

## Microbiology and Molecular Genetics—MMG

**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. SA: MPH 833

Gene structure and function. Genetic regulation at classical and molecular levels in prokaryotes and lower eukaryotes.

**835 Eukaryotic Molecular Genetics**  
Spring. 3(3-0) Interdepartmental with Genetics. RB: (BMB 462 and 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. RB: (MMG 425) SA: MPH 841

Ecology, physiology, and biochemistry of microorganisms indigenous to soil.

**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. SA: MPH 851

Functional aspects of immune responses; synthesis, structure, and function of effector molecules; cell-cell interactions; current advances and research techniques.

**855 Molecular Evolution: Principles and Techniques**  
Fall of odd years. 3(3-0) Interdepartmental with Zoology; Plant Biology. Administered by Department of Zoology. RB: (ZOL 341 or ZOL 445)

Current techniques used to characterize and compare genes and genomes. Genetic variation, assays of variation. Data analysis and computer use to conduct a phylogenetic analysis to compare organisms and infer relationships.

**861 Advanced Microbial Pathogenesis**  
Fall of even years. 3(3-0) RB: (MMG 461 or MMG 409)

Molecular basis of microbial virulence. Virulence factors of microorganisms and the relationship of these factors to disease; host-pathogen interactions.

**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. SA: MPH 890

Individualized laboratory or library research.

**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. SA: MPH 892

Student review and presentation of selected topics in microbiology and public health.

**899 Master's Thesis Research**  
Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 36 credits in all enrollments for this course. R: Open only to graduate students in Microbiology and Public Health. SA: MPH 899

Master's thesis research.

**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. SA: MPH 991

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.

**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 Molecular Genetics. SA: MPH 999

Doctoral dissertation research.

## MILITARY SCIENCE

MS

### Department of Military Science Office of the Provost

**101A Leadership: The Military Profession**  
Fall. 1(1-1) SA: MS 101 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.

**101B Leadership: The Military Profession**  
Spring. 1(1-2) SA: MS 101 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.

**102A Leadership: Wilderness Survival**  
Fall. 1(1-1) SA: MS 102 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) SA: MS 102 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.

**201A Leadership: The Military Leader**  
Fall. 1(1-1) SA: MS 201 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.

**201B Leadership: The Military Leader**  
Spring. 1(1-2) SA: MS 201 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.

**202A Introduction to Land Navigation and Tactics**  
Fall. 1(1-1) SA: MS 202 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.

**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.

**301 Leading Small Organizations**  
Fall. 3(3-2) RB: (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.

**302 Leadership: Small Unit Tactics**  
Spring. 3(3-2) RB: (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) RB: (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) RB: (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.

**MUSIC****School of Music  
College of Arts and Letters****112 Chamber Music**

Fall, Spring. 1(0-2) A student may earn a maximum of 10 credits in all enrollments for this course. R: Open only to students in the School of Music. Audition required. Rehearsal and performance of a broad range of chamber music literature.

**113 Philharmonic Orchestra**

Fall, Spring. 1(0-3) A student may earn a maximum of 10 credits in all enrollments for this course. RB: High school and/or youth orchestra experience/or other college or university ensemble experience R: Audition required. Rehearsal and performance of symphonic and operatic repertoire.

**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(0-4) A student may earn a maximum of 10 credits in all enrollments for this course. R: Audition required. Rehearsal and performance of a 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. Rehearsal and performance of representative literature for mixed choir with emphasis on vocal jazz and contemporary styles of choral music. No vocal jazz experience necessary.

**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) RB: (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) R: Open only to students in the School of Music with an emphasis in voice. C: MUS 151 concurrently. English lyric diction. Rules or pronunciation. Performance of English language songs in class.

**144 Class Instruction in Voice II: Music Majors**

Spring. 1(1-1) P:M: (MUS 143) R: Open only to students in the School of Music with an emphasis in voice. C: MUS 151 concurrently. 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:M: (MUS 145) R: Not open to students in the School of Music with an emphasis in voice. Vocal techniques and exploration of vocal literature.

**147 Class Instruction in Elementary Piano I**

Fall, Spring. 2(2-1) R: Not open to students in the School of Music. Basic notation, performance, improvisation, and transposition. Repertoire includes folksongs, simple classics, and blues.

**149 Keyboard Skills**

Fall, Spring. 1(0-2) A student may earn a maximum of 4 credits in all enrollments for this course. R: Open only to students in the School of Music. Sight-reading, transposing, figured bass, keyboard harmony, and accompanying instrumentalists and vocalists.

**MUS**