

Courses

Courses numbered 100-199 are freshmen level, 200-299 are sophomore level and 300 and above are junior/senior level.

Accounting and Finance

The Martha and Spencer Love School of Business

Associate Professors: McGregor, Synn

Assistant Professors: Cox, Currie, Poulson

Instructor: Cardwell

Accounting involves measuring business activities and communicating this information to investors, creditors and other decision makers, who use it to make sound, informed financial decisions. This practice serves to encourage investment activity, which in turn creates jobs and helps the economy to grow.

Elon's program leading to the B.S. in accounting includes the central topics of financial and managerial accounting plus an introduction to taxation, auditing and commercial law. The accounting program prepares the graduate to be a professional accountant in business, government, nonprofit and other organizations. This degree can also serve as a basis for graduate study in accounting and other fields, including business administration and law.

Students wishing to obtain certification as a CPA and practice in the field of public accounting must have 150 hours of college credit.

Accounting Majors: At least 50% of the accounting credit hours required for the degree (B.S. in Accounting) must be earned at Elon University.

A major in Accounting requires the following courses:

Choose one liberal studies course above and beyond the liberal studies requirements set by the University		4 sh
MTH 116	Applied Mathematics with Calculus	4 sh or
MTH 121	Calculus and Analytic Geometry I	
CIS 211	Management Information Systems	4 sh
ECO 201	Principles of Economics	4 sh
ECO 203	Statistics for Decision Making	4 sh
BUS 221	Legal Environment of Business	2 sh
BUS 202	Business Communications	4 sh
BUS 311	Principles of Marketing	4 sh
BUS 323	Principles of Management	4 sh
FIN 343	Managerial Finance	4 sh

BUS 465	Business Policy	4 sh
ACC 201	Principles of Accounting I	4 sh
ACC 212	Principles of Accounting II	4 sh
ACC 331	Intermediate Accounting I	4 sh
ACC 332	Intermediate Accounting II	4 sh
ACC 336	Cost Accounting	4 sh
ACC 341	Fundamentals of Income Taxation	4 sh
ACC 456	Auditing	4 sh
TOTAL		70 sh

Additional accounting courses that may be taken as electives include:

ACC 365	Computerized Accounting (Winter Term)	4 sh
BUS 418	Commercial Law	4 sh
ACC 471	Seminar: Special Topics	4 sh
ACC 481	Internship in Accounting	1-8 sh
ACC 491	Independent Study	1-4 sh

A minor in Accounting requires the following courses:

ACC 201	Principles of Accounting I	4 sh
ACC 212	Principles of Accounting II	4 sh
FIN 343	Managerial Finance (prerequisites ECO 201 and ECO 203 are required)	4 sh

Two electives from the following list: 8 sh

- ACC 331 Intermediate Accounting I
- ACC 332 Intermediate Accounting II
- ACC 336 Cost Accounting
- ACC 341 Fundamentals of Income Taxation
- ACC 365 Computerized Accounting (Winter Term)
- ACC 471 Special Topics

TOTAL		20 sh
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Accounting Courses

ACC 201. PRINCIPLES OF ACCOUNTING I 4 sh

In this introduction to the financial reporting process, study emphasizes the accrual basis of accounting. Students learn to prepare and interpret income statements and balance sheets, analyze business transactions and determine the effects of transactions on assets and equities. Offered fall and spring.

ACC 212. PRINCIPLES OF ACCOUNTING II 4 sh

Students gain an overview of the ways accounting information helps managers as they plan, develop control procedures and make decisions for their organizations. The course also covers the concepts of cost behavior, cost-volume-profit analysis and the preparation of budgets. Prerequisite: ACC 201. Offered fall and spring.

ACC 331. INTERMEDIATE ACCOUNTING I 4 sh

Intermediate Accounting begins an in-depth study of generally accepted accounting principles and their theoretical basis. Students explore the contents of and interrelationships among the balance sheet, income statement and statement of cash flows, along

with techniques for analyzing and correcting errors. Some of the more important accounting standards of the Financial Accounting Standards Board are included.

Prerequisites: ACC 201 and 212. Offered fall and spring.

ACC 332. INTERMEDIATE ACCOUNTING II 4 sh

This continuation of the in-depth study of financial accounting (begun in ACC 331) emphasizes intangible assets, acquisition of property, current and long-term liabilities and stockholders' equity. Prerequisite: ACC 331. Offered spring.

ACC 336. COST ACCOUNTING 4 sh

In cost accounting, students examine methods for gathering and analyzing production cost data, which managers use to plan, budget and set prices for their products, with emphasis on the job order costing, process costing and standard costing methods and the interpretation of data produced by each system. Prerequisites: ACC 201 and 212. Offered spring.

ACC 341. FUNDAMENTALS OF INCOME TAXATION 4 sh

This introduction to the structure of the federal income tax system emphasizes the theories, procedures and rationale associated with the taxation of individuals. Prerequisite: ACC 201. Offered fall.

ACC 365. COMPUTERIZED FINANCIAL ACCOUNTING 4 sh

In this interesting and practical course, students will assume the role of owner of a simulated small business. Up-to-date accounting software will be used to keep the financial records. This hands-on experience will enhance the understanding of accounting and its essential role in the business world and, at the same time, provide a practical instruction in the use of modern Windows-based accounting software. Prerequisite: ACC 201. Offered winter.

ACC 442. ADVANCED TAXATION 4 sh

This course continues the study of special topics including corporations, capital gains and losses, estate and gift taxation, tax administration and tax research. Students will learn to locate relevant information in regulations, revenue rulings and court cases. They will report their findings in the form of written reports and memoranda.

Prerequisite: ACC 341. Not offered on a regular basis.

ACC 451. ADVANCED FINANCIAL ACCOUNTING 4 sh

Continuing the in-depth study of financial accounting that began in Intermediate Accounting (ACC 331, 332), this course includes accounting for business combinations, with special emphasis on preparing consolidated financial statements for parent and subsidiary corporations. Accounting for governmental units and other not-for-profit organizations is also introduced. Prerequisites: ACC 331 and 332, or ACC 331 and concurrent enrollment in ACC 332. Not offered on a regular basis.

ACC 456. AUDITING 4 sh

Study of auditing covers both theory and practice, including ethics, generally accepted auditing standards, internal accounting controls, auditors working papers, the components of audit risk, compliance testing and substantive testing. Prerequisite: ACC 331. Offered spring.

ACC 471. SEMINAR: SPECIAL TOPICS 1-4 sh

This upper level seminar, an advanced study requiring active participation by students, consists of readings, problems, reports, discussions of current topics, or preparation for professional examinations. May be conducted by departmental faculty or other resource persons. Prerequisite: permission of instructor, may vary with topic.

ACC 481. INTERNSHIP IN ACCOUNTING 1-8 sh

An internship offers the student valuable experience in the field of accounting. Appropriate placement must be arranged by the student with the help and support of the faculty and other appropriate resources.

- ACC 491. INDEPENDENT STUDY** 1-4 sh
ACC 499. RESEARCH 1-4 sh
 Students can engage in an undergraduate research study in collaboration with a faculty sponsor.

Finance Courses

- FIN 343. MANAGERIAL FINANCE** 4 sh
 The study of corporate managerial functions from the finance perspective covers the principle elements of financial management, including financial analysis and control, working capital administration, capital budgeting, valuation theory, capital structure and leverage, and debt and equity instruments. Prerequisites: ACC 201, 212, ECO 201 and 203. Offered fall and spring.

- FIN 413. ADVANCED MANAGERIAL FINANCE** 4 sh
 The in-depth study of financial management from the perspective of valuative theory involves discussions of topics such as security evaluation and capital budgeting within the framework of the Capital Asset Pricing Model. Study relates cost of capital, capital structure and leverage to valuation concepts. Examination of long-term financing includes studies of leasing as well as warrants, convertibles and options. Valuation impacts of mergers and reorganizations are also covered. Prerequisite: FIN 343.

- FIN 416. FUNDAMENTALS OF INSURANCE** 4 sh
 This course provides a study of the basic principles of insurance contracts and the scope of coverage under the several divisions of insurance, including life, fire, casualty, marine, bond and automobile insurance. Prerequisite: FIN 343.

- FIN 421. INVESTMENT PRINCIPLES** 4 sh
 Study centers on managing investment funds according to a predetermined goal, emphasizing safety, income and marketability, diversification and vigilance, and analysis of company management and industry trends to determine the value of securities. Prerequisite: FIN 343. Offered fall.

- 50 **FIN 445. SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT** 4 sh
 This course teaches the application of tools and techniques for appraising the economy, specific industries and companies, emphasizing securities markets from the perspectives of institutional portfolio managers or personal investors. Prerequisite: FIN 343.

- FIN 471. SEMINAR: SPECIAL TOPICS** 1-4 sh
 This upper level seminar, an advanced study requiring active participation by students, consists of readings, problems, reports, discussions of current topics, or preparation for professional examinations. May be conducted by departmental faculty or other resource persons. Prerequisite: permission of instructor, may vary with topic.

- FIN 481. INTERNSHIP IN FINANCE** 1-8 sh
 An internship offers the student valuable experience in the field of finance. Appropriate placement must be arranged by the student with the aid and support of the faculty and other appropriate resources.

African/African-American Studies

Coordinator: Associate Professor Boyd

African/African-American Studies takes an interdisciplinary approach to study two cultures and connect the past with the present. The program, developed in 1994, allows the student to select from a current group of courses approved by an advisory group. Through connected study the student not only takes a fresh approach to learning but also develops an individualized study plan.

This program is highly recommended for those persons in education and programs leading to multicultural relations. The minor consists of a minimum of 20 credit hours including a capstone course.

A minor in African/African-American Studies requires the following:

Twenty semester hours selected from the following:

ART 341	African Art	4 sh
ENG 238	African-American Literature before 1945	4 sh
ENG 239	African-American Literature since 1945	4 sh
ENG 338	The African Experience in Literature	4 sh
ENG 359	African-American Novels	4 sh
GEO 320	Geography of Africa	4 sh
HST 313	Modern Africa	4 sh
HST 314	History of Southern Africa	4 sh
HST 363	African-American History, 1850-Present	4 sh
JCM 346	African Film	4 sh
POL 367	African Politics	4 sh
SOC 341	Ethnic and Race Relations	4 sh
AAA 361-9	Seminars in African/African-American Studies	4 sh
AAA 491	Independent Study	4 sh
TOTAL		20 sh

AAA 361-369. SEMINARS IN AFRICAN/ AFRICAN-AMERICAN STUDIES 4 sh

Interdisciplinary seminars focus on modern scholarship in African and African-American Studies. Topics vary according to course theme.

AAA 491. INDEPENDENT STUDY 1-4 sh

Art

Chair, Art Department : Assistant Professor Simpkins

Associate Professor: Sanford

Assistant Professors: Hassell, Wood

Adjunct Assistant Professors: Alter, Barnes, J. Henricks, Lanzoni, Rhodes, Rosenblatt-Farrell, Schaeffer

The art department provides students with many opportunities to develop their visual awareness, engage in creative activity, and to understand and critique their visual heritage. A variety of art courses are open to all students, majors and nonmajors alike.

The major and minor in art are designed to develop a strong background in the language of design, drawing and art history. An art major can choose a concentration in ceramics, digital art, painting or photography. The curriculum is a balance of courses in foundations and electives with in-depth involvement in the medium of concentration. Studio courses emphasize hands-on experience where confidence and skills are developed. Small classes and well-equipped work spaces provide students with the environment and tools conducive to the creative process. Students work closely with a faculty of active artists with first-hand knowledge of each medium.

The art major requires 48 semester hours. This allows art majors to pursue a career-oriented minor or even double major. The bachelor's degree in art builds on Elon's strong General Studies program to produce creative thinkers who are prepared for further professional and educational challenges.

A major in Art requires the following courses:

ART 112	Fundamentals of Design	4 sh
ART 201	Drawing I	4 sh
ART 220	Art and History	4 sh
ART 320	Issues in Contemporary Art	4 sh
ART 380	Professional Practices in Art	2 sh
ART 461	Senior Seminar	2 sh
Three electives in Art, eight hours of which must be at the 300-400 level		12 sh
Four courses in one concentration		16 sh
TOTAL		48 sh

It is recommended that ART 112 (Fundamentals of Design), ART 201 (Drawing I) and ART 220 (Art and History) be taken before the concentration courses.

Concentrations

<i>Ceramics</i>		16 sh
ART 200	Ceramics I	
ART 300	Ceramics II	
ART 400	Advanced Projects in Ceramics (must be taken for two semesters)	
<i>Digital Art</i>		16 sh
ART 263	Digital Art I	
ART 363	Digital Art II	
ART 463	Digital Art III	
ART 483	Digital Art IV	
<i>Painting</i>		16 sh
ART 202	Painting I	
ART 302	Painting II	
ART 402	Advanced Projects in Drawing and Painting (must be taken for two semesters)	
<i>Photography</i>		16 sh
ART 205	Photography I	
ART 305	Photography II	
ART 405	Photography III	
ART 485	Photography IV	

A minor in Art requires the following courses:

ART 112	Fundamentals of Design	4 sh
ART 201	Drawing I	4 sh
ART 220	Art and History	4 sh

ART 320	Issues in Contemporary Art	4 sh
	Two sequential courses in one media: painting, ceramics, photography or digital art	8 sh
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TOTAL		24 sh
ART 112. FUNDAMENTALS OF DESIGN		<i>4 sh</i>
	This introduction to the fundamental principles and processes of two-dimensional and three-dimensional design uses a variety of media. Emphasis is placed on problem-solving, craftsmanship, creative exploration and effective use of the language of art. Material fee: \$75. Offered fall and spring.	
ART 200. CERAMICS I		<i>4 sh</i>
	This introduction to principles and processes of working with clay and glazes emphasizes basic construction techniques and kiln firing. Material fee: \$75. Offered fall and spring.	
ART 201. DRAWING I		<i>4 sh</i>
	Students learn the fundamentals of drawing and composition using various media. Material fee: \$75. Offered fall and spring.	
ART 202. PAINTING I		<i>4 sh</i>
	Painting I introduces the techniques of painting and composition in oils, with additional emphasis on color theory and creative exploration of the medium. Material fee: \$100. Offered fall.	
ART 203. WATERCOLOR		<i>4 sh</i>
	Course work studies various techniques of painting and composition with watercolor, emphasizing color theory and creative exploration of the medium. Material fee: \$40.	
ART 204. PRINTMAKING		<i>4 sh</i>
	Students become familiar with the basic processes of printmaking, with emphasis on the technical processes, design elements and the terms and concepts of the medium. Material fee: \$75.	
ART 205. PHOTOGRAPHY I		<i>4 sh</i>
	Photography I introduces students to the techniques, processes and language of photography. Emphasis is placed on the expressive qualities of the medium by making pictures that communicate individual experiences and ideas. Laboratory experience included. No prior experience necessary; students must provide a 35mm camera. Lab fee: \$100. Offered fall and spring.	
ART 220. ART AND HISTORY, PREHISTORY TO PRESENT		<i>4 sh</i>
	This is an introductory survey of the visual arts from prehistory through the present, emphasizing artistic styles, their origin and development, major works of art and their creators. No prerequisite.	
ART 261. COLOR IN ART		<i>2 sh</i>
	Color is probably the visual artist's most powerful tool. To use this tremendous potential, all artists must explore its many aspects. In a studio setting, students will explore a variety of materials, color mixing, color perceptions and color interactions. The historical, psychological and cultural connections to color will also be addressed. No prerequisite. Material fee: \$40.	
ART 263. DIGITAL ART I		<i>4 sh</i>
	This course provides an introduction to the computer, software and related peripherals as tools in service of the creation of artwork. Digital Art I covers the basic elements of visual language and design and introduces students to the possibilities of this emerging medium through examples of work by professional artists, illustrators and designers. Students will conceive and produce artwork, develop critical thinking skills, and learn how to conduct research on topics related to technologies in the arts. Material fee: \$100.	

- ART 300. CERAMICS II** 4 sh
 Students continue from ART 200, with emphasis on wheel-thrown forms, glaze mixing, kiln firing and studio management. Prerequisite: ART 200. Material fee: \$75.
- ART 301. DRAWING II** 4 sh
 A continuation of ART 201, this course emphasizes composition, critical analysis and productive exploration through more extended studies in a variety of media. Prerequisite: ART 201. Material fee: \$75.
- ART 302. PAINTING II** 4 sh
 A continuation of ART 202, this class emphasizes individual development, advanced critical analysis of visual images and productive exploration of the medium. Prerequisite: ART 202. Material fee: \$100.
- ART 305. PHOTOGRAPHY II** 4 sh
 A continuation of ART 205, this course builds on the ideas and information in Photography I. More advanced techniques and a deeper understanding of the qualities and history of photography provide greater control over how photographs look and what they state. Prerequisite: ART 205. Lab fee: \$100.
- ART 313. ART OF THE NINETEENTH CENTURY** 2 sh
 This course will explore the political, social and creative origins of the art movements: Impressionism, Neoclassicism, Naturalism and Romanticism. The works of each group's central figures will be closely examined. No prerequisite.
- ART 320. ISSUES IN CONTEMPORARY ART** 4 sh
 The Twentieth Century is perhaps the most fascinating period in human history for the visual artist. Old forms remain and continue to exert influence, but new forms abound and multiply at an astonishing rate. This course will attempt to organize the works and ideas of this century in a way that gives students a sense of the art of their time. No prerequisite.
- ART 340. HISTORY OF PHOTOGRAPHY** 4 sh
 This course is an interdisciplinary exploration of the significant role photography plays in reflecting and defining modern culture. Discussions of images made by important photographers will prompt such issues as technology and creativity, politics of the camera, honesty in picture making, voyeurism and sexuality. No prerequisite.
- ART 341. AFRICAN ART** 2 sh
 This course will examine the complexity of expression found in the aesthetic objects of Sub-Saharan Africa. No prerequisite.
- ART 343. RENAISSANCE ART HISTORY** 2 sh
 The Renaissance bridges four centuries of genius in art and science. By examining the art of this time, students discover the dramatic changes in man's perception of self, society, religion and nature. Creative assignments provide students an opportunity to examine the Renaissance's impact upon their own lives. No prerequisite.
- ART 363. DIGITAL ART II** 4 sh
 In this course students continue to build on the skills and ideas introduced in ART 263 with the addition of digital photography, alternative materials, interactivity, animation and Web design. Students further investigate the creative potential of the computer through projects that integrate advanced software tools with strategies for creating complex imagery, and are introduced to new software in the production of Web-related artwork. Students continue their critical inquiry into the medium through required readings and research. Prerequisite: ART 263. Material fee: \$100.
- ART 380. PROFESSIONAL PRACTICES IN ART** 2 sh
 This course provides practical information for advanced students considering a career in art. Topics covered include: documenting artwork; writing resumes, artist statements and cover letters; developing skills in presentation, promotion and exhibition preparation;

applying to graduate school and preparing for other postgraduate opportunities. Junior standing art majors or instructor permission required. Offered fall.

ART 400. ADVANCED PROJECTS IN CERAMICS 4 sh

A continuation of ART 300, emphasis in this course is on increased individual exploration of a single form-making process, glaze calculation and kiln firing. Prerequisite: ART 300. Material fee: \$75. May be repeated a maximum of three times for credit.

ART 402. ADVANCED PROJECTS IN DRAWING AND PAINTING 4 sh

This continuation of ART 302 emphasizes increased individual exploration of the medium and the development of a focused body of work. Prerequisite: ART 302. Material fee: \$100. Offered fall. May be repeated a maximum of three times for credit.

ART 405. PHOTOGRAPHY III 4 sh

This course continues ART 305 with a semester-long project proposed and developed by each student, concluding in a portfolio. Course emphasis is on individual participation through class presentations on techniques and issues in contemporary photography. Prerequisite: ART 305. Lab fee: \$75.

ART 461. SENIOR SEMINAR 2 sh

This capstone course is intended to broaden the student's context and perspective for making art discussions, writings and presentations on some of the most important and topical issues in the contemporary art world. We will explore the work of artists, writers, philosophers, filmmakers, critics and others whose insights into the creative process are germane to a deeper understanding and application of the creative process. Prerequisite: senior art majors who have completed two levels in their medium of concentration. Spring semester only.

ART 463. DIGITAL ART III 4 sh

This course continues ART 363 with a portfolio project which emphasizes individual exploration of digital media resulting in a unified body of work and public presentation. Students are also introduced to multimedia-based software in order to create a project designed for electronic distribution. Prerequisite: ART 363. Material fee: \$100.

ART 481. INTERNSHIP IN ART 1-4 sh

This course for art majors and minors may only be taken with the permission of the department head and supervising instructor.

ART 483. DIGITAL ART IV 4 sh

This course continues ART 463 with a portfolio project which emphasizes intense individual exploration of digital media resulting in a unified body of work that includes supporting materials such as an artist statement and electronic presentation of work. Materials fee: \$100.

ART 485. PHOTOGRAPHY IV 4 sh

Photography IV is a self-directed involvement in a long-range photographic project proposed, researched and executed in consultation with the instructor/mentor. The project should reflect the student's knowledge and experience in the medium and culminate in a coherent portfolio for exhibition or publication. Materials fee: \$100.

ART 491. INDEPENDENT STUDY STUDIO 4 sh

Art majors and minors may pursue a program of advanced study and individual exploration in a selected medium. Proposals for independent studio should be prepared and submitted in the semester prior to enrollment. The instructor may require class attendance. Maximum 8 semester hours of credit; by permission of art faculty only.

ART 499. RESEARCH IN ART 1-8 sh

Students engage in an undergraduate research project under the guidance of an Art Department mentor. A special research proposal form must be prepared and submitted in consultation with the mentor. Maximum of 8 semester hours of credit.

Athletic Training

Chair, Department of Health Promotion, Leisure and Human Performance:

Professor J.P. Brown

Professors: Beedle, Calhoun

Assistant Professors: Baker, Davis, Hall, Miller, Smith

Instructors: Calone, Myers, Stevens

The Athletic Training Education Program (ATEP) major located within the Health Promotion, Leisure and Human Performance (HPLHP) Department includes clinical education and internship experiences within a CAAHEP approved curriculum.

Admission into the ATEP requires a separate application process that is outlined in the ATEP application packet which can be obtained through the HPLHP Department.

Upon completion of the curriculum, students are eligible to sit for the NATA-BOC certification exam. Graduates of this program may pursue careers in athletic training or graduate degrees in other allied health professions after satisfying the appropriate prerequisites.

A major in Athletic Training Education requires the following courses:

ATP 112	Athletic Training I	4 sh
ATP 212	Athletic Training II	4 sh
ATP 301	Clinical Education I	2 sh
ATP 302	Clinical Education II	2 sh
PED 305	Legal Aspects	2 sh
ATP 311	Introduction to Pharmacology	2 sh
PED 315	Advanced Strength Training Conditioning	4 sh
ATP 329	Assessment of Athletic Injuries	4 sh
ATP 330	Therapeutic Exercise/Rehabilitation	4 sh
ATP 401	Clinical Education III	2 sh
ATP 402	Clinical Education IV	2 sh
ESS 422	Physiology of Exercise	4 sh
ATP 430	Therapeutic Modalities	4 sh
ATP 481	Internship	2 sh
ATP 495	Senior Seminar	2 sh
PED 321	Biomechanics	4 sh
PED 410	Organization and Administration	4 sh
HED 220	First Aid	1 sh
HED 324	Nutrition	4 sh
HED 421	Chronic and Acute Diseases	4 sh
BIO 161*	Human Anatomy	4 sh
BIO 162*	Human Physiology	4 sh
PSY 111	General Psychology	4 sh
TOTAL		73 sh

*Should be completed by freshman or sophomore year.

- ATP 112. ATHLETIC TRAINING I** 4 sh
 This course introduces the student to the profession and principles of athletic training, including topics such as sports medicine organizations, emergency care of specific injuries, emergency procedures, tissue repair and healing, transportation and transfer of catastrophic injuries, methods of bandaging and dressing wounds and adhesive taping. Offered fall and spring.
- ATP 212. ATHLETIC TRAINING II** 4 sh
 Students will gain practical knowledge and hands-on experience of advanced skills and techniques of athletic training. Topics include but are not limited to: protective sports devices and equipment; drugs and sports; skin disorders; specific sports conditions and injuries and advanced taping skills. Prerequisites: ATP 112, BIO 161, admission to the athletic training education program or permission of instructor. Offered fall.
- ATP 301. CLINICAL EDUCATION I** 2 sh
 This course is the first in a progressive series of four clinical education courses and is intended to apply theories learned in SPM 329 Assessment and previous athletic training classes in a clinical setting. Outcome-based assessments of clinical skills will be performed to determine duties and responsibilities in each setting. Athletic training students are exposed to the practice of athletic training and are supervised by practicing certified athletic trainers. Rotations with medical doctors and other allied medical professionals will also be completed as a learning opportunity and to obtain a sense of where certified athletic trainers fit into the sports medicine team. Prerequisite: ATP 212. Offered spring.
- ATP 302. CLINICAL EDUCATION II** 2 sh
 This course is the second in a series of four clinical education courses. The athletic training student continues to practice and improve clinical decision-making skills by building upon Clinical Education I. Outcome-based assessments of clinical skills will be performed to determine duties and responsibilities in each setting. These students are further exposed to the practice of athletic training and are supervised by practicing certified athletic trainers. Prerequisite: ATP 301. Offered fall.
- ATP 311. INTRODUCTION TO PHARMACOLOGY** 2 sh
 This course is designed as an introduction to pharmacology. Pharmacodynamics, pharmacokinetics, and drug interactions and reactions will be discussed. Extra attention will be given to drugs commonly used in sports medicine including but not limited to: PNS- and CNS-acting, anti-inflammatory, antibiotics, gastrointestinal acting, respiratory acting, and ergogenic aids. An understanding of the practical implication of using these drugs will be emphasized. Prerequisite: BIO 162 or permission of instructor. Offered fall of odd years.
- ATP 329. ASSESSMENT OF ATHLETIC INJURIES** 4 sh
 This course familiarizes students with the principles of assessing sport injuries, including injury history, inspection, palpation, range of motion tests, muscle function tests, joint stability, neurological tests and specific anatomical features. This course is designed with a lecture and laboratory component. Prerequisites: ATP 212, admission to the athletic training education program or permission of instructor. Offered fall.
- ATP 330. THERAPEUTIC EXERCISE AND REHABILITATION** 4 sh
 Students study the process and components of therapeutic rehabilitation. Emphasis is placed on deconditioning and reconditioning following injury as well as the contribution of various forms of exercise and therapeutic techniques on recovery. Prerequisites: ATP 329, admission to the athletic training education program or permission of instructor. Offered spring.

ATP 401. CLINICAL EDUCATION III

2 sh

This course is the third in a series of four clinical education courses. The athletic training student continues to practice and improve clinical decision-making skills by building upon Clinical Education II and ATP 430 Therapeutic Modalities. Students are given more responsibility and required to problem solve and improve their decision-making abilities in a practical setting while under the supervision of a practicing certified athletic trainer. Outcome-based assessments are performed to determine duties and responsibilities in each setting. Prerequisite: ATP 302. Offered spring.

ATP 402. CLINICAL EDUCATION IV

2 sh

This course is the fourth in a series of clinical education courses. It is intended to be a capstone course to bring together all of the theories and skills learned in the classroom and clinical education courses and apply them in a practical setting under the supervision of a working professional. This course is intended to provide the student the opportunity to show mastery of the skills needed to function as a successful certified athletic trainer through outcome-based assessments. Successful completion of this course is required to sit for the NATA-BOC certification exam. Prerequisite: ATP 401. Offered fall.

ATP 430. THERAPEUTIC MODALITIES

4 sh

This course is designed to cover topics in therapeutic modalities as they relate to athletic training. It is directed towards students who plan on pursuing careers in athletic training and/or physical therapy. The main topics discussed in this class will be the theory workings, application and use of therapeutic modalities in the rehabilitation of sports injuries, and the effect of therapeutic modalities on both the stages of healing and pain process. Prerequisites: ATP 330, admission to the athletic training education program or permission of instructor. Offered fall.

ATP 481. INTERNSHIP IN ATHLETIC TRAINING

2 sh

In this course, upper level majors have opportunities to apply classroom knowledge and skills to real world problems under the supervision of a faculty member and a certified athletic trainer. Settings may include a sports medicine clinic, professional sports team, corporate setting, etc. Students must keep a daily journal of their experiences, which are discussed in conferences with the faculty supervisor. The student must also complete a project benefiting the internship facility, but which would not have been possible without the student. Student evaluations are based on these assignments. Students should make arrangements with their professors the semester prior to taking the internship. Prerequisites: ATP 329, 330; junior/senior majors only; permission of department; 2.0 GPA overall, 2.0 GPA in major. Offered fall, spring and summer.

ATP 491. INDEPENDENT STUDY

1-4 sh

ATP 495. SENIOR SEMINAR IN ATHLETIC TRAINING

2 sh

This course is designated to be the capstone class for the athletic training major. The course will review acquired knowledge and experiences of the athletic training curriculum. Students will be prepared to sit for the NATA-BOC certification exam. Students will discuss moral and ethical responsibility, state licensure, continuing education, decision-making accountability, and conflict management. The NATA professional code of practice and standards of practice will be reviewed. Resume and interview skills will be discussed. Prerequisite: senior majors only. Offered spring.

ATP 499. RESEARCH IN ATHLETIC TRAINING

1-4 sh

Independent research project supervised by faculty mentor.

Asian/Pacific Studies

Coordinator: Professor Arcaro

The vast area of the Pacific Rim is of major importance in political, economic and cultural terms. This program aids students to shift from an Atlantic to a Pacific perspective, to focus on some particular Asian/Pacific cultures, and to take first steps not only in seeing Asia with Western eyes but also in seeing the West through Asian eyes.

Asian/Pacific Studies takes an interdisciplinary approach to study the peoples and cultures of Asia and the Pacific Rim. The program allows students to select from a current group of courses approved by an advisory group.

The minor consists of a minimum of 20 credit hours. The Asian/Pacific Studies program may be expanded into an international studies major with Asian/Pacific Studies as a regional concentration. See note.

Foreign language study (e.g., Japanese or Chinese) is strongly recommended as is a study abroad experience in the region.

A minor in Asian/Pacific Studies requires 20 semester hours selected from the following list. Courses must be chosen from at least two disciplines.

General Asian/Pacific Studies courses

BUS 357	Emerging Markets in Asia	4 sh
BUS 358	Doing Business in Asia	4 sh
ENG 376	Asian Literature of Social Change	4 sh
ENS 310	Environmental Issues of Southeast Asia	4 sh
HST 320	China, Japan and the Pacific Century: Era of War and Revolution	4 sh
POL 363	Politics of Asia	4 sh
PHL 352	Eastern Philosophy	4 sh
PHL 353	Zen and the Culture of Japan	4 sh
REL 359	India Past and Present	4 sh
REL 353	Buddhism	4 sh
REL 356	Hinduism	4 sh
SOC 329	Peoples & Cultures of Southeast Asia	4 sh
SOC 344	Socio-Cultural Change in India	4 sh
APS 361-369	Seminars in Asian/Pacific Studies	2-4 sh
APS 481	Internship in Asian/Pacific Studies	1-4 sh

Asian/Pacific Foreign Language Courses

While not required for the minor, up to 8 semester hours of the courses below may count toward the minor.

CHN 110	Elementary Chinese	4 sh
CHN 210	Intermediate Chinese	4 sh
CHN 310	Advanced Chinese	4 sh
JPN 110	Elementary Japanese	4 sh

JPN 210	Intermediate Japanese	4 sh
JPN 310	Advanced Japanese	4 sh

Study Abroad in the Region

While not required for the minor, up to 4 semester hours of such study abroad may count for the minor.

Approved course lists for study abroad in Asia and the Pacific Rim may be obtained from the program coordinator.

TOTAL		20 sh
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Note: If they choose, students can extend the minor into an international studies major, with a regional concentration in Asia and the Pacific Rim. In this way, the minor supports the international studies major by providing focus for a regional concentration and opportunity to acquire language skills. For details and other requirements, see International Studies.

Biology

Chair, Department of Biology and Allied Health: Assistant Professor Vick

Professors: H. House, S. House

Associate Professors: M. Clark, N. Harris, Kingston, Seidel

Assistant Professors: Carloye, Gallucci, Haenal, MacFall, Niedziella, Touchette

Adjunct Instructors: DeVries, Hoiland

Biology is the study of life in all its diverse forms. As a species, we have always been deeply fascinated by other living creatures. Early human's dependence on other animals and plants for food, medicine, and shelter fostered an appreciation for life's interconnectedness. Modern society has rediscovered these relationships in the face of such challenges as global warming, rain forest destruction, AIDS, rising cancer rates and industrial pollution.

Our approach to biology at Elon University stresses hands-on experiences in the classroom, laboratory and field. The course of study includes off-campus experiential opportunities and research seminars that encourage creative approaches to biological problems. The focus is on science as a process, not merely a collection of established facts.

The faculty strives to provide students with a high quality program that enables them to (1) develop critical thinking and problem-solving skills to better understand and meet present and future biological challenges; (2) develop competency in information retrieval, use and analysis; (3) develop an understanding of the latest technologies utilized in biological investigation; (4) acquire broad-based knowledge of biological concepts from molecules to ecosystems; and (5) acquire an experiential learning opportunity through either research, internship or laboratory assistantship.

The bachelor of science in medical technology (MT) consists of three years of preprofessional training at Elon followed by application to the 12-month clinical program at our affiliated hospital. Admission to the affiliated program is competitive and based on overall GPA, evaluation by faculty and personal interviews. If needed, a fourth year of study at Elon can lead to a bachelor of science in biology.

In all of Elon's biology offerings, students receive a strong foundation in biology that prepares them for graduate studies, medical and other allied health-related professional schools, teaching and industry.

The Department of Biology and Allied Health offers programs leading to the bachelor

of arts or bachelor of science degree with a major in biology, the bachelor of science degree with a major in medical technology, and a minor concentration in biology for students majoring in another discipline.

The department of biology has divided its laboratory course offerings that serve as electives into three functional categories to assist students in the development of a broad-based major with the necessary fundamental biological concepts while at the same time providing the student with the flexibility to build a program that meets their individual interests and needs.

Molecular/Cellular Biology	Organismal Biology	Supraorganismal Biology
BIO 322	BIO 316 BIO 343	BIO 335
BIO 345	BIO 318	BIO 442
BIO 348	BIO 321	BIO 452
BIO 351	BIO 325	
BIO 352	BIO 342	

Both the Bachelor of Arts and the Bachelor of Science degrees in Biology require the following **Core Courses**:

BIO 111	Introductory Cell Biology	3 sh
BIO 112	Introductory Population Biology	3 sh
BIO 113	Cell Biology Lab	1 sh
BIO 114	Population Biology Lab	1 sh
BIO 221	General Zoology	4 sh
BIO 222	General Botany	4 sh
BIO 261	Introductory Seminar	2 sh
BIO 322	Molecular and Cellular Biology	4 sh
One course selected from the Organismal Biology category:		4 sh
BIO 316	Developmental Biology	
BIO 318	Comparative Vertebrate Structure & Function	
BIO 321	Microbiology	
BIO 325	Human Histology	
BIO 342	Plant Physiology	
BIO 343	Introductory Medical Anatomy and Physiology	
One course selected from the Supraorganismal Biology category:		4 sh
BIO 335	Field Biology	
BIO 442	Aquatic Biology	
BIO 452	General Ecology	
Eight semester hours of electives selected from the following:		8 sh
Organismal Biology category		
Supraorganismal Biology category		
Molecular/Cellular Biology category		
This may include a maximum of two 2-semester hour special topics seminars.		
BIO 462	Senior Seminar	2 sh

TOTAL **40 sh**

A Bachelor of Arts degree in Biology requires the following courses:

Core Courses in Biology	40 sh
CHM 111 General Chemistry I	3 sh
CHM 112 General Chemistry II	3 sh
CHM 113 General Chemistry I Lab	1 sh
CHM 114 General Chemistry II Lab	1 sh

In addition, a required experiential component selected from the following:

- (a) internship
- (b) research
- (c) a specialized approved laboratory assistantship.

TOTAL	48 sh
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A Bachelor of Science degree in Biology requires the following courses:

Core Courses in Biology	40 sh
CHM 111 General Chemistry I	3 sh
CHM 112 General Chemistry II	3 sh
CHM 113 General Chemistry I Lab	1 sh
CHM 114 General Chemistry II Lab	1 sh
CHM 211 Organic Chemistry I	3 sh
CHM 212 Organic Chemistry II	3 sh
CHM 213 Organic Chemistry I Lab	1 sh
CHM 214 Organic Chemistry II Lab	1 sh
PHY 111 General Physics I	4 sh
PHY 112 General Physics II	4 sh
or	
PHY 113 General Physics I with Calculus	
PHY 114 General Physics II with Calculus	4 sh
MTH 112 General Statistics	4 sh

In addition, a required experiential component selected from

- (a) internship
- (b) research
- (c) a specialized approved laboratory assistantship.

TOTAL	68 sh
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A Bachelor of Science degree in Medical Technology requires 45 semester hours of course work at Elon University and completion of the clinical curriculum.

BIO 111	Introductory Cell Biology	3 sh
BIO 112	Introductory Population Biology	3 sh
BIO 113	Cell Biology Lab	1 sh
BIO 114	Population Biology Lab	1 sh
BIO 321	Microbiology	4 sh
BIO 345	Genetics	4 sh
CHM 111	General Chemistry I	3 sh
CHM 112	General Chemistry II	3 sh

CHM 113	General Chemistry I Lab	1 sh
CHM 114	General Chemistry II Lab	1 sh
CHM 211	Organic Chemistry I	3 sh
CHM 212	Organic Chemistry II	3 sh
CHM 213	Organic Chemistry I Lab	1 sh
CHM 214	Organic Chemistry II Lab	1 sh
PHY 111	General Physics I	4 sh
PHY 112	General Physics II	4 sh
MTH 112	General Statistics (or higher)	4 sh
	A course in immunology: Immunology as a separate course or as part of a microbiology course	0-3 sh
Recommended additional courses:		
	CHM 311 Quantitative Analysis	
	CIS 112 Spreadsheets and their Application <i>and</i>	
	CIS 114 Web Site Development	
	BIO 162 Physiology	
	BUS 303 Introduction to Managing	
	MTH 112 General Statistics	
	Completion of the clinical curriculum.	
<hr/> TOTAL		44-47 sh

A minor in Biology requires the following courses:

BIO 111	Introductory Cell Biology	3 sh
BIO 113	Cell Biology Lab	1 sh
Sixteen semester hours chosen from the following:		16 sh
	BIO 112 Introductory Population Biology	
	BIO 114 Population Biology Lab	
	Biology courses at the 200-400 level	
<hr/> TOTAL		20 sh

BIO 101. TOPICS IN GENERAL BIOLOGY 3 sh

This topical approach to the foundational concepts of biology examines theories and issues in biology as they relate to varying special topics selected by the instructor. To Satisfy the general studies laboratory science requirement, BIO 102 should be taken concurrently. No credit to students with prior credit for BIO 111. No credit toward biology major or minor. Offered fall and spring.

BIO 102. GENERAL BIOLOGY LABORATORY 1 sh

This two-hour laboratory provides experiences to complement selected foundational concepts from BIO 101. To satisfy the general studies laboratory science requirement, BIO 101 and 102 should be taken concurrently. No credit to students with prior credit for BIO 113. No credit toward biology major or minor. Offered fall and spring.

BIO 105. CURRENT ISSUES IN BIOLOGY 4 sh

Designed for nonscience majors, this course focuses on reading, interpreting and evaluating facts behind biological issues and exploring the implications for science and human society. Students conduct library research, present oral reports, discuss and write papers on these issues. No credit toward biology major or minor. Satisfies General Studies nonlaboratory science requirement. Offered winter.

- BIO 111. INTRODUCTORY CELL BIOLOGY** 3 sh
 In this introduction to organization and function at the cellular level, topics of study include basic cell chemistry and structure, transport, energetics and reproduction. Required for biology majors/minors. Corequisite: BIO 113. Offered fall and spring.
- BIO 112. INTRODUCTORY POPULATION BIOLOGY** 3 sh
 Topics of study in this introduction to organization and function at the population level include reproduction and transmission genetics, patterns and mechanics of evolutionary change and basic concepts of ecology. Required for biology majors/minors. Corequisite: BIO 114. Offered fall and spring.
- BIO 113. CELL BIOLOGY LABORATORY** 1 sh
 Students have three hours of laboratory experience per week with topics complementing concurrent study in BIO 111. Required for biology majors/minors. Corequisite: BIO 111. Offered fall and spring.
- BIO 114. POPULATION BIOLOGY LABORATORY** 1 sh
 Students have three hours of laboratory experience per week with topics complementing concurrent study in BIO 112. Required for biology majors/minors. Corequisite: BIO 112. Offered fall and spring.
- BIO 121. BIOLOGICAL DIVERSITY** 4 sh
 This course exposes the nonscience major to the diversity of form and function through lectures and demonstrations, emphasizing the relationship of specific organisms and diversity in general to human society. No credit toward major/minor. Satisfies General Studies nonlaboratory science requirement.
- BIO 161. HUMAN ANATOMY** 4 sh
 This course explores human anatomy, concentrating on skeletal, muscular, nervous, endocrine, heart, blood, respiratory, digestive and urinary aspects. Three class hours, one laboratory per week. No credit toward BIO major/minor. Offered fall and spring.
- BIO 162. HUMAN PHYSIOLOGY** 4 sh
 This study of human physiology emphasizes skeletal, muscular, nervous, endocrine, heart, blood, respiratory, digestive and urinary aspects. Three class hours, one laboratory per week. No credit toward BIO major/minor. Offered fall and spring.
- BIO 181. BIOLOGY LABORATORY TECHNIQUES** 2 sh
 Skills taught in this training course for prospective laboratory assistants include laboratory procedures, materials preparation and grading procedures. Offered fall.
- BIO 215. ORGANISMAL BIOLOGY AND FIELD TECHNIQUES** 4 sh
 This course examines the basic concepts of biological form and function and the fundamentals of organismal systematics with a focus on herbaceous and woody plants, invertebrates and microbial ecology. Students investigate the natural history of local species and their role in community dynamics. Laboratory experiences emphasize keying and identification, field methodologies of specimen collection and preservation, sampling techniques and population estimation procedures for terrestrial and aquatic ecosystems. Satisfies the General Studies lab science requirement. No credit toward the major. Prerequisites: BIO 112, 114. (BIO 215 is the same course as ENS 215.) Offered spring.
- BIO 221. GENERAL ZOOLOGY** 4 sh
 Students survey the animal kingdom (emphasizing selected vertebrates and invertebrates) investigating basic concepts of morphology, anatomy, physiology and taxonomy as they affect the ecology of the animal. Three class hours, one laboratory per week. Prerequisites: BIO 111, 112, 113, 114. Offered fall and spring.
- BIO 222. GENERAL BOTANY** 4 sh
 This survey of the plant kingdom (emphasizing vascular plants) includes general morphology, anatomy, physiology of metabolism and growth, economic importance and

identification. Three class hours, one laboratory per week. Prerequisites: BIO 111, 112, 113, 114. Offered fall and spring.

BIO 261. INTRODUCTORY SEMINAR 2 sh

Students learn to use primary information sources and gain practice in manual and computer information retrieval, read and interpret research and review papers, write abstracts and present scientific information orally. Recommended for sophomore year. Offered fall.

BIO 271. SPECIAL TOPICS SEMINAR 2-4 sh

Study focuses on one biological topic per seminar in this nonlaboratory discussion course for biology majors. Topics are determined by student and faculty interest. Must have instructor's consent. Offered winter.

BIO 316. DEVELOPMENTAL BIOLOGY 4 sh

This course examines the changes that occur at the cellular and subcellular level as a single-cell zygote develops into a multi-cellular organism. Topics include fertilization, blastula formation, gastrulation and organogenesis. Three class hours, one laboratory per week. Prerequisites: BIO 221; CHM 111, 112, 113, 114. Offered spring of even-numbered years.

BIO 318. COMPARATIVE VERTEBRATE STRUCTURE AND FUNCTION 4 sh

An evolutionary approach to the form and function of vertebrates. Students will investigate a diversity of traits and follow the evolutionary changes of these traits from the earliest vertebrates to mammals. The primary focus is on the move from aquatic to terrestrial habitats, the evolution of flight and the evolution of endothermy. Students will compare changes in form and function of the major organ systems through laboratory dissection of the jawless fish, shark, amphibian and mammal. Prerequisites: BIO 112, 114, 221. Offered spring of odd-numbered years.

BIO 321. MICROBIOLOGY 4 sh

In a general survey of microorganisms, study emphasizes bacteria, their cytophysiological characteristics and classification, viruses, microbial diseases and immunity, and the role of microorganisms in human affairs. Three class hours, one laboratory per week. Prerequisites: BIO 111, 113; CHM 111, 112, 113, 114. Junior standing or consent of instructor. Offered spring of even-numbered years.

BIO 322. MOLECULAR AND CELLULAR BIOLOGY 4 sh

This course is a study of the structure and function of prokaryotic and eukaryotic cells at the molecular level. It examines in depth specific biochemical pathways and processes essential to life. Topics include considerable coverage of the principles, techniques and applications of molecular genetics. Three class hours and one laboratory per week. Junior standing or consent of instructor. Prerequisites: BIO 111, 112, 113, 114; CHM 111, 112, 113, 114. Offered fall and spring.

BIO 325. HUMAN HISTOLOGY 4 sh

Students survey human body tissues (especially of the cardiovascular, alimentary, respiratory, urinary and reproductive systems), stressing tissue identification and the relationship of microanatomy to physiology of the human body. Three class hours, one laboratory per week. Prerequisites: BIO 111, 113. Offered fall of odd-numbered years.

BIO 335. FIELD BIOLOGY 4 sh

In this field-oriented course, restricted to selected natural taxa, environments or biological phenomena, in-depth field study may include identification, classification, life histories and relationships among organisms. Prerequisite: consent of instructor. Offered winter and/or summer.

BIO 342. PLANT PHYSIOLOGY 4 sh

Topics in this study of the life processes of plants include photosynthesis, mineral nutrients, movement of materials, plant growth substances and senescence. Three class hours,

one laboratory per week. Prerequisites: BIO 222; CHM 111, 112, 113, 114. Offered spring of odd-numbered years.

BIO 343. INTRODUCTORY MEDICAL ANATOMY AND PHYSIOLOGY 4 sh

An introduction to the basic topics of human medical structure and function. Lecture emphasizes regular processes and responses occurring in human organ systems. Laboratory is a combination of equipment instruction, independent physiology projects and dissection. Three class hours, one laboratory per week. Prerequisites: BIO 221; CHM 111, 112, 113, 114. Offered fall of even-numbered years.

BIO 345. GENETICS 4 sh

Students are introduced to Mendelian and molecular principles of genetics and the applications of these principles to the modern world. Three class hours, one laboratory per week. Prerequisites: BIO 111, 112, 113, 114; CHM 111, 112, 113, 114. Offered fall of odd-numbered years.

BIO 348. BIOTECHNOLOGY 4 sh

Students explore how biological systems are utilized in scientific research. In collaboration with their peers, students will apply the techniques of molecular biology (restriction digestion, transformation, DNA hybridization, PCR, etc.) to investigate a research question. Emphasis will be placed on protocol design, solution preparation and critical analysis of research data. Additionally, the social context of biotechnology will be investigated as students explore the risks and rewards in this expanding field. Two laboratory periods and one class hour per week. Prerequisite: BIO 345 or 322. Offered spring of odd-numbered years.

BIO 351. BIOCHEMISTRY 3 sh

In this survey of biochemistry as it relates to the physiology of organisms, study includes biochemical methodology, buffers, proteins (structure, function and synthesis), enzymes, bioenergetics, anabolism and catabolism of carbohydrates and lipids, and metabolic regulation. Three class hours, one laboratory per week. Prerequisites: CHM 111, 112, 113, 114, 211, 212, 213, 214. (BIO 351 is the same as CHM 351.) Offered fall of odd-numbered years.

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BIO 352. BIOCHEMISTRY LABORATORY 1 sh

Experiments in this study of laboratory techniques and principles of biochemistry as it relates to the physiology of organisms include biochemical methodology, buffers, proteins (structure, function and synthesis), enzymes, bioenergetics, anabolism and catabolism of carbohydrates and lipids, and metabolic regulation. Corequisite: BIO 351. (BIO 352 is the same as CHM 352.) Offered fall of odd-numbered years.

BIO 371. SPECIAL TOPICS SEMINAR 2-4 sh

Each seminar – a nonlaboratory discussion course for biology majors – focuses on one biological topic determined by faculty interest. Offered winter.

BIO 442. AQUATIC BIOLOGY: THE STUDY OF INLAND WATERS 4 sh

Aquatic Biology considers the chemical, physical and biological properties of freshwater ecosystems including streams, rivers, ponds and lakes. Topics include the geomorphology of inland waters, thermal stratification, nutrient cycles, community metabolism, plankton community dynamics, seasonal succession and eutrophication resulting from human activities. Weekly laboratory meetings provide hands-on experience with the field techniques of freshwater scientists. Prerequisites for Biology major: BIO 221, 222; CHM 111, 112, 113, 114. Prerequisites for Environmental Studies major: BIO 112, 114, 215; CHM 111, 112, 113, 114. Junior standing or consent of instructor. Offered spring of even-numbered years.

BIO 452. GENERAL ECOLOGY 4 sh

Students explore ecological principles at population, community, and ecosystem levels in this study of the interrelationships of organisms with their biotic and abiotic envi-

ronments. Three lecture hours, one laboratory per week. Prerequisites for Biology major: BIO 221, 222; CHM 111, 112, 113, 114. Prerequisites for Environmental Studies major: BIO 112, 114, 215; CHM 111, 112, 113, 114. Junior standing or consent of instructor. Offered fall.

BIO 462. SENIOR SEMINAR *2 sh*

This course provides students with the opportunity to conduct both individual and group literature research projects of their own choosing based on recently published scientific papers. Students participate in group discussions of the current literature, research and write a scientific review paper, and develop a formal oral presentation. Recommended for senior year. Offered fall.

BIO 471. SPECIAL TOPICS SEMINAR *2-4 sh*

Each seminar – a nonlaboratory discussion course for biology majors – focuses on one biological topic determined by student and faculty interest. Must have instructor's consent.

BIO 481. INTERNSHIP IN BIOLOGY *1-4 sh*

Advanced-level work experience in a biological field is offered on an individual basis when suitable opportunities can be arranged. Prerequisite: permission of department.

BIO 499. RESEARCH *1-4 sh*

Students from all levels conduct laboratory and/or field research under the direction of the Biology faculty. Maximum eight semester hours total credit. Prerequisite: permission of the biology faculty.