

**531B. Medical Microbiology: Bacteriology and Mycology**  
Spring. 5(3-6) *Third-term Veterinary Medicine students or approval of department.*  
Basic principles of bacteriology and mycology and their relation to disease in animals.

**531C. Medical Microbiology: Virology**  
Fall. 4(3-2) *Fourth-term Veterinary Medicine students or approval of department.*  
General properties of animal viruses; pathogenesis, immune response and immunoprophylaxis in viral diseases; principles of clinical virology.

**531D. Medical Microbiology: Parasitology**  
Winter. 4(3-3) *Fifth-term Veterinary Medicine students or approval of department.*  
Basic principles of parasitology (protozoology, helminthology, and entomology) and their relation to disease in animals.

**618. Infectious Disease Clerkship**  
Fall, Winter, Spring, Summer. 2 to 12 credits. *May reenroll for a maximum of 12 credits. MED 608. Interdepartmental with and administered by the Department of Medicine.*  
The clerkship emphasizes acquisition in depth of knowledge and skills essential in solution of clinical problems in infectious and immunologic diseases. Integrated basic science input is afforded through relevant seminars.

**800. Seminar**  
Fall, Winter, Spring, Summer. 1(1-0)  
*May reenroll for a maximum of 9 credits. Approval of department.*

**810. Topics in Microbiology**  
Fall, Winter, Spring, Summer. 2 to 4 credits. *May reenroll for a maximum of 10 credits if different topic is taken. Approval of department.*  
Topics will be selected from taxonomic subsciences such as bacteriology, virology, protozoology, mycology, and helminthology; from transecting disciplines such as microbial genetics, immunology, physiology, and ecology.

**813. Molecular Virology**  
Winter. 4(4-0) *Background in biochemistry, and approval of department.*  
Molecular nature and biochemistry of replication of bacterial and animal viruses. Emphasis is on current advances, research concepts, and the role of viruses in molecular biology research.

**821. Advanced Microbial Physiology**  
Spring of even-numbered years. 4(4-0) MPH 303.  
Mechanism and regulation of physiologic and metabolic activities unique to prokaryotes including fermentation, photosynthesis, respiration and autotrophy.

**823. Microbial Genetics**  
Winter. 3(3-0) BCH 811.  
Gene structure, gene function, and genetic regulation at the classical and molecular levels in prokaryotes and lower eukaryotes.

**825. Cell Structure and Function**  
Winter. 4(4-0) BCH 451 or BCH 401 or approval of instructor. *Interdepartmental with the departments of Biochemistry, and Physiology. Administered by the Department of Biochemistry.*  
Molecular basis of structure and function of cells. Fundamental properties of cells: reproduction, dynamic organization, integration, programmed and interactive information transfer considered through original investigations in all five kingdoms.

**827. Immunochemistry**  
Spring of even-numbered years. 3(3-0) MPH 427; BCH 452 or ZOL 441; CEM 383 recommended.  
Structure and reactivity of antigens and antibodies; synthesis of immunoglobulins. Emphasis is on current advances and research concepts.

**829. Host-Parasite Relationships**  
Fall. 3(3-0) MPH 427, MPH 429 or approval of department.  
Pathogenesis and host responses to selected bacterial, parasitic, and fungal pathogens. Emphasis is on current research models which exemplify a variety of host-parasite relationships.

**831. Bacterial Diversity**  
Spring of odd-numbered years. 3(3-0) MPH 303, MPH 304; BCH 401 or BCH 453 or concurrently.  
Morphological and physiological properties of diverse groups of bacteria and how these properties relate to their ecological niche and importance.

**832. Bacterial Diversity Laboratory**  
Spring of odd-numbered years. 2(0-6) MPH 831 or concurrently.  
Representative groups of bacteria will be isolated and studied.

**842. Advanced Soil Microbiology**  
Fall of odd-numbered years. 3(3-0) MPH 425 or approval of department. *Interdepartmental with the Department of Crop and Soil Sciences.*  
Biochemistry, biology, and community ecology of microorganisms indigenous to soil. Emphasis on current research problems.

**843. Soil Microbiology Laboratory**  
Fall of odd-numbered years. 2(0-6) MPH 842 concurrently or approval of department. *Interdepartmental with the Department of Crop and Soil Sciences.*  
Fundamental techniques of dealing with microorganisms indigenous to soil. Metabolic activity of microorganisms. Interaction between microorganisms and plants.

**890. Special Problems in Microbiology**  
Fall, Winter, Spring, Summer. 2 to 6 credits. *May reenroll for a maximum of 12 credits. Approval of department.*

**899. Master's Thesis Research**  
Fall, Winter, Spring, Summer. *Variable credit. Approval of department.*

**900. Topics in Microbiology**  
Fall, Winter, Spring, Summer. 2(2-0) *May reenroll if different topic is taken. Approval of department.*  
Topics will be selected from taxonomic subsciences such as bacteriology, virology, protozoology, mycology, algology, and helminthology; and from transecting disciplines such as microbial genetics, immunology, physiology, and ecology.

**999. Doctoral Dissertation Research**  
Fall, Winter, Spring, Summer. *Variable credit. Approval of department.*

## MILITARY SCIENCE M S

### Office of the Provost

**101. Introduction to the Military Profession**  
(M S 121.) Fall, Winter, Spring. 1(1-1) *Approval of department.*

Analysis of the military profession from several academic perspectives. Exploration of the technical, ethical, and personal ramifications of service as an officer in the U.S. Army. Lab introduces military skills.

**102. Military Leadership I**  
(M S 041A.) Winter. 1(1-1) M S 101 or approval of department.

Introduction to military leadership. Draws upon examples from military history to illustrate what a military leader must be, know, and do to lead soldiers in battle. Lab includes both military skills and leadership applications.

**103. Army Physical Fitness Training**  
Spring. 1(0-3) M S 102 or approval of department.

The leader's role in implementing the Army Physical Fitness Program to provide for the physical well being of subordinates. Individual and group fitness programs are introduced. Includes rappelling and smallbore rifle marksmanship.

**201. Military First Aid**  
(M S 221.) Fall. 1(1-1) M S 103 or approval of department.

Emergency first aid techniques including casualty evaluation, lifesaving measures, CPR, and environmental injury prevention. Lab includes military skills and first aid applications.

**202. Military Leadership II**  
(M S 041B.) Winter. 1(1-1) M S 201 or approval of department.

Descriptive model of small unit leadership. Provides cadets with a realistic preview of the small unit leader's role in the Army. Lab includes small unit drill and ceremonies.

**203. Land Navigation**  
(M S 223.) Spring. 1(1-2) M S 202 or approval of department.

Use of military topographic and special use maps to include intersection, resection, modified resection, and polar coordinates. Development of overlays for tactical operations. Lab includes actual land navigation in the field using the lensatic compass.

**301. Command and Control Communications**  
Fall. 3(2-3) M S 203 or approval of department.

Tactical wire and radio communications systems and employment during tactical operations to provide effective control of military operations. Encryption/decryption, use of codes, and electronic warfare. Lab emphasizes practical application of communication skills.

## Descriptions — Military Science

### of Courses

#### 302. **Military Leadership III**

Winter. 3(2-3) M S 301 or approval of department.

Application of the theories and models of the behavioral sciences to leadership as it functions in a military environment. Case studies from military history. Lab emphasizes practical leadership applications.

#### 303. **Small Unit Tactics**

(M S 325.) Spring. 3(2-3) M S 302 or approval of department.

Offensive and defensive military tactics. Incorporates practical exercises which allow cadets to view the modern battlefield through the eyes of the infantry platoon leader. Lab emphasizes tactical employment of the infantry squad and platoon.

#### 401. **Training Management and Unit Administration**

(M S 426.) Fall. 3(2-2) M S 303 or approval of department.

The Army training management system and the leader's role as a trainer. Operations and administration in military units to provide effective personnel management and logistic support. Oral and written military communication. Lab includes practical experience in unit administration.

#### 402. **Military Leadership IV**

(M S 041D.) Winter. 3(2-2) M S 401 or approval of department.

Leadership assessment, development, and training practices. Integration of theory, practice, and self-assessment in leadership. Development of subordinates and the role of the noncommissioned officer. Lab includes leadership development and assessment exercises.

#### 403. **Military Law, Ethics, and Professionalism**

(M S 427.) Spring. 3(2-2) M S 402 or approval of department.

Military legal system and the responsibilities of leaders in the application of military justice. Examination of fundamental values and principles of conduct in the profession of arms. Lab includes practical exercises in professional development.

#### 499. **Independent Study in Military Science**

Fall, Winter, Spring, Summer. 1 to 3 credits. May reenroll for a maximum of 6 credits. Approval of department and Juniors.

Individual research and study in an area related to military science as approved and directed by the Department of Military Science.

#### 118. **Band**

##### A. Marching Band

Fall. 1 credit. May reenroll for credit. Membership determined by audition. The Marching Band participates at football games.

##### B. Spartan Brass

Winter. 1 credit. May reenroll for credit. Membership determined by audition. The Spartan Brass participates at basketball games.

##### C. Concert Band

Fall, Winter, Spring. 1 credit. May reenroll for credit. Membership determined by audition.

Public appearances are scheduled on campus each term.

##### D. Symphonic Band

Fall, Winter, Spring. 1 credit. May reenroll for credit. Membership determined by audition. A high level of achievement in performing ability is required.

Concerts are scheduled both on and off campus.

##### E. Wind Ensemble

Fall, Winter, Spring. 1 credit. May reenroll for a maximum of 12 credits. Membership determined by audition. The highest level of performance is required.

Full range of wind literature is performed. Public concerts are presented both on and off campus.

##### F. Repertory Band

Fall, Winter, Spring, Summer. 1 credit. May reenroll for a maximum of 12 credits. Membership determined by audition.

Public appearances are scheduled on campus each term.

#### 133A. **Symphony Orchestra**

Fall, Winter, Spring. 1(0-5) May reenroll for a maximum of 12 credits. Admission by audition.

Preparation and performance of symphony and operatic repertoire under direction of faculty and guest conductors of international reputation.

#### 133B. **Chamber Orchestra**

Fall, Winter, Spring. 1(0-5) May reenroll for a maximum of 12 credits. Membership determined by audition.

A specialized ensemble of advanced performers concentrating on the repertoire of the classic composers, and modern repertoire for chamber orchestra. Rehearsals and performances with faculty and guest artists.

#### 135. **Music in Elementary Education**

Fall, Winter, Spring, Summer. 4(3-3) Elementary education majors.

Study of music learning strategies in the elementary schools. Music concepts and literature are developed through listening, performing, creative and analytical skills. Methods and materials are emphasized.

#### 141. **Class Instruments and Voice**

Fall, Winter. 1(0-2) Knowledge of notation. Music majors, or approval of department.

Class instruction in piano, voice, violin, cello, clarinet, and cornet.

#### 142. **Class Instruments and Voice**

Winter, Spring. 1(0-2) MUS 141.

Continuation of MUS 141.

#### 143. **Class Instruments and Voice**

Spring. 1(0-2) MUS 142.

Continuation of MUS 142.

#### 147. **Elementary Piano**

Fall, Winter, Spring. 2(2-2) MUS 145 or approval of department. Elementary Education and Physical Education and Recreation majors.

Beginning class piano instruction. Development of ability to play the three principal chords in all keys and to harmonize simple melodies using these chords. Transposition of simple melodies. Ability to play melodies and rhythms suitable for use in lower intermediate grades or in recreation work.

#### 148. **Elementary Piano**

Winter, Spring. 2(2-2) MUS 147. Elementary Education majors.

Continuation of MUS 147.

#### 150. **Keyboard Instruments and Harp**

Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 24 credits. Audition required.

Instruction in piano, organ and harp.

#### 151. **Voice**

Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 24 credits. Audition required.

#### 152. **Stringed Instruments**

Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 24 credits. Audition required.

#### 153. **Woodwind Instruments**

Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 24 credits. Audition required.

#### 154. **Brass Instruments**

Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 24 credits. Audition required.

#### 155. **Percussion**

Fall, Winter, Spring, Summer. 1 to 4 credits. May reenroll for a maximum of 24 credits. Audition required.

#### 180. **Basic Harmony**

Fall. 3(3-1)

Fundamentals of basic musicianship: notation, clefs, scales, intervals, triads, meter, rhythm, and tonality. The analysis and writing of diatonic harmony in the style of the Bach 4-part chorale.

#### 181. **Basic Harmony**

Winter. 3(3-1) MUS 180.

Continuation of MUS 180.

#### 182. **Basic Harmony**

Spring. 3(3-1) MUS 181.

Continuation of MUS 181.

#### 183. **Aural Harmony**

Fall, Winter, Spring, Summer. 1(0-2) MUS 180 concurrently.

The aural counterpart of basic harmony. Drill in harmonic, melodic and rhythmic dictation. Sight singing and keyboard harmony.

#### 184. **Aural Harmony**

Fall, Winter, Spring, Summer. 1(0-2) MUS 183; MUS 181 concurrently.

#### 185. **Aural Harmony**

Fall, Winter, Spring, Summer. 1(0-2) MUS 184; MUS 182 concurrently.

## MUSIC

## MUS

### College of Arts and Letters

#### 112. **Chamber Music**

Fall, Winter, Spring, Summer. 1(1-0) May reenroll for a maximum of 18 credits. Approval of department.

Performance of works for small ensembles.