

- PKGSC 201 Packaging Perishable Products 3(3,0)** Covers fundamental characteristics and applications of various materials and systems used to package perishable products such as foods and pharmaceuticals. Discusses packaging issues regarding food, pharmaceutical, and medical packaging. Includes product/package interactions and packaging requirements to address basic theory in food and pharmaceutical protection. *Preq:* CH 201, PKGSC 202, or consent of instructor.
- PKGSC 202 Packaging Materials and Manufacturing 4(3,3)** Detailed study of packaging materials including glass, metal, metal foils and sheets, wood, paper, paperboard, plastics, composites, adhesives, coatings, cushioning media; their functional properties in packaging application; laminating and combining of different packaging materials. *Preq:* PKGSC 102 or consent of instructor.
- PKGSC 204 Container Systems (Rigid and Flexible) 3(3,0)** Examination of all the packages and containers used to develop systems to distribute products. Compatibility of product and package, structural design, costs, and merchandising considerations are stressed. *Preq:* PKGSC 202, 206 (or concurrent enrollment) or consent of instructor.
- PKGSC 206 Container Systems Laboratory 1(0,3)** Laboratory practice in sample making, designing and constructing various containers. *Preq:* PKGSC 204 (or concurrent enrollment).
- PKGSC 320 Package Design Fundamentals 3(2,3)** Study of specific package design concepts. Students understand how the design affects manufacturing processes, costs, and protective functions; begin skill development using hand-drawing and model packages; then move to software-based design and real packages. *Preq:* PKGSC 204, 206.
- PKGSC 368, H368 Packaging and Society 3(3,0)** Study of the role of packaging in society as it specifically relates to the responsibilities of the packaging scientist in protecting people and the environment. Includes study of packaging and environmental regulations and guidelines currently in place to achieve these goals. Ability to make informed decisions and ethical judgments is an encompassing goal. *Preq:* PKGSC 102 or consent of instructor.
- PKGSC 401, 601 Packaging Machinery 3(3,0)** Systematic study of types of machinery used to form, fill, seal, and handle various packaging, products, and packaging materials. Emphasizes basic mechanical, electrical, pneumatic, and hydraulic components of packaging machinery along with packaging machinery terminology. Discusses methods for machine line optimization and layout. *Preq:* PKGSC 204, PHYS 207 or consent of instructor.
- PKGSC 403 Packaging Career Preparation 1(1,0)** Preparation for a successful career in Packaging Science by completing the professional E-portfolio, and finalizing a résumé and career E-portfolio. Refines career skills through role playing. Topics include presentations, interviewing, effective collaboration and communication, business and foreign travel etiquette. *Coreq:* PKGSC 420, second semester senior standing or consent of instructor.
- PKGSC 404, H404, 604 Mechanical Properties of Packages and Principles of Protective Packaging 3(3,0)** Study of the mechanical properties of products and packages and standard methods of determining these properties. Focuses on the functional properties of packages related to shock and vibration isolation and compression. *Preq:* PHYS 207, MTHSC 106, PKGSC 204, or consent of instructor.
- PKGSC (FD SC) 409 Total Quality Management for the Food and Packaging Industries 3(3,0)** See FD SC 409.
- PKGSC 416, 616 Application of Polymers in Packaging 4(3,3)** Detailed study of polymer science and engineering as applied to packaging science. Includes polymer morphology, rheology, physical properties, processing methods, and polymerization. Emphasizes relationships among processing, structure, and properties. *Preq:* PKGSC 204, 206; CH 201 or 223; PHYS 207; or consent of instructor.
- PKGSC 420, 620 Package Design and Development 3(2,3)** Study of the principles and methods practiced in designing and developing packages and packaging systems and of methods used to coordinate and analyze package development activities including interfacing with product development, manufacturing, marketing, purchasing, and accounting. *Preq:* Second semester senior standing; PKGSC 368, 401, 404, 416, 464; or consent of instructor.
- PKGSC 421 Special Problems in Packaging Science 1-4(0,3-12)** Independent research investigations in packaging science related to packaging materials, machinery, design, and applications. Special emphasis is placed on organizing a research proposal, conducting research, and reporting results. May be repeated for a maximum of 15 credits. *Preq:* Consent of instructor.
- PKGSC 422 Selected Topics in Packaging Science 1-3(1-3,0)** Comprehensive study of selected topics in packaging science not covered in detail or contained in other courses. Contemporary developments in each area are stressed. May be repeated for a maximum of 15 credits, but only if different topics are covered. *Preq:* Consent of instructor.
- PKGSC 430, 630 Converting for Flexible Packaging 3(1,6)** Study of materials, methods, processes, and equipment used in converting web materials for flexible packaging. Laboratory provides hands-on experience preparing and operating pilot-scale converting equipment. *Preq:* PKGSC 204, 206; or consent of instructor.
- PKGSC 440, 640 Packaging for Distribution 3(3,0)** Packages are exposed to various shipping methods and numerous hazards during distribution. To ensure adequate product protection, packaging professionals need to understand the fundamental principles of distribution packaging design. Topics include ASTM and ISTA packaging test methods, packaging design guidelines for distribution, terminology, transport modes, distribution hazards, and protective packaging materials. *Preq:* PKGSC 454 or consent of instructor.
- PKGSC 454, 654 Product and Package Evaluation Laboratory 1(0,3)** Laboratory experiments to determine properties of packaging materials and to evaluate the response of packages and products to shock, vibration, and compression. Students operate standard testing equipment and become familiar with industry recognized test methods and standards. *Preq:* PKGSC 404 (or concurrent enrollment).
- PKGSC 464, H464, 664 Food and Health Care Packaging Systems 4(3,3)** Characteristics, engineering properties, and applications of various materials and systems used in the packaging of foods, pharmaceuticals, and medical devices. Packaging systems for specific food and medical applications are considered. Laboratory and field exercises on food and medical packaging operations and packaging materials are included. Emphasis is on evaluation methods. *Preq:* PKGSC 201, 204, 206, or consent of instructor.
- PKGSC 471, 671 Wood and Paper Packaging 3(3,0)** In-depth study of use of wood and paper in packaging. Covers characterization of raw materials, basic conversion processes, and the use of converted products in packaging. Emphasizes the relationship between structure, processing, and properties. *Preq:* PKGSC 102 or consent of instructor.

PARKS, RECREATION, AND TOURISM MANAGEMENT

Professors: L. R. Allen, S. J. Backman, R. H. Becker, G. W. Burnett, K. G. Diem, W. E. Hammitt, F. A. McGuire, N. M. Porter, D. J. Thomason, J. E. Voelkl, D. E. Weatherford, B. A. Wright, *Chair;* *Associate Professors:* K. F. Backman, R. D. Bixler, H. J. Grove, W. C. Norman, C. R. White, Jr.; *Assistant Professors:* D. M. Anderson, S. G. Arthur-Banning, C. O. Oh, R. B. Powell, D. L. Schmalz; *Senior Lecturer:* B. W. Stevens; *Lecturers:* R. S. Brookover, L. E. Conrad, R. A. Lucas, A. R. Savedra

PRTM 101 Concepts of Leisure 3(3,0) Introduces recreation professions and organizations: government, voluntary, and commercial; overviews professional preparation; outlines development of man's uses of leisure and evolution of recreation, city parks, natural resources conservation, and preservation movements as philosophical forces affecting leisure services. Restricted to Parks, Recreation, and Tourism Management majors.

PRTM 201, H201 The Recreation/Leisure Environment 3(3,0) Discusses the development characteristics of built and natural environmental resource settings for recreation, tourism development, and community expression. Examines human/environment interactions during leisure, including the impact of the recreation environment on people and the impact of people on the recreation environment. Surveys public agencies and private interests in these settings.

PRTM 205 Program and Event Planning 3(2,2) Principles and methods of program development. Time and facility utilization for sports activities, social functions, arts and crafts, outdoor activities, hobbies or special-interest groups, and activities in the cultural and performing arts are pursued. *Preq:* PRTM 101.

- PRTM 206 Practicum I 1(0,3)** Students conduct a recreation program in a supervised setting. A minimum of 90 hours with a leisure agency approved by the University is required. To be taken Pass/Fail only. *Preq:* PRTM 205, Sophomore standing in Parks, Recreation, and Tourism Management.
- PRTM 207 Practicum II 1(0,3)** Continuation of PRTM 206. Experience in a leisure situation different from the PRTM 206 exposure. A minimum of 90 hours with a leisure agency approved by the University is required. To be taken Pass/Fail only. *Preq:* PRTM 205, Sophomore standing in Parks, Recreation, and Tourism Management.
- PRTM 210 Serving Diverse Populations in Parks, Recreation, and Tourism Management 3(3,0)** Introduces students to the leisure patterns and constraints of diverse constituents, including members of ethnic and racial minorities, people of diverse socioeconomic status, women, older adults, people with disabilities, and people with alternative lifestyles. *Preq:* PRTM 101.
- PRTM 241 Introduction to Community Recreation, Sport, and Camp Management 3(3,0)** Conceptual examination of community recreation, including the history and structure of public and private nonprofit recreation agencies with an emphasis on programs and services, career opportunities, funding mechanisms, the role of government, and current trends and issues impacting delivery of services. *Preq:* PRTM 101.
- PRTM 254 Introduction to Sport Management 3(3,0)** Development of a conceptual understanding of sport management, career opportunities in sport management, and the necessary competencies for the different career fields.
- PRTM 270, H270 Introduction to Recreation Resources Management 3(3,0)** Fundamentals of recreation resources management are presented to include the framework of management, management of specific resources, management of visitors, and management of services.
- PRTM 281 Introduction to Golf Management 3(3,0)** Development of a conceptual understanding of the golf industry, career opportunities in professional golf management, and specific introductory competencies utilized within the field. *Preq:* Professional Golf Management concentration and consent of instructor.
- PRTM 282 Principles of Golfer Development 3(3,0)** Introduction to golf instruction. Provides knowledge and skills necessary to develop successful golf programs. *Preq:* PRTM 281 or consent of instructor.
- PRTM 283 Advanced Methods of Teaching Golf 3(3,0)** Provides students with the knowledge and skills necessary to succeed as golf instructors. Particular emphasis is on golf swing mechanics, learning styles and motivation theory, the business of teaching golf, and the use of advanced technology in golf instructions. *Preq:* PRTM 282.
- PRTM 295 Seminar I 1(1,0)** Introduction to the golf industry, professionalism, and current issues of interest in the industry. Special emphasis is placed on topics covered in the PGA/PGM Training Program Level I. *Preq:* PRTM 281.
- PRTM 301 Recreation and Society 3(3,0)** Investigation of the role of recreation in a technological and work-oriented society. Particular emphasis is on recreation behavior, resources, and programming in public and private organizations which serve the public wants. Not open to Parks, Recreation, and Tourism Management majors; may not be substituted or otherwise used to meet Parks, Recreation, and Tourism Management area requirements. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 304 Challenge Course Facilitation 3(2,2)** Develops knowledge and skill in planning, directing, and evaluating group performance in an adventure challenge course environment; emphasis is placed on low and high ropes elements, processing, assessment, safety, and course management. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 305 Safety and Risk Management in Parks, Recreation, and Tourism Management 3(3,0)** Provisions of safe services, facilities, and activities in the parks, recreation, and tourism domain are studied through the application of germane concepts from the areas of safety, risk management, and liability. *Preq:* PRTM 321, Junior standing, 2.0 cumulative grade-point ratio.
- PRTM 307 Facility Planning and Operations 3(3,0)** Introduction to recreation facility planning and operations processes. Design, planning, financing, construction, budgeting, personnel, operating policies and procedures, maintenance, and equipment considerations are covered. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 308, H308 Leadership and Group Processes in Recreation 3(3,0)** Leadership is analyzed through experience-based learning. Various styles of leadership and communication and their probable consequences are examined. Techniques for planning large and small group meetings are considered. Examination is made of literature in the field of leadership and group processes. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 309 Behavioral Concepts in Parks, Recreation, and Tourism 3(3,0)** Studies social psychological concepts concerning leisure behavior in various park, recreation, and tourism settings. Students learn to apply those theories and behavioral concepts required to understand and manage leisure activities and environments. *Preq:* PRTM 101, 2.0 cumulative grade-point ratio, consent of instructor.
- PRTM 311, H311 Therapeutic Recreation 3(3,0)** Examination of the profession of therapeutic recreation by analyzing the history, philosophy, concepts, roles, and functions involved in the therapeutic recreation services. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 317 Group Initiatives 3(2,2)** Examination and development of initiative modalities used by therapeutic recreators to teach teamwork, problem-solving communication, goal setting, leadership and personal interaction to diverse populations in a variety of settings. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 318 Leisure Lifestyle Management 3(3,0)** Examines principles and techniques applicable to guiding disabled as well as nondisabled individuals in an exploration of leisure needs, barriers, consequences, and accessibility. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 320, H320 Recreation Policymaking 3(3,0)** Structures and processes for public park and/or recreation policy formation in the United States. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 321, H321 Recreation Administration 3(3,0)** Analysis of the internal organization of a recreation department dealing with finances and accounting, records and reports, publicity and public relations, state and federal legislation, staff organization, coordination of community resources. *Preq:* PRTM 308, Junior standing, 2.0 cumulative grade-point ratio.
- PRTM 330, H330 Visitor Services and Interpretation 3(3,0)** Introduces the philosophy and principles of the art of environmental interpretation. Comprehensive survey of interpretive theory as it applies to the recreation and parks practitioner and the varying settings within the profession. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 342, H342 Introduction to Tourism 3(3,0)** Survey of travel and tourism in the United States with focus on terminology, demographics, financial significance, and trends. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 343 Spatial Aspects of Tourist Behavior 3(3,0)** Spatial patterns of national and international leisure travel destinations are explored and analyzed regarding their tourism attractiveness. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 344 Tourism Markets and Supply 3(3,0)** Acquaints students with the principles of matching tourism markets and supply. Students examine the strategies used in developing markets. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 349 Survey of Tourism Sites 1(0,3)** On-site study of various exemplary components of the travel and tourism industry in the Southeast. There are additional costs to students to cover travel. To be taken Pass/Fail only. *Preq:* PRTM 342, Junior standing in Parks, Recreation, and Tourism Management, 2.0 cumulative grade-point ratio, consent of instructor.
- PRTM 352 Camp Organization and Administration 3(2,3)** Surveys the development and trends of camping in America. Considers programming for the operations of agency and private camps. Enables students to master the techniques of group living. Laboratory offers practical experience in camp craft including trips and outdoor cooking. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 380 Community Recreation in South Carolina 3(1,4)** Students study indoor and outdoor recreation facilities, governmental jurisdiction, funding, programming, management, and staffing at community recreation agencies throughout South Carolina during a hands-on five-day field trip. *Preq:* PRTM 101, 2.0 cumulative grade-point ratio, or consent of instructor.

- PRTM 383 Golf Shop Operations 3(3,0)** Provides students with the knowledge and skills necessary to succeed as managers of golf shops. Particular emphasis is on fundamental business planning, development of policies and procedures, merchandising, inventory control, pricing, and customer service. *Preq:* PRTM 282, 2.0 cumulative grade-point ratio.
- PRTM 390 Independent Study in Parks, Recreation, and Tourism Management 1-3(1-3,0)** Comprehensive studies and investigation of special topics not covered in other courses. Emphasizes field studies, community service, and independent readings. May be repeated for a maximum of six credits. *Preq:* Junior standing, 2.0 cumulative grade-point ratio, consent of instructor.
- PRTM 391 Selected Topics in Parks, Recreation, and Tourism Management 2-3(2-3,0)** In-depth examination of developing trends in parks, recreation, and tourism that warrant timely study. May be repeated twice for a maximum of six credits, but only if different topics are covered. *Preq:* Junior standing, 2.0 cumulative grade-point ratio.
- PRTM 392 Special Event Management 3(3,0)** Students acquire an in-dept knowledge about the field of special event management. Planning techniques, strategies, and requirements for planning, implementing, and evaluating community events are included. Emphasizes ordinances, planning, funding, and marketing. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 395 PGM Seminar II 1(1,0)** Current issues of interest in the golf industry. Special interest is placed on topics covered in the PGA/PGM Training Program Level II checkpoint. *Preq:* PRTM 295, 2.0 cumulative grade-point ratio.
- PRTM H399 Introduction to Field Training and Research 1(1,0)** For students pursuing departmental honors, provides an initial orientation to the internship and research requirements including identification of a faculty mentor to supervise these activities. *Preq:* PRTM 207, consent of instructor.
- PRTM 403 Elements of Recreation and Park Planning 3(3,0)** Basic recreation and park planning principles, processes, and trends in area and facility development combine to form the basis for formulation of a relevant knowledge of planning. *Preq:* Senior standing, 2.0 cumulative grade-point ratio.
- PRTM 404 Field Training I 1(1,0)** Preparation for field training experience including topics such as résumé development, interviewing techniques, internship agency selections, and responsibilities of the student, department, and agency. To be taken Pass/Fail only. *Preq:* PRTM 206, 207 (or concurrent enrollment), 2.0 cumulative grade-point ratio, consent of instructor.
- PRTM 405 Field Training II 6(0,18)** Minimum ten weeks (400 hours) of uninterrupted, supervised work in a park, recreation, or tourism management agency. Under agency supervision, students observe, organize, and implement activities, events, and programs. To be taken Pass/Fail only. *Preq:* PRTM 206, 207, 404; Senior standing in Parks, Recreation, and Tourism Management; 2.0 cumulative grade-point ratio; consent of instructor.
- PRTM 407 Personnel Administration in Parks, Recreation, and Tourism Management 3(3,0)** Study of personnel administration practices in recreation agencies, including employee selection, training, motivation, rewards, evaluation, and legal issues related to personnel and supervision. *Preq:* PRTM 321, 2.0 cumulative grade-point ratio.
- PRTM H408 Honors Internship 6(0,18)** Minimum of 400 hours of uninterrupted, supervised work in a park, recreation, or tourism setting. Written report on observations, special project, or research is required in compliance with a contract between student and course instructor. *Preq:* PRTM H399, consent of instructor.
- PRTM 409, H409 Methods of Recreation Research I 3(3,0)** Analysis of the principal methods of recreation research, the application of descriptive statistics to recreation research, and the development of a research proposal. *Preq:* EX ST 301; Senior standing in Parks, Recreation, and Tourism Management; 2.0 cumulative grade-point ratio; or consent of instructor.
- PRTM 410, H410 Methods of Recreation Research II 3(3,0)** Continuation of PRTM 409; includes supervised execution and reporting of results of research proposal developed in PRTM 409 and the application of inferential statistics to research. *Preq:* PRTM 409, 2.0 cumulative grade-point ratio, consent of instructor.
- PRTM 412, H412, 612 Therapeutic Recreation and Mental Health 3(3,0)** Therapeutic recreation services in mental health clinics, institutions, and outdoor settings. Review of disorders and current modes of treatment as they relate to therapeutic recreation. *Preq:* PRTM 311, 2.0 cumulative grade-point ratio, consent of instructor.
- PRTM 416 Leisure and Aging 3(3,0)** Examines the role of leisure services in later life, the needs of community-based and institutionalized elderly, and the development of service-delivery systems to meet those needs. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 417 Therapeutic Recreation Processes I 4(3,2)** Examination of models, principles, and procedures applicable to comprehensive program planning, specific program plans, individualized care plans, activity analysis, documentation, and evaluation. *Preq:* PRTM 311 or consent of instructor, three credit hours of human anatomy and physiology, 2.0 cumulative grade-point ratio.
- PRTM 418 Therapeutic Recreation Processes II 4(3,2)** Examination of theories and concepts that guide therapeutic recreation interventions, including knowledge and use of communication skills, therapeutic relationships, counseling theories, and group processing techniques. *Preq:* PRTM 311 and 417 or consent of instructor, 2.0 cumulative grade-point ratio.
- PRTM 420 Therapeutic Recreation Trends and Issues 3(3,0)** Advanced principles and practices of therapeutic recreation, including philosophy, ethics, professional development, standards of practice, certification, recreation inclusion, and marketing services. *Preq:* PRTM 416, 418 or consent of instructor, 2.0 cumulative grade-point ratio.
- PRTM 421, H421, 621 Recreation Financial Resources Management 3(3,0)** Analysis of recreation financial resources management. Deals with revenue sources and their allocation. *Preq:* PRTM 321, Senior standing in Parks, Recreation, and Tourism Management; 2.0 cumulative grade-point ratio.
- PRTM (GEOG) 430, 630 World Geography of Parks and Equivalent Reserves 3(3,0)** Major international patterns in the provision and use of urban and rural parks and recreation are examined. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 431, 631 Methods of Environmental Interpretation 3(2,3)** Practice and instruction in the use of equipment and methods available to the interpreter in public contact work. Coaching in presentation and evaluation of live programs and in design, execution, and evaluation of mediated programs is the major emphasis. Programs are delivered to public audiences in the Clemson area. *Preq:* PRTM 330; Senior standing in Parks, Recreation, and Tourism Management; 2.0 cumulative grade-point ratio; consent of instructor.
- PRTM 441, 641 Commercial Recreation 3(3,0)** Components of offering leisure services and products to the public by individuals, partnerships, and corporations for the purpose of making a profit. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 443, 643 Resorts in National and International Tourism 3(3,0)** A variety of resort types are studied with respect to their development, organization, visitor characteristics, and environmental consequences. A case-study approach is used. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 444, 644 Tour Planning and Operations 3(3,0)** Provides the opportunity to understand the psychology of touring, with emphasis on packaged and group tours and how tours of different types and scale are planned, organized, marketed, and operated. *Preq:* PRTM 342, 2.0 cumulative grade-point ratio, consent of instructor.
- PRTM 445, 645 Conference/Convention Planning and Management 3(3,0)** Provides the opportunity to understand the problems of and solutions to conference and convention planning and management from both the sponsoring organization's and facility manager's perspectives. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 446, 646 Community Tourism Development 3(3,0)** Provides a community-based perspective of organizational, planning, development, and operational needs for a successful tourism economy at the local level. *Preq:* PRTM 342, 2.0 cumulative grade-point ratio, consent of instructor.
- PRTM 447, 647 Perspectives on International Travel 3(3,0)** Using the United States as a destination, international travel patterns and major attractions are presented. Factors which restrain foreign travel to the United States are analyzed. *Preq:* 2.0 cumulative grade-point ratio.
- PRTM 452, 652 Campus Recreation 3(3,0)** Study of the basic components required for administration of successful college union and intramural-recreation sport programs. *Preq:* 2.0 cumulative grade-point ratio.

PRTM 453 Sports Information and Event Management 3(3,0) Introduction to basic techniques, tools, and procedures associated with sports information and event management activities. Focuses on the application of sports information and event management activities building upon knowledge from personal interviews, selected readings, event management brochures and field experience. *Preq:* PRTM 254, 2.0 cumulative grade-point ratio, consent of instructor.

PRTM 454 Trends in Sport Management 3(3,0) Examination of trends in the sport management area that allows PRTM majors to obtain an updated knowledge base of the field. Students are able to relate their academic studies to the current trends, problems, and management strategies confronting and being used within the sport management industry. *Preq:* PRTM 254, 2.0 cumulative grade-point ratio, consent of instructor.

PRTM 455 Advanced Program Planning 3(3,0) Advanced recreation programming techniques with an emphasis on funding, outcome measurement, customer service, program development, marketing, specialized populations, and current trends and issues impacting the delivery of recreation programs. *Preq:* PRTM 205, 2.0 cumulative grade-point ratio, or consent of instructor.

PRTM 474, H474 Advanced Recreation Resources Management 3(3,0) Advanced topics in recreation resource management focusing on management strategies and techniques for addressing common resource and social problems in recreation resource management. Case studies and problem analysis are emphasized. *Preq:* PRTM 270, Senior standing, 2.0 cumulative grade-point ratio.

PRTM 483 Golf Club Management and Operations 3(0,9) Focuses on activities related to merchandising, purchasing and selling, inventory management, vendor selection, pricing strategies, strategies for monitoring sales and inventory related to financial control and customer service. Students are exposed to the responsibilities of a golf professional at a full-service golf club facility. *Preq:* 2.0 cumulative grade-point ratio. *Coreq:* CO-OP 104 and 105.

PRTM 490 Senior Independent Study 1-3(1-3,0) In cooperation with and under supervision of a faculty member, students develop and execute a field study or community project. May be repeated for a maximum of six credits. *Preq:* Senior standing, 2.0 cumulative grade-point ratio, consent of instructor.

PRTM 495 PGM Seminar III 1(1,0) Emphasizes topics covered in the PGA/PGM Training Program Level III checkpoint. *Preq:* PRTM 395, 2.0 cumulative grade-point ratio.

PRTM H499 Presentation of Honors Projects I(1,0) Under direction of a faculty supervisor, students prepare and deliver oral presentations on projects that were carried out in PRTM H407 or H410. *Preq:* PRTM H407 or H410, consent of instructor.

PERFORMING ARTS

Professors: R. E. Goodstein, *Chair*; C. S. M. Egan, L. U. Harder, D. J. Hartmann, D. R. Rash, R. C. Sawyer; *Associate Professors:* L. L. Li-Bleuel, P. L. Buyer, N. M. Hosler, A. R. Levin; *Assistant Professors:* C. A. Collins, L. Dzuris, A. G. Harrington, K. Johnson, A. M. Penna, M. J. Spede, B. A. Whisler; *Lecturers:* M. T. Anderson, E. J. Austin, T. Broussard, S. R. Cullen, J. B. Fankhauser, T. Hayden, R. M. Houze, L. Kibler, H. C. Parker, M. G. Rowell, S. M. Sawyer, H. R. Spires, D. E. Stevenson, W. H. Thomas

P A 101 Introduction to Performing Arts 3(3,0) Overview of performing arts including performance, careers, technology, production, management, community outreach, safety, sales, and marketing. *Preq:* Performing Arts major. *Coreq:* P A 103.

P A 103 Portfolio I 1(0,3) Develops discipline-specific portfolios that display creative design and contain samples of work that demonstrate integrated learning. To be taken Pass/Fail only. *Coreq:* P A 101.

P A 201 Performing Arts Seminar I 3(2,3) Study of selected performing arts topics. Includes seminars and masterclasses with faculty and visiting artists and concert and theatre attendance and evaluation. Emphasis is placed on written communication skills. *Preq:* P A 101, Sophomore standing.

P A 279 Performing Arts Practicum 1(0,3) Practical work on performing arts presentations including backstage technical work, multimedia support, and arts management. May be repeated for a maximum of four credits. *Preq:* P A 101.

P A 301 Performing Arts Seminar II 3(2,3) Continuation of P A 201 with added focus on critical and ethical analysis of performing arts. Emphasis is placed on oral communication skills. *Preq:* P A 201, Junior standing.

P A 398 Special Topics in Performing Arts 1-3(1-3,0) Select areas of study in performing arts not addressed by other performing arts course offerings. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* P A 101 and consent of instructor.

P A 399 Internship 1-3(0,3-9) Provides performing Arts majors an opportunity to apply technical, managerial, and artistic concepts in a performing arts environment through preplanned, preapproved, faculty-supervised internships. Minimum of 45 hours of work per credit hour. May be repeated for a maximum of six credits. To be taken Pass/Fail only. *Preq:* P A 279 and consent of Internship Program Coordinator.

P A 401 Senior Project Research I(0,3) Performing Arts students research a substantial project for the community. Interdisciplinary performing arts group generates a proposal for P A 402. May be repeated for a maximum of two credits. *Preq:* P A 301, Senior standing. *Coreq:* P A 403.

P A 402 Senior Project 3(0,9) Capstone course for Performing Arts majors. Preparation, execution, and assessment of a substantial group performing arts project for the community. Students, with faculty guidance, manage all aspects of the project. *Preq:* P A 401 with a B or better, Senior standing.

P A 403 Portfolio II 1(0,3) Students revise discipline-specific portfolios through use of current technologies. Further demonstration of integrated learning is provided with the incorporation of senior project research content from P A 401. To be taken Pass/Fail only. *Coreq:* P A 401.

P A H491 Performing Arts Honors Research 3(3,0) Research for the preparation of an honors project. *Preq:* P A 301 or consent of instructor.

P A H492 Performing Arts Honors Project 3(3,0) Preparation and presentation of an honors project. *Preq:* P A 491, consent of department chair and project advisor.

P A 499 Independent Studies 1-3(1-3,0) Supervised study for students with special interests in performing arts outside the scope of existing courses. May be repeated for a maximum of six credits. *Preq:* Consent of department chair.

PHILOSOPHY

Professors: W. A. Maker, *Chair*; T. G. May, S. Silvers; *Associate Professors:* S. A. Sattris, K. C. Smith, D. E. Wueste; *Assistant Professor:* C. B. Starkey; *Lecturers:* J. Benson, A. Saldino, D. L. Stegall

PHIL 101, H101 Introduction to Philosophic Problems 3(3,0) Discussion of representative philosophical questions which arise from human thought and action. Characteristic topics are values, knowledge, human nature, and society.

PHIL 102, H102 Introduction to Logic 3(3,0) Introduction to methods of evaluating arguments. Simple valid argument forms are given which can be joined together to produce the logical form of virtually any argument. Informal fallacies may also be considered.

PHIL 103, H103 Introduction to Ethics 3(3,0) Philosophical consideration of the nature of ethics, basic ethical issues, and problems and modes of ethical reasoning.

PHIL 105 Introductory Seminar in the Big Questions 3(3,0) Introductory seminar dealing with a single important philosophical question ("Who are we?" "What is the meaning of life?" "Are we free or determined?" etc.). Question is pursued throughout the semester with active student involvement. Questions may vary from semester to semester.

PHIL 124 Technology and Its Discontents 3(3,0) Philosophical introduction to issues arising from the development of technologies, their implementation, and their integration into society. Considers theoretical questions regarding the nature of technology and its evaluation, as well as issues related to specific technologies.

PHIL 201 Responsibilities in Leadership 3(3,0) Exploration of the responsibilities leaders have to those who are being led, to those on whose behalf they are leading, to those affected by leadership decisions and actions. Focuses on the relationship between responsibility and authority and the role of judgment in the exercise of leadership.

- PHIL 225 Art and Logic of Scientific Reasoning 3(3,0)** Examines applications and misapplications of inductive reasoning and causal inference in scientific explanation and everyday discourse. Topics include correlation and confirmation, natural laws, natural kinds, scientific explanation, causal inference, and experimental methods.
- PHIL 303 Philosophy of Religion 3(3,0)** Critical consideration of the meaning and justification of religious beliefs. Representative topics are the nature and existence of God, religious knowledge, religious language, the problem of evil.
- PHIL 304 Moral Philosophy 3(3,0)** Study of moral problems, their origin in conflicts between duty and desire, and alternative solutions proposed by classical and contemporary writers.
- PHIL (CHIN) 312 Philosophy in Ancient China 3(3,0)** Study of the history of Chinese philosophy from fifth century B.C.E., including Confucianism, Daoism, Moism, legalism, Buddhism, Neo-Daoism, and Neo-Confucianism. Examination of Chinese philosophers' views and arguments on questions of life and death, history and society, education and personal cultivation. May not be used to satisfy general foreign language requirements.
- PHIL (CHIN) 313 Philosophy in Modern China 3(3,0)** Study of the history of Chinese philosophy from the 19th century to the present including Neo-Confucianism, Conservatism, Liberalism, Nationalism, and Chinese Marxism. Examination of the conflict and fate of traditional and modern values in China. All readings and discussions are in English. May not be used to satisfy general foreign language requirements.
- PHIL 314 Comparative Topics in Eastern and Western Philosophy 3(3,0)** Study of issues and areas of overlapping concern to Eastern and Western philosophical traditions (e.g., ontology, ethics) with emphasis on both contrasts and convergences in philosophical approaches. Topics may vary.
- PHIL 315 Ancient Philosophy 3(3,0)** Origins and development of rationality as found in the thought of selected philosophers such as Socrates, Plato, and Aristotle.
- PHIL 316 Modern Philosophy 3(3,0)** Development of the modern view as seen in major Western philosophers of the 16th, 17th, and 18th centuries. Thought of Berkeley, Descartes, Hume, Leibniz, Locke, and Spinoza may be considered to illustrate the development of rationalism and empiricism.
- PHIL 317 Nineteenth-Century Philosophy 3(3,0)** Development of 19th-century philosophy emphasizing selected works of philosophers such as Kant, Hegel, Marx, Nietzsche, and Kierkegaard.
- PHIL 318 Twentieth-Century Philosophy 3(3,0)** Historical overview of selected significant movements in 20th-century Western philosophy such as Continental and/or analytic philosophy.
- PHIL 320 Social and Political Philosophy 3(3,0)** Critical consideration of the views of some major philosophers on the nature of the individual's relation to society and the state in the context of their wider philosophical (logical, epistemological, metaphysical, and ethical) doctrines. Philosophers may include Plato, Aristotle, Augustine, Hobbes, Rousseau, Mill, Marx, Hegel, Rawls, and Nozick.
- PHIL 321 Crime and Punishment 3(3,0)** Investigates what sorts of conduct should be criminalized and what society should do with those who engage in criminal activity. Specific topics may include the enforcement of morals, euthanasia, hate crimes, deterrence, retribution, and restitution.
- PHIL 323 Theory of Knowledge 3(3,0)** Examination of concepts, criteria, and decision procedures underlying rational belief and the justification of knowledge claims. Representative answers to the problem of skepticism are considered, with special attention to some leading theories of knowledge.
- PHIL 324 Philosophy of Technology 3(3,0)** Examines technology and representative philosophical assessments of it with a focus on understanding its impact on the human condition.
- PHIL 325 Philosophy of Science 3(3,0)** Philosophical study of problems generated by science, but which are not themselves scientific, such as what comprises a scientific theory; how scientists formulate theories and acquire knowledge; what, if anything, differentiates science from other ways of knowing; what role concepts play in scientific knowledge; whether scientific progress is rational.
- PHIL 326 Science and Values 3(3,0)** Examination of several features of the relation between science and values. Topics may include ethical and social obligations of scientists, role of value judgements in scientific practice, and influence of social and political values on science and scientists.
- PHIL 327 Philosophy of Social Science 3(3,0)** Inquiry into the philosophical foundations of social science, in particular questions of objectivity, explanatory structure, causality, agency, normativism and naturalism, and social determination of knowledge.
- PHIL 330 Contemporary Issues in Philosophy 3(3,0)** Examination of a variety of issues of broad concern to philosophers today. Issues may vary. May be repeated once for credit with departmental consent.
- PHIL 333 Metaphysics 3(3,0)** Examination of issues and problems concerning the ultimate nature of reality. Topics may include the appearance/reality distinction, the nature of existence, freedom and determinism, personal identity, idealism, and realism.
- PHIL 343 Philosophy of Law 3(3,0)** Explanation of the nature of legal theory and the law through a critical examination of the basic concepts and principles of these fields.
- PHIL 344 Business Ethics 3(3,0)** Study of ethical issues created by business activities, relating them to fundamental questions of ethics generally. Representative topics may include hiring, firing, promotions, business and minorities, organizational influence in private lives, consumer interests, economic justice, and reindustrialization.
- PHIL 345 Environmental Ethics 3(3,0)** Study of ethical problems in our dealings with the rest of nature and of how they relate to ethics in general. Representative topics include the basis of ethics, nature and intrinsic value, duties to future generations, economics and the environment, rare species, animal rights, ethics and agriculture, energy doctrine.
- PHIL 346 Medical Ethics 3(3,0)** Examines ethical dilemmas facing modern medicine. Topics may include controversies surrounding death, reproductive technologies, abortion, allocation of resources, the concept of disease, the doctor-patient relationship, and medical research.
- PHIL 347 Ethics in Architecture 3(3,0)** Interdisciplinary course focused on the architectural profession and the practices of design, building, and other processes in a social and business context. Consideration is given to both general moral principles and particular case studies.
- PHIL 348 Philosophies of Art 3(3,0)** Examines some of the predominant attempts to understand art in ancient and modern philosophy and also considers a variety of contemporary views and controversies about the nature, meaning, value, and future of art.
- PHIL (NURS) 350 Technology and Philosophy in Nursing 3(3,0)** See NURS 350.
- PHIL 355 Philosophy of Mind and Cognitive Science 3(3,0)** Critical examination of philosophical and scientific theories of mental phenomena and of the relationship between mental and material phenomena. Theories of Mind-Body Dualism, Monism, Functionalism, Eliminative and Reductive Materialism, Connectionism, and the status of folk psychology versus cognitive neuroscience are studied.
- PHIL 360 Symbolic Logic 3(3,0)** Introduction to the basic concepts of modern symbolic logic, including the symbolization of statements and arguments and the techniques of formal proof.
- PHIL 370 Philosophy of War 3(3,0)** Examines war from both ethical and strategic perspectives: the nature of a just war, the aims of war, and the kinds of general strategies appropriate for achieving those aims.
- PHIL 375 Minds and Machines 3(3,0)** Examines controversial questions in artificial intelligence and the Computational Theory of Mind. Topics may include "Can machines think?" "What's involved in being able to think?" "Can machines reason, understand, be conscious, be self-aware, learn, be creative, have emotions, and use natural language?" Focus is on manmade computers and the mind as computer.
- PHIL (REL) 393 Science and Religion 3(3,0)** See REL 393.
- PHIL 399 Philosophy Portfolio 2(2,0)** Creation of a digital portfolio to demonstrate competence in reasoning, critical thinking, and problem solving skills as well as ethical judgment. Course also serves as a resource for academic and professional development. *Preq:* Junior standing in Philosophy.
- PHIL 401, 601 Studies in the History of Philosophy 3(3,0)** In-depth study of a selected philosopher, philosophical school, or movement. Topics vary. With departmental consent, may be repeated once for credit. Current topics and course descriptions are available in the department's course offering brochure. *Preq:* Consent of instructor.

PHIL 402, 602 Topics in Philosophy 3(3,0)

Thorough examination of a particular philosophical topic, issue, or problem. Topics vary. May be repeated once for credit with departmental consent. Current topics and course descriptions are available in the department's course offering brochure. *Preq:* Consent of instructor.

PHIL 406, 606 Continental Philosophy for Architects 3(3,0)

Examines contemporary Continental philosophy over the course of the 20th century with the goal of offering the proper theoretical background to architecture students who use such theory in their studies and design work.

PHIL 422 Anarchism 3(3,0)

Philosophical study of the roots of anarchist thought and its current articulations.

PHIL 425, 625 Philosophy of Psychology 3(3,0)

Detailed examination of psychology as an autonomous science. Issues include explanation in psychology and cognitive neuroscience, psychology naturalized as a "special science" comparable to biology and geology, evolutionary psychology, philosophy and psychopathology, and moral issues in psychology. *Preq:* Nine hours of psychology or consent of instructor.

PHIL (A A H) 433, 633 Issues in Contemporary Art and Philosophy 3(3,0)

Examines the intersections between recent developments in art and those in philosophy and critical theory. Course content varies, for example, Postmodernism in Art and Philosophy, Themes of Resistance in Contemporary Culture.

PHIL 485, 685 Topics in Philosophy of Biology 3(3,0)

Detailed analysis of a selected topic in philosophy of biology/theoretical biology. Topics may include the levels of selection debate, sociobiology, genetic explanation and genetic causation, the species question, and the history and sociology of biology. *Preq:* Eight credit hours of biology or consent of instructor.

PHIL H497 Philosophy Honors Research 3(3,0)

Students conduct research, clearly define the topic, and complete an annotated bibliography under the supervision of the thesis advisor. *Preq:* Consent of department chair and thesis advisor.

PHIL H498 Philosophy Honors Thesis 3(3,0)

In consultation with the thesis advisor and committee, students write, revise, defend, and complete the thesis. *Preq:* PHIL H497 and consent of department chair and thesis advisor.

PHIL 499, 699 Independent Study 1-3(1-3,0)

Course of study designed by the student in consultation with a faculty member who agrees to provide guidance, discussion, and evaluation of the project. Student must confer with the faculty member prior to registration. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.

PHYSICAL SCIENCE**PH SC 107 Introduction to Earth Science 4(3,3)**

Survey of topics in geology, meteorology, astronomy, and oceanography emphasizing comprehension and practical application of earth science concepts to experiments and activities appropriate for the elementary school classroom. Enrollment priority will be given to Early Childhood and Elementary Education majors.

PH SC 108 Introduction to Physical Science 4(3,3)

Survey of topics in chemistry and physics emphasizing comprehension and practical application of physical science concepts to experiments and activities appropriate for the elementary school classroom. Enrollment priority will be given to Early Childhood and Elementary Education majors.

PHYSICS

Professors: P. A. Barnes, *Chair*; D. D. Clayton, M. S. Daw, L. L. Larcom, M. F. Larsen, M. D. Leising, P. J. McNulty, J. R. Manson, J. W. Meriwether, B. S. Meyer, A. M. Rao, T. M. Tritt; *Associate Professors:* P. J. Flower, D. H. Hartmann, H. Jiang, J. C. King; *Assistant Professors:* P-C Ke, G. A. Lehmacher, D. C. Marinescu, C. E. Sosolik

PHYS 101 Current Topics in Modern Physics 1(0,2)

Demonstrations and lectures serving as an introduction to different areas of physics and astronomy are presented by various members of the staff. May include such topics as astrophysics, energy, relativity, and weather, as well as visits to the planetarium.

PHYS 122, H122 Physics with Calculus I 3(3,0)

First of three courses in a calculus-based physics sequence. Topics include vectors, laws of motion, conservation principles, rotational motion, oscillations, and gravitation. Credit for a degree will be given for only one of PHYS 122, 200, or 207. *Coreq:* MTHSC 108.

PHYS 124 Physics Laboratory I 1(0,3)

Introduction to physical experimentation with emphasis on mechanical systems, including oscillatory motion and resonance. Computers are used in the experimental measurements and in the statistical treatment of data. *Coreq:* PHYS 122.

PHYS 200 Introductory Physics 4(3,2)

Introduction to classical physics. Includes elements of mechanics, heat, electricity, and light. May not be substituted for PHYS 122 but may be substituted for PHYS 207, only with the approval of the Department of Physics and Astronomy. Credit for a degree will be given for only one of PHYS 122, 200, or 207. *Coreq:* MTHSC 105 or equivalent.

PHYS 207 General Physics I 3(3,0)

Introductory course for students who are not majoring in physical science or engineering. Covers such topics as mechanics, waves, fluids, and thermal physics. Credit for a degree will be given for only one of PHYS 122, 200, or 207. *Coreq:* MTHSC 105 or equivalent.

PHYS 208 General Physics II 3(3,0)

Continuation of PHYS 207. Covers such topics as electricity, magnetism, electromagnetic waves, optics, and modern physics. Credit for a degree will be given for only one of PHYS 208 or 221. *Preq:* PHYS 207. *Coreq:* PHYS 210.

PHYS 209 General Physics I Laboratory 1(0,2)

Introductory laboratory course for students who are not majoring in physical science or engineering. Covers such topics as mechanics, waves, fluids, and heat. *Coreq:* PHYS 207.

PHYS 210 General Physics II Laboratory 1(0,2)

Covers such topics as electricity, magnetism, electromagnetic waves, optics, and modern physics. *Preq:* PHYS 207, 209. *Coreq:* PHYS 208.

PHYS 221, H221 Physics with Calculus II 3(3,0)

Continuation of PHYS 122. Topics include thermodynamics, kinetic theory of gases, electric and magnetic fields, electric currents and circuits, and motions of charged particles in fields. Credit for a degree will be given for only one of PHYS 208 or 221. *Preq:* PHYS 122.

PHYS 222, H222 Physics with Calculus III 3(3,0)

Continuation of PHYS 221. Topics include wave motion, electromagnetic waves, interference and diffraction, relativity, atomic particles, and atomic and nuclear structure. *Preq:* PHYS 221.

PHYS 223 Physics Laboratory II 1(0,3)

Experiments in heat and thermodynamics, electrostatics, circuits, and magnetism. Computers are used in statistical treatment of data. *Coreq:* PHYS 221.

PHYS 224 Physics Laboratory III 1(0,3)

Experiments involve atomic, molecular, and nuclear systems. Wave particle dualism of light and matter is emphasized. Calculators and computers are used in statistical treatment of data. *Coreq:* PHYS 222.

PHYS 240 Physics of the Weather 3(3,0)

Descriptive introduction to meteorology. Includes atmospheric thermodynamics, solar radiation, heat budget, atmospheric circulation, force laws governing air motion, fronts, precipitation, synoptic prediction. Special topics of current interest such as the effect of environmental pollution on weather and the effect of weather on health are included.

PHYS 262 Physics of Music 3(3,0)

Elementary, nontechnical study of the relationship between the laws of physics and the production of music for the music student or layman who wishes to understand the physical principles of the art. Topics include mechanical and acoustical laws, harmonic analysis, musical scales, sound production in instruments, physiology of hearing, etc.

PHYS 290 Physics Research 1-3(0,3-9)

Individual research project in any area of experimental or theoretical physics or astronomy supervised by a physics or astronomy faculty member. Project need not be original but must add to students' ability to carry out research. May be repeated for a maximum of six credits. *Preq:* Minimum grade-point ratio of 3.0; consent of instructor.

PHYS 300, H300 Introduction to Research 1(2,0)

Acquaints students with current research in physics. Seminars are provided where research activities in various areas of physics and astronomy are summarized. Provides a basis for students to choose a suitable topic for a senior thesis. *Preq:* Junior standing in Physics.

PHYS 311 Introduction to the Methods of Theoretical Physics 3(3,0)

Survey of methods and techniques of problem-solving in physics. Emphasizes the application of mathematical techniques to the solution of problems of vectors, fields, and waves in mechanics, electromagnetism, and quantum physics. *Preq:* PHYS 222 or consent of instructor.

PHYS 312 Methods of Theoretical Physics II 3(3,0)

Continuation of PHYS 311 focused on introducing various mathematical notions widely used in upper level physics courses, such as differential equations, special functions and complex numbers, and complex functions. *Preq:* PHYS 311 or consent of instructor.

- PHYS 321, H321, 621 Mechanics I 3(3,0)** Statics, motions of particles and rigid bodies, vibratory motion, gravitation, properties of matter, flow of fluids. *Preq:* PHYS 221.
- PHYS 322, H322, 622 Mechanics II 3(3,0)** Dynamics of particles and rigid bodies, Lagrangian and Hamiltonian formulations, vibrations of strings, wave propagation. *Preq:* PHYS 321 or consent of instructor.
- PHYS 325, H325, 625 Experimental Physics I 3(1,4)** Introduction to experimental modern physics, measurement of fundamental constants, repetition of crucial experiments of modern physics (Stern-Gerlach, Zeeman effect, photoelectric effect, etc.). *Coreq:* PHYS 321 or consent of instructor.
- PHYS 326, H326, 626 Experimental Physics II 3(1,4)** Continuation of PHYS 325.
- PHYS 355, H355 Modern Physics 3(3,0)** Study of the topics of modern physics, including relativity, atomic physics, quantum mechanics, condensed-matter physics, nuclear physics, and elementary particles. *Preq:* PHYS 222, MTHSC 206, or consent of instructor.
- PHYS 356 Modern Physics Overview 1(1,0)** Overview of topics in modern physics, including a short description of the structure of solids, nuclear physics, and particle physics. *Preq:* PHYS 222 or consent of instructor.
- PHYS 401, H401 Senior Thesis 1-3** Semi-original theoretical, experimental, or computational research project performed under the direction of a faculty member. Fields available include astronomy, astrophysics, atmospheric physics, biophysics, high energy physics, relativity, solid state physics, and statistical mechanics. May be repeated for a maximum of six credits. *Preq:* Nine credits of physics at the 300–400 level.
- PHYS 417, H417, 617 Introduction to Biophysics I 3(3,0)** Introduction to the application of physics to biological problems. Topics include review of elementary chemical and biological principles, physics of biological molecules, and fundamentals of radiation biophysics. *Preq:* MTHSC 206, PHYS 221, or consent of instructor.
- PHYS 420, 620 Atmospheric Physics 3(3,0)** Study of physical processes governing atmospheric phenomena. Topics include thermodynamics of dry and moist air, solar and terrestrial radiative processes, convection and cloud physics, precipitation processes, hydrodynamic equations of motion and large-scale motion of the atmosphere, numerical weather prediction, atmospheric electricity. *Preq:* MTHSC 108, PHYS 208 or 221.
- PHYS 432, H432, 632 Optics 3(3,0)** Covers a selection of topics, depending on the interest of the student. Topics may include the formation of images by lenses and mirrors, design of optical instruments, electromagnetic wave propagation, interference, diffraction, optical activity, lasers, and holography. *Preq:* PHYS 221.
- PHYS 441, H441, 641 Electromagnetics I 3(3,0)** Study of the foundations of electromagnetic theory. Topics include electric fields, electric potential, dielectrics, electric circuits, solution of electrostatic boundary-value problems, magnetic fields, and magnetostatics. *Preq:* PHYS 221 and MTHSC 208, or consent of instructor.
- PHYS 442, H442, 642 Electromagnetics II 3(3,0)** Continuation of PHYS 441. Study of foundations of electromagnetic theory. Topics include magnetic properties of matter, microscopic theory of magnetization, electromagnetic induction, magnetic energy, AC circuits, Maxwell's equations, and propagation of electromagnetic waves. Other topics may include waves in bounded media, antennas, electrodynamics, special theory of relativity, and plasma physics. *Preq:* PHYS 441 or consent of instructor.
- PHYS 445 Solid State Physics I 3(3,0)** Topics include an overview of crystal structures, chemical and atomic bonding, and periodicity in relation to solid materials. Covers electronic, thermal, and magnetic properties of materials, electrical conduction in metals and semiconductors. Overview of the role of electrons and phonons and their interactions is presented. *Preq:* PHYS 455 or consent of instructor.
- PHYS 446, H446, 646 Solid State Physics II 3(3,0)** Continuation of PHYS 445, including selected topics in solid-state physics such as optical properties, superconductivity, non-crystalline solids, dielectrics, ferroelectrics, and nanomaterials. Plasmons, polarons, and excitons are discussed. Brief introduction into methods of solid-state synthesis and characterization tools is presented. *Preq:* PHYS 445 or consent of instructor.
- PHYS 452, H452, 652 Nuclear and Particle Physics 3(3,0)** Study of our present knowledge concerning subatomic matter. Experimental results are stressed. Topics include particle spectra, detection techniques, Regge pole analysis, quark models, proton structure, nuclear structure, scattering and reactions.
- PHYS 455, H455, 655 Quantum Physics I 3(3,0)** Discussion of solution of the Schroedinger equation for free particles, the hydrogen atom, and the harmonic oscillator. *Preq:* PHYS 322 and 441, or consent of instructor.
- PHYS 456, H456, 656 Quantum Physics II 3(3,0)** Continuation of PHYS 455. Application of principles of quantum mechanics as developed in PHYS 455 to atomic, molecular, solid state, and nuclear systems. *Preq:* PHYS 455.
- PHYS 465, H465, 665 Thermodynamics and Statistical Mechanics 3(3,0)** Study of temperature development of the laws of thermodynamics and their application to thermodynamic systems. Introduction to low temperature physics is given. *Preq:* Six hours of physics beyond PHYS 222 or consent of instructor.
- PHYS 475 Selected Topics 1-3(0-3,0-9)** Comprehensive study of a topic of current interest in the field of physics. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Consent of instructor.
- PHYS 481 Physics of Surfaces 3(3,0)** Introduction for advanced undergraduates to the physics and chemical physics of solid surfaces and to the interaction of atoms and molecules with those surfaces. *Preq:* PHYS 312, 322, 325, 326, 441, or consent of instructor.
- PHYS 482 Surface Experiments 3(2,3)** Introduction for advanced undergraduates to experimental methods of surface physics. Includes on-hands experience in advanced laboratory. *Preq:* PHYS 312, 322, 325, 326, 441, or consent of instructor.

PLANT PATHOLOGY

Professors: N. D. Camper, B. A. Fortnum, A. P. Keinath, S. A. Lewis, S. B. Martin, J. D. Mueller, M. B. Riley, S. W. Scott; *Associate Professor:* S. N. Jeffers, G. Schnabel

PL PA 302, H302 Plant Pathology Research 1-3(0,3-9) Research experience in a plant pathology project for undergraduates who understand basic concepts of research. Students develop research objectives, procedures, and collect data. A written report includes interpretation of results. To be taken Pass/Fail only. *Preq:* Consent of instructor.

PL PA 310 Plant Diseases and People 3(2,3) Introduction to diseases caused by biotic and abiotic agents, symptom development, diagnosis, economics, control, and relationship of plant diseases to human welfare including the uses of genetic engineering to develop disease resistant crops. *Preq:* BIOL 104 or equivalent.

PL PA (ENT) 406, 606 Diseases and Insects of Turfgrasses 2(2,0) Host-parasite relationships, symptomatology, diagnosis, economics, and control of infectious diseases of turfgrasses; and life histories, diagnosis, and control of important insect pests of turfgrasses. *Preq:* ENT 301, PL PA 310, or equivalent; or consent of instructor.

PL PA (ENT) 408, 608 Diseases and Insects of Turfgrasses Laboratory 1(0,3) Laboratory to complement PL PA (ENT) 406 to learn symptomatology, diagnosis and control of infectious diseases of turfgrasses, and diagnosis of damage caused by important insect pests of turfgrasses. *Preq:* PL PA (ENT) 406.

PL PA 411, 611 Plant Disease Diagnosis I 2(1,2) Methods and procedures used in the diagnosis of plant diseases, especially late spring and early summer diseases. Basic techniques of pure culture and identification of plant pathogens and Koch's postulates are taught. Diagnosis of a wide variety of diseases of cultivated and wild plants is carried out. Offered summer session only. *Preq:* PL PA 310 or equivalent.

PLANT PHYSIOLOGY

PL PH (BIOSC) 340 Plant Medicine and Magic 3(3,0) Study of use of compounds of plant and fungal origin as poisons, hallucinogens, and pharmaceuticals. *Preq:* BIOL 104, CH 102, or consent of instructor.

POLITICAL SCIENCE

Professors: W. Lasser, M. A. Morris, B. W. Ransom, J. E. Stewart, Jr., *Chair*; S. H. Wainscott, J. D. Woodard; *Associate Professors:* X. Hu, L. R. Olson, R. W. Smith; *Assistant Professors:* M. D. Crosston, A. L. Warber; *Lecturers:* V. Matic, J. R. Willand Dillard

- PO SC 101, H101 American National Government 3(3,0)** Introduction to American national government and politics examining topics such as the Constitution, federalism, political institutions, political behavior, and political participation.
- PO SC 102, H102 Introduction to International Relations 3(3,0)** Overview of both theory and practice in contemporary global politics. Topics include the structure of and primary actors in the international system; reasons conflict occurs; and roles of international institutions, law, and policy.
- PO SC 104, H104 Introduction to Comparative Politics 3(3,0)** Introduction to the study of comparative politics in the post-Cold War era, with emphasis on theories and applications. Topics include democratic and nondemocratic systems; ideology; political culture; party systems; and legislative, executive, and judicial structures.
- PO SC 302 State and Local Government 3(3,0)** Introduction to American state and local governments, including examination of nature and scope of non-national governments and their interaction with the U.S. federal system. Emphasis is on structural features, functions, and policies of non-national governments.
- PO SC 310 Political Science Internship 1-3(1-3,0)** Off-campus internship for at least one semester or its equivalent. May be repeated for a maximum of three credits. No more than six hours credit from PO SC 310, 311, and 312 may be counted toward any degree. *Preq:* PO SC 101 and consent of instructor.
- PO SC 311 Model United Nations 1(0,1)** Participation in United Nations simulation exercises, in competition with other colleges and universities. May be repeated for a maximum of six credits; however, no more than six hours credit from PO SC 310, 311, and 312 may be counted toward any degree. *Preq:* Consent of instructor.
- PO SC 312 State Student Legislature 1(0,1)** Participation in state student legislature simulation exercises, in competition with other colleges and universities in the State. May be repeated for a maximum of six credits; however, no more than six hours credit from PO SC 310, 311, and 312 may be counted toward any degree. *Preq:* Consent of instructor.
- PO SC 321 Public Administration 3(3,0)** Introduction to public administration including the elements of organization, personnel and financial management, administrative law, and administrative responsibility. *Preq:* PO SC 101, Junior standing, or consent of instructor.
- PO SC 341 Quantitative Methods in Political Science 3(3,1)** Introduction to quantitative research methods in political science. Topics include research design, measurement, data collection, sampling procedures, and applications of statistical techniques to research problems in political science. This course also stresses computer use for elementary data analysis.
- PO SC 343 The Mass Media in American Politics 3(3,0)** Role and impact of the mass media in the American political system, emphasizing the media's role in shaping public opinion and in influencing government and public policy. *Preq:* PO SC 101, Junior standing, or consent of instructor.
- PO SC (LANG) 350 Seminar in International News 3(3,0)** See LANG 350.
- PO SC (E L E, PSYCH, SOC) 356 Social Science of Entrepreneurship 3(3,0)** See SOC 356.
- PO SC 361, H361 International Politics in Crisis 3(3,0)** Factors contributing to the prevalence of tension and conflict in the contemporary global arena are identified and analyzed, with particular emphasis on political, economic, and military elements. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 362 International Organizations 3(3,0)** Examines normative and institutional foundations of civil society. Explains the formal institutions, decision-making processes, and multilateral capacities of international governmental and nongovernmental organizations. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 363 United States Foreign Policy 3(3,0)** American foreign policy in historical perspective, with particular emphasis on decision-making process, contemporary American capabilities and challenges, and analysis of key issues. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 367 Political Risk Assessment 3(3,0)** Risks associated with conducting business and other activities in different countries, especially in the frequently unstable setting of the developing world. Major commercial providers of country risk assessment are identified and critiqued. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 371 European Politics 3(3,0)** Major emphasis on European governments and issues of importance in the European context. Current methods of comparison are studied and applied to the formal and informal functioning of European governments. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 372 Political Culture of East Asia 3(3,0)** Introduction to political culture that commonly characterizes East Asian countries, with emphasis on political subcultures of different nations, and on the analysis of the mutual influence between politics and culture. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 375, H375 European Integration 3(3,0)** Survey course analyzing increasing institutional cooperation between European countries with a focus on the European Union. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 381 African American Politics 3(3,0)** Examination of African American political thought, interests and agenda setting, and dynamics of African Americans' participation in political and governmental decision making. *Preq:* PO SC 101, Junior standing, or consent of instructor.
- PO SC (SPAN) 382 Spanish-Language News 1(1,0)** Weekly discussions of Spanish-language news articles in the foreign press with an emphasis on politics and on the connections among political, economic, social, and cultural trends. Emphasizes Spanish vocabulary as well as cross-cultural contrasts with the United States. May be repeated for a maximum of three credits. *Preq:* SPAN 202 or equivalent or consent of instructor.
- PO SC (FR) 383 French-Language News 1(1,0)** Weekly discussions of French-language news articles in the foreign press with an emphasis on politics and the connections among political, social, economic, and cultural trends. Emphasizes French vocabulary as well as cross-cultural contrasts with the United States. May be repeated for a maximum of three credits. *Preq:* FR 202 or equivalent or consent of instructor.
- PO SC 389 Selected Topics 1-3(1-3,0)** Study of a selected area of political science. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Consent of instructor.
- PO SC H395 Junior Honors Research Seminar 1(1,0)** Readings and discussion to prepare for the Junior Research Paper and the Senior Thesis. *Preq:* Junior standing, membership in Calhoun Honors College, consent of instructor.
- PO SC H396 Junior Honors Research 1(1,0)** Readings and research in conjunction with an approved political science course at the 300 or 400 level. *Preq:* Junior standing, membership in Calhoun Honors College, and consent of instructor.
- PO SC 403 United States Congress 3(3,0)** Examination of the evolution of Congress, congressional elections, the organization of the legislative branch, congressional rules and procedures, decision making, styles of representation, and policymaking. *Preq:* PO SC 101, Junior standing, or consent of instructor.
- PO SC 405 The American Presidency 3(3,0)** Examines the evolution of the presidency, the powers of the chief executive, the public presidency, executive branch organization and staffing, decision making, and political relations with Congress and the federal judiciary. *Preq:* PO SC 101, Junior standing, or consent of instructor.
- PO SC 407 Religion and American Politics 3(3,0)** Examination of the impact of religion on American politics, including an analysis of the role of religion in politics, political behavior of major religious groups, constitutional issues and voting behavior. *Preq:* PO SC 101, Junior standing, or consent of instructor.
- PO SC 409, 609 Directed Study in American Politics 1-3(1-3,0)** Supervised reading and/or research in selected areas of American government. May be repeated for a maximum of six credits. *Preq:* Consent of instructor.
- PO SC 410 Directed Study in International Politics 1-3(1-3,0)** Supervised readings and/or research in selected areas of international and comparative politics. *Preq:* Consent of instructor.

- PO SC 416, 616 Interest Groups and Social Movements 3(3,0)** Empirical and normative examination of the origins, roles, and influence of interest groups and social movements in the United States and of the relationships among interest groups, social movements, and democratic theory. *Preq:* PO SC 101, Junior standing, or consent of instructor.
- PO SC 421, 621 Public Policy 3(3,0)** Introduction to the major approaches to public policy making in American government. Topics include theories and models of policy making, the identification of policy problems, agenda setting, the formulation and adoption of policy, implementation, and program evaluation. *Preq:* PO SC 101, Junior standing, or consent of instructor.
- PO SC 423, 623 Urban Politics 3(3,0)** Examines the nature and scope of politics in urban communities and offers an analysis of urban governance, especially in the interaction of public authority and private institutions in metropolitan areas. Emphasis is on the structure, processes, and problems challenging governments in urban America. *Preq:* PO SC 101, Junior standing, or consent of instructor.
- PO SC 424, 624 Federalism and Intergovernmental Relations 3(3,0)** Introduction to the historical, theoretical, legal, and fiscal aspects of constitutionally divided government. Federal, state, and local division of responsibility for public services is emphasized along with the emerging devolution of those responsibilities from the federal government to states and localities. *Preq:* PO SC 101, Junior standing, or consent of instructor.
- PO SC 427, 627 Public Management 3(3,0)** Examination of emerging management problems and issues facing federal, state, and local government and the application of management principles, practices, and techniques of public administration. *Preq:* PO SC 101, Junior standing, or consent of instructor.
- PO SC 428, 628 National Security Policy 3(3,0)** National security threats and policy decision making. Issues covered include weapons of mass destruction, terrorism, organized crime, narcotics, arms control, intelligence, and homeland security. Students deliberate and assess threat priorities and crisis management. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 429, 629 Global Security Threats 3(3,0)** Analysis, assessment, and management of the principal threats facing global security today. Topics include rogue nations, regional superpowers, alliances, organized crime, illegal weapons proliferation, and corruption. Emphasis is on the strategies available to the international community for dealing with these threats. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 430 Public Policy Evaluation 3(3,0)** Discussion of the role of policy analysis in government. Applications of analytical and computer tools to substantive policy areas such as transportation, economic/community development, education, poverty, and health. Students focus on assessing a policy from a set of options based on analytic criteria as well as developing policy alternatives. *Preq:* MTHSC 301 or PO SC 341 or equivalent.
- PO SC 432, 632 American Constitutional Law: Structures of Government 3(3,0)** Examination and analysis of Supreme Court decisions and other legal materials in the areas of national power, federalism, the separation of powers, and the role of the judiciary. *Preq:* Junior standing or consent of instructor.
- PO SC 433, 633 American Constitutional Law: Rights and Liberties 3(3,0)** Examination and analysis of Supreme Court decisions and other legal materials in the areas of civil rights and civil liberties, with an emphasis on freedom of speech, freedom of religion, equal protection of the laws, and privacy rights. *Preq:* Junior standing or consent of instructor.
- PO SC 442, 642 Political Parties and Elections 3(3,0)** Study of the distinctive features of the American two-party system with emphasis on presidential elections. Parties are examined as formal organizations, coalitions of voters and interest groups, coordinators of nomination and election processes, and managers of policy-making institutions. *Preq:* PO SC 101, Junior standing, or consent of instructor.
- PO SC 450 Political Theory 3(3,0)** Moral concepts central to political life, including equality, freedom, community, and individualism. Emphasis is placed on the ideologies that express these concepts, including democracy, liberalism, conservatism, socialism, and Fascism. Philosophers covered range from Plato to Foucault. *Preq:* PO SC 101 or 102 or 104, Junior standing, or consent of instructor.
- PO SC 453 American Political Thought 3(3,0)** American political philosophy from the 17th century to the present with emphasis on political and social developments since the 1770s. *Preq:* PO SC 101, Junior standing, or consent of instructor.
- PO SC 454, 654 Southern Politics 3(3,0)** Examination of the unique political environment of the American South, with emphasis on the events and social forces which have shaped politics in the region since World War II. Course material is approached from a variety of perspectives, including history, literature, social themes, and political culture. *Preq:* PO SC 101, Junior standing, or consent of instructor.
- PO SC 456 Diplomacy: The Art of Negotiation 3(3,0)** Examines the conduct of foreign policy in the historical and contemporary context. Explores theories and key concepts of international negotiation, offering a comparative look at the behavior and practice of major powers. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 457, 657 Political Terrorism 3(3,0)** Examination and analysis of the international phenomenon of terrorism in terms of origins, operations, philosophy, and objectives. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 458, 658 Political Leadership 3(3,0)** Comparative examination of political leaders, focusing particularly on types, methods, and consequences of leadership and on the relationship between leaders and followers. *Preq:* PO SC 101, Junior standing, or consent of instructor.
- PO SC 459 Ethnic Violence 3(3,0)** Examination of both theories and case studies of ethnic violence in today's world, with emphasis on understanding potential strategies of conflict resolution. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 466 African Politics 3(3,0)** Comprehensive survey of major regional blocks as well as analysis of individual states and thematic concepts. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 471 Russian Politics 3(3,0)** Comprehensive examination of the Russian Federation since the fall of the Soviet Union. The successes and failures of democratic transition are analyzed, with topics covering political participation, organized crime and corruption, center-periphery conflict, and ethnic/religious unrest. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 472 Japanese Politics 3(3,0)** Concepts and operation of contemporary Japan's political system. Emphasis is on institution building and political economy after World War II. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 473 Eurasian Politics 3(3,0)** Examination of the areas of the Caucasus and Central Asia, covering themes including democratization, globalization, terrorism, and stability. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 476 Middle East Politics 3(3,0)** Comprehensive thematic and empirical analysis of the Middle East region. Issues covered include democratization, political and religious freedom, oil, the role of women, and terrorism. States analyzed include Syria, Jordan, Iran, Iraq, Saudi Arabia, Turkey, and the Gulf States. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 477 Chinese Politics 3(3,0)** Concepts and operation of contemporary China's political system; emphasizes institutional innovation and political economy in recent reforms. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 478 Latin American Politics 3(3,0)** Survey of prominent trends in Latin American politics, with a focus on major countries in the region and major issues affecting the region. Relations between Latin America and the United States and other prominent countries are also considered. *Preq:* PO SC 102 or 104, Junior standing, or consent of instructor.
- PO SC 480, 680 Gender and Politics 3(3,0)** Examination of the role of gender in politics in the United States and in other countries. Particular emphasis on the role of women in electoral politics, issues of gender, women's rights as human rights, and feminist theory. *Preq:* PO SC 101, 102, or 104, Junior standing, or consent of instructor.
- PO SC 482 The Political Novel and Film 3(3,0)** Examination of political novels and films. Emphasizes the development of these media as art forms; the relationship between political novels and films and politics at large; and the role of these media in shaping public opinion. *Preq:* PO SC 101, Junior standing, or consent of instructor.

PO SC (LANG) 485, 685 Global Affairs and Governments 3(3,0) Designed for teachers and education students who wish to learn how to incorporate global affairs more fully into high school curricula. Overview of major topics involving foreign policies and world politics is provided.

PO SC 489, 689 Selected Topics 1-3(1-3,0) Intensive examination of a selected area of political science. May be repeated for a maximum of six credits, but only if different topics are covered. *Preq:* Consent of instructor.

PO SC H490 Senior Honors Thesis Research 3(3,0) Reading and research related to the senior honors thesis. *Preq:* Senior standing, membership in Calhoun Honors College, and consent of instructor.

PO SC H491 Senior Honors Thesis 3(3,0) Research and writing of the senior honors thesis. *Preq:* Senior standing, membership in Calhoun Honors College, and consent of instructor.

POLYMER AND FIBER CHEMISTRY

Professors: J. R. Aspland, S. B. Bhaduri, D. A. Brosnan, M. J. Drews, M. S. Ellison, B. C. Goswami, C. W. Jarvis, B. I. Lee, G. C. Lickfield, H. J. Rack, K. A. Richardson, *Director*; E. A. Vaughn; *Associate Professors:* J. M. Ballato, S. H. Foulger, E. C. Skaar, T. D. Taylor; *Assistant Professors:* P. Brown, J. Luo, I. A. Luzinov; *Visiting Lecturer:* J. L. Grossman

PFC 303 Textile Chemistry 3(3,0) Study of the properties and reactions of aliphatic and aromatic organic compounds. Emphasizes mechanistic interpretations and the development of synthetic schemes leading to polyfunctional compounds of the types encountered in the textile industry. *Preq:* CH 102. *Coreq:* MTHSC 206 or 207.

PFC 304 Textile Chemistry 3(3,0) Fundamental principles of physical chemistry with emphasis on areas frequently encountered in the textile industry including thermodynamics, kinetics, and solution properties. These concepts are applied to the study of organic compounds and organic reaction mechanisms. *Preq:* PFC 303.

PFC 305 Textile Chemistry Laboratory 1(0,3) Introduction to techniques used in synthesis and characterization of organic compounds. *Coreq:* PFC 303.

PFC 306 Textile Chemistry Laboratory 1(0,3) Techniques used in the measurement of the physicochemical properties of polymers and textile chemicals. *Coreq:* PFC 304.

PFC 405 Principles of Textile Printing 3(2,3) Development of modern textile printing systems is studied. Also examines colloidal requirements of colorants, thickener compositions, rheology of printing pastes, and various physical requirements necessary for a successful printing system in a modern plant. *Preq:* Consent of instructor.

PFC 406 Textile Finishing—Theory and Practice 3(2,3) Study of the application of chemicals to textile substrates and how they affect the substrate's physical and chemical properties. Emphasizes the theories of chemical modification of textiles as well as the technology of finishing.

PFC 415, H415, 615 Introduction to Polymer Science and Engineering 3(3,0) Chemistry of monomers and polymers and the chemical and physical properties of polymers are discussed emphasizing fiber forming, synthetic polymers. Includes molecular characterization, structure, morphology, and mechanical properties as they relate to the design of polymer systems for end uses in textiles, geotextiles, plastics and fiber-reinforced composite materials. *Preq:* CH 201 and 330 or 224, PFC 304, or consent of instructor.

PFC 416, 616 Chemical Preparation of Textiles 3(2,3) Chemicals used in the preparation of fabric for dyeing and finishing. Oxidizing and reducing agents and their control and effect on various fibers. Colloidal and surface active properties of various compounds and the fundamental factors influencing these properties.

PFC 417 Polymer and Fiber Laboratory 1(0,3) High molecular weight polymers are prepared from monomers, and their chemical and physical properties are measured as functions of critical end use parameters using instrumental and physical methods. *Coreq:* PFC 415.

PFC 457, H457, 657 Dyeing and Finishing I 3(3,0) Understanding of physical, chemical, and mechanical principles behind the application of colors and finishes to textiles. Requires an appreciation of fiber chemistry and morphology, dye and finish structures and reactivity and mechanical principles behind equipment used to effect transfer of these chemicals onto the textile substrate.

PFC 458, H458, 658 Dyeing and Finishing II 3(3,0) Kinetics and equilibria of dyeing processes. The use of conductivity, diffusion, and other methods useful for measuring absorption of isotherms and dyeing rates and the general thermodynamic relationships applicable to dyeing operations. Fiber properties such as zeta potential, dye sites, relative amorphous area available are included.

PFC 459 Dyeing and Finishing I Laboratory 1(0,3) Introduction to common dyeing and printing methods and to some of the machinery necessary to carry out dyeing operations. *Coreq:* PFC 457.

PFC 460 Dyeing and Finishing II Laboratory 1(0,3) Covers finishing in addition to dyeing operations and their instrumental control. *Coreq:* PFC 458.

PORTUGUESE

PORT 101 Elementary Portuguese 4(3,1) Introduction to speaking, listening, and writing. Attention is given to the sound system of Portuguese to develop basic communication skills.

PORT 102 Elementary Portuguese 4(3,1) Continuation of PORT 101. *Preq:* PORT 101 or consent of instructor.

PORT 201 Intermediate Portuguese 3(3,0) Intermediate course with more emphasis on communication skills and structure. Reading and writing practice in and outside the classroom, with special attention to idiomatic usage. Introduction to perspectives through readings and cultural activities. *Preq:* PORT 102 or consent of instructor.

PORT 202 Intermediate Portuguese 3(3,0) Continuation of PORT 201. *Preq:* PORT 201 or consent of instructor.

PSYCHOLOGY

Professors: T. R. Alley, R. L. Campbell II, P. A. Connor-Greene, R. M. Kowalski, J. A. McCubbin, *Chair*; D. D. Moore, J. W. Murdoch, J. J. Pilcher, B. R. Stephens, F. S. Switzer III, M. A. Taylor, R. A. Tyrrell; *Associate Professors:* E. G. Brainerd, Jr., T. R. Britt, L. Gugerty, E. R. Muth, C. C. Pagano, C. L. S. Pury, P. H. Raymark; *Assistant Professors:* J. O. Brooks, C. Cantalupo, M. Horvath, C. H. Pak; *Senior Lecturer:* P. R. Alley

PSYCH 201, H201 Introduction to Psychology 3(3,0) Introduction to the study of behavior. Analysis of the biological bases of behavior, learning, thinking, motivation, perception, human development, social behavior, and the application of basic principles to more complex phenomena such as education, personal adjustment, and interpersonal relations.

PSYCH 202 Introductory Psychology Laboratory 1(0,2) Major phenomena and methods of psychology are illustrated and investigated in a series of laboratory modules. Students also explore career and academic development issues.

PSYCH 275 Applied Psychology and Transportation 3(3,0) Introduces psychological principles used to study human behavior (methodological, cognitive, perceptual, etc.). These psychological principles, in addition to ethical, legal, and societal perspectives, are applied to transportation issues.

PSYCH 306 Human Sexual Behavior 3(3,0) The subject of sexual behavior is approached from the psychophysiological, behavioral, and cultural points of view. Evolutionary, historical, and cross-cultural perspectives are considered.

PSYCH 309 Introductory Experimental Psychology 4(3,2) Introduction to the analysis of data from experimental and correlational research in psychology. Emphasizes the applications and logical nature of statistical reasoning. Laboratory periods stress the techniques of data analysis using microcomputers. *Preq:* PSYCH 201 with a C or better or consent of instructor.

PSYCH 310 Advanced Experimental Psychology 4(3,2) Continuation of PSYCH 309. Focus is on techniques of empirical research (experiments, quasi-experiments, survey research, etc.) that are widely used in psychology. Students design and carry out their own empirical research projects. Extensive practice in the writing of reports is included. *Preq:* PSYCH 201 with a C or better, PSYCH 309, or consent of instructor.

PSYCH 320 Principles of Behavior 3(3,0) Study of basic learning principles including classical conditioning, operant conditioning, and modeling. Initial emphasis is on animal studies followed by human applications and techniques. *Preq:* PSYCH 201 with a C or better or consent of instructor.

PSYCH 324 Physiological Psychology 3(3,0) Study of human neuroanatomy with emphasis on the function of the nervous and endocrine systems. Discusses the biological basis of behavior in its normal and abnormal dimensions. *Preq:* PSYCH 201 with a C or better or consent of instructor.

- PSYCH 325 Physiological Psychology Laboratory 1(0,3)** Demonstrations and techniques of selected physiological procedures are presented to explain the principles discussed in PSYCH 324. *Coreq:* PSYCH 324.
- PSYCH 330 Motivation 3(3,0)** Various aspects of motivation are considered by studying physiological, emotional, and environmental influences on behavior. Orientation is empirical rather than theoretical with emphasis on pertinent research, applications, and measurement of motives. *Preq:* PSYCH 201 with a C or better or consent of instructor.
- PSYCH 333 Cognitive Psychology 3(3,0)** Study of higher-order mental processing in humans. Topics include memory, learning of concepts, problem solving, and the psychology of language. *Preq:* PSYCH 201 with a C or better or consent of instructor.
- PSYCH 334 Laboratory in Cognitive Psychology 1(0,2)** Selected experiments and demonstrations are conducted to reveal phenomena related to human perception, memory, reasoning, problem solving, and high-level mental processes. *Preq:* PSYCH 201 with a C or better and PSYCH 309, or consent of instructor. *Coreq:* PSYCH 333.
- PSYCH 340, H340 Lifespan Developmental Psychology 3(3,0)** Survey of current theory and research concerned with the psychological aspects of human growth and development across the entire lifespan. Major topics include developmental methods, physical maturation, cognition, socialization, personality, psycholinguistics, intelligence, learning, behavior problems, and exceptionality. *Preq:* PSYCH 201 with a C or better or consent of instructor.
- PSYCH 344 Psychology of Adolescence 3(3,0)** Study of the psychosocial processes of adolescence. Major emphasis is on personality development, growth of thinking, social and sexual maturation, and variations in adolescence. *Preq:* PSYCH 201 with a C or better or consent of instructor.
- PSYCH 345 Adulthood and Aging 3(3,0)** Special consideration of the major psychological processes of aging as they relate to individual behavior and adaptation. Includes the influences of aging on the body, learning and psychomotor skills, thinking and intelligence, employment and productivity, personality, and psychopathology. Opportunity for contact with institutionalized and noninstitutionalized elderly persons is provided. *Preq:* PSYCH 201 with a C or better or consent of instructor.
- PSYCH 352, H352 Social Psychology 3(3,0)** Survey course analyzing human social behavior from the perspective of the individual as a participant in social relationships. Major emphasis is on the study of such contemporary social processes as attitude formation and change, interpersonal relations, conformity, conflict resolution, aggression and violence, social communication, and group phenomena. *Preq:* PSYCH 201 with a C or better or consent of instructor.
- PSYCH 355 Environmental Psychology 3(3,0)** Considers the influences of the physical environment on human behavior. Topics include perception of and adaptation to the environment, effects of physical design on behavior, and individual reactions to environmental stressors. *Preq:* PSYCH 201 with a C or better or consent of instructor.
- PSYCH (E L E, P O S C, S O C) 356 Social Science of Entrepreneurship 3(3,0)** See SOC 356.
- PSYCH 364 Industrial Psychology 3(3,0)** Reviews perception of work from the pre-industrial revolution to the present. Comparative approaches to motivation, development, maintenance, and attraction of successful work behaviors are discussed. Topics include the organization's responsibilities to the community, implementing a disease- and accident-free workplace, and the effects of consumerism. *Preq:* PSYCH 201 with a C or better or consent of instructor.
- PSYCH 368 Organizational Psychology 3(3,0)** Analysis of individual behavior for the purpose of investigating problems in organizations and increasing organization effectiveness. Topics include psychological factors affecting communication, decision making, conflict, leadership, work stress, power, and organizational change. *Preq:* PSYCH 201 with a C or better or consent of instructor.
- PSYCH 369 Leadership in Organizational Settings 3(3,0)** Broad survey of theory and research on leadership in formal organizations. A detailed explanation and critical evaluation of major theories (including participative and charismatic leadership) are bridged with helpful remedies and prescriptions for effective leadership in organizations. *Preq:* PSYCH 201.
- PSYCH 370 Personality 3(3,0)** Historical and contemporary views of individual differences in behavior, affect, health, coping, and motivation. Covers topics such as personality development and structure, personality assessment, cross-cultural issues, and applications of personality psychology. *Preq:* PSYCH 201 with a C or better or consent of instructor.
- PSYCH 375 Psychology of Substance Abuse 3(3,0)** Study of the psychological approaches to treatment of substance abuse. Topics include behavioral, social learning, and family-systems theories as applied to treating substance abuse. Emphasis is on empirical approaches to evaluating methods of treatment and matching clients to treatments. *Preq:* PSYCH 201 with a C or better or consent of instructor.
- PSYCH H385 The Social Construction of Madness 3(3,0)** Study of the construct of mental illness and the variety of ways in which psychosis has been explained, portrayed, and treated over time. Interdisciplinary approach to examining representations of "madness" that shape a culture's understanding of mental illness and its treatment, including popular culture, art, and literature. *Preq:* PSYCH 201 with a C or better or consent of instructor.
- PSYCH H390 Honors Seminar in Psychology 3(3,0)** Variable topic seminar for Honors students from all majors. Topics are announced prior to registration for each semester. May be repeated once for credit, but only if different topics are covered. *Preq:* PSYCH 201 with a C or better or consent of instructor.
- PSYCH 408 Women and Psychology 3(3,0)** Explores the wide variety of psychological issues that concern women. Emphasizes empirical research on topics such as motherhood, sex differentiation, motivation, and psychological disorders. *Preq:* PSYCH 201 with a C or better or consent of instructor.
- PSYCH 415 Systems and Theories of Psychology 3(3,0)** Study of the development of psychology particularly during the past 100 years. Emphasis is on giving students a better perspective of present-day psychology. Focus is on the various approaches taken by influential psychologists and the conflicts among these approaches. *Preq:* PSYCH 201 with a C or better and one 300-level psychology course, or consent of instructor.
- PSYCH 422, H422 Sensation and Perception 3(3,0)** Study of psychophysical techniques of measurement and sensory and perceptual processes related to vision, hearing, and the other senses. *Preq:* PSYCH 201 with a C or better and one 300-level psychology course, or consent of instructor.
- PSYCH 423 Sensation and Perception Laboratory 1(0,2)** Selected experiments are conducted to demonstrate the phenomena involved in sensation and perception. *Preq:* PSYCH 309 or consent of instructor.
- PSYCH 426, 626 Advanced Physiological Psychology 3(3,0)** Advanced studies of the biological basis of behavior with emphasis on functional neuroanatomy and endocrinology. Topics may vary. May not be repeated for credit. *Preq:* PSYCH 324 or consent of instructor.
- PSYCH 435 Human Factors Psychology 3(3,0)** Analyses of theoretical issues and research methods related to the interaction between people and machines and human performance. Topics include information processing theory, human control systems and displays, task simulation, perceptual and motor factors limiting human performance. *Preq:* PSYCH 201 with a C or better and one 300-level psychology course, or consent of instructor.
- PSYCH 443 Infant and Child Development 3(3,0)** Cognitive, emotional, and social development from conception through childhood (up to age 12). Major theories and research findings are covered. *Preq:* PSYCH 201 with a C or better and PSYCH 340, or consent of instructor.
- PSYCH 447 Moral Development 3(3,0)** Explores the development of moral reasoning, judgment, and character from a descriptive psychological point of view. Examines the theoretical and empirical work of Jean Piaget, Lawrence Kohlberg, and Elliot Turiel as well as prosocial, eudaemonistic, and cross-cultural alternatives to these ideas. *Preq:* PSYCH 201 with a C or better; PSYCH 340, 344, or 345; or consent of instructor.
- PSYCH 454 Psychology of Human Relationships 3(3,0)** Research, theory, and their practical applications regarding the development, maintenance, and dissolution of human relationships; understanding successful and unsuccessful relationships. Emphasis is on improving the individual's ability to relate to other persons both interpersonally and professionally. *Preq:* PSYCH 201 with a C or better and one 300-level psychology course, or consent of instructor.

PSYCH 459, 659 Group Dynamics 3(3,0) Review of current theory and research on small-group processes with special emphasis given to group formation and development, group structure, the dynamic forces within a group, leadership, and group problem solving and decision making. *Prq:* PSYCH 201 with a C or better and one 300-level psychology course, or consent of instructor.

PSYCH 462, 662 Psychology and Culture 3(3,0) Seminar examining the cultural context in which psychological theories and research are generated and psychological perspectives on human diversity. Topics include the philosophical positions influencing psychological theory and research; methodological issues in the study of diversity, historical and contemporary perspectives; and cross-cultural psychological research in selected content areas. *Prq:* PSYCH 310 or consent of instructor.

PSYCH 471 Psychological Testing 3(3,0) Introduction to the theory of psychological testing, emphasizing the principles of measurement and psychometric characteristics of a good psychological test. Issues in test development, administration, and interpretation are reviewed. Educational, industrial, and clinical uses of tests are examined. *Prq:* PSYCH 201 and 309, or consent of instructor.

PSYCH 480, 680 Health Psychology 3(3,0) Study of the role of health-related behaviors in the prevention, development and/or exacerbation of health problems. Emphasis on the biopsychosocial model and its application in the assessment, treatment, and prevention of health problems. *Prq:* PSYCH 201 with a C or better and one 300-level psychology course, or consent of instructor.

PSYCH 483, H483, 683 Abnormal Psychology 3(3,0) Introduction to the diagnosis and treatment of mental illnesses. Uses current diagnostic standards for mental disorders as a framework for understanding the symptoms, causes, and treatments of the most commonly observed maladaptive behaviors. *Prq:* PSYCH 201 with a C or better and one 300-level psychology course, or consent of instructor.

PSYCH 488 Theories of Psychotherapy 3(3,0) Survey of alternative theories of psychological treatment for behavioral and emotional disorders. Various theoretical assumptions, techniques, and applications of each approach are examined and compared, and case examples are considered. *Prq:* PSYCH 370 or 483 or consent of instructor.

PSYCH 489, 689 Selected Topics 3(3,0) Seminar in current topics in psychology. Topics change from semester to semester and are announced prior to each semester's registration. May be repeated once for credit, but only if different topics are covered. *Prq:* PSYCH 201 with a C or better and one 300-level psychology course, or consent of instructor.

PSYCH H490 Senior Division Honors Research I 2-4(2-4,0) Preparation and defense of a research proposal. Proposed project should be empirical, historical, or theoretical in nature. *Prq:* Junior standing, consent of department chair.

PSYCH H491 Senior Division Honors Research II 2-4(2-4,0) Completion of the proposed research project resulting in a written thesis. *Prq:* PSYCH H490.

PSYCH 492 Senior Laboratory in Psychology 1(0,2) Students complete an integrative review of topics in psychology in the context of producing a reflective portfolio. *Prq:* Senior standing in Psychology.

PSYCH 493 Practicum in Clinical Psychology 3(1,5) Students apply classroom theory in solving individual and community problems through interaction with community agencies and other professional groups in the mental health area. Students have limited but well-controlled contact with actual clinical problems as they occur in the community environment. *Prq:* PSYCH 483 and consent of instructor.

PSYCH 495 Practicum in Applied Psychology 3(1,5) Students are provided practical experience in the area of applied psychology. Students usually are involved in a project designed to help solve an industrial problem through a direct application of industrial or social psychology. *Prq:* PSYCH 352 or 364 or 454; consent of instructor.

PSYCH 496 Laboratory in Psychology 1-3(0,2-6) Laboratory in a variety of topics in psychology such as human factors psychology and psychological testing. May be repeated for a maximum of three credits. *Prq:* PSYCH 201 with a C or better; PSYCH 309, 310; or consent of instructor.

PSYCH 497, H497 Directed Studies in Psychology 1-4(0,2-6) Study under the direction of a faculty member of a particular topic agreed upon by the student and faculty member. May be repeated for a maximum of 12 credits in combination with PSYCH 498. *Prq:* Six credits in psychology, a course in research methods, and consent of the instructor.

PSYCH 498 Team-Based Research 1-4(1-4,0) Students conduct psychological research and learn about phases of the research process with a team of their peers under the direction of a faculty member. The collaborative nature of psychological research is emphasized. May be repeated for a maximum of 12 credits in combination with PSYCH 497. *Prq:* Consent of instructor.

READING

Professors: L. B. Gambrell, K. S. Headley; *Associate Professors:* P. J. Dunston, S. K. Fullerton, V. G. Ridgeway; *Assistant Professor:* J. C. McNair; *Lecturer:* M. A. Wise; *Visiting Assistant Professor:* G. M. Nemeth

READ 101 Reading Strategies 2(3,0) Primary focus is on critical reading of textbook materials and persuasive materials. Students learn how to apply and generalize newly acquired strategies to a variety of reading materials.

READ 102 Critical Reading and Thinking 2(3,0) Students learn critical reading skills in interpretation, analysis, inference, oral communication, and debate. Includes characteristics of debate in addition to the steps and sources of research. These skills are applied to important political and social issues of contemporary public concern.

READ 103 Learning Strategies 2(3,0) Students learn strategies of active learning and critical thinking skills which become an integral part of their natural thinking processes. Students learn how to generalize and apply newly acquired strategies to a variety of settings and situations.

READ 458 Early Literacy: From Birth to Kindergarten 3(3,0) Provides early childhood, elementary, and special education majors with knowledge of theory and research-based, developmentally appropriate instructional practices related to children's literacy development within the home and school from birth to kindergarten. Factors related to assessment and communication within and between the family, school, and teacher are addressed. *Prq:* Admission to the professional level.

READ 459, H459 Teaching Reading in the Early Grades: K-3 3(3,0) Provides early childhood and Elementary Education majors an understanding of teaching reading in the elementary school setting in kindergarten through third grade. Students investigate general principles of language and literacy development and learn methods for teaching and assessing children's literacy. *Prq:* ED EC 336, ED F 301, 302; admission to the professional level. *Coreq:* ED EC 400 for Early Childhood majors.

READ 460, H460 Teaching Reading in the Elementary Grades: 2-6 3(3,0) Provides preservice teachers with an understanding of teaching reading in the elementary setting in grades 2-6. Students investigate general principles of language and literacy development and learn methods for teaching and assessing children's literacy. *Prq:* ED F 301, 302, 334; admission to the professional level.

READ 461 Content Area Reading: Grades 2-6 3(2,3) Provides preservice teachers with an understanding of teaching content area literacy in grades 2-6. Students learn methods and strategies for teaching children to learn with and make use of expository texts. Comprehension, the role of expository texts, and vocabulary learning in content areas are presented. *Prq:* READ 460, admission to the professional level. *Coreq:* ED EL 451, 487, 488 (for Elementary Education majors).

READ 498, H498 Secondary Content Area Reading 3(2,2) Designed for preservice teachers who are involved with field experiences prior to student teaching full time. Prepares content area teachers to teach the reading skills necessary for effective teaching of content area material. *Prq:* Admission to professional level.

RELIGION

Professors: S. E. Grosby, N. A. Hardesty

REL 101 Introduction to Religion 3(3,0) Study of the variety of religious experience and expression in human life.

REL 102 World Religions 3(3,0) Survey of major religious traditions of the world.

REL 301 The Old Testament 3(3,0) Survey of the books of the Old Testament with special consideration given to the development of the concepts, institutions, and theology of the ancient Hebrews.

REL 302 Survey of New Testament Literature 3(3,0) Study of the books of the New Testament from the standpoint of their occasion, content, literary form, and basic theology.

REL 306 Judaism 3(3,0) Examines the development of Judaism from Biblical to modern times.