

Mathematics (MTH)

Professor J. Johnson

Professor Masters

Associate Professor Hart

Assistant Professor Fairbanks

Instructor Vertin

Adjunct Instructor Dolezal

Adjunct Instructor Steuer

The mathematics major provides students with a rigorous, balanced curriculum designed to develop their critical-thinking skills and deepen and broaden their understanding of both applications and theoretical aspects of the discipline. Students majoring in mathematics are sought by business and industry because of their problem-solving skills and ability to think clearly and logically. Some students combine the mathematics major with a second major, often one which applies mathematics. Our graduates enter careers in teaching (all levels, elementary through college), research, engineering, actuarial science, and a wide variety of positions in business, government, and industry. Many pursue advanced study in education, mathematics, engineering, computer science, the natural and social sciences, statistics, or other fields.

Requirements for the Mathematics Major:

Complete 1 or 2.

1. Students not seeking secondary education certification in mathematics must complete the following:
 - a. A minimum of 38 credits in mathematics with a cumulative grade point average of 2.00 or above
 - b. Mathematics 235, 236, 237, 238, 250, and 303
 - c. Mathematics 403 or 433
 - d. Mathematics 496 and 497
 - e. Twelve additional credits in Mathematics at the 300-400 level (excluding Mathematics 326)
 - f. The cognate Information Science and Technology 145.
2. Students seeking secondary education certification in mathematics must complete the following:
 - a. A minimum of 42 credits in mathematics with a cumulative grade point average of 2.80 or above
 - b. Mathematics 218, 235, 236, 237, 238, 250, 303, 323, 324, 325, 326, 351, 355, 356, 403, 496, and 497

- c. All requirements listed under the catalog section Secondary Education
- d. The cognate Information Science and Technology 145

Recommended 300-400 level electives:

- a. Graduate study (mathematics): 329, 403, 433, and as many additional 300-400 level mathematics courses as possible
- b. Graduate study (statistics): 331, 355, 356, 433
- c. Graduate study (computer science): 330, 331, 355, 356, 433
- d. Actuarial science: 329, 334, 355, 356, 433
- e. Pre-engineering: 329, 334, 355, 356, 433
- f. Math education: 329, 331, 347

Requirements for the Mathematics Minor:

Complete the following 20 credits in mathematics:

1. Mathematics 235, 236, 237
2. Nine credits in courses numbered above Mathematics 237 (excluding Mathematics 326)

107 Problem Solving (3)

A survey of a wide variety of problem solving strategies deemphasizing algebraic skills and concepts. Students successfully completing this course will effectively communicate mathematically, utilize various strategies in analyzing problems, and increase problem-solving persistence and sharpen problem-solving skills.

108 Modeling & Applications (3)

An examination of real-life models and their applications using algebra as a foundation. Students successfully completing this course will effectively use algebra and technology to analyze models of real-world phenomena; effectively read, interpret and analyze problems; and gain quantitative literacy and confidence.

115 Finite Mathematics (3)

Matrices, systems of linear equations, linear programming using geometric and simplex methods, set theory, probability, Markov chains, and game theory. *Prerequisite: Two years of high school algebra or Mathematics 107 or 108.*

125 Precalculus (4)

A study of topics in algebra and trigonometry that are used in calculus. Topics include functions, advanced algebra, logarithmic and exponential functions, and trigonometry. Students who successfully complete this course will have the mathematics background needed to study calculus. *Prerequisite: Two years of high school algebra or Mathematics 107 or 108. Offered spring term.*

217 Mathematics for Elementary Teachers (3)

This course explores mathematics for elementary and middle grades

teachers. Topics include sets, functions, logic, numeration, algorithms for basic computation, integers, rational numbers and their application, algebra concepts, probability and statistics. The course also introduces the NCTM standards and the Nebraska content standards for K-12 students. Upon successful completion, students will be able to present mathematics from a problem-solving perspective and integrate exploration and communication as methods of presenting mathematics to elementary and middle grades students. *Prerequisite: Junior standing or permission. Offered fall term.*

218 Geometry for Teachers (3)

A study of geometric topics encountered in middle school and high school mathematics. Topics include the van Hiele theory, measurement, congruence and similarity, fractals, polyhedra, coordinate geometry, transformational geometry, and applications. Students who successfully complete this course will be able to teach the geometric topics at all levels covered in public schools. *Prerequisite: Two years of high school algebra or mathematics 107 or 108. Offered spring term.*

235 Calculus and Analytic Geometry I (4)

An introduction to the fundamentals of differentiation and integration with applications. *Prerequisite: High school precalculus (algebra and trigonometry) or Mathematics 125. (Mathematics 125 is recommended if ACT math score is 22 or lower.)*

236 Calculus and Analytic Geometry II (4)

A continuation of Mathematics 235. Topics include conic sections, the calculus of transcendental functions, methods of integration, and applications. *Prerequisite: Mathematics 235. Offered spring term.*

237 Calculus and Analytic Geometry III (3)

A continuation of Mathematics 236. Topics include parametric equations, polar coordinates, limits, indeterminate forms, and infinite series. *Prerequisite: Mathematics 236. Offered fall term.*

238 Calculus and Analytic Geometry IV (3)

A continuation of Mathematics 237. Topics include vectors, solid analytic geometry, partial derivatives, and multiple integrals. *Prerequisite: Mathematics 237. Offered spring term.*

250 Foundations of Mathematics (3)

An introduction to understanding and constructing the different types of mathematical proofs, inductive and deductive reasoning, functions, cardinality and the real number system. *Prerequisite: Mathematics 235. Offered spring term.*

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.

Students desiring advanced course work in areas not regularly offered may do so by enrolling in a directed study. Topics could include, for example, actuarial mathematics, computer mathematics, topology, or advanced topics in abstract algebra, analysis, geometry, or mathematical statistics. Seniors planning to pursue graduate study in mathematics are especially encouraged to consider this option.

303 Linear Algebra (3)

Vector spaces, systems of linear equations, linear transformations, matrices, determinants, eigenvalues and eigenvectors. *Prerequisite: Sophomore standing, Mathematics 235 (may be taken concurrently). Offered fall term.*

323 Teaching of Mathematics-Geometry (0)

The beginning of the transition from student of mathematics to teacher of mathematics. Considers topics from traditional Euclidean geometry courses and topics in geometry which could be introduced at the junior high level. **Generally taken during the sophomore year. Offered spring term.**

324 Teaching of Mathematics-Junior High (0)

An examination of options and topics appropriate in seventh, eighth, and ninth grade mathematics courses. **Generally taken during the junior year. Offered spring term.**

325 Teaching of Mathematics-Algebra (0)

An examination of topics from beginning and advanced algebra and their relationship to further study in mathematics. Looks at the integration of algebra into other courses in a high school curriculum. **Generally taken during the junior year. Offered fall term.**

326 Teaching of Mathematics (4)

A selection of topics not covered in Mathematics 323, 324, or 325. Various teaching approaches and methods are examined. Changes that are continually occurring in mathematics education are discussed and appropriate techniques for the teaching of mathematics in the public schools are presented, including teaching from a constructivist point of view, becoming familiar with the vanHiele levels of learning geometry, observing master teachers, and utilizing and integrating technology. Many of the ideas are examined from the viewpoint of the National Council of Teachers of Mathematics. *Prerequisite: Mathematics 323, 324, and 325, enrolled in professional term, or permission. Offered fall term.*

329 Differential Equations (3)

First-order equations, linear differential equations, series solutions, systems of linear differential equations, Laplace transforms, applications. *Prerequisite: Mathematics 236.*

330 Combinatorics (3)

A study of the models of combinatorial mathematics including graphs, digraphs, trees, recurrence relations, and generating functions. Students

who successfully complete this course will be able to use these models in solving problems. *Prerequisite: Mathematics 250. Offered alternate fall terms.*

334 Complex Variables (3)

Complex numbers, analytical functions, complex integration, residues and poles, and conformal mapping. *Prerequisite: Mathematics 237 and 250. Offered alternate fall terms.*

347 Number Theory (3)

Divisibility, congruences, primitive roots, quadratic residues, Diophantine equations, continued fractions. *Prerequisite: Mathematics 236 and 250. Offered alternate spring terms.*

351 Geometries (3)

Survey of Euclidean geometry, study of selected topics in non-Euclidean and other geometries. *Prerequisite: Sophomore standing. Mathematics 236 (may be taken concurrently) and 250. Offered alternate spring terms.*

355 Probability (3)

Random variables, conditional probability and independence, expectation, moment generating functions, special distributions. *Prerequisite: Mathematics 236 and 250. Offered fall term.*

356 Statistics (3)

A continuation of Mathematics 355. Sampling distributions, hypothesis testing, nonparametric methods, linear statistical models. *Prerequisite: Mathematics 355. Offered spring term.*

358 Actuarial Mathematics (2)

A review of topics included on the Course 1 Examination of the Society of Actuaries and the Casualty Actuarial Society. Topics include calculus, probability, and basic concepts of risk management and insurance. Course open only to students planning to take S.O.A. Course 1 Exam in May. *Prerequisite: Mathematics 238 and 355. Offered spring term.*

403 Abstract Algebra (3)

Introduction to properties of groups, rings, integral domains, and fields. *Prerequisite: Mathematics 250 and 303. Offered alternate spring terms.*

421 Mathematics Internship (0-12)

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

433 Introductory Analysis (3)

A study of the theoretical basis of elementary calculus. Topics include sequences, limits, differentiability, the Riemann integral, pointwise and uniform convergence. *Prerequisite: Mathematics 238 and 250. Offered alternate fall terms.*

435 Mathematical Methods for Physics (4)

A course designed to integrate mathematics into a coherent foundation for problem solving for upper-level physics and engineering courses. Topics

include Laplace and Fourier transformations, Fourier series, vector operators, ordinary and partial differential equations, and orthogonal functions. Emphasis is given to the solution (analytical and numerical) of problems from both physics and engineering. Completion of the course allows the student to define important aspects of each mathematical topic, to describe the relevance of each topic to physics and engineering problems, and to work both formal and physics/engineering problems involving each topic. *Prerequisite: Physics 107, 108; Mathematics 235, 236, 237, 238. (Cross-referenced with Physics 435.)*

496 Mathematics Seminar I (1)

An introduction to research in a selected area of mathematics, mathematics education, or an application in mathematics. The course increases the students' abilities to communicate their explorations in mathematics. Each student explores possible topics and develops a plan of action for his/her Mathematics Seminar II project. The student also develops research, writing, and presentation skills to carry out an independent research project. *Prerequisite: Junior or senior mathematics major and 12 credits at the 300 level or above, or permission. Offered spring term.*

497 Mathematics Seminar II (2)

In consultation with a faculty member, the student executes the plan of action created in Mathematics Seminar I. The project culminates in a formal paper and oral presentation demonstrating the student's ability to independently research a topic and effectively communicate mathematics. *Prerequisite: Mathematics 496 or permission. Offered every term.*

Military Science (MSI)

Military science courses are available to Doane students through a cooperative program with the University of Nebraska-Lincoln. Military science is not an academic major, but credits earned in military science courses apply toward graduation from Doane. Courses are taught by UNL military science personnel and are primarily offered on the UNL campus. Upon successful completion of the Advanced Course of ROTC and upon recommendation by the military science faculty at UNL and the Vice President for Academic Affairs at Doane College, students may be commissioned during the graduation ceremony when they earn their Doane degree. Army ROTC students are commissioned as Second Lieutenant, United States Army Reserve or Regular Army. Air Force ROTC students are commissioned as Second Lieutenant, United States Air Force.

ARMY**111 Foundations of Officership (1)**

Students are introduced to issues and competencies that are central to a commissioned officer's responsibilities. The course contents include understanding officership, leadership, Army values, and life skills, such as physical fitness and time management.

111L Leadership laboratory (0)**121 Basic Leadership (1)**

Students learn the foundations of leadership, such as problem solving, communication, military briefings, effective writing, goal setting, physical well-being, techniques for improving listening and speaking skills, and counseling.

121L Leadership Laboratory (0)**212 Individual Leadership Studies (2)**

Introduction to identifying and replicating successful leadership characteristics, through observations during experiential learning exercises. Students record these characteristics, discuss them in small group settings, and use them in subsequent activities. Students also practice communication skills necessary for leadership roles, especially in military environments.

212L Leadership Laboratory (0)**222 Leadership and Teamwork (2)**

Students learn how to build successful teams, methods to influence group actions, effective communication within groups, creativity in problem solving, and how to motivate subordinates and peers. Students will also learn how to use these skills in the context of military environments, such as while performing land navigation and infantry tactics.

222L Leadership Laboratory (0)**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.

310 United States Military History, 1607-1917 (3)

Significance of military affairs in the context of American political, economic, and social history from the formation of the earliest colonial militias to the pre-WWI preparedness movement. Discusses all of the major wars of this period but also emphasizes such themes as the professionalization of the officer corps, the relationship between war and technology, and civil-military relations.

311 United States Military History Since 1917 (3)

Significance of military affairs in the context of American political, economic, and social history from American's entry into WWI to the present. Discusses all of the major wars of this period but also emphasizes such themes as the professionalization of the officer corps, the

relationship between war and technology (especially nuclear weapons), and civil-military relations.

313 Leadership and Problem Solving (3)

Students conduct self-assessments of their leadership style, develop a personal fitness regimen, and learn to plan and conduct individual/small unit tactical training, while testing reasoning and problem solving techniques. Students receive direct feedback on their leadership abilities.

313L Leadership Laboratory (0)

323 Leadership and Ethics (3)

This course examines the role communication, values and ethics play in effective leadership. Topics include ethical decision making, consideration of others, spirituality in the military, and Army leadership doctrine. There is also an emphasis on improving students' oral and written communication abilities.

323L Leadership Laboratory (0)

413 Leadership and Management (3)

This course develops students' proficiencies in planning and executing complex operations, functioning as a member of a staff, and mentoring subordinates. Students explore training management, methods of effective staff collaboration, and developmental counseling techniques.

413L Leadership Laboratory (0)

423 Officership (3)

This course includes case study analysis of military law and practical exercises in establishing an ethical command climate. Students complete a semester-long Senior Leadership Project that requires them to plan, organize, collaborate, analyze, and demonstrate leadership skills.

423L Leadership Laboratory (0)

AIR FORCE

102 Foundation of the United States Air Force I (1)

Officership, communication skills, opportunities, and benefits in today's US Air Force. A weekly Leadership Lab consists of Air Force customs and courtesies, Air Force environment, drill and ceremonies.

105 Foundation of the United States Air Force II (1)

Communication and leadership skills, US military history, and the organizational structure of today's US Air Force. A weekly Leadership Lab consists of Air Force customs and courtesies, Air Force environment, drill and ceremonies.

102L, 105L Leadership Laboratory (0)

Increasing students' knowledge of Air Force uniform wear, customs, and active duty opportunities. *Successful completion of this course is required for commissioning.*

210 The Evolution of US Air and Space Power I (1)

History of the development and deployment of airpower from the Wright Brothers' first flight to the Persian Gulf War and how the events were affected by technology, politics, doctrine, and geography. Emphasizes U.S. airpower. *Prerequisite: Military Science 105 or permission.*

211 The Evolution of US Air and Space Power II (1)

History of the development and deployment of airpower from the Wright Brothers' first flight to the Persian Gulf War and how the events were affected by technology, politics, doctrine, and geography. Emphasizes US airpower. *Prerequisite: Military Science 210 or permission.*

210L, 211L Leadership Laboratory (0)

Introduction to cadet leadership training. Practical experience in leadership roles. *Successful completion of this course is required for commissioning.*

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.

325 Air Force Leadership Studies I (3)

Communication skills, leadership, quality initiatives, and human relations. Requires cadet research and participation in the instructional process. *Prerequisite: Permission.*

339 Air Force Leadership Studies II (3)

Principles of leadership, professionalism, ethics, communication skills, and problem solving, including quality leadership applications. *Prerequisite: Military Science 325 or permission.*

325L, 339L Leadership Laboratory (0)

Practical application of the principles of leadership in the operation and administration of the cadet wing. *Successful completion of this course is required for commissioning.*

435 National Security Affairs and Preparation for Active Duty I (3)

Environment in which defense policy is formulated. Requisites for maintaining adequate national security forces; political, economic, and social constraints of the national defense structure; and the overall defense policymaking process. *Prerequisite: Military Science 339 or permission.*

436 National Security Affairs and Preparation for Active Duty II (3)

The armed forces as an integral element of society; the broad range of civil-military relations. The role of the professional officer in a democratic society, the socialization process within the armed services, and the military justice system. *Prerequisite: Military Science 435 or permission.*

435L, 436L Leadership Laboratory (0)

Practical application of the principles of leadership and experience in the operation and administration of the cadet wing. *Successful completion of this course is required for commissioning.*

Modern Languages

Languages are an important communication skill in global business, academia, and science. Doane has majors in French, German and Spanish and offers other languages, although not as majors and minors. Language majors may be combined with other courses of study for careers in teaching, business, and science. Language proficiency is required for further studies in graduate school or studies abroad (Fulbright and other programs).

FRENCH

(See page 152.)

GERMAN

(See page 157.)

RUSSIAN (RUS)

Adjunct Instructor M. Peters

121-122 Beginning Russian (3-4) (3-4)

Intensive self-instructional study of first-year Russian. Language lab work with tapes and text is supplemented by drill instruction and examination by professional instructors. *Prerequisite: Permission.*

302-402 Russian Language Enrichment (1) (1)

A course designed to encourage interdisciplinary study in Russian. It is taken in conjunction with a second course in a discipline other than Russian. The student reads materials relating to the second course, which is selected by the faculty teaching it. The student does, however, read the materials in Russian, under the guidance of a faculty member qualified to teach that language. *Prerequisite: Permission of both faculty involved.*

SPANISH

(See page 229.)

Music (MUS)

Professor Gilbert

Associate Professor Ferguson

Assistant Professor Runestad

Adjunct Assistant Professor Breckbill

Adjunct Instructor Bou

Adjunct Instructor Freeouf

Adjunct Instructor Howell

Adjunct Instructor Kelly

Adjunct Instructor Nelson

The mission of the music program is to prepare students for careers as music educators, performers, music business entrepreneurs, musicologists and theorists, as well as prepare students for graduate programs in music.

The study of music touches on many aspects of the college's mission. It is an outstanding way to stimulate inquiry and develop perspective on the world. Those who study music at Doane gain valuable training and experience for participating in community ensembles and performing groups after graduation, thereby enriching their lives out of the workplace. Like courses in art and theatre, music is an excellent area to enhance the talents possessed by students. Finally, the band and choir programs are excellent examples of Doane's mission to provide models of harmonious community living. These programs develop student leadership and social interaction skills.

Requirements for the Music Major:

Complete 1, 2, or 3.

1. Music:

- a. Six credits chosen from the following applied lessons: Music 111, 112, 211, 212, 311, 312, 411, 412.
- b. Music 100, 115, 116, 204, 215, 235, 307, 308, 496.
- c. Three additional music credits.
- d. Participation each semester in a major performing ensemble—Music 190, 191, 192, 195—for a maximum of six credits.
- e. The cognate Fine Arts 104.

2. Music (Performance emphasis):

- a. Twelve credits of the following applied lessons: Music 111, 112, 211, 212, 311, 312, 411, 412.
- b. Music 100, 115, 116, 204, 215, 235, 307, 308, 401, 496.
- c. Six additional music credits.
- d. Participation each semester in a major performing ensemble—Music 190, 191, 192, 195—for a maximum of six credits.
- e. The cognate Fine Arts 104.

3. Music (General Certification)

Students seeking certification for public school teaching of music must complete the following 52 credits in music:

- a. Six credits in a primary performing medium and two credits in a secondary performing medium (instrument and/or voice) chosen from the following applied lessons: Music 111, 112, 211, 212, 311, 312, 411, 412.
- b. Music 100, 204, 205, 206, 221, 301, 305, 316, 326, 405, 407.
- c. Music 115, 116, 215, 235, 307, 308.
- d. Participation each semester in one or more of the major performing ensembles—Music 190, 191, 192, 195—for a maximum of seven credits.

- e. The cognate Fine Arts 104.
- f. All requirements listed under the catalog section Secondary Education.

Requirements for the Music Minor:

1. Four credits of the following applied lessons: Music 111, 112, 211, 212.
2. Music 115, 116, 235.
3. Two additional music credits.
4. Eight ensemble credits chosen from the following: Music 190, 191, 192, 195.
5. The cognate Fine Arts 104.

MUSIC PERFORMANCE

105, 106, 107, 108 Class Piano (0-1)

Class instruction in providing proficiency in the basic keyboard skills. **Completion of the piano proficiency examination with a grade of “B” or above on each part of the exam fulfills the music major piano proficiency requirement, but does not fulfill a Doane Plan requirement.**

105, 106 Class Voice (1)

Class instruction in basic pedagogical skills for the voice. These skills include breath control and vocal health, beginning interpretation and artistry, diction technique and musicianship. **Successful completion of the beginning skills elevates the student to Music 111 (applied voice). All first-year voice students should enroll in class voice unless they have received permission to enroll in Music 111 (applied voice). Class Voice does not fulfill a Doane Plan requirement.**

111, 112 Piano/ Voice/ Instruments (1-2) (1-2)

First year private instruction. *Prerequisite: Permission.*

211, 212 Piano/ Voice/ Instruments (1-2) (1-2)

Second year private instruction. *Prerequisite: Permission.*

301 Junior Recital (0)

A public performance event demonstrating a musical competency with faculty-approved literature. Music (General Certification) majors are required to present a prepared program of 25 minutes of music during their junior or senior year. Other majors and minors may request permission to give a junior recital. *(Pass/Fail)*

311, 312 Piano/ Voice/ Instruments (1-2) (1-2)

Third year private instruction. *Prerequisite: Permission from a full-time music faculty member.*

401 Senior Recital (1)

A senior capstone event demonstrating a mature performance level with faculty-approved literature. Music (Performance Emphasis) majors

are required to present a prepared program of 50 minutes of music.
Prerequisite: Senior music major, and permission.

411, 412 Piano/ Voice/ Instruments (1-2) (1-2)

Fourth year private instruction. *Prerequisite: Permission from a full-time music faculty member.*

MUSIC PEDAGOGY

100 Piano Proficiency (0)

All music majors are required to pass a piano-playing proficiency exam. Completion of the piano proficiency examination with a grade of “B” or above on each part of the exam fulfills the music major piano proficiency requirement. The examination includes basic piano skills such as scales, simple improvised accompaniment, sight reading and selected prepared works. Students may fulfill the piano proficiency requirement any time before the end of the second semester of their junior year. **Students will not be allowed to student teach or graduate until this requirement has been fulfilled. (Pass/Fail)**

204 Basic Conducting (2)

An introduction to the basic grammar of conducting. Objectives include the mastery of basic beat patterns, beat styles, cuing and other interpretive gestures. Upon successful completion, students will have an understanding of the basic conducting gestures, patterns, position, and style. *Prerequisite: Fine Arts 104. Offered spring term.*

205 Percussion/String Methods (2)

A pragmatic approach to the study of instrumental performance. Students develop a basic playing proficiency on string and percussion instruments.

206 Brass/Woodwind Methods (2)

A pragmatic approach to the study of instrumental performance. Students develop a basic playing proficiency on brass and woodwind instruments.

221 Elementary School Music Methods (3)

Principles and procedures of elementary education including methods and techniques used in teaching singing, listening, creative movement, folk and square dance, Orff instrumentation, autoharp, basic soprano recorder, rhythmic activities, and basic note reading in grades K-6. Students will have the primary skills for successful teaching of music in the elementary school setting. *Prerequisite: Music 115.*

226 Music and Movement for Young Children (3)

A study of the elementary principles of music and methods of developing the child and adolescent’s (including early child, elementary, and middle grade settings) musical growth through various phases of musical activity. The course is designed for prospective elementary teachers with little or no technical music background. Not open to music majors. *Prerequisite: Enrollment in professional term, or permission.*

231 Accompanying (2)

The study of the role of accompanist as co-artist. Standard vocal and instrumental repertoire is studied and performed, with emphasis on the development of sight reading and ensemble skills. *Prerequisite: Intermediate pianist skill level and permission.*

305 Advanced Conducting (2)

Refining the basic conducting skills, with emphasis on the development of score reading, skills, rehearsal preparation and techniques, and the development of interpretive skills. *Prerequisite: Music 204 and 215.*

309 Diction (2)

The study of Italian, English, German and French diction as applied to the interpretation of and instruction in vocal and choral music. *Offered alternate years.*

316 Secondary Vocal and Instrumental Music Teaching Techniques (0)

A presentation of strategies for teaching pitch, rhythm, and musical sensitivity, with special emphasis on music of other cultures. Students will learn basic skills for teaching general music in both middle school and high school. *Prerequisite: Permission.*

326 Seminar in Music Teaching (4)

An opportunity for students to share common problems and solutions during the student teaching experience. *Prerequisite: Music 316 and senior music major enrolled in the professional term.*

332 Piano Pedagogy (2)

A study of beginning piano instruction involving current pedagogical theories and teaching methods and materials. *Prerequisite: Permission.*

405 Vocal Literature and Ensemble Techniques (3)

A survey of quality repertoire for solo voice and for vocal ensemble. Music from the common practice period suitable for use in the public schools is the focus of the course. An overview of choral arranging is also a component of this class. *Prerequisite: Music 215 or permission.*

407 Instrumental Literature and Marching Band Techniques (3)

A survey of instrumental solo and ensemble literature suitable for use in secondary schools. An overview of band arranging is also a component of this class. *Prerequisite: Music 215 or permission.*

421 Music Internship (0-12)

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

MUSIC THEORY, HISTORY AND LITERATURE**115 Theory of Music I (4)**

A study of the elements of music, including melody, harmony, and rhythm, and of four-part writing, including aural perception of materials written. Upon successful completion, students will be able to analyze,

notate, and identify, both visually and aurally, triads in root position and inversions, cadences, harmonic progressions, figured bass realization, and non-harmonic tones. *Prerequisite: Fine Arts 104. Offered spring term.*

116 Theory of Music II (3)

A continuation of the aural and written study of the common harmonic practices of the 18th and 19th centuries. Upon successful completion, students will be able to analyze, notate and identify, both visually and aurally, seventh chords, secondary dominants, borrowed chords, and modulations. *Prerequisite: Music 115 or permission, co-enrollment in Music 235. Offered fall term.*

215 Theory of Music III (2)

A continuation of the aural and written study of the common harmonic practices of the 18th and 19th centuries. Upon successful completion, students will be able to analyze, notate, and identify, both visually and aurally, augmented sixth chords, Neapolitan sixth chords, chromatic thirds, and 9th, 11th, and 13th chords. *Prerequisite: Music 116 or permission, co-enrollment in Music 307. Offered spring term.*

235 Survey of Musical Literature (2)

A general survey of the literature of Western music. Upon successful completion, students will have an understanding of the major style periods of musical history, important forms and procedures in musical composition, basic analytical and score-reading skills, and a variety of important musical compositions. *Prerequisite: Music 115 or permission, co-enrollment in Music 116. Offered fall term.*

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 availability and approval of the faculty.

307 History of Music I (3)

A survey of the history and literature of Western music from c. 1600 to 1900. Upon successful completion, students will be familiar with the numerous important styles, genres, and composers of this period, and will be able to place this information within the context of cultural history. Important musical compositions will be analyzed for musical content and cultural impact. *Prerequisite: Music 116, 235, co-enrollment in Music 215. Offered spring term.*

308 History of Music II (2)

A survey of 20th century music, with analysis of selected representative compositions. Upon successful completion, students will become aware of the many cultural and stylistic strains in the music of the 20th century and begin to study ways in which this music is organized and

communicates meaning. *Prerequisite: Music 215 and 307. Offered fall term.*

335 World Music (3)

A survey/appreciation course to stimulate interest in music of other cultures, including Eastern, Latin American, African, and Spanish civilizations.

496 Senior Seminar (2)

A capstone event that combines skills in analysis, historical research and writing. Topics for inquiry include the detailed analysis of significant works in the repertoire.

MUSIC PERFORMANCE ENSEMBLES

190 Concert Band (0-1)

An all-college instrumental ensemble. The concert band presents several concerts throughout the year. *Prerequisite: Audition.*

191 Doane Choir (0-1)

Doane's premier choral ensemble. The choir presents several concerts throughout the year and tours annually. *Prerequisite: Audition.*

192 Collegiate Chorale (0-1)

An all-college choral ensemble. The Collegiate Chorale presents several concerts throughout the year. *Prerequisite: Permission.*

193 Jazz Band (0-1)

A jazz combo of select instrumentalists. Jazz Band is the vehicle for learning improvisation. *Prerequisite: Audition.*

194 Jazz Unlimited (0-1)

A small, highly select group of singers with a repertoire of music from all periods. Upon successful completion, students will be able to perform solo and ensemble music from musical theater, jazz classics, and operetta. *Prerequisite: Audition.*

195 Symphonic Wind Ensemble (0-1)

The premier wind organization of the college. The Symphonic Wind Ensemble presents several concerts throughout the school year and makes an annual tour. *Prerequisite: Audition.*

196 String Chamber Music (0-1)

This course provides an opportunity for string players to perform chamber music in both small and larger ensembles. *Prerequisite: Audition.*

197 Doublewide (0-1)

A highly select ensemble of tenor and bass voices who perform music in all genres, including classical, doo-wop, barbershop, vocal jazz, gospel, and spiritual styles. *Prerequisite: Fall audition.*

MUSIC PERFORMANCE ACTIVITIES

106 Tiger Pep Band (0-1)

The college's pep band is open to all students. The band performs at selected athletic events both on and off campus during the course of each semester. (*Pass/Fail*)

Natural Science (NSI)

Associate Professor Souchek

Adjunct Instructor Anderson

Adjunct Instructor Coe

Adjunct Instructor Kent

The Natural Science major is a broadly based bachelor of science degree program for students seeking a general education in science and the Natural Science Field Endorsement. This major meets the requirements for certification to teach biology, chemistry, physics, and earth science in grades 7-12.

Requirements for the Natural Science Major:

1. Complete the following courses: Biology 101, 206, 208, 252; Chemistry 125, 126, 205, 303; Physics 107 (or 201), 108 (or 202); Geology 101 (or 103); Mathematics 125 (235 recommended); Natural Science 322, 324, 326, 327.
2. Complete eight additional credits in one of the following two areas: Biology or Chemistry.
3. Complete all requirements listed under the catalog section Secondary Education.

322 The Teaching of Laboratory Sciences I (0)

This course begins the transition from student of the natural sciences to teacher of the natural sciences. Major emphasis on laboratory safety, innovative methods for facilitating learning in the natural sciences in the public schools and the methods and procedures for evaluating student learning. **Generally taken during the sophomore year. Offered spring term.**

324 The Teaching of Laboratory Sciences II (0)

Examines topics in the teaching and evaluation of natural science curriculum. **Generally taken during the junior year. Prerequisite: Natural Science 322 or permission. Offered fall term.**

326 The Teaching of Laboratory Sciences III (0)

Examines topics in the teaching and evaluation of natural science curriculum. **Generally taken during the junior year. Prerequisite: Natural Science 324 or permission. Offered spring term.**

327 The Teaching of Laboratory Sciences IV (4)

Includes topics not covered in Natural Science 322, 324, 326. Various

teaching approaches and methods are examined. Focus is on the Nebraska K-12 Science Standards and the use of the Internet/World Wide Web for natural science teaching and research. *Prerequisite: Major in the sciences, enrolled in the professional term, Natural Science 322, 324, 326, or permission. Offered fall term.*

421 Natural Science Internship (0-12)

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

Philosophy and Religious Studies

Professor Wolters

Assistant Professor Betz

Both philosophy and religious studies offer students the opportunity to explore deep-rooted values and ideals that have shaped the development of human culture, particularly in the West. Questions about the nature of being human, the nature of our private and social obligations, and faith and its relation to reason are discussed in many of the courses. Discussed are the historical dimensions of these questions, how answers to them have developed historically, and how questions have shaped the growth of our civilization. In religious studies, students do this through introductory and upper-level course work in Biblical studies, theology, and comparative religious traditions. In a non-religious context, they see many of the same concerns arising in such courses as Ethics or Ancient and Medieval Philosophy.

In all courses, a major emphasis is to help students develop the ability to think knowledgeably, rationally and critically for themselves. Thus, at the end of either major, each student completes a senior thesis, in which he or she has the opportunity to work closely with one member of the department to explore in-depth an issue of the student's choosing.

Requirements for the Philosophy Major:

Complete the following 33 credits:

1. A minimum of one course chosen from Philosophy-Religion 110, 111, 231
2. Philosophy 114 (or 214), 210
3. One course chosen from Philosophy 311, 411, or 371 (3 credits)
4. Nine additional credits in Philosophy (PHI), or Philosophy-Religion (PRE), three of which must be at the 400 level. Philosophy-Religion 120 and 121 are excluded.
5. Philosophy-Religion 120 (or 121)
6. Two additional Religious Studies courses at the 300 or 400 level
7. Philosophy 495

Requirements for the Philosophy Minor:

Complete the following 18 credits:

1. A minimum of one course chosen from Philosophy-Religion 110, 111, 231
2. Philosophy-Religion 120 (or 121) plus three additional credits in Religious Studies
3. Philosophy 210 (or 214)
4. One course chosen from Philosophy 311, 411, 317, 417
5. Three additional credits in Philosophy at the 300 or 400 level

Requirements for the Religious Studies Major:

Complete the following 33 credits:

1. Philosophy-Religion 120, 121
2. Fifteen credits in Religious Studies, three of which must be at the 400 level, excluding Religious Studies 495
3. One course chosen from Philosophy-Religion 110, 111, 231, Philosophy 114
4. Two courses chosen from Philosophy 210, 214, 311, 317, 371, 411, 417, 471
5. Religious Studies 495

Requirements for the Religious Studies Minor:

Complete the following 18 credits:

1. Philosophy-Religion 120, 121
2. Six credits in Religious Studies at the 300 or 400 level
3. Six credits in Philosophy

PHILOSOPHY-RELIGION (PRE)

110 Philosophical Problems (3)

An examination of several major philosophical problems and traditionally influential solutions to them. Upon completion of the course, students will be able to develop their own solutions to the answers provided by the philosophers discussed.

111 Ethics (3)

An examination of theories and forms of reasoning about moral problems. Procedures for reasoning about ethical issues are examined as well as several major philosophical theories, such as Utilitarianism, which attempt to provide guidance in these issues. Upon completion of the course, students will be able to provide their own solutions to these problems, guided by the theories discussed.

120 Understanding the Old Testament (3)

An introductory exploration of the Old Testament within the context of the ancient Near East. Students will become acquainted with the various types of literature that constitute the Old Testament canon

and the people who produced it. As modern readers of a different time and culture, students will learn to approach the Old Testament using sound strategies that are sensitive to these differences. Upon successful completion of this course, students will have an understanding of: 1) the general contents of the Old Testament; 2) its presumed historical context in the ancient Near East; and 3) fundamental interpretive strategies.

121 Understanding the New Testament (3)

An introductory exploration of the New Testament within the context of the first-century Mediterranean world. Students will become acquainted with the gospels, letters, and other literary types that constitute the New Testament canon. As modern readers of a different time and culture, students will learn to approach the New Testament using sound strategies that are sensitive to these differences. Upon successful completion of this course, students will have an understanding of: 1) the general contents of the New Testament; 2) its presumed historical context in Greco-Roman antiquity; and 3) fundamental interpretive strategies.

231 History and Philosophy of Technology (3)

A focus on aspects of the history of technology; the moral and social dilemmas that past technologies gave rise to (even when those dilemmas were not clearly acknowledged); the potentials of selected current technologies; and the moral and social dilemmas that those technologies raise. Students study the ways major thinkers have tried to deal with the dilemmas technologies have posed, and are asked to think through their own responsibilities concerning the technologies discussed.

PHILOSOPHY (PHI)

114 Informal Logic (3)

A course providing a non-formal examination of the nature of good reasoning. Students will examine and learn the nature of cognitive argument, the role of inductive and deductive reasoning, and the effects of non-cognitive aspects of language on the cognitive. Students will examine informal fallacies and apply what is studied to examples of reasoning in such areas as science and law.

210 Ancient and Medieval Philosophy (3)

An examination of Greek philosophy, concentrating on Plato's Republic and ending with Aristotle. This is followed by a brief study of the spiritual renaissance seen in Plotinus and culminating in the works of St. Augustine. *Offered alternate years.*

214 Formal Logic (3)

A study of propositional logic, including truth tables, symbolization, deductive formal proof, quantification theory, and deductive completeness of formal systems.

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. *Offered alternate years.*

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 Philosophy of Yoga (3)

How do we conduct an inquiry in the self? This is the central question asked in Philosophy of Yoga. Students will study and integrate an inquiry into the self through the ancient philosophy of hatha yoga. Students are introduced to three preparatory stages in yoga: asana (poses), pranayama (breath), and meditation. By studying these three stages of practice, students will begin to ponder the steps necessary to understand a contemplative discipline. Heavy emphasis is placed on experiential and participatory study of yoga. Upon successful completion of this course, students will have a broad spectrum of direct experience with yoga and a grounded perspective on the application of philosophy to their own life.

305 World Views (3)

An overview of major ideas and events shaping Western civilization through the examination of narratives, discourses, artworks, films and popular culture. Upon successful completion of this course, students will have a better understanding of classical mythology and philosophy, the biblical concept of reality, modern secularism, the intellectual foundations of totalitarianism, post-modernism, New Age spirituality and alternative concepts of history. **This course fulfills the Cultural Perspectives requirement of the Doane Plan.** *Offered alternate spring terms.*

311, 411 Philosophy of Science (3) (3)

An examination of the philosophical questions raised by science – particularly physics – and the implications science has for other areas of thought and practice, such as religion. **Students may complete at one level only.** *Prerequisite: One course in philosophy or religious studies, or permission. Offered alternate years.*

317, 417 Human Rights (3) (3)

An examination of theories about the nature, scope, and importance of human rights. There will be an exploration of both religious and non-religious roots of these doctrines, their developments through the 20th century and the role human rights play today in both the national and international arenas. Upon successful completion of this course, students will be able to trace the origins of the belief in human rights and articulate at least two ways in which the doctrine of human rights is justified. **Students may complete at one level only.** *Prerequisite: Philosophy-Religion 110 or 111 or permission. Offered alternate years.*

395 Proseminar I (1)

A course to supplement a student's background in the history of philosophy. Students independently watch a previously agreed upon number of videotapes on the history of philosophy and complete essays reviewing them. Videos will be supplemented by various readings, by resources from the Internet, and by regular discussions with the professor. Upon successful completion of this course, students will demonstrate the ability to continue learning about philosophy on their own, with minimal guidance from a professor. *Prerequisite: Philosophy or Religious Studies major or minor.*

396 Proseminar II (1)

A concentrated examination of current journal literature in philosophy. Students read from, and do research in, specified journals on a given topic. The work is reviewed regularly by the course professor. Upon successful completion of this course, students will be able to identify the major journals in their area of interest, and articulate the major positions in the journal literature on an area of their interest. *Prerequisite: Philosophy or Religious Studies major or minor.*

421 Philosophy Internship (0-12)

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

495 Examination and Thesis (3)

A comprehensive examination, emphasizing depth and interrelationships among ideas, is required of every major. An individually chosen thesis is read to the faculty and other students. *Prerequisite: One course in philosophy.*

RELIGIOUS STUDIES (RST)**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.

309 Introduction to Judaism (3)

An exploration of the beliefs and practices of Judaism. Careful reading of classical Jewish texts and participation in Jewish religious services constitutes the major component of the course. Upon successful completion, students will have an understanding of Judaism as defined by sacred time, space, and leadership. Students will also be able to engage in a variety of contemporary issues pertaining to Judaism. *Offered alternate fall terms.*

310 The Historical Jesus (3)

Beginning with historical critical study of the Bible in the 18th century

enlightenment, scholars of the New Testament and early Christian literature have sought to separate the historical figure of Jesus from the image of Jesus within the early church. This course traces the various quests for the historical Jesus based on New Testament writings and other related literature. Upon successful completion of the course, students will: 1) have an understanding of the New Testament and early Christian literature as it pertains to the historical Jesus; 2) have an understanding of basic interpretive methods used to reconstruct the historical Jesus; and 3) be able to engage fundamental issues in the form of a presentation and research project. *Offered alternate spring terms.*

312 The Letters and Life of Paul (3)

An introduction to the content and background of the new Testament letters attributed to the Apostle Paul. Particular attention is devoted to the literary structure of the letters and the social context of Christian communities in the Mediterranean world of the first century. There is also a consideration of the biography of Paul according to early Christian sources. Upon successful completion of the course, students will have an understanding of: 1) the general contents of Paul's letters; 2) Greco-Roman antiquity as it serves as a backdrop for Paul; and 3) basic interpretive strategies. *Offered alternate spring terms.*

316, 416 The Book of Genesis (3) (3)

A seminar-style study of Genesis. As a backdrop to the book, the course first explores ancient Near Eastern history and literature. Students are then introduced to classical and contemporary interpretive approaches and apply them to portions of Genesis. Careful reading of Genesis over the course of the semester will result in a deeper understanding of the stories, both in their antiquity and as they speak to us today. Upon successful completion of the course, students will have an understanding of: 1) the ancient Near East as it serves as a backdrop for Genesis; 2) the general contents of Genesis; and 3) basic interpretive strategies. **Students may complete one level only.** *Offered alternate fall terms.*

328 Religions and Culture in the Middle East (3)

An exploration of the religious traditions of the Middle East (Judaism, Zoroastrianism, Christianity, Islam, and Bahai) and the way these traditions affect the daily lives of Middle Eastern people. Special attention is devoted to the geography and history of the region as it pertains to religion, culture, and politics. There is also a consideration of current events in the Middle East and how the perception of these events impacts the life of Middle Eastern people in the United States. Upon successful completion of the course, students will be conversant with the major religious traditions of the Middle East and have a better understanding of the Middle East as it is depicted in the modern media. **This course fulfills the Cultural Perspectives requirement of the Doane Plan.**

421 Religious Studies Internship (0-12)

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

495 Examination and Thesis (3)

A comprehensive examination, emphasizing depth and interrelationships among ideas, is required of every major. An individually chosen thesis is read to the faculty and other students. *Prerequisite: One course in religious studies.*

498 Honors in Religious Studies (3)

Students who have demonstrated outstanding performance in religious studies are offered opportunities for academic enrichment, such as: reading projects, research and writing, teaching and tutorial assistance in courses. Upon successful completion of this experience, students will have gained a better understanding of research, professional writing, or instruction within the context of the discipline. *Prerequisite: Permission of instructor.*

