC 314 World Music 3(3,0) Introduction to ethnomusicology and music of the world's peoples. Emphasis is placed on music through culture.

MUSIC 317 History of Country Music 3(3,0) Chronological study of country music origins, styles, and artists. Emphasis is on the evolution of country music from a cultural expression of the South to a commercial art form of worldwide appeal.

MUSIC 321 Principles of Piano Performance I 3(3,0) In-depth study of the principles of piano performance focusing on how to interpret a musical score, develop technical skills and practice techniques, and use the body correctly at the keyboard. Prereq: By audition.

MUSIC 322 Principles of Piano Performance II 3(3,0) Continuation of MUSIC 321. Prereq: MUSIC 321 or consent of instructor.

MUSIC 323 Piano Accompanying I 1(0,3) Group study in piano accompanying. Focus on sight-reading and choral, vocal, and instrumental accompanying. Students take group lessons and accompany choral groups and/or apply music students. Prereq: Consent of instructor.

MUSIC 325 CU Carillonneurs 1(0,2) Group study in playing the 47-bell University carillon. One two-hour meeting each week for which a minimum of two hours of individual practice is required. Participation in a recital is required. Prereq: Musial keyboard experience, consent of the instructor.

MUSIC 330 Small Ensemble 1(0,3) Ensembles devoted to the musical training of instrumental, vocal ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Enrollment in simultaneous sections is allowed. Prereq: Consent of director.

MUSIC 331 Pep Band 1(0,3) Ensembles devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given in addition to the minimum rehearsal time. Simultaneous enrollment in multiple sections is allowed. Prereq: Consent of director.

MUSIC 332 Woodwind Quintet 1(0,3) Ensembles: advanced study of woodwind chamber music media. One one-hour class meeting each week, for which a minimum of two hours of ensemble practice is required. Prereq: By audition only; concurrent enrollment in MUSIC 362.

MUSIC 333 String Quartet 1(0,3) Ensembles advanced study of string quartet repertoire. Two 90-minute meetings each week for which a minimum of two hours of practice is required. Prereq: By audition only. Coreq: MUSIC 369, A applied music.
Courses of Instruction

MUSIC 334 Flute Choir 1(0,3) Ensembles: study of flute ensemble literature. One 60-minute meeting each week for which a minimum of two hours of practice is required. Preq: By audition only.

MUSIC 336 Percussion Ensemble 1(0,2) Ensembles: study and performance of percussion ensemble literature. One two-hour class meeting each week, for which a minimum of two hours of individual practice is required. C qreq: MUSIC 331, 362, 363, 364, or 369.

MUSIC 337 Steel Drum Band 1(0,2) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSIC 338 Men’s Small Ensemble 1(0,3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSIC 339 Concert Band 1(0,2) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSIC 343 Flute Choir 1(0,3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSIC 344 Vocal Jazz Ensemble 1(0,3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSIC 345 Applied Music 1(0,1) Continuation of MUSIC 353. Consent of instructor. May be repeated on other performance media with departmental approval. Juried full recital performance is required. A applied music fee is assessed. Preq: MUC 354 and consent of instructor.

MUSIC 346 Applied Music 1(0,1) Continuation of MUSIC 353. Consent of instructor. May be repeated on other performance media with departmental approval. Juried full recital performance is required. A applied music fee is assessed. Preq: MUC 354 and consent of instructor.

MUSIC 351 A applied Music 1(0,1) Continuation of MUSIC 252. May be repeated for credit with departmental approval of differing performance media. A applied music fee is assessed. Preq: MUC 252, consent of instructor.

MUSIC 352 A applied Music 1(0,1) Continuation of MUSIC 351. Students are required to perform an appropriate solo in a student recital. May be repeated for credit with departmental approval of differing performance media. A applied music fee is assessed. Preq: MUC 351, consent of instructor.

MUSIC 353 A applied Music for Majors 1(0,1) Continuation of MUSIC 254. May be repeated on other performance media with departmental approval. A applied music fee is assessed. Preq: MUC 254, consent of instructor.

MUSIC 354 A applied Music for Majors 1(0,1) Continuation of MUSIC 353. May be repeated on other performance media with departmental approval. Juried half-recital performance is required. A applied music fee is assessed. Preq: MUC 353, consent of instructor.

MUSIC 361 Marching Band 1(0,3) Ensembles: devoted to musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Offered fall semester only. Preq: Consent of director.

MUSIC 362 Symphonic Band 1(0,3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSIC 363 Jazz Ensemble 1(0,3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSIC 364 Concert Band 1(0,2) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSIC 369 Symphony Orchestra 1(0,3) Small, college-community orchestra devoted to performing works from standard repertoire. Weekly evening rehearsals with one or more performances per semester. Preq: Consent of director.

MUSIC 370 Clemson University Singers 1(0,3) Ensembles devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSIC 371 Women’s Glee 1(0,3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given in addition to the minimum rehearsal time. Preq: Consent of director.

MUSIC 372 Men’s Glee 1(0,3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given in addition to the minimum rehearsal time. Preq: Consent of director.

MUSIC 373 University Chorus 1(0,3) Ensembles: devoted to the musical training of ensemble members through reading and rehearsal of appropriate music. Public performances are given periodically in addition to the minimum rehearsal time. Preq: Consent of director.

MUSIC 380 Audio Engineering 1 3(2,2) Intermediate-level course in music technology focusing on digital hard-disk recording and acoustical considerations in audio engineering. Preq: MUC 180 or consent of instructor.

MUSIC 398 Special Topics in Music 3(3,0) Consideration of select areas of study in music not addressed by other music courses. May be repeated once for credit. Preq: Consent of instructor.

MUSIC 400, 600 Music in the Elementary Classroom 3(3,0) Familiarizes teachers in the elementary classroom with traditional, Kodaly, Orff, and Kindermusik approaches in correlating music with language arts, mathematics, and social studies.

MUSIC 405 Instrumental and Vocal Arranging 3(2,3) A advanced study of the properties of instrumental and vocal arrangements. May be repeated on other performance media with departmental approval. Juried full recital performance is required. A applied music fee is assessed. Preq: MUC 180, 205, or consent of instructor.

MUSIC 415 Music History to 1750 3(3,0) Development of Western music from antiquity to 1750, emphasizing representative literature from various styles and periods. Preq: MUC 210, 310, or consent of instructor.

MUSIC 416 Music History Since 1750 3(3,0) Continuation of MUSIC 315. Mrusc from 1750 to the present. Preq: MUC 210, 310, or consent of instructor.

MUSIC 430 Conducting 3(0,3) Study of choral and instrumental conducting. Emphasis is on manual conducting techniques, attitudes, philosophies, and responsibilities necessary for the preparation, planning, and execution of artistic conducting. Preq: MUC 205 or consent of instructor.

MUSIC 451 A applied Music 1(0,1) Continuation of MUSIC 352, guiding students in interpretation of advanced solo and ensemble literature. Students are required to perform an appropriate solo in a student recital. A applied music fee is assessed. Preq: MUC 352 and consent of instructor.

MUSIC 452 A applied Music 1(0,1) Continuation of MUSIC 451. Students are required to perform an appropriate solo in a student recital. A applied music fee is assessed. Preq: MUSIC 451 and consent of instructor.

MUSIC 453 A applied Music for Majors 1(0,1) Continuation of MUSIC 354. May be repeated on other performance media with departmental approval. Juried full recital performance is required. A applied music fee is assessed. Preq: MUC 354, consent of instructor.

MUSIC 454 A applied Music for Majors 1(0,1) Continuation of MUSIC 453. May be repeated on other performance media with departmental approval. Juried full recital performance is required. A applied music fee is assessed. Preq: MUC 453, consent of instructor.

MUSIC 480, 680 Audio Engineering II 3(2,2) A advanced course in music technology focused on music production integrating digital audio and virtual instruments. Preq: MUC 380 or consent of instructor.

MUSIC 485 Production Workshop 3(2,2) Project-based course focused on music production. Students produce an audio CD that includes recorded audio tracks and/or newly-created sequenced material with creative and appropriate packaging. Preq: MUSIC 480.

MUSIC 499, 699 Independent Studies 1-3(1-3,0) Tutorial work for students with special interests in music study outside the scope of existing courses. May be repeated for a maximum of six credits. Preq: Consent of department chair.