

829. Advanced Microbial Ecology
Fall of even years. 3(3-0) Interdepartmental with Crop and Soil Sciences.

Functional roles of microorganisms, their population dynamics and interactions, and their mechanisms of evolutionary change in natural communities, laboratory experiments, and mathematical models.

833. Microbial Genetics
Fall. 3(3-0) R: Open only to graduate students in the Colleges of Human Medicine, Osteopathic Medicine, Veterinary Medicine, Natural Science, and Agriculture and Natural Resources.
Gene structure and function. Genetic regulation at classical and molecular levels in prokaryotes and lower eukaryotes.
SA: MPH 833

835. Eukaryotic Molecular Genetics
Spring. 3(3-0) Interdepartmental with Genetics. P: BCH 462, ZOL 341. R: Open only to graduate students in the colleges of Agriculture and Natural Resources, Engineering, Human Medicine, Natural Science, Osteopathic Medicine, and Veterinary Medicine.
Gene structure and function in animals, plants, and fungi. Basic aspects of modern human genetics and the genetic basis for disease. Molecular genetic analyses. Eukaryotic modeling systems.

841. Soil Microbiology
Spring of even years. 3(3-0) Interdepartmental with Crop and Soil Sciences. P: MIC 425.
Ecology, physiology, and biochemistry of microorganisms indigenous to soil.
SA: MPH 841

851. Immunology
Fall of odd years. 3(3-0) R: Open only to graduate students in the Colleges of Human Medicine, Osteopathic Medicine, Veterinary Medicine, Natural Science, and Agriculture and Natural Resources.
Functional aspects of immune responses; synthesis, structure, and function of effector molecules; cell-cell interactions; current advances and research techniques.
SA: MPH 851

855. Molecular Evolution: Principles and Techniques
Fall of odd years. 3(3-0) Interdepartmental with Zoology; and Botany and Plant Pathology. Administered by Zoology. RB: (ZOL 341 Or ZOL 445)
Current techniques used to characterize and compare genes and genomes. Types of genetic variation, assays of variation. Emphasis on data analysis, and computer use to conduct a phylogenetic analysis to compare organisms and infer relationships.

890. Special Problems in Microbiology
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open only to graduate students in the Colleges of Human Medicine, Osteopathic Medicine, Veterinary Medicine, Natural Science, and Agriculture and Natural Resources. Approval of department.
Individualized laboratory or library research.
SA: MPH 890

892. Seminar
Fall, Spring. 1(1-0) A student may earn a maximum of 6 credits in all enrollments for this course. R: Open only to graduate students in College of Agriculture and Natural Resources, College of Engineering, College of Human Medicine, College of Natural Science, College of Osteopathic Medicine, or College of Veterinary Medicine.
Student review and presentation of selected topics in microbiology and public health.
SA: MPH 892

899. Master's Thesis Research
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 24 credits in all enrollments for this course. R: Open only to graduate students in Microbiology and Public Health.
SA: MPH 899

991. Topics in Microbiology
Fall, Spring. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
Topics are selected from traditional subdisciplines such as bacteriology, virology, cell biology, and immunology or from transecting subdisciplines such as microbial genetics, physiology, molecular biology and ecology.
SA: MPH 991

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 99 credits in all enrollments for this course. R: Open only to graduate students in Microbiology and Public Health.
SA: MPH 999

MILITARY SCIENCE MS

Department of Military Science Office of the Provost

101A. Leadership: The Military Profession
Fall. 1(1-1) Not open to students with credit in MS 101B.
Introduction to military leadership and fundamental concepts of leadership. Application of leadership doctrine. The role of the U.S. Army, Army Reserves, and National Guard. Leadership laboratory introduces basic military skills.
SA: MS 101

101B. Leadership: The Military Profession
Spring. 1(1-2) Not open to students with credit in MS 101A.
Introduction to military leadership and fundamental concepts of leadership. Application of leadership doctrine. The role of the U.S. Army, Army Reserves, and National Guard. Leadership laboratory introduces basic military skills.
SA: MS 101

102A. Leadership: Wilderness Survival
Fall. 1(1-1) Not open to students with credit in MS 102B.
Introduction to wilderness survival including the psychology of survival, survival planning, and survival kits; shelters; water procurement; fire craft; field expedient weapons, tools, and equipment; desert, tropical, and cold weather survival; basic survival medicine; and food procurement.

102B. Leadership: Wilderness Survival
Spring. 1(1-2) Not open to students with credit in MS 102A.
Introduction to wilderness survival including the psychology of survival, survival planning, and survival kits; shelters; water procurement; fire craft ; field expedient weapons, tools, and equipment; desert, tropical, and cold weather survival; basic survival medicine; and food procurement.
SA: MS 102

201A. Leadership: The Military Leader
Fall. 1(1-1) Not open to students with credit in MS 201B.
Introduction to effective leadership. Communications. Value of the United States Army. Responsibilities of military officers and professionalism. Laboratory includes tactics, marksmanship training, and military skills.
SA: MS 201

201B. Leadership: The Military Leader
Spring. 1(1-2) Not open to students with credit in MS 201A.
Introduction to effective leadership. Communications. Value of the United States Army. Responsibilities of military officers and professionalism. Laboratory includes tactics, marksmanship training, and military skills.
SA: MS 201

202A. Introduction to Land Navigation and Tactics
Fall. 1(1-1) Not open to students with credit in MS 202B.
Introduction to land navigation using military maps and lensatic compass. Planning routes using azimuth and distance. Determining location by terrain association and other methods. Introduction to infantry defensive and reconnaissance operations.
SA: MS 202

202B. Introduction to Land Navigation and Tactics
Spring. 1(1-2) Not open to students with credit in MS 202A.
Introduction to land navigation using military maps and lensatic compass. Planning routes using azimuth and distance. Determining location by terrain association and other methods. Introduction to infantry defensive and reconnaissance operations.
SA: MS 202

301. Leading Small Organizations
Fall. 3(3-2) P: (MS 101A or MS 101B) and (MS 102A or concurrently or MS 102B or concurrently) and (MS 201A or concurrently or MS 201B or concurrently) and (MS 202A or concurrently or MS 202B or concurrently) Completion of basic camp or boot camp. Must meet U.S. Army contracting requirements.
Skills required for military officers: communication, team building, delegating tasks, supervision, ethics, and physical fitness. Leading small units. Participation in physical fitness is required.

Descriptions—Military Science of Courses

- 302. Leadership: Small Unit Tactics**
Spring. 3(3-2) P: (MS 301)
Basic military tactics and the military communication/orders process focusing on small units. Application of lessons learned from leadership case studies to practical exercises of leadership. Delegation of tasks and supervision of subordinates in a stressful environment.
- 401. Leadership: Training Management, Counseling, and Unit Management**
Fall. 3(3-2) P: (MS 302)
Army training philosophy. The lieutenant's role in training management, personnel administration, and logistics. Practical exercises in counseling and training presentations. Practical application of leadership development doctrine. Laboratory includes practical experience in unit administration and training management.
- 402. Military Law, Ethics and Professionalism**
Spring. 3(3-2) P: (MS 401)
Introduction of the military legal system and the Law of War. The basis of the military profession and the importance of ethical development to the profession of arms. Development of subordinates. Laboratory includes practical exercises in professional development and leadership opportunities.
- 490. Independent Study in Military Science**
Fall, Spring. 1 to 4 credits. A student may earn a maximum of 4 credits in all enrollments for this course. R: Open only to juniors or seniors. Approval of department.
Individual research in areas related to military science.
- 112. Chamber Music**
Fall, Spring. 1(0-2) A student may earn a maximum of 10 credits in all enrollments for this course. R: Audition required.
Rehearsal and performance of broad range of chamber music literature.
- 114. Marching Band**
Fall. 1(0-9) A student may earn a maximum of 6 credits in all enrollments for this course. R: Audition required.
Rehearsal and performance of broad range of marching band literature at football games.
- 115. Spartan Brass**
Spring. 1(0-2) A student may earn a maximum of 6 credits in all enrollments for this course. R: Audition required.
Rehearsal and performance of broad range of brass literature at basketball and hockey games.

- 116. Campus Band**
Fall, Spring. 1(0-3) A student may earn a maximum of 10 credits in all enrollments for this course.
Rehearsal and performance of broad range of band literature chosen from baroque period to the present.
- 117. Concert Band**
Fall, Spring. 1(0-3) A student may earn a maximum of 10 credits in all enrollments for this course. R: Audition required.
Rehearsal and performance of broad range of wind literature from various historical periods and styles.
- 118. Wind Symphony**
Fall, Spring. 1(0-6) A student may earn a maximum of 10 credits in all enrollments for this course. R: Audition required.
Rehearsal and performance of broad range of wind literature from various periods and styles.
- 119. Symphony Band**
Fall, Spring. 1(0-3) A student may earn a maximum of 10 credits in all enrollments for this course. R: Audition required.
Rehearsal and performance of broad range of wind and percussion literature.
- 120. Symphony Orchestra**
Fall, Spring. 1(0-6) A student may earn a maximum of 10 credits in all enrollments for this course. R: Audition required.
Rehearsal and performance of symphonic and operatic repertoire.
- 122. Campus Orchestra**
Fall, Spring. 1(0-2) A student may earn a maximum of 10 credits in all enrollments for this course.
Rehearsal and performance of symphonic and concert literature written for large orchestra, conducted by staff conductors under the supervision of faculty.
- 123. Collegiate Choir**
Fall, Spring. 1(0-3) A student may earn a maximum of 10 credits in all enrollments for this course. R: Audition required.
Rehearsal and performance of representative literature for mixed choir with emphasis on renaissance, baroque, classical, romantic, and contemporary composers.
- 124. Choral Union**
Fall, Spring. 1(0-2) A student may earn a maximum of 10 credits in all enrollments for this course. R: Audition required.
University and community chorus. One evening rehearsal per week, culminating in performance of a major work with orchestra.
- 125. Glee Club, Men and Women**
Fall, Spring. 1(0-3) A student may earn a maximum of 10 credits in all enrollments for this course.
Rehearsal and performance of broad range of choral literature chosen from medieval period to the present.

- 126. State Singers**
Fall, Spring. 1(0-4) A student may earn a maximum of 10 credits in all enrollments for this course. R: Audition required.
Mixed choir performing music from all periods.
- 127. University Chorale**
Fall, Spring. 1(0-4) A student may earn a maximum of 10 credits in all enrollments for this course. R: Audition required.
Mixed chamber choir for experienced singers performing representative literature from all periods.
- 129. Percussion Ensemble**
Fall, Spring. 1(0-3) A student may earn a maximum of 10 credits in all enrollments for this course. R: Audition required.
Rehearsal and performance of representative works for percussion and mallet ensembles.
- 130. Jazz Band**
Fall, Spring. 1(0-4) A student may earn a maximum of 10 credits in all enrollments for this course. R: Audition required.
Rehearsal and performance in large jazz ensemble. Literature from classic bands of Ellington and Basie to contemporary composers.
- 131. Jazz Combo**
Fall, Spring. 1(1-2) A student may earn a maximum of 10 credits in all enrollments for this course. R: Audition required.
Rehearsal and performance in small jazz ensembles. Literature from all historical periods of jazz.
- 141. Class Instruction in Piano I**
Fall, Spring. 1(1-1) R: Open only to students in the School of Music.
Use of the piano as a teaching tool.
- 142. Class Instruction in Piano II**
Spring. 1(1-1) P: (MUS 141) R: Open only to students in the School of Music.
Use of the piano as a teaching tool.
- 143. Class Instruction in Voice I: Music Majors**
Fall. 1(1-1) C: MUS 151 concurrently. R: Open only to students in the School of Music with an emphasis in voice.
English lyric diction. Rules of pronunciation. Performance of English language songs in class.
- 144. Class Instruction in Voice II: Music Majors**
Spring. 1(1-1) P: (MUS 143) R: Open only to students in the School of Music with an emphasis in voice.
Italian lyric diction. Rules of pronunciation. Performance of Italian language songs in class.
- 145. Class Instruction in Voice I**
Fall. 1(1-1) R: Not open to students in the School of Music with an emphasis in voice.
Rules of pronunciation. Vocal techniques.
- 146. Class Instruction in Voice II**
Spring. 1(1-1) P: (MUS 145) R: Not open to students in the School of Music with an emphasis in voice.
Vocal techniques and exploration of vocal literature.

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