

Electives must be approved by the ESS chair and the chair in the second major.

Statistics (Mathematics 204 or Psychology 211), Computer Information Systems 106 and related internships are strongly recommended for graduate preparation.

Bachelor of Arts in Environmental Science (30 hours from various departments; 24 hours of cognates; requires a second major)

#### **Environmental Studies Core (5-7 hours)**

- ESS 125 Environmental Perspectives and Careers (2)
- ESS 325 Environmental Problems and Solutions (2)
- ESS 400 Senior Culminating Experience (1-3)

#### **Environmental Science Cognate Electives (23-25 hours)**

1 of the following: GEOL 205, PHIL 304, PSCI 345, or SOC 309 (3-4)  
Career-related electives\* (19-22)

\*Electives must be approved by the ESS chair and the chair in the second major.

#### **Environmental Science Cognates (24 hours)**

- BIOL 103 Plant Biology (4)
  - BIOL 104 Animal Biology (4)
  - BIOL 217, 218 Principles of Ecology, Laboratory (3,1)
  - CHEM 105/107, 106/108 General Chemistry I, II (4,4)
  - GEOL 101 Physical Geology (4)
- Statistics (Mathematics 204 or Psychology 211), Computer Information Systems 106 and related internships are strongly recommended for graduate preparation.

The semesters listed after course descriptions indicate when courses are expected to be offered. Schedules are subject to change; students should confirm semester offerings with the department when planning degree programs.

**125.** Environmental Perspectives and Careers (2). An investigation of environmental perspectives from a variety of disciplines and their relationship to environmentally related careers. The course will include representatives from many academic departments and off-campus professionals and requires that a four-year curriculum be designed for career preparation. Spring.

**325.** Environmental Problems and Solutions (2). An investigation of current environmental problems and possible solutions offered from different perspectives. Students will prepare a proposal dealing with a possible solution to an environmental problem. The proposal will reflect the academic interest and perspective of each student (their minor or major) and will serve as preparation for ESS 400. (Prerequisite: 125 and sophomore standing.) Spring.

**375.** Geographic Information and Positioning Systems (4). Historical perspective of how maps are made and global

positions determined and the current means of employing computer and satellite technology using geographic information systems (GIS) and global positioning systems (GPS). Three hours lecture, three hours laboratory per week. (Prerequisites: GEOL 101, MATH 115 and a 200-level Biology or Earth Science course.)

**400.** Capstone: Senior Culminating Experience (1-3). Original research writing, performance or show on an environmental issue. A formal presentation of the final product is required. (Prerequisite: 325.) Fall.

#### ***Special and Advanced Courses***

**199.** Exploratory Internship (1-3). Does not count toward a departmental major.

**299.** Experimental Course (1-3).

**399.** Professional Internship (1-12).

**451.** Independent Study (1-3). A program of supervised reading, research or work in an area of special interest to the student. (Prerequisite: written departmental permission.)

**499.** Advanced Experimental Course (1-3).

## **Exercise Science/Physical Education**

### ***Mission Statement***

The Department of ESPE offers undergraduate majors in exercise science and physical education, as well as a graduate degree track in athletic training through the exercise science major. Within the exercise science major there are three tracks: health management, pre-professional (intended for graduate school preparation), and the graduate degree in athletic training. Within the health management track there are two areas of concentration: business or psychology. Essentially, students majoring in exercise science with a track in health management will have a minor in business or psychology as well.

Students graduating from the ESPE department have pursued: (a) careers in teaching (K-12), coaching, personal training, health promotion, and sports administration, (b) graduate study in areas such as athletic training, adapted physical education, biomechanics, coaching, exercise physiology, growth and motor development, sport psychology, sport sociology, and sport administration; and (c) professional study in medically-related fields such as medicine (allopathic or osteopathic), physician assistant, physical therapy, athletic training, and occupational therapy.

The departmental mission for all of our undergraduate students is to develop creativity and critical thinking skills required of responsible professionals in order to develop and improve the health and wellness of those in the local and global communities. By incorporating academic disciplines from across campus and hands-on experience in and out of the classroom, the department prepares students with a blend of academic diversity and practical application.

The mission of the department for the Five-year Combined Master's Degree Program in Athletic Training is committed to the personal and professional growth of individual students. In

a supportive, student-centered learning environment, students will be challenged intellectually through advanced coursework, and professional and scholarly experiences. Graduates will achieve success in the allied health profession of athletic training, as well as related fields in health and wellness.

### **Major Program Requirements**

#### Exercise Science Major

3 Areas of Concentration (Students must choose one area of concentration):

- Health Management (Students must choose one minor)
- Business
- Psychology
- Pre-Professional
- 5 year combined B.A. Degree in Exercise Science and M.S Degree in Athletic Training

#### **Major Program Requirements (All Students majoring in Exercise Science must complete the core and cognate courses)**

##### **Exercise Science Core (25 hours)**

- ESPE 115 Care and Prevention of Athletic Injuries (3)
- ESPE 201 Red Cross First Aid and Emergency Care (2)
- ESPE 203 Foundations and Careers in ESPE and AT (2)
- ESPE 225 Anatomy (3)
- ESPE 250 Human Physiology (3)
- ESPE 300 Kinesiology (3)
- ESPE 311 Exercise Physiology (3)
- ESPE 339 Exercise Prescription and Conditioning (3)
- ESPE 350 Laboratory Experiences in Exercise Physiology (3)

##### **Exercise Science Cognates (18 hours)**

- BIOL 101, 103, or 104 Biology and Society, Plant Biology, or Animal Biology (4)
- BIOL 209 Human Nutrition (3)
- CHEM 101 The World of Chemistry or CHEM 105/107 Gen Chemistry (3)/Gen Chemistry Lab (1)
- PSYC 100 General Psychology (3)
- PHYS 101 Introductory Physics (3)
- PHYS 103 Introductory Physics Laboratory I (1)

##### **Areas of Concentration**

###### *1. Health Management (25 credits)*

Business Minor: All Health management majors must choose either a business or psychology track. To complete the business track, students must complete a business minor including the business and accounting courses listed below. Other approved electives may be taken as desired.

- ACCT 203 Principles of Accounting I (3)
- ACCT 204 Principles of Accounting II (3)
- BAD 230 Marketing (3)
- BAD 241 Management (3)
- ESPE 399 Professional Internship (3)
- ESPE 481 Capstone Course: Internship Seminar (1)
- Other Business electives counting toward a business minor.

Psychology Minor: All Health management majors must choose either a business or psychology track. To complete the psychology track, students must complete a psychology minor including PSYC 100 and the psychology courses listed below. Other approved electives may be taken as desired.

- ESPE 399 Capstone Course: Professional Internship (3)
- ESPE 481 Capstone Course: Internship Seminar (1)
- PSYC 205 Developmental Psychology (3)
- PSYC 206 Health Psychology (3)
- PSYC 212 Research Methods for Non-Majors (4)
- Other Psychology electives counting toward a psychology minor
- Suggested Courses: PSYC 211, PSYC 214, and PSYC 341
- Students wishing to go on to Graduate School may opt to take ESPE 404

###### *2. Pre-Professional (27 credits)*

- CHEM 106 General Chemistry II (3)
- CHEM 108 General Chemistry Laboratory II (1)
- ESPE 230 Motor Learning and Development (3)
- ESPE 399 Professional Internship (3)
- ESPE 481 Capstone Course: Internship Seminar (1)
- ESPE 404 Senior Seminar (2)
- MATH 115 Pre-Calculus mathematics (4)
- PHYS 102 Introductory Physics II (3)
- PHYS 104 Introductory Physics Laboratory II (1)
- PSYC 205 Developmental Psychology (3)
- PSYC 211 or MATH 204 Statistics for Psychology or Elementary Stats (4)
- Other electives required by the graduate school in which the student is applying

###### *3. Five-year combined B.A. Degree in Exercise Science and M.S. Degree in Athletic Training*

This degree program combines requirements from the Exercise Science major and Athletic Training major for the completion of both a B.A. in Exercise Science and an M.S. in Athletic Training in five years.

“Certified athletic trainers are health care professionals who specialize in preventing, recognizing, managing and rehabilitating injuries that result from physical activity. Students who want to become certified athletic trainers must earn a degree from an accredited athletic training curriculum. To become certified athletic trainers, students must pass a comprehensive test administered by the Board of Certification. ([www.nata.org](http://www.nata.org)).”

For students interested in majoring in Athletic Training, years one and two comprise the Candidacy Phase, and then students apply to be retained in the Professional Phase of the degree. By the end of the fifth year of study, students will have earned a B.A. in Exercise Science, an M.S. in Athletic Training, and be eligible to sit for the Board of Certification (BOC) exam.

#### Master of Science in Athletic Training Graduation Requirements

- Completion of B.A. degree program in Exercise Sci-

ence with a concentration in Athletic Training from Adrian College.

- Completion of required courses listed below (see retention and probation criteria for more specific information)
- Completion of a thesis that includes a proposal, data collection, analysis, and presentation of results

Note: Students who have completed the undergraduate requirements for Exercise Science and Athletic Training who opt not to continue with Master's level Athletic Training courses may earn a B.A. in Exercise Science/Pre-Athletic Training upon completion of the capstone course ESPE 481.

#### **Athletic Training Requirements (20 Credits)**

- ESPE 140 Athletic Training Clinical Observation (1)
- ESPE 142 Orthopedic Taping and Wrapping (2)
- ESPE 325 Orthopedic Assessment I (3)
- ESPE 326 Orthopedic Assessment II (3)
- ESPE 330 Therapeutic Modalities (3)
- ESPE 345 Athletic Training Clinical Skills I (2)
- ESPE 346 Athletic Training Clinical Skills II (2)
- ESPE 445 Athletic Training Clinical Skills III (2)
- ESPE 446 Athletic Training Clinical Skills IV (2)

#### **Athletic Training Cognates (11)**

- PSYC 206 Health Psychology (3)
- PSYC 211 Statistics for Psychology (4)
- PSYC 265 Research Methods for Majors (4)

#### **Graduate Courses (28 Credits)**

- ESPE 501 Athletic Training Administration (3)
- ESPE 510 Athletic Health Symposium (3)
- ESPE 525 Therapeutic Exercise (3)
- ESPE 526 General Medical Conditions (3)
- ESPE 545 Advanced Clinical Skills I (4)
- ESPE 546 Advanced Clinical Skills II (4)
- ESPE 595 Capstone Course: Thesis (8)

#### **M.S Degree Electives (3 Credits)**

Students must complete at least three credits from this list:

- ESPE 500 Biomechanics (3)
- ESPE 515 Advanced Therapies (3)
- ESPE 520 Advanced Exercise Physiology (3)

#### ***Athletic Training Professional Phase Retention/Probation Criteria:***

**Retention Application:** After the Candidacy Phase (typically after the second year of study), students must apply to be formally reviewed for retention in the Athletic Training Professional Phase. Because there are specific accreditation standards regarding maximum enrollment, retention in the athletic training major is competitive, and will be based on students' performance in the following areas:

- Minimum cumulative GPA of 2.75
- Minimum major GPA of 2.75
- Completion of the following courses with a grade of C- or better: ESPE 140, ESPE 201 (or certification),

ESPE 100, ESPE 115, and ESPE 142, ESPE 225, ESPE 250

- Interview with athletic training faculty/staff
  - Completed Retention Application and Essay  
Prior to enrolling in professional phase athletic training clinical coursework (ESPE 345, 346, 445, 446, 545, and 546) students must have the following on file:
    - Signed technical standards
    - Proof of current CPR for the professional rescuer (or equivalent), and first aid certifications
    - Proof of a current health history, immunization review, and physical examination that verifies a student is able to meet the physical and psychological rigors of the program.
    - Proof of annual blood-borne pathogen training
- Professional Phase Retention: After students have applied for retention in the Professional Phase, student performance will be evaluated each semester thereafter, and retention will be based on the following criteria:
- Minimum cumulative GPA of 2.75
  - Minimum major GPA of 2.75
  - Completion of athletic training required coursework with a grade of C- or better
- Prior to enrolling in professional phase athletic training clinical coursework (ESPE 345, 346, 445, 446, 545, and 546) students must also have the following on file:
- Proof of current CPR for the professional rescuer (or equivalent), and first aid certifications
  - Proof of annual blood-borne pathogen training

#### ***Probation***

Students who do not meet minimum retention criteria will be placed on probation, and will have one year to rectify the deficiency. If deficiencies are not corrected within the one year period, the student may be dismissed from the Athletic Training program. If students do not meet the minimum criteria above at the time of completion of the B.A. in Exercise Science, they will not be allowed to continue Master's level coursework.

Transfer Students: Information regarding Adrian College's transfer policies can be found in the Academic Catalog, under the Admissions section. Students wishing to transfer into the Athletic Training program will be held to the Professional Phase retention standards listed above. Students wishing to transfer into the Athletic Training program must do so during the Candidacy Phase (year 1 or 2). Students should be aware that certain athletic training coursework may not transfer. Transfer acceptance is contingent on space availability, and performance level in the stated criteria.

The semesters listed after course descriptions indicate when courses are expected to be offered. Schedules are subject to change; students should confirm semester offerings with the department when planning degree programs.

#### ***General Exercise Science Courses***

**100.** Principles of Fitness (FITNESS DEVELOPMENT) (2). The basic principles of fitness, with emphasis on development of a wellness concept. Various physical assessments are used to determine a student's levels of fitness and individual programs are explored for the purpose of establishing a lifetime positive attitude toward activity. Includes class-

room and laboratory experience. Required of all students, recommended for out-of-season athletes. Fall, spring.

**101.** Physical Education Activities (1). The fundamental skills and techniques of various activities which students may select. May be repeated once with different activities. Additional fees for equestrian classes will apply. Fall, spring.

**109.** American Red Cross Lifeguard Training (1). Development of the skill and knowledge required in a swimming emergency. Upon satisfactory completion, students earn American Red Cross certification. (An additional fee is charged by the American Red Cross.) Fall.

**115.** Care and Prevention of Athletic Injuries (3). Designed for students interested in majoring in exercise science, physical education and athletic training, this course will cover basic injury prevention, emergency care, assessment and treatment for the physically active.

**133.** American Red Cross Water Safety Instructor's Course (1). Methods for planning, conducting and evaluating swimming and water safety courses. (Prerequisite: ARC Lifeguard Training Course. (An additional fee is charged by the American Red Cross.) Spring.

#### ***Professional Preparation Courses***

**140.** Athletic Training Clinical Observation (1). Observation in athletic training procedures. The student gains knowledge and experiences in basic athletic training procedures and policies.

**142.** Orthopedic Taping and Wrapping (2). Laboratory experience to review and test the clinical skills related to palpation, taping, wrapping, and orthosis fabrication. (Prerequisites: BIOL 101 or 104 or concurrent, ESPE 140 or concurrent, ESPE 115 or concurrent, ESPE 100 or concurrent, ESPE 201 or concurrent, Athletic Training Major.)

**201.** Red Cross First Aid and Emergency Care (2). Development of knowledge, skills and personal judgment in first aid, CPR, airway obstruction and rescue breathing. Upon satisfactory completion, students earn American Red Cross certification in First Aid, Adult, Child, and Infant CPR. (An additional fee is charged by the American Red Cross.) Open to freshmen. Fall, spring.

**203.** History and Principles of Physical Education, Sport and Recreation (3). Relationships among physical education, sport and recreation through history, including principles, objectives and programs. Various philosophies are explored as a basis for developing a personal philosophy relating to each area. Fall, spring

**218.** Rhythmic Activities (1). The development of rhythmic movement principles taught in the elementary and secondary schools. Designed for elementary and secondary teachers. Open to freshmen. Fall.

**222.** Instructional Methods in Physical Education (2). Plan-

ning for instruction in physical education with emphasis on activities appropriate for all elementary students. Designed to assist physical education majors and minors present lessons, develop unit plans, observe various teaching styles and address assessment techniques. Fall.

**225.** Anatomy (3). An introduction to gross anatomical structure. Designed for exercise science/physical education majors and students in related fields of interest. Fall.

**230.** Motor Learning and Development (3). Examination of motor skill acquisition and application to skill performance. Factors influencing motor learning such as growth and development, neural mechanisms, and optimal teaching strategies are explored. Fall.

**236.** Sports Technique I (2). Individual techniques and teaching methods in soccer and track and field. Open to freshmen. Spring.

**237.** Sports Technique II (2). Teaching and officiating methods and techniques for use in tennis, badminton and volleyball. Open to freshmen. Fall.

**238.** Sports Technique III (2). Teaching and officiating methods and techniques for use in team and individual sports. Open to freshmen. Spring.

**250.** Human Physiology (3). Introduction to physiological mechanisms which govern systemic organ function. Designed for exercise science/physical education majors and related fields of interest. Spring.

**300.** Kinesiology (3). The theory and practical application of basic facts, laws, principles and concepts of biomechanical movement, with attention given to the physiological and anatomical study of muscles. (Prerequisite: ESPE 225, 250.)

**301.** Basketball Theory (2). Materials, organization and methods of coaching basketball at the middle and senior high school levels. Emphasis is on fundamental principles for successful teaching and coaching. Fall.

**302.** Organization of Intramurals (2). The organization of a comprehensive intramural program, with major emphasis on philosophy, objectives, rules and policies, scheduling, reporting and promotional techniques. Fall.

**309.** Theory and Practice (1). Practical application of methods and techniques of teaching physical education activities. Students teach in the required exercise science physical education program. (Prerequisite: Permission of instructor.) Fall, spring.

**311.** Exercise Physiology (3). A physiological examination of how the body responds and adapts to exercise. (Prerequisite: ESPE 250 or permission of instructor.) Fall

**315.** General Medical Conditions (3). Classroom and laboratory experience will explore general medical, dermatology

logical and pharmacological considerations for the athlete. Students will gain practical experience in evaluation and treatment of such conditions. (Prerequisites: ESPE 216, 225, 250, Athletic Training major.)

**316.** Physical Education for the Classroom Teacher (3). Combined theory and applied technique, providing elementary teachers with general knowledge of specific physical education objectives and principles. Students teach their peers lessons in self-testing activities, games, rhythms and movement exploration. Fall.

**320.** Therapeutic Exercise (3). A lecture and laboratory class studying the components of therapeutic exercise. Emphasis is placed on the rehabilitation of athletic injuries, and return to sport considerations. (Prerequisites: ESPE 216, 300 or concurrent, 315, Athletic Training major.)

**321.** Football Theory (2). A brief history of the origin of football and its evolution into the modern game, including playing rules. Students complete a coaching booklet addressing such aspects as offense, defense, kicking game, scouting, game strategy and practice organization. Fall.

**325.** Orthopedic Assessment I (3). Classroom and laboratory experience will cover intermediate level orthopedic evaluation techniques. Course content will include reviewing basic injury evaluation skills, with emphasis on posture and range of motion evaluation, along with the practice and assessment of special tests. (Pre-requisites: ESPE 115, ESPE 142, ESPE 225, ESPE 250, Athletic Training Concentration.)

**326.** Orthopedic Assessment II (3). Classroom and laboratory experience will cover advanced level orthopedic evaluation techniques. Course content will include reviewing basic injury evaluation skills, with emphasis on advanced special tests and neurological evaluation. (Pre-requisites: ESPE 325.)

**330.** Therapeutic Modalities (3). This course explores the theory behind, and the principles of use of therapeutic modalities. Proper application techniques including indications, contraindications, and safe operating procedures will be covered. Students will gain practical experience in a laboratory setting. (Pre-requisites: ESPE 115, ESPE 225, ESPE 250, Athletic Training Concentration.)

**333.** Adapted Physical Education (3). A theoretical and practical approach to physical education for the physically and mentally disabled student. The use of rhythms and other tools as they relate to developmental patterns of movement including lifetime sports skills will be part of various laboratory experiences. Spring.

**339.** Theory and Application of Strength and Conditioning to Exercise Prescription and Conditioning (3). Integrates scientific principles, concepts, and theories of exercise to

improve the condition of the physically active. Topics include scientific basis of training and conditioning, testing and assessment methods, exercise technique, periodization, and issues related to organization and administration of programs. This course provides preparatory information for various exercise certifications. (Prerequisite: ESPE 219, 225, and 250.) Spring

**345.** Athletic Training Clinical Skills I (2). Laboratory and practical experience to review and test the clinical skills taught during pre-requisite coursework. Clinical skill development experiences are provided in the athletic training facility, at intercollegiate events, or at an off campus clinical site. (Pre-requisites: ESPE 115, ESPE 140, ESPE 142, Athletic Training Concentration.)

**346.** Athletic Training Clinical Skills II (2). Laboratory and practical experience to review and test the clinical skills taught during pre-requisite coursework. Clinical skill development experiences are provided in the athletic training facility, at intercollegiate events, or at an off campus clinical site. (Pre-requisites: ESPE 325, ESPE 330, ESPE 345, Athletic Training Concentration.)

**350.** Measurement and Evaluation in Physical Education and Exercise Science to laboratory Experiences in Exercise Physiology. (2). Statistical methods and assessment techniques applied to physical education and exercise science. Criteria for selecting tests, statistical techniques, and tools for assessing fitness, skills and attitudes will be examined. (Prerequisite: ESPE 311) Fall, spring.

**390.** Topics in Exercise Science. (1-6). An in-depth study of a special topic, which varies from semester to semester depending on specialties of the professor teaching the course. May be repeated with a different topic. (Pre-requisite: ESPE 203). Fall and/or spring.

**401.** Athletic Training Administration (2). Organizing and administering an athletic training program and facility, with emphasis on program management, human resources, budget planning, facility design, record keeping, liability, and legal considerations. (Prerequisites: Athletic Training major, senior standing.)

**402.** Capstone: Administration of Physical Education and Sport (3). Organizing and administering a physical education or sport program, with emphasis on legal considerations, public relations, personnel, program, facilities, equipment and financial management. Spring.

**404.** Senior Seminar (2). The use of statistical tools and methods needed for research in Exercise Science/Physical Education. The student is required to make a formal presentation as a culminating senior experience. (Prerequisite: senior standing.) Fall.

**405.** Athletic Training Exam Prep (1). A preparation course

for athletic training majors wishing to sit for the Board of Certification Exam. (Prerequisites: Athletic Training major, senior standing.)

**441.** Athletic Training Skills V (2). Laboratory and practical experience to review and test the clinical skills taught during the second and third year of the athletic training program. Clinical skill development experiences are provided in the athletic training facility, at intercollegiate events, or at an off-campus clinical site. (Prerequisites: ESPE 300, 320,336, 339 or concurrent, BIOL 209, Athletic Training major.)

**445.** Athletic Training Clinical Skills III (2). Laboratory and practical experience to review and test the clinical skills taught during the pre-requisite coursework. Clinical skill development experiences are provided in the athletic training facility, at intercollegiate events, or at an off-campus clinical site. (Prerequisites: ESPE 326,346)

**446.** Athletic Training Clinical IV (2). Laboratory and practical experience to review and test the clinical skills taught during pre-requisite coursework. Clinical skill development experiences are provided in the athletic training facility, at intercollegiate events, or at an off-campus clinical site. (Prerequisites: ESPE 445).

### *Special and Advanced Courses*

**199.** Exploratory Internship (1-3). Does not count toward a departmental major.

**299.** Experimental Course (1-3).

**399.** Capstone: Professional Internship (1-12). The professional internship will provide an opportunity for students to test their career interests and develop job-related skills through college-approved work experiences and to bring them in contact with professionals in the field. Students will make a formal presentation following the conclusion of the internship.

**451.** Independent Study (1-3). A program of supervised reading, research or work in an area of special interest to the student. (Prerequisite: written departmental permission.)

**481.** Capstone: Internship Seminar (1). Course to be taken with ESPE 399, this course is designed to maximize the experiences learned through the ESPE 399 professional Internship. Additional projects include a research proposal, culminating in an end of the semester presentation. (Prerequisites: Must take concurrently with ESPE 399.)

**499.** Advanced Experimental Course (1-3).

### *Graduate Courses*

**500.** Biomechanics (3). This laboratory driven course involves the study of the mechanical principles, analytical methods, and instrumentation systems involved in the analysis of human movement. (Pre-requisites: Successful

Completion of B.A. Degree in Exercise Science with Concentration in Athletic Training).

**501.** Athletic Training Administration (3). Organizing and administering an athletic training program and facility, with emphasis on program management, human resources, budget planning, facility design, record keeping, liability, and legal considerations. (Pre-requisites: Successful Completion of B.A. in Exercise Science with Concentration in Athletic Training).

**510.** Athletic Health Symposium (3). This course is designed to examine various topics of an athlete's health. Topics of sports medicine, nutrition and conditioning will be the emphasis. The course targets undergraduates, as well as allied health professionals, physical educators, coaches and nurses. This course is for academic credit as well as professional continuing education.

**515.** Advanced Therapies (3). Classroom and laboratory experiences involving advanced therapeutic techniques. Topics may include, but are not limited to muscle energy, massage, and acupressure techniques. (Pre-requisites: Successful Completion of B.A. in Exercise Science with Concentration in Athletic Training).

**520.** Advanced Exercise Physiology (3). Acute and chronic effects of exercise on various body systems. Principles of training, exercise prescription, and the role of physical activity in health and disease. Physiological and biochemical basis of exercise responses and adaptations will be explored, as well as, how they relate to exercise testing and/or prescription. (Pre-Requisites: Successful Completion of B.A. in Exercise Science with Concentration in Athletic Training).

**525.** Therapeutic Exercise (3). A lecture and laboratory class studying the components of therapeutic exercise. Emphasis is placed on the rehabilitation of athletic injuries, and return to sport considerations. (Pre-requisites: ESPE 326, Athletic Training Concentration.)

**526.** General Medical Conditions (3). Classroom and laboratory experience will explore general medical, dermatological and pharmacological considerations for the athlete. Students will gain practical experience in evaluation and treatment of such conditions. (Pre-requisites: ESPE 525, Athletic Training Concentration.)

**545.** ADVANCED CLINICAL SKILLS I (4). Laboratory and practical experience to review and evaluate the advanced clinical skills taught in previous coursework. Professional development for the entry level professional will be emphasized. (Pre-requisites: Successful Completion of B.A. in Exercise Science with Concentration in Athletic Training).

**546.** ADVANCED CLINICAL SKILLS II (4). Labora-

tory and practical experience to review and evaluate the advanced clinical skills taught in previous coursework. Professional development for the entry level professional will be emphasized. (Pre-requisites: Successful Completion of B.A. in Exercise Science with Concentration in Athletic Training).

**595. THESIS (1-12).** CAPSTONE COURSE: Design and performance of research leading to an MS degree in Athletic Training.

## **Geology**

### ***Mission statement***

The Geology program provides students with a strong foundation in geology that will prepare them for jobs in industry, graduate school, or K-12 education. The program encompasses strong field and laboratory components that enhance classroom learning experiences. Experiential learning in the field allows students to apply principles learned in the classroom and provides them with the background to better understand the world around them. The laboratory component provides the opportunity for creative problem solving and critically evaluating current issues in the geosciences. An integrated capstone course encompasses all of the above components and allows students to integrate geologic research with other related math and sciences fields. The geology program provides students the ability to address current geoscience issues from the scientific, environmental and political perspective as well as the ability to carry on a lifetime of learning.

### ***Major Program Requirements***

Bachelor of Arts in Geology (33-35 hours and 10-12 hours of cognates)

#### **Geology B. A. Core (33-35 hours)**

- GEOL 101 Physical Geology (4)
- GEOL 102 Historical Geology (4)
- GEOL 301 Mineralogy (4)
- GEOL 302 Petrology (4)
- GEOL 307 Structural Geology (4)
- GEOL 313 Sedimentology (4)
- GEOL 315 Biostratigraphy (4)
- GEOL 318 Field and Laboratory Methods (4)
- GEOL 400 Senior Culminating Experience (1-3)

#### **Cognates (10-12 hours)**

CHEM 105/107 and two courses from the following: CHEM 106/108; PHYS 101; 102, 103, 104, 205, 206, 209, 210; MATH 115, 135, 204, 205; or CIS 106. Bachelor of Arts candidates who plan professional geology careers are strongly encouraged to include in their degree programs the following courses, which are usually required for entry into graduate school: Chemistry 106/108, Physics 101, 102 and Mathematics 115.

Bachelor of Science degree in Geology  
(33-35 hours of Geology and 28 hours of cognates)

#### **Geology B.S. Core (33-35 hours)**

- GEOL 101 Physical Geology (4)
- GEOL 102 Historical Geology (4)
- GEOL 301 Mineralogy (4)
- GEOL 302 Petrology (4)
- GEOL 307 Structural Geology (4)
- GEOL 313 Sedimentology (4)
- GEOL 315 Biostratigraphy (4)
- GEOL 318 Field and Laboratory Methods (4)
- GEOL 400 Senior Culminating Experience (1-3)

#### **Geology B.S. Cognates (28 hours)**

- MATH 115 Pre-Calculus Mathematics (4)
- MATH 135, 205 Calculus I, II (4, 4)
- PHYS 205, 206 General Physics I, II (3, 3)
- PHYS 209, 210 General Physics Lab I, II (1,1)
- CHEM 105/107, 106/108 General Chemistry I, II (4, 4)

Computer Information Systems is recommended. Many graduate schools require a summer field course that is available at several field camps operated by major universities.

Bachelor of Arts in Environmental Geology (28-31 hours and 22-23 hours of cognates)

#### **Environmental Geology Core (25-27 hours)**

- GEOL 101 Physical Geology (4)
- GEOL 102 Historical Geology (4)
- GEOL 205 Environmental Geology (4)
- GEOL 307 Structural Geology (4)
- GEOL 313 Sedimentology (4)
- GEOL 318 Field and Lab Methods (4)
- GEOL 400 Senior Culminating Exp. (1-3)

#### **Geology Electives (3-4 hours)**

#### **Cognates (22-23 hours)**

- ESS 375 Geographic Information and Positioning Syst. (4)
- CHEM 105/107, 106/108 General Chemistry I, II (4,4)
- CIS 106 Computer Programming (3)
- BIOL 217 Principles of Ecology (3)
- BIOL 218 Ecology Lab (1)
- MATH 115 or 204 Pre-calculus (4); Statistics (3)

#### ***Minor and Associate Program Requirements***

The Associate of Arts degree and the minor in geology each require 18 semester hours of credit in the department.

The semesters listed after course descriptions indicate when courses are expected to be offered. Schedules are subject to change; students should confirm semester offerings with the department when planning degree programs.

**101.** Physical Geology (NATURAL SCIENCE/LABORATORY) (4). The rocks, landscapes and structures of the earth's surface and the processes that produced them, including volcanism, earthquakes, landslides, glaciation and con-