



## **Programs and Courses of Instruction**

### **Accounting (ACC)**

(An ACBSP Accredited Program)

**Professor Bale**

**Associate Professor Springer**

The accounting major prepares students for a variety of careers in business, both in and out of the accounting field. Accounting students learn to understand, analyze, report, and interpret accounting information as a decision-making tool in various organization structures. Students must exhibit effective communication and interpersonal skills in a variety of business contexts. The accounting major also prepares students for further study at the graduate level.

Some accounting students may consider taking a certification examination (e.g., CMA [Certified Management Accountant] or CPA [Certified Public Accountant]); however, accountants can have successful careers without a certificate. Students qualify to take the CMA exam upon completion of the accounting major. Students considering the CPA exam need to meet additional state-mandated requirements, in addition to completion of the accounting major, in order to write the exam. Academic advisers at Doane work closely with students who are considering certification options.

**Internship Credits:** Students majoring in Accounting who are on the 150-hour track are required to earn a minimum of 1 credit hour for internship experience. However, many Accounting majors complete more than one internship during their four years at Doane. Because internships are a valued part of the Accounting degree and help meet the 150-hour requirement to

sit for the Uniform CPA Exam, Accounting majors on the 150-hour track are allowed to apply up to six hours of Summer internship credit to the following Fall semester (rather than the three credit hours usually allowed).

**Testing Option:** Students with strong accounting backgrounds may attempt to test out of Accounting 103. Such students should contact an accounting faculty member and discuss the process in detail. Even if attempting to test out of the course, students must enroll in Accounting 103 in the fall semester and pass a comprehensive examination (with a C- or better) within the first week of class. Upon passing the examination, a student may either continue in the course and receive a letter grade (A, B, C, etc.) at the end of the semester or drop the course, pay a fee and receive credit by examination. In the latter case, the course will appear on the student's transcript as credit by examination and the grade assigned will be a "P" (pass). Students are advised that some graduate schools in business require two graded accounting courses.

### **Requirements for the Accounting Major:**

Upon successful completion of the Accounting major, students qualify to take the CMA examination.

1. Complete the following 36 credits in accounting: Accounting 103, 104, 231, 232, 315, 331, 332, 335, 411, 415, 421 (1 credit minimum), and 427.
2. Complete the following cognates:
  - a. Business 205, 215 (or Mathematics 356), 226, 242, 251, 339, 341, 342 and 497.
  - b. Economics 203, 204.
  - c. Mathematics 115 or 235.

### **Requirements to Sit for the CPA Examination in the State of Nebraska:**

Any student interested in writing the CPA examination in Nebraska after January 1, 1998 must meet the state-mandated "150-hour rule." Students should work closely with their academic adviser to be sure that they are aware of all of their options, which may include graduate study.

1. Complete all requirements for the Accounting major (see above).
2. Earn a total of 150 credit hours (excluding the CPA Review course). Sixty of the 150 credit hours must include oral and written communication skills, mathematics, arts, natural sciences, social sciences, humanities and statistics.

### **Requirements for the Accounting Minor:**

1. Complete the following 17 credits in accounting: Accounting 103, 104, 231, 232, and 315.

2. Complete three additional credits in accounting at the 300/400 level, excluding Accounting 411, 421, and 427.

**103 Financial Accounting (3)**

An introduction to accounting principles and their application to the proprietorship, partnership and corporation through a financial statement approach.

**104 Managerial Accounting (3)**

An introduction to the use of accounting data by managers in directing the internal affairs of organizations. Topics include cost relationship, statement analysis, management reports and other accounting techniques and methodology used for management purposes. *Prerequisite: Accounting 103 with a minimum grade of C-, or permission.*

**231-232 Intermediate Accounting I, II (3-4) (3-4)**

An introduction to the theory and practice of accounting which addresses financial reporting; conceptual framework; review of the accounting process; preparation of accounting statements (financial position), results of operations (income), cash flow, and changes in retained earnings. Other topics include calculation of compound interest; financial reporting; determination of cash and receivables; inventory measurement and flow assumptions; acquisition and disposal of property, land, and equipment; calculation and presentation of appreciation and depreciation. The courses also cover measurement of intangibles; valuation of current and non-current liabilities; valuation of current and non-current investment; accounting for income taxes and post retirement benefits; accounting for leases; computation and presentation of earnings per share; and accounting for changes in prices (inflation). Prerequisite for Accounting 231: Accounting 104 with a C- or higher, or permission. *Prerequisite for Accounting 232: Accounting 231 with a C- or higher, or permission.*

**271, 371, 471 Selected Topics (1-3) (1-3) (1-3)**

An investigation of topics not offered in other courses, selected on the basis of student interest and available instruction.

**290, 390, 490 Directed Studies (1-3) (1-3) (1-3)**

An opportunity for supervised, independent study of a particular topic based on the interest of the student and the availability and approval of the faculty.

**315 Tax Accounting I (3)**

A focus on taxation fundamentals with emphasis on procedures for business taxpayers and individuals and practice in preparation of tax returns. *Prerequisite: Junior standing. Offered alternate fall terms.*

**331 Advanced Accounting I (3)**

Advanced Accounting I focuses primarily on financial accounting concepts and methods of analysis applicable to accounting for (1) combined, consolidated financial statements, and (2) multinational

accounting issues (foreign currency transactions and financial instruments, and translation of foreign entity financial statements). Upon completion of this course, students will recognize the ethical implications and understand the precise accounting terminology and rules and procedures related to combined and/or consolidated corporations and issues related to accounting for transactions with foreign countries that have currencies other than U.S. dollars (foreign currency exchange rate differences). *Prerequisite: Accounting 232 with a C- or higher or permission. Offered alternate fall terms.*

### **332 Advanced Accounting II (3)**

Advanced Accounting II focuses on the concepts and methods of analysis applicable to accounting for partnerships and the major types of not-for-profit organizations: governmental units, hospitals and other health care providers, colleges, and universities, and voluntary health and welfare organizations. Other advanced accounting topics are also covered (SEC reporting, and segment and interim reporting). Upon completion of this course, students will recognize the ethical implications and understand the precise accounting terminology and rules and procedures related to partnerships and not-for-profit organizations, as well as in the other advanced accounting topic areas discussed. *Prerequisite: Accounting 331 with a C- or higher or permission. Offered alternate spring terms.*

### **335 Managerial Cost Accounting (3)**

A study of the concepts and techniques of managerial cost accounting. Includes analysis for management planning, budgeting, internal control and standard costing. *Prerequisite: Accounting 232 with a C- or higher or permission. Offered alternate fall terms.*

### **411 Systems/Applied Accounting (3)**

A presentation of the rudiments of a conceptual framework for designing and evaluating management accounting and control systems. Students utilize personal computers and selected programs on a variety of problems, cases and exercises. *Prerequisite: Accounting 232 with a C- or higher or permission. Offered alternate spring terms.*

### **415 Tax Accounting II (3)**

A general overview of income tax laws as they relate to partnerships, corporations, fiduciaries, estates and trusts, gifts and tax research and planning. *Prerequisite: Accounting 232, and 315 with a C- or higher or permission. Offered alternate spring terms.*

### **421 Accounting Internship (0-12)**

On-the-job experience where work related to accounting is the primary responsibility of the position. *Prerequisite: Cooperative Education 205 and accounting faculty permission. (Pass/Fail).*

### **427 Auditing (3)**

This accounting major capstone course focuses on Generally Accepted Auditing Standards (GAAS), the ethical and legal responsibilities of auditing, and auditing procedures and sampling techniques. In addition

to focusing on current ethical issues in accounting/auditing, the course includes the study of working paper techniques, preparation of audit reports, and evaluation of internal controls. Upon successful completion of this course, students will: 1) recognize the ethical and legal implications of various accounting/auditing situations in terms of the standards set by the accounting profession, 2) analyze, synthesize, and evaluate various accounting/auditing issues to form reasoned, logical solutions in light of the ethical and legal considerations, 3) analyze prepared financial statements in light of current Generally Accepted Auditing Standards, 4) be able to read and understand the precise accounting terminology used in the field of auditing, and 5) be able to communicate audit findings, both orally and in written form to interested stakeholders. *Prerequisite: Senior accounting majors only, Accounting 232 with a C- or higher. Offered spring term.*

## **Anthropology (ANT)**

Assistant Professor DeBoer

### **308 Cultural Anthropology (3)**

An anthropological investigation of the meaning, content, and acquisition of the ways of thinking, doing and behaving as individuals in society. **This course fulfills the Cultural Perspective requirement of the Doane Plan.** *(Cross-referenced with Sociology 308.)*

## **Art (ART)**

Professor Martin

Professor Terrell

Instructor Knobel

Adjunct Instructor Easton

Adjunct Instructor Stastny

Doane College's art department offers courses which prepare students for careers in the visual arts and which provide general appreciation of cultural heritage. The art major has four emphases: the liberal arts emphasis, which is often combined with a major from another field; the certification emphasis, which prepares students for public school certification; and the professional and graphic arts emphases, which prepare students for professional careers and/or graduate studies.

### **Requirements for the Art Major:**

1. Complete the following core studio courses: Art 107, 110, 207, 235, 307.

2. Complete the following core art history courses: Art 204, 205, 252.
3. Complete one emphasis chosen from the following:
  - a. Liberal Arts (maximum of 48 total art credits)
    - 1) minimum of 12 elective credits in art; maximum of 4 elective credits in art
  - b. Professional (maximum of 65 total art credits)
    - 1) Minimum of 31 elective credits in art; maximum of 41 elective credits in art
  - c. Graphic Arts (maximum of 65 total art credits)
    - 1) 18 credits chosen from the following: Art 225, 234, 256, 258, 270, 303, 304, 357, 403, 404.
    - 2) Minimum of 13 elective credits in art; maximum of 23 elective credits in art.
  - d. Students seeking certification for public school teaching in Art (K-12) must complete the following courses in addition to the core requirements listed in #1 and #2 (maximum of 54 total art credits)
    - 1) Art 201, 209, 211, 221, 358
    - 2) Art 310, 315, 320, 325, 326
    - 3) A total of seven elective credits in art
    - 4) All requirements listed under the catalog section *Secondary Education*
4. All students majoring in Art must contribute works to the annual Seniors' Art Exhibition group show. Students completing the Professional emphasis have the option of a solo show in addition to the group show. Students, with permission of the art faculty, may write a major research paper in lieu of the exhibition requirement.

### **Requirements for the Art Minor:**

Complete the following 18 credits in Art:

1. Art 107, 207 (or 110).
2. Art 204 (or 205), 252.
3. Six additional credits in art.

### **107 Two-Dimensional Design (3)**

A course which focuses on the fundamentals of visual composition and design theory. Students work in various media, exploring the visual potential of line, color, texture, pattern, light and shadow, and space. Students will be able to apply the principles and elements of design, to understand how these principles and elements interact, and to analyze and evaluate the quality of design and form.

### **110 Three-Dimensional Design (3)**

A course which introduces the student to basic methods of sculptural processes in additive and subtractive techniques.

**201-202 Painting (3) (3)**

Painting in oil, acrylic, and watercolor. Open to non-art majors.  
*Prerequisite: Art 107.*

**204 Visual Communication in History I (3)**

A presentation of the various patterns of symbolic communication used in European, African and Middle-Eastern cultures and civilizations, from prehistoric times through the later Middle Ages. Topics include the Egyptian pyramids, Stonehenge, the classical heritage of Greece and Rome, and the Christian arts of Rome, Byzantium and northern Europe. Students will be able to articulate the meanings of artworks in their historical context. *Offered alternate fall terms.*

**205 Visual Communication in History II (3)**

A discussion of the symbolic expression of ideas and values from the 14th century proto-Renaissance through 17th century Baroque. The major visual arts of architecture, painting, and sculpture are studied in the context of important historical, philosophic, and spiritual concerns. Students will be able to articulate the meanings of artworks in their historical context. *Offered alternate spring terms.*

**207 Drawing (3)**

An exploration of various drawing media in relation to the expression of still life objects and the human figure. Students will learn to sketch fundamental shapes, draw still life compositions and develop the ability to draw what they see through the use of the principles and elements of design.

**209 Sculpture (3)**

Basic methods in three-dimensional art, including carving, casting, construction, and modeling.

**210 Metal Craft – Jewelry (3)**

A course which introduces the student to the basic methods of fabricating jewelry to include form, function, and technique. Students will demonstrate their understanding of these methods by creating a series of work that includes a ring, pendant, brooch, bracelet, and necklace.  
*Prerequisite: Art 110. Offered alternate spring terms.*

**211-212 Printmaking (3) (3)**

Studio work exploring various intaglio processes in zinc and copper. Emphasis is given to etching, engraving, aquatint, and soft-ground techniques. *Prerequisite: Art 107. Offered alternate years.*

**221-222 Ceramics (3) (3)**

Studio work in ceramics with emphasis given to various methods of pottery-making: slab, coil, sculptural, and wheel-thrown. Students will present a body of work that demonstrates their understanding of these methods. **Open to non-art majors.**

**225 Typography (3)**

A study of the history and character of various letter forms. Students create visual works in which letters and text are the primary design

elements. Finished projects will be executed in traditional and digital methods. Students will submit a portfolio of work for evaluation.

*Prerequisite: Art 107.*

**234 Introduction to Digital Photography (3)**

An introduction to the fundamentals of digital photography, including the operation of digital cameras and related hardware, the uses of the various digital media, and the basic functions of image editing software. Additional topics will include the basic principles of photographic aesthetics and composition, and the history of photography. Course content will consist of lectures and demonstrations, with an emphasis on hands-on learning through the application of digital techniques to sample photographs and to the student's own work. Upon satisfactory completion of the course, the student will have the requisite knowledge to determine the appropriate equipment, materials, and software to meet their basic photographic requirements. The student will know the basic functions and capabilities of common digital services and software, and the skills required to utilize those functions and capabilities.

**235 Color Theory and Application (3)**

The study of color systems and interaction through studio work, computer programs, and the consideration of historically notable works of art. Students will demonstrate their understanding through the creation of a portfolio of works. *Prerequisite: Art 107. Offered alternate fall terms.*

**245 Ceramic Tile Design (3)**

A studio course exploring methods and techniques of creating handmade ceramic tiles. The course includes a study of the tile-making process in terms of its history and the design and installation of projects. Students will create finished projects that represent the full process of shaping, glazing, firing, and mounting design. *Offered alternate fall terms.*

**252 Modern Art (3)**

The study of architecture, sculpture and painting in Europe from the 18th century through the present. Attention is given to the role of the visual arts in political and social milieu, the impact of aesthetic theories, and the revolutionary impulses in modern Western civilization. Students will articulate the meanings and significance of artworks in their historical context. *Offered alternate fall terms.*

**254 The Visual Arts in the United States (3)**

The history of the visual arts of architecture, sculpture, and painting in America from colonial times through the present. Emphasis is placed on the inter-relationships of the visual arts and social, political, and spiritual concerns. Students will articulate the meanings and significance of artworks in their historical context. *Offered alternate spring terms.*

**256 Illustration (3)**

The development of concepts and techniques relevant to the interpretation of stories, historical and contemporary events, architecture, and nature.

The course includes an historical perspective on illustration art from the mid-19th century to the present. Upon completion of the course, students will be able to plan and execute a copy illustration, choosing the style, medium, and color scheme that most effectively illustrates the copy. *Prerequisite: Art 107, 201 and 207 or (Art 107, 207 and permission). Offered alternate years.*

**258 Introduction to Computer Graphics (3)**

An introduction to various software design programs and their applications to modern business design, including web design. Students will submit a portfolio of finished, printed works for evaluation. *Prerequisite: Art 107.*

**270 Design Applications (3)**

The application of graphic design principles to problems of advertising and product packaging. The course provides a basic orientation to methods and materials of commercial art. *Prerequisite: Art major or Art 107, 201, and 207. Offered alternate years.*

**271, 371, 471 Selected Topics (1-3) (1-3) (1-3)**

An investigation of topics not offered in other courses, selected on the basis of student interest and available instruction.

**290, 390, 490 Directed Study (1-3) (1-3) (1-3)**

An opportunity for supervised, independent study of a particular topic based on the interest of the student and the availability and approval of the faculty.

**301-302 Painting (3) (3)**

Advanced studio work for art majors with attention given to problems of presentation and exhibition of paintings. *Prerequisite: Art 201-202.*

**303 Graphic Design I (3)**

A course emphasizing the use of digital media in advertising, publications, and corporate communications. Upon completion of the course, students will understand how a computer and its devices work and will have a basic knowledge of various software products used in graphic design. *Prerequisite: Art 258.*

**304 Graphic Design II (3)**

A course emphasizing the application of graphic design principles and relevant software programs to web design, with attention to the incorporation of audio and animation as design elements. Finished production will be submitted on a disk portfolio for evaluation. *Prerequisite: Art 303.*

**307 Drawing (3)**

Advanced drawing for art majors with special emphasis given to maturing compositional concepts. *Prerequisite: Art 207.*

**310 Art in Secondary Schools: 7-8 (1)**

An exploration of curriculum development for the middle grades learner. Students will gain an understanding of the foundations of art education; plan, organize, deliver, and assess an art education program; study

methodology for integrating art with other content areas; and explore and implement safe instructional practices and safety standards for the teaching of art. *Prerequisite: Art major or permission.*

**311-312 Printmaking (3) (3)**

Advanced work with emphasis given to problems of color. *Prerequisite: Art 211-212. Offered alternate years.*

**315 Art in Secondary Schools: 9-10 (1)**

An exploration of curriculum development for the 9<sup>th</sup> and 10<sup>th</sup> grade classrooms. Students will gain an understanding of the foundations of art education; plan, organize, deliver, and assess an art education program; study methodology for integrating art with other content areas; and explore and implement safe instructional practices and safety standards for the teaching of art. *Prerequisite: Art major or permission.*

**320 Art in Secondary Schools: 11-12 (1)**

An exploration of curriculum development for the secondary classroom. Students will gain an understanding of the foundations of art education; plan, organize, deliver, and assess an art education program; study methodology for integrating art with other content areas; and explore and implement safe instructional practices and safety standards for the teaching of art. *Prerequisite: Art major or permission.*

**321-322 Ceramics (2-3) (2-3)**

Advanced work in ceramics with emphasis on challenges of glazing. *Prerequisite: Art 221-222.*

**325 Art in Secondary Schools (2)**

A seminar and studio for art majors seeking certification to teach art in the public schools (K-12). Emphasis is placed on the use of various materials and techniques including drawing and painting, printing, ceramics and fiber arts, photographic projects, and three-dimensional art. The course explores curriculum development for the K-12 classroom. Students will gain an understanding of the foundations of art education; plan, organize, deliver, and assess an art education program; study methodology for integrating art with other content areas; and explore and implement safe instructional practices and safety standards for the teaching of art. *Prerequisite: Art 310, 315, 320 and enrolled in professional term, or permission.*

**326 Art in Elementary Schools (3)**

A foundation of art education course exploring problems related to the teaching of art in the elementary (including early childhood K-3) and middle grades, emphasizing various materials and techniques, including fiber art, photography projects, printing, drawing and painting, and three-dimensional art. *Prerequisite: Elementary Education major and enrolled in professional term.*

**357 Illustration II (3)**

A course exploring the creative interaction between visual imagery and texts through projects in black and white, as well as color, using various

traditional and digital media. Students will submit a portfolio of work for evaluation. *Prerequisite: Art 256.*

**358 Arts, Issues, and Controversies (3)**

The study of the interplay within the arts and the role they play in ideology, politics, propaganda, and moral issues. Consideration is given to issues of patronage, advertising, eroticism and pornography, religion, and the visual images of popular culture. Students will be able to articulate the role of the visual arts in society and relate how images serve and challenge dominant human institutions. *Prerequisite: Junior standing or three previous credits in Art History. Offered alternate spring terms.*

**401-402 Painting (3) (3)**

Advanced studio work for art majors with attention given to problems of presentation and exhibition of paintings. *Prerequisite: Art 301-302.*

**403 Graphic Design III (3)**

An emphasis on the application of graphic design principles and relevant software programs to animation, multi-media, and interactive visuals. Students learn the relationships between traditional cell animation and computer animation and develop technical skills to integrate media into animated imagery. Finished productions will be saved in a disk portfolio for evaluation. *Prerequisite: Art 304.*

**404 Advanced Graphic Design Studio (3)**

The creative exploration of digital and traditional media in accordance with the individual student's long-term goals and interests. Advertising, game design, web site design, "fine arts" applications, illustration, book design, and animation are among the options for student exploration. Finished works will be saved in a disk portfolio for evaluation. *Prerequisite: Art 403.*

**407 Advanced Drawing (3)**

Continued exploration of drawing problems with emphasis on developing a mature command of drawing techniques in a specialized medium. *Prerequisite: Art 307.*

**421 Art Internship (0-12)**

On-the-job experience in art. *Prerequisite: Cooperative Education 205 or permission. (Pass/Fail)*

## **Astronomy (AST)**

Associate Professor Plano Clark

**103 Introductory Astronomy (3)**

A study of the structure and evolution of the universe with emphasis on the solar system, stellar evolution, galaxies, cosmology, and planetary systems.

### 103L Astronomy Laboratory (1)

An optional laboratory accompanying Astronomy 103. The laboratory work includes telescope operations and viewing, and laboratory experiments illustrating the physical principles of astronomy. Must be concurrently enrolled in Astronomy 103.

## Biology (BIO)

Professor Georgi

Associate Professor Clement

Associate Professor Soucek

Assistant Professor Elder

Assistant Professor Marley

Assistant Professor Tallman

Instructor Ebmeier

Adjunct Professor Muckel

Adjunct Instructor Coe

### Requirements for the Biology Major:

Complete 1 or 2.

1. Students not seeking certification for public school teaching of biology will complete the following:
  - a. Biology 101, 201, 206, 208, 252, 295, 351, 495, 496.
  - b. One course from each of the following groups plus one additional course from any group:
    - 1) Biology 215, 216, 307, 308, 321, 322, 325.
    - 2) Biology 302, 310, 337, 342, 353.
    - 3) Biology 205, 207, 315, 317, 331, 335, 336, 412.
  - c. Three courses must be at the 300-400 level, excluding Biology 351, 495, 496, 498.
  - d. A maximum of four credits of biology directed study at any level may be counted toward the major.
  - e. Complete the following cognates:
    - 1) Chemistry 125-126.
    - 2) Two additional four-credit courses in Chemistry **OR** Physics 107 and 108.
    - 3) Mathematics 107 or 108 or above (Math 235 is strongly recommended).
  - f. Pass a departmentally administered comprehensive examination with a score of at least 60 percent or higher. This examination is to be taken upon completion of the core requirements, but not later than the sixth semester of study. A student who does not achieve a passing score must take an oral examination given by two faculty members of the department.

- If a student does not successfully complete either the written or the oral examination, he/she will not be allowed to graduate with a major in biology.
- g. Partial fulfillment of the major may be arranged through transfer of credit by successful completion of appropriate courses from an approved professional school.
2. Students seeking certification for public school teaching in biology must complete:
    - a. A total of 35-36 credits of biology which includes Biology 101, 206, 208, 215 (or 216), 252, 351 and at least one course chosen from each of the following groups:
      - 1) Biology 307, 308, 321, 322, 325.
      - 2) Biology 302, 310, 337, 342, 353.
      - 3) Biology 315, 317, 331, 335, 336, 412, 425.
    - b. Cognates Chemistry 125-126; Mathematics 105 or above (Mathematics 235 is strongly recommended); Natural Science 322, 324, 326, and 327; Physics 107; either Geology 103 or 104
    - c. One additional teaching major or subject endorsement
    - d. All requirements listed under the catalog section Secondary Education.

### **Requirements for the Biology Subject Endorsement:**

Students who are not biology majors and are seeking certification for public school teaching in biology must complete the following:

1. A total of 24 credits in biology which includes Biology 101, 206, 208, 215 (or 216), 252, and four additional 300 or 400-level biology credits.
2. Cognates Chemistry 125 and 126; Natural Science 322, 324, 326, 327; either Geology 101 or 103; Physics 107.
3. A teaching major.
4. All requirements listed under the catalog section Secondary Education.

### **Requirements for the Honors Program in Biology:**

Qualified students are encouraged to apply to the biology faculty for admission to the biology honors program after the first semester of their sophomore year. Students participating in the biology honors program must maintain an accumulated grade point average of 3.00 overall and in the natural sciences. Students in the honors program must complete the biology major requirements plus:

1. Physics 107, 108 and an additional eight credits of chemistry beyond 125-126.

2. Mathematics 235.
3. Two semesters of a single foreign language (minimum of six credits)
4. Honors Course (Biology 498).

**Requirements for the Biology Minor:**

1. Complete the following:
  - a. Biology 101 and two of the following three courses: 206, 208, and 252.
  - b. Four credits in biology at the 300 or 400 level, excluding Biology 351, 495, 496, and 498.
  - c. Four additional credits in biology.
2. Complete the cognates Chemistry 125, 126.

**101 Introduction to Biology (4)**

An introductory course in biology utilizing the scientific method in the study of molecular, cellular, organismal, taxonomic, genetic, ecological and evolutionary aspects of life. A weekly laboratory experience emphasizes observation and problem solving.

**201 Introductory Biology Seminar (1)**

An introduction to the biological sciences for students expressing an interest in majoring in biology. Through a series of discussions and presentations, the course addresses current issues in the life sciences, including the scientific, ethical, political, social, and legal aspects of the discipline. **Generally taken during the first semester of the sophomore year.**

**205 Comparative Physiology (4)**

A general physiological principles course in which students will learn the functioning of tissues, organs, and organ systems in vertebrates, invertebrates, and plants. Mechanisms of control and integration of various systems will be covered. *Prerequisite: Biology 101, Chemistry 125. Offered spring term.*

**206 Zoology (4)**

A survey of the animal kingdom, stressing evolutionary relationships, anatomy, ecology, special adaptations, and biological significance of the various groups. Upon successful completion of this course, students will gain an in-depth knowledge of zoology, providing the necessary foundation for upper-level courses. *Prerequisite: Biology 101. Offered every year.*

**207 Evolution (3)**

A multidisciplinary course covering the nature of science and the major areas of the evidence for organic evolution. Topics include astronomy, geology, paleontology, phylogeny, biogeography, taxonomy, comparative anatomy, embryology, and molecular biology. Students will become familiar with the scientific support for the major unifying

concept of modern biology. *Prerequisite: Biology 101. Offered fall term.*

**208 General Botany (4)**

A survey of three major groups of organisms – algae, fungi, and plants – that are normally studied in introductory botany courses. Students will develop an understanding of the life histories, phylogeny, and systematic treatment of these ecologically and economically important groups, as well as the basic anatomy, morphology, and physiology of the vascular plants. *Prerequisite: Biology 101, or taken concurrently. Offered alternate fall terms and spring term.*

**215, 216 Human Anatomy and Physiology (4) (4)**

A study of the structure and function of the human body. The course begins with the study of the structure and function of cells and tissues and then continues with the study of the 11 major systems. *Prerequisite: Biology 101, or permission.*

**224 Conservation Biology (3)**

This course introduces students to the principles of biodiversity conservation and addresses genetic, species, community and ecosystem diversity. It examines the practical application of conservation methods through case studies, as well as addresses the economic realities of action and inaction. Upon completion of this course, students will demonstrate an understanding of conservation issues facing the world and will be able to interpret the quality of conservation policies. *Prerequisite: Biology 101. Offered alternate spring terms.*

**252 Bacteriology (4)**

A course revolving around four basic questions about microscopic life forms: 1) *What are they?* (bacteria, viruses, fungi, protozoa, algae, and cultured cells), 2) *What do they do?* (grow, reproduce, cause disease, produce human and livestock foods, produce valuable chemicals, recycle elements), 3) *How do they do it?* (derive energy from foods, produce organic molecules), and 4) *How are they controlled?* (heat, disinfectants, surfactants, antibiotics). Questions 2-4 will be dealt with almost exclusively in terms of bacteria. *Prerequisite: Biology 101.*

**271, 371, 471 Selected Topics (1-3) (1-3) (1-3)**

An investigation of topics not offered in other courses, selected on the basis of student interest and available instruction.

**290, 390, 490 Directed Study (1-3) (1-3) (1-3)**

An opportunity for supervised, independent study of a particular topic based on the interest of the student and the availability and approval of the faculty.

**295 Biostatistics (3)**

An introductory course to the use of statistics and study designs in biology in preparation for Biology 495/496, Senior Research. Upon successful completion of this course, students will be able to design experimental, quasi-experimental and observational studies that will

meet regulatory guidelines; collect, analyze, and interpret data using appropriate statistical tools; and submit their study for publication.

*Prerequisite: Sophomore standing.*

**302 Flora of Nebraska (4)**

A field-oriented course emphasizing the diversity of algae, fungi, and vascular plants found in Nebraska, with an emphasis on phylogeny, systematics, ecological relations, and life cycles. *Prerequisite: Biology 101 and 108. Offered alternate years.*

**307 Plant Form and Function (4)**

An integrative approach to the structure and function of higher plants. The course includes the anatomy and physiology of plant tissues which are responsible for various plant processes such as storage, photosynthesis, support, protection, conduction, and reproduction. *Prerequisite: Biology 101 and 208. Offered alternate years.*

**308 Animal Behavior (4)**

Questions concerning the behavior of individuals and populations are explored in a mechanistic and evolutionary context. The relationships of animal behavior studies to ecology, taxonomy, evolution, and genetics are investigated, as well as the anatomical and physiological basis of behavior. Upon successful completion of this course, students will develop an understanding of the behavior of animals in field and laboratory and will also become aware of the adaptive significance of behavior. *Prerequisite: Biology 101.*

**310 Natural History of Nebraska Vertebrates (4)**

This course covers the history, climate, ecology, and effects on the evolution of vertebrates in Nebraska. Topics covered include: climatology, geography, biomes, taxonomy, and vertebrate adaptations such as reproductive strategies, metabolism, endothermy, locomotion, predator-prey relationships, populations, and food gathering mechanisms. Upon successful completion of this course, students will gain an understanding of the evolutionary forces resulting in today's ecology of Nebraska. *Prerequisite: Biology 101 and 206.*

**315 Genetics (4)**

Genetics is the study of inheritance of traits and will be explored from both the Mendelian and molecular genetic perspectives. This exploration may include such Mendelian topics as segregation of traits, independent assortment, and the chromosomal theory of inheritance, and such molecular topics as recombinant DNA technology, genomic analysis, gene mapping, and genetic engineering. Issues of human genetics will include pedigree analysis, gene therapy and genetic counseling. Throughout, students will also explore the contributions of leading scientists to this growing field of biology. Students completing this course will have a thorough understanding of the mechanisms of inheritance and will be able to apply that understanding to more advanced course

work in biology. *Prerequisite: Biology 101 and sophomore standing. Offered fall term.*

### 317 Introduction to Immunology (4)

People and other animals, constantly besieged by disease-causing microorganisms, are more often healthy than ill. This course introduces the student to the reasons for this relative state of good health: a complex array of organs (bone marrow, thymus, lymph nodes, etc.), cells (lymphocytes, macrophages, dendritic cells, etc.), and chemicals (antibodies, lymphokines, etc.) that constitute the immune system.

*Prerequisite: Biology 101 and 252. Offered alternate years.*

### 321-322 Microanatomy and Histotechniques (5) (5)

First semester topics include: microscopy, tissue processing and staining, cellular ultrastructure and function, mammalian embryology epithelial tissues, connective tissues, muscle tissues, and nerve tissues. Second semester topics include: the endocrine system, the respiratory system, the digestive system, the integumentary system, the reproductive systems, the excretory system, and the sensory systems. Both form and function of these structures are discussed. Both semesters have a strong laboratory component, including scanning electron microscopy, a research project, tissue processing and staining, photomicrography and digital imaging, plus traditional slide-based learning. Upon successful completion of the course, students will gain an understanding of the embryology, cells, tissues, and organs and their function in the mammalian body.

*Prerequisites: Biology 101 and 206. Offered every year.*

### 325 Human Anatomy (4)

This is a dissection-based course in human anatomy, utilizing cadavers and a regional approach to study the human body. Upon completion, students will be able to identify major skeletal, muscular, nervous, and vascular structures, organs, and the relationship of these structures to each other in each body area. They will learn the flow of blood from the heart through vascular structures to organs and limbs, understand the structure and significance of the cervical, brachial, and lumbosacral plexuses, and be able to explain the actions of muscles based on origin and insertions. Students will gain skills in dissection and in collaboration with colleagues to dissect and present findings to the class. Finally, students will gain an appreciation of the intricacy and detail of the human body, the importance of precision and accuracy in experimental work, and the value of collaborative learning. *Prerequisite: Biology 101 and Biology major or instructor permission. Offered alternate fall terms.*

### 331 Cell Biology (4)

A microscopic and molecular analysis of the structure and function of cells and their organelles. The laboratory involves an experimental approach to the study of the structure, composition, and function of isolated cell organelles. *Prerequisite: Biology 101, and 206 (or 208); Chemistry 125, 126. Offered alternate years.*

**335 Molecular Biology (4)**

This course offers a detailed study of the structure and function of DNA, RNA, chromatin, transposable elements and 'junk' DNA. The student will thoroughly examine the molecular events governing the cell cycle, DNA replication, basal and regulated transcription, and translation. The lab will include extensive use of current molecular biology techniques. This course is particularly appropriate for students interested in proceeding to graduate school, professional school, or careers in biotechnology, as students completing this course will be well-versed in the molecular events of the cell and familiar with the techniques used to study them. *Prerequisite: Biology 101 and 315. Offered alternate fall terms.*

**336 Mammalian Physiology (4)**

This course covers the basics of mammalian physiology. Students will learn to identify major organs of body systems, significant subdivisions of these organs, and the etiologies of many disease states. Students will gain skills in determining blood type, measuring respiratory volumes, and conducting urinalysis tests. Finally, students will gain an appreciation of the intricacy and detail of the human body, the importance of precision and accuracy in experimental work, and the value of collaborative learning. *Prerequisite: Biology 101, Chemistry 125, and sophomore standing. Offered alternate spring terms.*

**337 Wetlands Biology (4)**

This course provides an in-depth study of wetland ecosystems, including history, regulations, delineation, major types of wetland systems, hydrology, biogeochemical cycling, human impact and management of wetlands, and wetland creation and restoration. Particular emphasis will be placed on examination of and familiarization with Nebraska wetlands. Students will gain an understanding and appreciation of wetland function and the role wetlands play in the health of the environment on both local and global scales. *Prerequisite: Biology 101 and one additional lab course in biology. Offered alternate fall terms.*

**342 Ecology (4)**

The study of interrelationships between organisms and the environment. *Prerequisite: Biology 101, and 206 (or 208).*

**351 Biology Research I (2)**

Biology Research I is the biology student's introduction to research. Each student will choose a topic, investigate it thoroughly in the scientific literature, and present both a written and an oral report in a formal setting. The report will include a proposal for further research. The topic chosen will then be investigated during the student's senior research project. Biology Research I is designed to heighten information retrieval skills in regard to the primary scientific literature and to give students practice in formal scientific writing, speaking, and experimental design. *Prerequisite: Biology major and junior standing.*

**353 Environmental Microbiology (4)**

An examination of the roles of microbes in the environment and of several distinctly different ecosystems and their microbial components. Upon successful completion of this course, the student will have an understanding of the roles of microbes and microbial processes in shaping the earth's biosphere as we know it today. *Prerequisite: Biology 252. Offered alternate fall terms.*

**395 Biomedical Research Seminar (0-1)**

A seminar which will introduce students to current work in biomedical research. Specific topics will be selected by students and can include any research that has biomedical application. Students taking this seminar will learn how to read and present primary literature articles and to critically evaluate research results. **This course cannot be used to fulfill any requirements for the major.**

**400 Tutorial (1)**

An organized review of biology directed toward the advanced placement tests most majors take (GRE, MCAT, DAT, etc.). The course meets one hour per week. To pass the course, students must pass the departmental Comprehensive Examination and/or other departmental requirements given as part of the course. *Prerequisite: Junior standing.*

**412 Developmental Biology (4)**

Animal development is a fascinating process that begins with a single cell and ends with a complex multicellular organism. This course examines the genetic and cellular mechanisms that guide development in vertebrate animals. Upon successful completion of this course, students will understand the importance of egg preparation and the stages of development, including fertilization, cleavage, gastrulation, neurulation, organogenesis, and gametogenesis. Students will also be able to integrate their knowledge of genetics and cell biology to understand the complex interplay of signals that direct the organization of the developing vertebrate. *Prerequisite: Biology 101 and 315.*

**421 Biology Internship (0-12)**

On-the-job experience in biology. *Prerequisite: Cooperative Education 205 or permission. (Pass/Fail)*

**425 Theories and Techniques for Transmission Electron Microscopy (4)**

A presentation of the theories of electron microscopy, fixation, embedding, sectioning and staining of specimens. Techniques taught include knife-making, sectioning, staining, vacuum evaporation, TEM usage and maintenance. *Prerequisite: Biology 101, 206, 321, 322 or permission. Offered alternate years.*

**495 - 496 Biology Research II, III (2) (2)**

A two-semester laboratory or field research project required of all senior biology majors. The course is a continuation of students' Biology 351 Biology Research I topics. Students will conduct a scientific study

concluding with a report in an appropriate format. *Prerequisite: Senior Biology major, Biology 351. Biology 495 offered fall; Biology 496 offered spring.*

**498 Honors in Biology (1)**

Presentation of the Senior Research project at a professional scientific meeting such as that of the Nebraska Academy of Sciences. The presentation may either be oral or in a poster format. *Prerequisite: Concurrent enrollment in Biology 496 and minimum GPA of 3.00 overall and in the natural sciences. Offered spring term.*

