Astronomy

Department of Physics and Astronomy

*ASTR 120. The Solar System. 3 credits.
An introductory course in astronomy which includes the following topics: motions of celestial objects, eclipses, historical development, the nature of light, telescopes, properties and evolution of the solar system.

*ASTR 121. Stars, Galaxies and Cosmology. 3 credits.
An introductory course in astronomy which includes the following topics: the Sun, stellar properties, stellar evolution, black holes, the Milky Way, galactic evolution, and quasars, cosmology.

ASTR 220. General Astronomy I: The Sky, the Solar System and Stars. 3 credits.
ASTR 220 is the first in a two-course sequence in general astronomy intended for students with a background in physics. Topics covered include: appearance and movements of the night sky, astronomical coordinate systems and timekeeping; seasons, eclipses and planetary configurations; planetary motions and gravitation; fundamental forces: electromagnetic radiation and its detection; content, structure, formation and evolution of solar system; observations and models of the Sun, stellar interior models; stellar magnitudes and spectra, classifications; Hertzsprung-Russell diagram. Prerequisite: PHYS 140 or PHYS 240.

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 161, GSCI 162, GSCI 163 and GSCI 164.

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 adviser. 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, 3). 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, coaching minor, or permission of instructor.

ATEP 206. Recognition and Management of Athletic Injuries. 3 credits. Offered spring.
Building on the concepts learned in ATEP 205, the course will emphasize the recognition of common athletic injuries. Pathology, mechanisms of injury, signs and symptoms, evaluation findings, and basic management of injuries will be explored. Athletic injuries of special populations will also be addressed. Prerequisites: BIO 290 and ATEP 205 with a grade of "C" or better.

ATEP 291. Pre-Professional Practicum in Athletic Training. 2 credits. Offered spring.
This course is designed to help students better understand the duties and responsibilities of the athletic trainer. By focusing on psychomotor skills and the application of didactic knowledge, students build a foundation which prepares them for future clinical rotations. Prerequisite: Permission of the instructor.

ATEP 304A. Lower Quarter Evaluation (2, 3). 3 credits. Offered fall.
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 304A.

ATEP 304B. Upper Quarter Evaluation (2, 3). 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.

ATEP 305. Rehabilitation in Athletic Training: Lower Extremity (2, 3). 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.

ATEP 306. Therapeutic Modalities (3, 2). 4 credits. Offered fall.
This course provides a thorough overview of tissue injury, inflammatory response, healing process and neuromuscular applied to musculoskeletal injuries. Theory, application and clinical decision-making processes using therapeutic modalities during rehabilitation will be 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 spine 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.
ATEP 350. Measurements and Testing in Athletic Training. 2 credits.

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.

ATEP 355. Infectious Disease Control. 1 credit. Offered fall.

Discussion includes theories of origins, statistics and characteristics of the causative pathogen, incubation, illness patterns, transmission, prevention and treatment of infectious and noninfectious disease. Emphasis is placed on STDS, HIV, Hepatitis and OSHA regulations. Prerequisite: Admission to clinical component of athletic training curriculum.

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.

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 deemed necessary. Students in the Trelawny Learning Community will cover body composition, bone density and quality of life outcome measurement tools. Prerequisite: Admission to clinical component of athletic training education program. Corequisite: ATEP 377.

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 palpation and wound care are key components of this course. August preseason orientation and clinical participation required. Prerequisite: Admission to clinical component of athletic training curriculum.

ATEP 399. Level III Practicum in Athletic Training. 2 credits. Offered spring.

This course focuses on clinical performance and application of didactic knowledge. Clinical rotations, clinical competencies, inservices, case studies and professional journal are included in course content. Sport specific activities and clinical applications involving palpation and wound care are key components of this course. Offered fall.

Prerequisite: Permission of the instructor.

ATEP 494. Level IV Practicum in Athletic Training. 2-3 credits. Offered fall.

This course focuses on clinical performance and application of didactic knowledge. Clinical rotations, clinical competencies, inservices, case studies and professional journal are included in course content. Sport specific activities and clinical applications involving cranial nerve assessment and neurological evaluation are key components of this course. Prerequisite: ATEP 494.

Biology

Department of Biology

GBIO 103. Contemporary Biology (3,0). 3 credits.

An in-depth exploration of selected biological concepts connected to current, relevant topics and emphasizing an understanding and appreciation of the diversity of life as well as the ways of obtaining knowledge. Not available for major or minor credit in biology or biotechnology. Formerly GSCI 103. Students may not receive credit for both GSCI 103 and GBIO 103.

*BIO 114. Organisms (3, 3). 4 credits.

An exploration of how of 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.


In this course students will learn about variation within populations, the mechanisms of evolution, phylogeny and classification, population and community ecology, animal behavior and ecosystems dynamics. Labs will include investigations in laboratory and field settings. Prerequisite: Grades of “C-” or better in BIO 114, GEOG 110, GEOG 210 or GISAT 112.

BIO 201. Trelawny Learning Community Seminar. 1 credit.

Introduction to the biology major and biological research for first-year students in the Trelawny Learning Community. In addition to lab/field work with faculty or graduate students for 2-3h per week, students attend a weekly seminar. Seminar includes research skill and team-building exercises, guest speakers, and case studies geared toward a career in science. Faculty and students interact with community members to provide perspectives on the major and research in a scientific network. Prerequisite: Membership in the Trelawny Learning Community. Corequisite: BIO 114.

BIO 202. Trelawny Learning Community Seminar II. 2 credits.

The second part of the research skills seminar for first-year students in the Trelawny Learning Community. Students will have already begun research projects during fall semester, and will continue their projects into spring semester while continuing to build research skills. Students will take part in community, campus, and social events and gain experience helping to run a research-based event. Prerequisite: BIO 201. Corequisite: BIO 124.

BIO 203/ISAT 165. Viral Discovery (3, 3). 1 credit.

This course is an exploratory laboratory experience, designed for incoming freshmen. In the course, the students will learn about the life cycle and ecology of viruses infecting bacteria. Soil samples will be collected, and techniques for isolation and purification of the viruses will be performed by the students. Isolated viruses will be visualized using electron microscopy. The genomic material will be isolated and prepared for nucleic acid sequencing.

BIO 204/ISAT 166. Viral Genome and Bioinformatics (0, 4). 2 credits.

This is a computer-based laboratory experience, designed for those students completing the Viral Discovery course. Students will learn how to identify genes in a viral genome, compare the predicted proteins with known proteins in databases, describe the contents of the genome and note all the relevant information for publication. Students will also research the ecology of soil and the role played by bacteriophages in ecology and evolution. Prerequisite: BIO 203 or ISAT 105.

BIO 214. Cell and Molecular Biology (3, 3). 4 credits.

Students will explore the physiology, metabolism and reproductive biology of prokaryotic and eukaryotic cells. Topics will include the structure and function of macromolecules, theoretical and mechanistic aspects of metabolism, bioenergetics and signal transduction. Labs will include investigations that introduce students to various biochemical techniques. Prerequisites: Grades of “C-” or better in BIO 114 and CHEM 131. Students not meeting these prerequisites prior to the start of classes will be administratively dropped.

BIO 222. Interdisciplinary Biology for Engineering and Physical Sciences (3, 3). 3 credits.

Case studies and an issues-based approach will provide a framework to understand the science of biology, to stimulate critical thinking, and to appreciate the interdisciplinary nature of biological investigations. This interdisciplinary biology course is intended for students who have at least sophomore status and who are physical science, engineering or mathematics majors. This course is not available for credit toward the major or minor in biology or biotechnology. Prerequisites: MATH 231 or MATH 232.