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
Spring of odd years. 3(3-0) RB: (MMG 461 or MMG 460)
Molecular basis of microbial virulence. Virulence factors of microbial pathogens, 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 6 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 Microbiology and Public Health. 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 transdisciplinary subdisciplines such as microbial genetics, physiology, molecular biology, and ecology.

999 Doctoral Dissertation Research
Fall, Spring. Summer. 1 to 24 credits. A student may earn a maximum of 120 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

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.

110 Army Leadership and Officer Development
Fall. 1 to 2 credits. SA: MS 101, MS 101A Not open to students with credit in MS 101B
Duties and responsibilities of the Army officer and noncommissioned officer. Organizational structure of the Army, Army Reserve, and National Guard. The Army's role in joint operations. Introduction to Army values, leadership, customs, and traditions.

120 Introduction to Army Leadership and Problem Solving
Spring. 1 to 2 credits. RB: (MS 101A or MS 101B)
Fundamentals of basic Army leadership. Military problem solving process. Military briefing and writing skills. Goal setting and time management. Introduction to the Army's developmental counseling program.

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. Labora-tory includes tactics, marksmanship training, and military skills.

210 Values and Ethics of Army Leaders
Fall. 1 to 2 credits. RB: (MS 120) SA: MS 201, MS 201A Not open to students with credit in MS 201B
Application of military case studies. Critical dilemmas in combat situations and the ethical decisions Army leaders make to ensure mission success. Understanding how to improve Army organizations and soldier performance. Introduction to the Army's leadership development program, battle drills, land navigation, and combat decision making.

220 Challenges in Army Leadership
Spring. 1 to 2 credits. RB: (MS 201A or MS 201B) Not open to students with credit in MS 202A or MS 202B
Application of military case studies. Recognizing challenging situations for military leaders and units. Applying sound ethical leadership practices to implementation decisions. Understanding basic military small unit tactics.

310 Leading and Problem Solving in Army Units
Fall. 3 to 4 credits. RB: (MS 101B or MS 110) and (MS 120) and (MS 201B or MS 210) and (MS 220) Completion of basic training, or the leader training course. SA: MS 301
Planning and executing military activities in small Army units. Recognizing and analyzing problems in challenging situations. Implementing the skills required to communicate decisions and supervise subordinates. Applying fundamentals of map reading and land navigation.

320 Army Small Unit Tactics and Leadership
Spring. 3 to 4 credits. RB: (MS 310) SA: MS 302
Fundamentals of military tactics and battle drills. Applying troop leading procedures to military tactical operations. Implementing tactical skills and making decisions to lead small Army units on the battlefield. Integrates terrain analysis into military planning and operations.

410 Adaptive Army Leadership
Fall. 3 to 4 credits. RB: (MS 320) SA: MS 401
Application of military case studies. Skills and attributes of military leaders used to make decisions in combat situations. Practical exercises in problem solving and crisis counseling. Fundamentals of Army Training Management, the military justice system, and the law of land warfare.

420 Army Leadership in a Complex World
Spring. 3 to 4 credits. RB: (MS 410) SA: MS 402
Application of military case studies to the principles of the law of land warfare, and rules of engagement in the face of international terrorism. Importance of ethics in military leadership. Integration of the media into military operations. Evaluation of interaction with non-governmental organizations, civilians, and host nation support on the battlefield.

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 MUS

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.
Rehearsal and performance of a broad range of chamber music literature.

113 Philharmonic Orchestra
Fall, Spring. 1(0-5) 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.