Health and Human Physiology Courses (HHP)

This is a list of health and human physiology courses. For more information, see Health and Human Physiology.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>HHP:1000</td>
<td>First-Year Seminar</td>
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<td>Small discussion class taught by a faculty member; topics chosen by instructor; may include outside activities (e.g., films, lectures, performances, readings, visits to research facilities). Requirements: first- or second-semester standing.</td>
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<tr>
<td>HHP:1010</td>
<td>Exploring Athletic Training</td>
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<td></td>
<td>Exploration of professional preparation for athletic trainers; application, career opportunities, professional organizations, awareness of basic athletic training principles.</td>
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<tr>
<td>HHP:1030</td>
<td>Introduction to Critical Thinking</td>
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<td>Concepts and skills required for critical thinking about what should and should not be taken as true; analysis and evaluation of a variety of complex extended arguments. GE: Quantitative or Formal Reasoning.</td>
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<tr>
<td>HHP:1048</td>
<td>Basics of Personal Training and Program Design</td>
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<td>Provides a basic understanding of the role of a personal trainer and key concepts for exercise program design; presentation of a fitness training model to assist in the design of individualized programs based on a client's health, fitness, and performance goals; how to facilitate rapport, adherence, self-efficacy, and behavior change in clients; design programs that help clients improve posture, movement, flexibility, balance, core function, cardiorespiratory fitness, muscular endurance, and strength; aligns with basic personal training certifications, but does not certify students on completion.</td>
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<tr>
<td>HHP:1050</td>
<td>Exploring Exercise Science</td>
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<td></td>
<td>Introduction to field of exercise science; employment and observation opportunities, academic and professional development.</td>
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<tr>
<td>HHP:1100</td>
<td>Human Anatomy</td>
<td>3 s.h.</td>
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<td></td>
<td>General human anatomy covering most systems of the body. GE: Natural Sciences without Lab.</td>
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<tr>
<td>HHP:1110</td>
<td>Human Anatomy Laboratory</td>
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<td></td>
<td>All major systems of the human body, understood through computer-generated images, models, histological slides, anatomical specimens.</td>
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<tr>
<td>HHP:1150</td>
<td>Human Anatomy Lecture with Lab</td>
<td>4 s.h.</td>
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<tr>
<td></td>
<td>Study of general human anatomy, covering all systems of the body in lecture and most systems in lab; appropriate for students planning on careers in various health professions or for those needing an introductory human anatomy course.</td>
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<tr>
<td>HHP:1200</td>
<td>First Aid/CPR Athletic Training</td>
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<td>First Aid and CPR with automated external defibrillator (AED); opportunity for certification in basic life support through the American Heart Association; satisfies the first aid and CPR requirement for the athletic training program application; for declared athletic training interest majors. Requirements: completion of or current enrollment in ATEP:1010.</td>
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<tr>
<td>HHP:1300</td>
<td>Fundamentals of Human Physiology</td>
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<td></td>
<td>Introduction to function and regulation of the human body. Recommendations: high school chemistry and basic biology. GE: Natural Sciences without Lab.</td>
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<tr>
<td>HHP:1310</td>
<td>Human Physiology Laboratory</td>
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<td></td>
<td>Laboratory course illustrating principles of physiological principles through experimental measurements, practical assessments, and computer-based illustrations of human function. Recommendations: one semester of biology.</td>
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<tr>
<td>HHP:1350</td>
<td>Fundamentals of Human Physiology with Laboratory</td>
<td>4 s.h.</td>
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<td></td>
<td>Combines lecture and laboratory; introduction to function and regulation of the human body; laboratory work illustrates principles learned in lectures utilizing experimental measurements, practical assessments, and computer-based simulations.</td>
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<tr>
<td>HHP:2130</td>
<td>Human Development Through the Life Span</td>
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<td></td>
<td>Overview of human developmental theories across the life-span: aspects of cognitive, physical, and personality development from birth to death; the role of culture, environment, health, and economic factors over the developmental process and life continuum.</td>
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<tr>
<td>HHP:2200</td>
<td>Physical Activity and Health</td>
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<td>Physical activity determinants in society; school, workplace, community-based health promotion interventions to improve activity levels. GE: Values and Culture.</td>
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<tr>
<td>HHP:2280</td>
<td>Cultural Competency in Health Interventions</td>
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<td>Examination of the importance of ethnic and cultural factors for community health practice; essential theories, models, and practices for working with race, ethnicity, gender, and social issues; topics may include demographics, disparities, complementary and alternative medicine, spiritually grounded approaches, multicultural populations, communication, workforce, aging, sexual orientation, and future challenges.</td>
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<td>HHP:2300</td>
<td>Biomechanics of Sport and Physical Activity</td>
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<td>Principles of biomechanics, kinesiology, and anatomy; quantitative aspects of sport and physical activity; emphasis on developing a qualitative grasp on mechanical principles of human movement within sports and physical activity; how to apply these principles in a sport/exercise environment. Prerequisites: HHP:1100 or HHP:1150.</td>
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<tr>
<td>HHP:2500</td>
<td>Psychological Aspects of Sport and Physical Activity</td>
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<td>Psychological theory and research related to sport and physical activity; motivation, aggression, attribution, socialization, competitive anxiety, leadership.</td>
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<td>HHP:3000</td>
<td>Equity Issues in the Health Sciences</td>
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<td>Examination of equity issues in the health sciences, including a review of the historical challenges that led to Human Subjects Review Boards, FDA oversight of drug development and clinical trials, inclusion of women in research; effect of situational ethics in the workplace; potential danger of making assumptions about clients/patients; importance of developing an inclusive communication style; assessing the effectiveness of family-friendly employment policies in providing equitable opportunities for career advancement for both women and men. Recommendations: junior or senior standing. Same as INTD:3020.</td>
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HHP:3030 Coaching for Health and Wellness 3 s.h.
Opportunities to expand knowledge and develop skills to help individuals change behavior and meet health-related goals; general health and wellness principles; principles and techniques for change; experience providing health-coaching services to clients. Prerequisites: HHP:2200 and HHP:2310. Same as INTD:3030.

HHP:3050 Obesity: Causes, Consequences, Prevention, and Treatment 3 s.h.
In-depth overview of biological, behavioral, and societal causes and consequences of obesity epidemic; potential solutions from primary and secondary prevention standpoints; causes of obesity, available treatments, and global impact that obesity epidemic presents to society. Prerequisites: HHP:2200 and HHP:2310.

HHP:3060 Advanced Human Anatomy for Athletic Trainers 4 s.h.
Extremities and relevant body cavity anatomy; anatomical terminology, anatomical relationships of human body, 3-D view of anatomy, clinical relevance of anatomy; basic science lectures, radiologic imaging discussions, introduction to clinically relevant anatomy, dissection laboratories, small group learning and teaching, faculty interaction, and computer-assisted resources. Offered summer sessions. Prerequisites: HHP:1100.

HHP:3105 Anatomy for Human Physiology 3 s.h.
All major systems of the body are covered with focus on the normal structure of the human body; appropriate for preprofessional students planning on careers in the various health professions.

HHP:3110 Advanced Anatomy Laboratory 2 s.h.
Detailed gross anatomy of all major systems of the body; structure of the human body at organ, tissue, and cellular levels; examination of various human and other mammalian specimens.

HHP:3115 Anatomy for Human Physiology with Lab 5 s.h.
Covers all major systems of the body in a combined lecture and laboratory anatomy course; focus on normal structure of the human body; laboratory includes gross anatomy of some human structures and dissection of other mammalian specimen; appropriate for preprofessional students planning on careers in various health professions. Prerequisites: BIOL:1411.

HHP:3148 Personal Training for the Exercise Scientist 3 s.h.
Essential aspects of personal training including theory and applied practice of screening, assessment, exercise prescription, and technique for development of safe and effective training programs for clients. Prerequisites: (HHP:1100 or HHP:1150) and HHP:2200 and HHP:2310 and (HHP:1300 or HHP:1350).

HHP:3150 Program Design in Strength and Conditioning 3 s.h.
Examination of elements of program design for developing muscular fitness and skill related to fitness; applies to programming for individuals with whom a major goal of their physical activity program is to maximize human performance potential; these goals can either be for personal fitness, success in specific sports, or for applications in occupational athletes.
**HHP:3550 Human Physiology with Laboratory**  
5 s.h.  
Use of organ system approach to understand human function from submolecular and cellular levels to the whole organism; emphasis on development of a mechanistic understanding of organ system function and integrated function across systems necessary for homeostatic regulation in the human body; experiential laboratory activities incorporate fundamental measurements of human physiological function, basic research methodologies, and presentation of experimental data. Prerequisites: (HHP:1300 or BIOL:1141 or BIOL:1140 or BIOL:1411) and (CHEM:1070 or CHEM:1110).

**HHP:3555 Lab for Human Physiology**  
arr.  
Experiential laboratory activities incorporating fundamental measurements of human physiological function; basic research methodologies and data analysis; presentation of experimental data. Prerequisites: HHP:3500.

**HHP:3650 Applied Sport and Exercise Psychology**  
3 s.h.  
Application of sport and exercise psychological theory; theoretical and practical experience using psychological skills training for sport and exercise.

**HHP:3655 Emotional and Psychological Aspects of Health**  
3 s.h.  
Interfaces among emotional, psychological, and physical aspects of health; examination of how individuals with healthy psychological profiles engage in health behaviors; health-related implications of negative emotional and psychological states; strategies for promoting healthy psychological patterns; designed for health promotion, health studies students, and others interested in health-related careers. Prerequisites: HHP:2200.

**HHP:3850 Promoting Health Globally**  
3 s.h.  
Major global health threats in the United States and abroad; impact of culture, history, economics on health disparities; approaches, programs, policies to remedy them. Requirements: junior or senior standing, or certificate student. Same as GHS:3850.

**HHP:3860 Leadership Theory for Health and Fitness**  
3 s.h.  
Theories and applications of current scholarship in group and individual leadership relevant for health, sport, fitness, and exercise leadership; areas of study include group dynamics, humanist leadership, leader-member exchange theory, transformational leadership, contingency/reinforcement leadership models, path-goal leadership, and multi-dimensional leadership models; approaches to leadership contextualized to build skills in cultural competence and ethics of leadership.

**HHP:3870 Motivational Interviewing for Health Professions**  
3 s.h.  
Theoretical foundations, empirical research support, and application of motivational interviewing; how people make changes with regard to health behaviors, how health professionals can support positive change, barriers to change process, empowerment and autonomy, intrinsic motivation, applications of motivational interviewing; theory and research; motivational interviewing for health behavior change; extensive applied practice of motivational interviewing techniques and group work to practice skills; discussion and application of techniques, research, and practical knowledge.

**HHP:3900 Writing for Health and Human Physiology**  
3 s.h.  
Effective written communication specific to health sciences; planning, drafting, revising, and peer-editing materials (e.g., personal statements, professional communications, general articles of interest, scientific papers); practicum experience.
HHP:4160 Exercise Electrocardiography 2 s.h.
Electrocardiography (ECG) including basic cardiac electrophysiology and ECG leads; atrial, junctional, ventricular, and atrioventricular (AV) node block arrhythmias; identifying myocardial infarction, hypertrophy, and QRS axis deviation on 12 lead ECG; other topics include ECG changes during exercise testing, diagnostic and prognostic value of exercise/pharmacological testing, and cardiac rehabilitation. Prerequisites: HHP:3500.

HHP:4190 Scientific Basis of Training for Elite Performance 3 s.h.
Application of scientific principles to goal of improving strength, speed, endurance, and overall human function; general overview of structure and function of muscular, nervous, cardiovascular, and respiratory systems; bioenergetics of exercise; endocrine response to exercise; biomechanics of resistance exercise; adaptations to anaerobic and aerobic training programs; age and sex related considerations on training; nutrition and ergogenic aids. Prerequisites: HHP:3500 or HHP:1300.

HHP:4195 Exercise Programming for Special Populations 3 s.h.
Measurement of health-related fitness and exercise capacity in special populations (e.g., children, older adults, obesity, orthopedic problems, cerebral palsy, intellectual disabilities). Prerequisites: HHP:3400 and (HHP:4200 or HHP:4210).

HHP:4200 Metabolic Exercise Testing and Prescription 4 s.h.
Basic techniques in physical fitness assessment, prescription of exercise for healthy and unhealthy adults, promotion of physical activity within communities; provides knowledge and skill competencies required for certification as American College of Sports Medicine health fitness instructor. Prerequisites: HHP:2200 and (HHP:3400 or HHP:3500 or HHP:3550). Requirements: health promotion, exercise science, or human physiology major.

HHP:4210 Musculoskeletal Exercise Testing and Prescription 4 s.h.
Educational and practical experience for designing resistance training and flexibility programs; competencies for certification with National Strength and Conditioning Association. Prerequisites: HHP:2200 and (HHP:3400 or HHP:3500 or HHP:3550). Requirements: health promotion, exercise science, or human physiology major.

HHP:4220 Biomechanics of Human Motion 3 s.h.
Application of the principles of mechanics to investigation of human motion in two dimensions; system modeling, force system and equilibrium analysis, particle and rigid body kinematics, Newton’s and Euler’s equations of motion, work-energy and impulse-momentum integral principles. Prerequisites: (HHP:1100 or HHP:1150 or HHP:3105 or HHP:3115) and (PHYS:1400 or PHYS:1511 or PHYS:1611 or HHP:2350).

HHP:4230 Motor Learning: Theory and Application 3 s.h.
How skilled motor behavior is acquired; behavioral changes that occur during skill acquisition; structural and physiological changes that occur in central nervous system; principles of training and practice that yield efficient and effective motor learning; how this information is helpful to health professionals involved in motor rehabilitation, physical educators and coaches, music instructors and musicians, strength and conditioning professionals, fitness professionals, and athletes, among others. Prerequisites: HHP:1300. Recommendations: familiarity with basic neuroscience (neurons, synaptic transmission, basic anatomical organization of sensory and motor systems).

HHP:4250 Human Pathophysiology 3 s.h.
In-depth study of human pathological processes and their effects on homeostasis; etiology, symptoms, and risk factors of various diseases; emphasis on major diseases impacting worldwide disability and death; how pathological processes are manifested and progress in the body. Prerequisites: HHP:3500 or HHP:3550.

HHP:4260 Respiratory Pathophysiology 3 s.h.
Structure and function of human respiratory system; focus on didactic and case study-based learning; control of breathing, gas exchange, lung mechanics, regulation of pulmonary blood flow, respiratory responses to stress; application of these physiological concepts to case studies of human disease. Prerequisites: HHP:3500 or HHP:3550. Recommendations: PHYS:1511, and MATH:1460 or MATH:1850.

HHP:4300 Neural Control of Posture and Movement 3 s.h.
Neuroanatomical and neuropsychological bases of human motor control; mechanisms for locomotion and posture, control of arm and hand movements, role of sensory information. Offered spring semesters. Prerequisites: HHP:3500 or HHP:1100. Requirements: anatomy or human physiology course.

HHP:4310 Sport and Exercise Nutrition 3 s.h.
Relationship between nutrition, fitness and sport performance; basic nutrition, physiology, chemistry, psychology, food preparation. Prerequisites: HHP:2200 and HHP:2310.

HHP:4320 Nutrition Interventions 3 s.h.
Strategies that assist in assessment and evaluation of nutrition behaviors of individuals and groups; interventions to meet nutritional needs of individuals and groups with a variety of health issues. Prerequisites: HHP:2200 and HHP:2310.

HHP:4340 Global Health and Global Food 3 s.h.
Practices, patterns, and policies that contribute to the epidemics of obesity, diabetes, and heart disease in wealthy populations; environmental degradation, hunger, and malnutrition among impoverished populations; strategies to meet food and agricultural needs for the world; local/global aspects or perspectives on food/health concerns for Iowa and the international community. Same as GHS:4340.

HHP:4350 Health and Human Physiology Practicum 1 s.h.
Experience in planning and implementing programs in the areas of fitness, strength and conditioning, nutrition, clinical rehabilitation, or health promotion. Prerequisites: (HHP:1100 or HHP:1150) and HHP:2200 and HHP:2310 and (HHP:1300 or HHP:1350 or HHP:3500).
HHP:4360 Practicum in Group Fitness Instruction  2 s.h.
Opportunity to observe group-fitness instructors in an applied setting; help organize and execute a group-fitness class. Prerequisites: (HHP:4410 or HHP:3400) and HHP:2310 and (HHP:3500 or HHP:1300) and HHP:1100. Requirements: CPR/AED or Group Fitness Instructor (ACSM, ACE, AFASA) or specific fitness (yoga, indoor cycling, crossfit) certification.

HHP:4365 Practicum in Health Coaching  3 s.h.
Opportunity to develop and practice coaching skills in an observed classroom setting; includes discussion, reviews of case studies, and role playing as health coaches; students dedicate seven-and-one-half hours per week in the community outreach laboratory, remotely (phone, Skype, text messaging) or in person, providing health coach services to referred patients and community members. Prerequisites: HHP:4020 or HHP:3030.

HHP:4370 Practicum in Strength and Conditioning  2 s.h.
Opportunity to observe strength and conditioning professionals in an applied setting; participation in process of helping athletes reach performance goals. Prerequisites: HHP:2310 and (HHP:3400 or HHP:4410) and HHP:1100 and (HHP:3500 or HHP:1300). Requirements: CPR/AED certification.

HHP:4390 Understanding Human Disease  3 s.h.
Introduction to process of human disease at cell, organ, and whole body level throughout the lifespan; pathophysiological changes occurring with disease, including risk factors, disease development, and overall effects of disease on the body; cancer, diabetes, obesity, cardiovascular, neurodegenerative diseases, and aging. Prerequisites: HHP:1300 or HHP:1350 or HHP:3500.

HHP:4400 Health Promotion Clinical Practicum  1 s.h.
Experience in planning and implementing clinical health promotion programs focusing on nutrition, physical fitness, cardiac rehabilitation, and respiratory rehabilitation. Prerequisites: HHP:3200 and (HHP:4200 or HHP:4010).

HHP:4405 Health Promotion Community and Worksite Practicum  1 s.h.
Planning and implementing community and worksite health promotion programs. Prerequisites: HHP:3200 or HHP:4010.

HHP:4410 Exercise Physiology  3 s.h.
Mechanisms responsible for the acute and chronic effects of exercise on the different organ systems of the body. Offered fall semesters. Prerequisites: HHP:1300 or HHP:1350 or HHP:3500 or HHP:3550.

HHP:4415 Exercise Science Practicum  1 s.h.
Experience in planning and implementing exercise programs related to physical fitness, including strength and conditioning in healthy and diseased/injured populations, and in elite athletes. Prerequisites: HHP:4200 and HHP:4210.

HHP:4420 Planning and Evaluating Health Interventions  3 s.h.
Assessment, planning, implementation, and evaluation of health promotion programs. Prerequisites: HHP:3200.

HHP:4440 Physiology of Nutrition  3 s.h.
Metabolic and biological aspects of human energy production, relationship to energy consumption; systems or integrative approach. Prerequisites: HHP:1300 or HHP:1350 or HHP:3500 or HHP:3550.

HHP:4450 Genetic Basis of Disease  3 s.h.
Changes in single molecules that lead to systemic physiological alterations in mammals; relationship of these changes to development, aging, exercise, and specific diseases; current methodologies for studying mammalian genetics and physiology. Prerequisites: HHP:3500 or HHP:3550.

HHP:4460 Cardiovascular Physiology  3 s.h.

HHP:4465 Environmental Exercise Physiology  3 s.h.
Study of physiological responses of the human organism to various forms of environmental stress at rest and during exercise; how physical performance is affected by environmental stressors such as heat, cold, altitude, microgravity, and hyperbaria. Prerequisites: HHP:3400 or HHP:3500 or HHP:3550.

HHP:4470 Physiology of Aging  3 s.h.
Aging’s effects on cells, tissues, and organs; how aging influences function of major body organ systems and the whole organism; physiological mechanisms that underlie age-related changes in body function and performance; integrative approach with focus on human aging. Prerequisites: HHP:3500 or HHP:3550.

HHP:4480 Introduction to Human Pharmacology  3 s.h.
General pharmacology (e.g., administration, distribution, and elimination of drugs, dose response curves, adverse effects, placebos, homeopathy); pharmacotherapy of selected human diseases, pathophysiologic aspects of the disease, how different classes of drugs modify pathophysiologic effects to restore health or reduce disease’s impact; focus on mechanisms of drug actions in humans; adverse effects, pharmacokinetic considerations, drug interactions; how to write prescriptions. Prerequisites: HHP:3500 or HHP:3550.

HHP:4490 Diagnosing Diseases: Patient History and Physical Examination  3 s.h.
Different diseases studied by interacting with patients at Meenakshi Mission Hospital and Research Center in Madurai, India; formal lectures in mornings followed by bedside teaching in afternoons and grand rounds in evenings; for pre-health professional students.

HHP:4500 Undergraduate Independent Study  arr.
Library or laboratory research related to a specific topic in human physiology, normally culminating with a written manuscript; work directed by a faculty member.

HHP:4510 Energy Metabolism in Health and Disease  3 s.h.
Comprehensive and molecular-driven approach to energy metabolism during exercise and calorie restriction regimens in skeletal muscle, adipose tissue, liver, heart, brain; special emphasis on muscle metabolism and its interaction with other organ systems in treatment and prevention of metabolic diseases (e.g., obesity, diabetes, cardiovascular diseases, cancer). Prerequisites: HHP:3500 or HHP:3550. Recommendations: HHP:4410 and BIOL:2723.
HHP:4800 Honors Research I 2 s.h.
Research for honors thesis; selection of faculty mentor, preparation of research proposal, written and oral presentations of research proposal, literature review, participation in experiments designed to develop laboratory skills for research, work with an active research tenure-track faculty member in a laboratory; first of a two-semester sequence. Requirements: honors standing.

HHP:4900 Honors Research II 3 s.h.
Completion of honors research begun in HHP:4800; analysis of data, writing and oral presentation of honors thesis, work with an active research tenure-track faculty member in a laboratory; second of a two-semester sequence. Prerequisites: HHP:4800 with a minimum grade of B. Requirements: honors standing.

HHP:4930 Health and Human Physiology Internship 3-9,12 s.h.
Directed practical field experience involving program planning, implementation, evaluation, and administration; varied areas such as fitness, wellness, nutrition, clinical, and strength and conditioning.

HHP:4935 Clinical Exercise Physiology Internship 1-6 s.h.
Directed practical field experience; program planning, implementation, evaluation, and administrative procedures.

HHP:4940 Health Promotion Honors Readings 1-2 s.h.
First step to complete an honors thesis; work with health and human physiology faculty member; comprehensive readings in a specific area (e.g., obesity in children, disabilities and sport); readings include primarily research reviews, popular press, and editorials; production of an annotated bibliography summarizing readings and presentation to faculty member at end of semester; brief research proposal summarizing background, research questions, and methods of selected area.

HHP:5000 Problems arr.

HHP:5200 Epidemiology of Physical Activity 3 s.h.
Overview of epidemiological evidence on how physical activity, sedentary behavior, and sleep affect health outcomes including cardiovascular disease, diabetes, cancer, and obesity; emphasis on research design, interpretation of studies, selection of appropriate measurement tools, and translating scientific findings to recommendations/policies for health promotion and disease prevention.

HHP:5300 Advanced Human Physiology 3 s.h.
Provides an advanced study of human physiology for students entering health related fields; mechanisms of body function will be presented at various levels ranging from cellular and molecular, to tissue and organ system levels, with emphasis on integration of the various systems. Offered spring semesters. Prerequisites: HHP:1100 and HHP:3500.

HHP:6000 Research arr.

HHP:6010 Non-Thesis Seminar 2 s.h.
For candidates for the M.S. without thesis. Offered spring semesters.

HHP:6020 Research Methods and Ethics 1,3 s.h.
Introduction to concepts, principles, and methods of research; topics include research design, data collection, data analysis, and reporting research; students identify and formulate research questions, design appropriate research, collect data using different methods, conduct data analysis, present research findings, and critically critique research literature; main ethical issues and professional conduct in scientific research. Recommendations: concurrent enrollment in BIOS:5120 or STAT:6513.

HHP:6030 Physical Activity and Dietary Behavior Change 3 s.h.
Major determinants (barriers and facilitators) of physical activity and dietary behaviors; evidence-based behavior change techniques; application of behavior change techniques to improve physical activity and dietary behaviors at the individual and organizational levels.

HHP:6050 Advanced Topics in Obesity 3 s.h.
In-depth overview of biological, behavioral, and societal causes and consequences of obesity epidemic; potential solutions from primary and secondary prevention standpoints; causes of obesity, available treatments, and global impact that obesity epidemic presents to society.

HHP:6100 Health and Human Physiology Seminar 0 s.h.
Biweekly forum for research presentations by health and human physiology faculty and graduate students, and by invited guest speakers; attended by health and human physiology faculty and students, and by faculty and guests from other departments and programs on campus.

HHP:6130 Advanced Skeletal Muscle Physiology 1,3 s.h.
Skeletal muscle structure, contractile mechanisms, production of movement, biomechanical properties; adaptation to increased use, disuse, injury. Prerequisites: HHP:3500.

HHP:6150 Advanced Clinical Exercise Physiology 1,3 s.h.
Recent advances in exercise physiology for clinical populations; emphasis on acute and chronic responses to exercise in healthy aged adults and in patients with cardiac, vascular, pulmonary, and metabolic diseases; basic and intermediate electrocardiography (ECG), pathophysiology of disease process, clinical assessment of disease severity, diagnostic testing, acute exercise responses, and exercise rehabilitation. Prerequisites: HHP:3500. Recommendations: HHP:4460.

HHP:6160 Advanced Exercise Electrocardiography 1-2 s.h.
Electrocardiography (ECG) including basic cardiac electrophysiology and ECG leads; atrial, junctional, ventricular, and atrioventricular (AV) node lock arrhythmias; identifying myocardial infarction, hypertrophy, and QRS axis deviation on 12 lead ECGs; other topics include ECG changes during exercise testing, diagnostic and prognostic value of exercise/pharmacological testing, and cardiac rehabilitation; readings and critiquing current research literature. Prerequisites: HHP:3500.

HHP:6200 Advanced Metabolic Exercise Testing and Prescription 1,4 s.h.
Basic techniques in physical fitness assessment; prescription of exercise for healthy and unhealthy adults; promotion of physical activity within communities; knowledge and skill competencies required for certification as American College of Sports Medicine health fitness instructor. Prerequisites: HHP:2200 and (HHP:1300 or HHP:3500).
HHP:6300 Motor Control Seminar 1 s.h.
Current topics in neural control of movement, biomechanics, and rehabilitation sciences.

HHP:6400 Integrative Physiology Seminar 1 s.h.
Current topics in cardiovascular physiology, vascular biology, free radical biology.

HHP:6410 Advanced Exercise Physiology 1,3 s.h.
Mechanisms responsible for acute and chronic effects of exercise on different organ systems of the body. Offered fall semesters. Prerequisites: HHP:1300 or HHP:3500.

HHP:6460 Advanced Cardiovascular Physiology 1,3 s.h.

HHP:6470 Advanced Physiology of Aging 1,3 s.h.
Effects of aging on cells, tissues, and organs; how aging influences function of major body organ systems and the whole organism; physiological mechanisms that underlie age-related changes in body function and performance; integrative approach with focus on human aging. Prerequisites: HHP:1100 and HHP:3500.

HHP:6480 Advanced Human Pharmacology 1,3 s.h.
General pharmacology (administration, distribution, elimination of drugs, dose response curves, adverse effects, placebos, homeopathy); pharmacotherapy of selected human diseases, pathophysiologic aspects of disease, how different classes of drugs modify pathophysiologic effects to restore health or reduce impact of disease; focus on mechanisms of drug actions in humans; adverse effects, pharmacokinetic considerations, drug interactions; how to write prescriptions. Prerequisites: HHP:3500.

HHP:6500 Seminar in Health Promotion 1 s.h.
Peer and faculty response to graduate student work addressing health promotion, physical activity and health outcomes, clinical exercise physiology; review and critique current literature; presentation of published work or in-process projects; critical thinking, scientific writing, and oral communication skill development pertaining to health promotion.

HHP:6510 Advanced Energy Metabolism in Health and Disease 1,3 s.h.

HHP:7000 Practicum in College Teaching arr.

HHP:7290 Graduate Internship 3-9 s.h.
Requirements: recreational sports management emphasis.

HHP:7300 Advanced Neural Control of Posture and Movement 1,3 s.h.
Neuroanatomical and neurophysiological bases of human motor control; mechanisms for locomotion and posture, control of arm and hand movements, role of sensory information. Offered spring semesters. Prerequisites: HHP:3500 and (HHP:1100 or HHP:3500). Requirements: anatomy or human physiology course.

HHP:7500 Thesis: M.S. 0-4 s.h.