ASTR 221. General Astronomy II: Star Systems, the Interstellar Medium and Cosmology. 4 credits.

ASTR 221 is the second in a two-course sequence in general astronomy intended for students interested in science. Topics covered include: stellar evolution; variability and high-energy phenomena in stars and multiple-star systems; content, structure, and dynamics of the Milky Way; external galaxies, quasars and AGN; large-scale structure and the distance scale of the universe; the Big Bang model and alternative cosmologies, possible geometries and eventual fates of the universe. An observational astronomy laboratory component is part of this course. The lab component will cover basics of telescope set up and operation as well as astronomical coordinate systems. Prerequisite: ASTR 220.

ASTR 297. Topics in Astronomy. 1-4 credits.

Topics in astronomy at the second year level. May be repeated for credit when course content changes. Topics selected may dictate prerequisites. Students should consult instructor prior to enrolling for course. Prerequisite: Permission of the instructor.

ASTR 301. Searching for Life in the Universe. 3 credits.

A study of the search for life in the universe, with emphasis on teacher preparation. Topics include how life on earth can guide the search, conditions for life within our solar system, extrasolar planets that may be conducive to life, possible radio communications with other civilizations and technologies necessary for search. Significant time is spent developing student lesson plans. Prerequisites: GSCI 181, GSCI 162, GSCI 163 and GSCI 184.

ASTR 320. Astronomical Techniques. 3 credits.

An overview of modern astronomical techniques with an emphasis on quantitative data collection and analysis. The design and use of various astronomical devices will be covered. Topics will include visible light telescopes and radio telescopes as well as CCD data collection in addition to other current astronomical techniques. Data reduction software will also be addressed. Prerequisites: ASTR 220 and ASTR 221.

ASTR 397. Topics in Astronomy. 1-4 credits.

Topics in astronomy at the intermediate level. May be repeated for credit when course content changes. Topics selected may dictate prerequisites. Students should consult instructor prior to enrolling for course. Prerequisite: Permission of the instructor.

ASTR/PHYS 398. Independent Study in Physics or Astronomy. 1-3 credits, repeatable to 4 credits.

An individual project related to some aspect of physics or astronomy. Must be under the guidance of a faculty advisor. A student may not earn more than a total of four credits for PHYS/ASTR 398.

ASTR 480. Astrophysics. 3 credits.

An introduction to the problems of modern astronomy and the quantitative application of physical principles to these problems. Topics of study include stellar structure and evolution, the interstellar medium and star formation, cosmic rays, pulsars, galactic structure, extragalactic astronomy and cosmology. Prerequisites: PHYS 340 and PHYS 380.

ASTR 497. Topics in Astronomy. 1-4 credits.

Topics in astronomy at the advanced level. May be repeated for credit when course content changes. Topics selected may dictate prerequisites. Students should consult instructor prior to enrolling for course. Prerequisite: Permission of the instructor.

ASTR/PHYS 498R. Undergraduate Research in Physics or Astronomy. 1-4 credits, repeatable to 6 credits.

Research in a selected area of physics or astronomy as arranged with a faculty research advisor. A student may not earn more than a total of six credits for PHYS/ASTR 498R. Prerequisite: Proposal for study must be approved prior to registration.

Athletic Training Education Program

Department of Health Sciences

ATEP 205. Introduction to Athletic Training (2, 2). 3 credits. Offered fall, spring and summer.

This course provides a broad introduction to the profession of athletic training. Lectures will focus on the domains of athletic training. Emphasis will be placed on basic emergency management as well as injury prevention including environmental issues, strength and conditioning, and selection of equipment. Laboratory will mirror lecture. Prerequisite: ATEP or HS major, teaching minor, or permission of the instructor.
ATEP 206. Recognition and Management of Athletic Injuries. 3 credits.
This course systematically focuses on orthopedic and neurological evaluation including functional testing of athletic injuries. The lower quarter consists of the lower extremity, pelvis and lumbar spine. Other topics include management of internal injuries and sudden death related to athletic participation. Prerequisite: ATEP 206 and admission to the clinical component of the athletic training curriculum. Offered fall.

ATEP 207. Acute Care of Athletic Injuries. 3 credits. Offered fall.
This course focuses on clinical performance and application of didactic knowledge. Clinical rotations, clinical competencies, inservices, case studies and professional journals are included in course content. Sport specific activities and clinical applications involving palpation and wound care are key components of this course. August preseason orientation and clinical participation required. Prerequisite: ATEP 392.

ATEP 304A. Lower Quarter Evaluation (2, 2). 3 credits. Offered fall.
This course systematically focuses on orthopedic and neurological evaluation including functional testing of athletic injuries. The upper quarter consists of the upper extremity, head, neck and thorax. Other topics include management of crisis situations and facial injuries related to athletic participation. Prerequisite: ATEP 304A. Offered fall.

ATEP 305. Rehabilitation in Athletic Training: Lower Extremity (2, 2). 3 credits. Offered spring.
This course explains the rehabilitation process of lower extremity muscular and joint injuries related to athletic activities. Additional topics include rehabilitation facility design, budget preparation and pre-season assessment. Prerequisite: BIO 290 and admission to the clinical component of the athletic training curriculum. Offered spring.

ATEP 306. Therapeutic Modalities (3, 2). 4 credits. Offered fall.
This course provides a thorough overview of tissue injury, inflammatory response, healing process and neurophysiology applied to musculoskeletal injuries. Theory, application and clinical decision-making processes using therapeutic modalities during rehabilitation are emphasized. Documentation, purchasing and maintenance are also addressed. Prerequisites: ATEP 206 and admission to the clinical component of the athletic training curriculum.

ATEP 307. Acute Care of Injuries and Illnesses. 3 credits. Offered fall.
This course is designed for student athletic trainers to meet the educational competencies for national accreditation in the following areas: development of risk management/emergency action plans; primary assessment of athletic injuries, emergency care of athletic injuries, immediate care of spinal injuries, prevention of injuries associated with the physically active, utilization of diagnostic tools and an overall understanding of protective equipment. Prerequisite: Admission to clinical component of athletic training curriculum. Offered fall.

ATEP 350. Measurements and Testing in Athletic Training. 2 credits. Offered fall.
The purpose of this course is to introduce and develop proficiency with measurement techniques frequently used in athletic training. Students will learn clinical evaluation techniques such as manual muscle testing, goniometry, volumetric measurements and girth measurements. How these measures are used in research will also be presented. Prerequisite: Admission to clinical component of athletic training curriculum. Offered spring.

ATEP 376. Pharmacology for Athletic Trainers. 2 credits. Offered fall.
This course is designed for students to understand knowledge, skills and values that an entry-level certified athletic trainer must possess in pharmacological applications, including awareness of the indications, contraindications, precautions and interactions of medications, and the governing regulations relevant to physically active individuals. Prerequisite: Admission to clinical component of athletic training curriculum. Offered fall.

ATEP 377. General Medicine in Athletic Training. 2 credits. Offered spring.
This course is designed for students to understand knowledge, skills and values that an entry-level certified athletic trainer must possess in order to recognize, treat and refer when dealing with general medical conditions and disabilities related to athletes or others involved in physical activity. Prerequisite: Admission to clinical component of athletic training curriculum. Offered fall.

ATEP 378. Assessment Skills in Athletic Training. 1 credit. Offered spring.
This course is designed for students to understand knowledge, skills and values that an entry-level certified athletic trainer must possess in order to recognize, treat and refer when dealing with general medical conditions and disabilities related to athletes or others involved in physical activity. Prerequisite: Admission to clinical component of athletic training curriculum. Offered spring.

ATEP 392. Level II Practicum in Athletic Training. 3 credits. Offered fall.
This course focuses on clinical performance and application of didactic knowledge. Clinical rotations, clinical competencies, inservices, case studies and professional journals are included in course content. Sport specific activities and clinical applications involving manual muscle testing and equipment fitting are key components of this course. August preseason orientation and clinical participation required. Prerequisite: ATEP 392.

ATEP 405. Rehabilitation in Athletic Training: Upper Extremity. 3 credits. Offered fall.
This course explains the rehabilitation process of upper-extremity muscular and joint injuries related to athletic activities. Additional topics include prevention of athletic injuries and aquatic rehabilitation. Prerequisite: ATEP 305.

ATEP 406. Organization and Administration in Athletic Training. 3 credits. Offered fall.
This course is an overview of managerial issues including legal concerns, OSHA guidelines, budgeting/purchasing and staffing. In addition, this course provides a variety of experiences culminating in the knowledge and skills needed to meet entry-level competencies set by the National Athletic Trainers’ Association. Prerequisite: Permission of the instructor. Offered fall.

Biology

BIO 103. Contemporary Biology (3, 0). 3 credits. Offered spring.
An in-depth exploration of selected biological concepts connected to current, relevant topics and emphasizing an understanding of science as a way of obtaining knowledge. Not available for major or minor credit in biology or biotechnology. Formerly SCI 103. Students may not receive credit for both SCI 103 and BIO 103.

*BIO 114. Organisms (3, 3). 4 credits. Offered spring.
An exploration of how diverse life forms carry out fundamental processes that sustain life, including acquiring and using essential molecules, growing and reproducing, responding to environmental stimuli and maintaining a stable internal environment. Labs will introduce students to the scientific method in a series of investigative lab and field experiences. Biology and biotechnology majors receive registration priority in the fall.

http://www.jmu.edu/catalog/14