BIOM 101. Careers in Microbiology. 1 Credit. (1 Lec) F
The course introduces students to educational and career opportunities in the fields of medical, molecular, ecological, and environmental microbiology. The course introduces students to the various options in the microbiology degree program. It will emphasize the differences in the options and the employment opportunities in each once a degree has been obtained.

BIOM 103IN. Unseen Universe: Microbes. 3 Credits. (2 Lec, 1 Lab) F,S
Beneficial and harmful effects of microorganisms on individual health, public health, food and water quality; are relevant to an informed citizen of the 21st century. Current news topics and historical perspectives are emphasized. Laboratory exercises investigate microbial activity in our everyday world.

BIOM 107CS. Molecules of Life. 3 Credits. (3 Lec) S
Introduction to uses of biological molecules for improving health and agriculture. Gene therapy and DNA fingerprinting are discussed in relation to social/moral issues. Intent of course is to help students develop a rational approach to evaluate cost/benefits of biotechnology to society.

BIOM 210RN. Environmental Health Science. 3 Credits. (3 Lec) F
PREREQUISITES: WRIT 101W or exempt from course based on ACT or SAT scores. High school chemistry or one semester of college level chemistry; MO96 or MI121Q. Environmental health science emphasizes how human health is linked to the health of the environment. This course combines classroom instruction with current events discussions, training activities and field trips to explore physical, chemical and biological factors that impact human health, including water pollution and treatment, air pollution, food safety, vectorborne diseases, hazardous waste disposal, community sanitation, emergency preparedness and hazard control in institutional and occupational environments.

BIOM 250. Microbiology for Health Sciences: Infectious Diseases. 3 Credits. (3 Lec) F,S
Introduction to the world of microorganisms and the role of viral, bacterial, fungal and parasitic infectious agents in human health. Emphasis is on public health aspects of transmission, epidemiology, treatment and control of these diseases. Also host-pathogen interactions with regards to pathogenesis and host immune responses are considered.

BIOM 290R. Undergraduate Research. 1-6 Credits. (1 Ind; 12 cr max) F,S
Directed undergraduate research/creative activity which may culminate in a written work or other creative project. Course will address responsible conduct of research. May be repeated.

BIOM 291. Special Topics. 3 Credits. (1 Lab; 12 cr max) On Demand
PREREQUISITE: None required but some may be determined necessary by each offering department. Courses not required in any curriculum for which there is a particular one time need, or given on a trial basis to determine acceptability and demand before requesting a regular course number.

BIOM 292. Independent Study. 1-4 Credits. (1-4 Ind; 6 cr max) On Demand
PREREQUISITE: Consent of instructor and approval of instructor. Directed research and study on an individual basis.

BIOM 360. General Microbiology. 5 Credits. (3 Lec, 2 Lab) F,S
PREREQUISITE: BIOC 160 or BIOC 260. An introduction to major topics and subdisciplines in microbiology including microbial diversity and classification, microbial anatomy and physiology, microbial genetics, microbial ecology, medical microbiology and immunology, public health, and biotechnology.

BIOM 363. Eukaryotic Cell Biology. 3 Credits. (3 Lec) F
PREREQUISITE: Microbiology major or consent of department. COREQUISITE: BIOM 360 and CHMY 321 or CHMY 211. The course will provide an understanding of how eukaryotic cells, in eukaryotic microorganisms such as protozoans and fungi, and multicellular euakaryotic organisms work. Topics covered include membranes, organelles, membrane trafficking, signaling, cell adhesion, and the extracellular matrix, cytoskeleton, cell motility and a comprehensive section on the cell cycle, which integrates all the other topics. Basic molecular biology relevant to each of these topics will also be covered.

BIOM 400. Medical Microbiology. 3 Credits. (3 Lec) S
PREREQUISITE: BIOM 360; Recommended BIOC 410 and BIOM 435. Selected viral, bacterial and protozoan infections of man and domestic animals will be covered with an emphasis on disease process and immune responses.

BIOM 405. Host-Associated Microbiomes. 3 Credits. (3 Lec) S
PREREQUISITES: BIOM 360 or BIOC 160 and CHMY 123 or BCH 380. This course will introduce students to the microbial ecosystems that colonize human and animal hosts, detailing their essential roles in host nutrition, health and development. Students will also be exposed to modern molecular techniques used to study these systems.

BIOM 410. Microbial Genetics. 3 Credits. (3 Lec)
PREREQUISITE: BIOM 360, BCH 380. The students will become familiar with concepts in microbial genetics, including DNA replication, RNA, and protein biosynthesis. Other concepts covered in the course include bacteriophage and plasmid biology, gene regulation, mobile genetic elements, and the fundamentals of genetic engineering.

BIOM 415. Microbial Diversity, Ecology, and Evolution. 3 Credits. (3 Lec) S
alternate years, to be offered even years.
PREREQUISITE: BIOM 360, BCH 380, or consent of instructor. The diversity of prokaryotic and eukaryotic microorganisms will be explored from both classical phenotypic and contemporary genotypic perspectives. The linkage between microbial diversity, its evolutionary origins, and its ecological value will be emphasized.

BIOM 421. Concepts of Plant Pathology. 3 Credits. (2 Lec, 1 Lab) S
PREREQUISITE: BIOL 110CS or BIOC 220. An introductory course in the study of plant diseases. Includes plant pathogens, etiology of disease, and various control strategies.

BIOM 423. Mycology. 3 Credits. (2 Lec, 1 Lab) F
Alternate Even Years PREREQUISITE: BIOL 100IN or BIOL 110CS or BIOC 160 or BIOC 170 IN or BIOM 103IN. This course surveys the immense diversity of fungi, including all major groups with emphasis on structures, life cycles, identification, and ecology. It provides a basis of knowledge for the rapidly expanding relevance of fungi in research, medicine, agriculture, biotechnology, and industry. This course is co-convened with BIOM 523.

BIOM 425. Toxicology: Science of Poisons. 3 Credits. (3 Lec) S
PREREQUISITES: CHMY 141, CHMY 143, BIOC 160 or BIOC 260, BCH 380 or BCH 441. This course is appropriate for pre-med, health professional, and environmental science majors. Topics include history principles, and mechanisms of toxicology, disposition of toxicants, chemical carcinogens, target organ toxicity, clinical and environmental toxicology. Co-convened with MB 527.

BIOM 427. General Parasitology. 4 Credits. (3 Lec, 1 Lab) F
Study of the life cycles, biochemistry, molecular parasitology, pathogenesis, identification and treatment of the major parasitic groups, including parasitic protozoa, monogeneans, digeneans, cestodes, nematodes, acanthocephalans, and parasitic arthropods.

BIOM 430. Applied and Environmental Microbiology. 4 Credits. (3 Lec, 1 Lab) F
PREREQUISITE: BIOM 360. The course introduces students to complex concepts in water microbiology, food microbiology, sterility and disinfection, the use of microorganisms in manufacturing processes and in the degradation of contaminants in the environment.

BIOM 431. Medical Bacteriology. 3 Credits. (3 Lec) S
PREREQUISITE: BIOM 360; recommend BIOC 410. This course considers the nature of the agents of bacterial infectious disease; the etiology, signs, symptoms, pathogenesis, diagnosis, therapy, epidemiology, and prevention of specific diseases. The major objective is for students to gain an understanding of bacteria that cause disease in humans.

BIOM 432. Med Bacteriology Lab. 2 Credits. (2 Lec) S
PREREQUISITE: BIOM 360. COREQUISITE: BIOM 431. Laboratory methods designed to teach techniques used in cultivating and identifying bacterial pathogens and normal flora from clinical specimens. Procedures used to test the antibiotic susceptibility of pathogenic bacteria.

BIOM 435. Virology. 3 Credits. (3 Lec) F
PREREQUISITE: BIOM 360 or BIOC 375 or BIOC 320 or BCH 380 or BCH 442 or BCH 444R. Fundamentals of virology with emphasis on animal viruses of medical importance. Molecular aspects of structure, replication transmission and host response to viral infection will be covered.

BIOM 441. Eukaryotic Pathogens. 4 Credits. (3 Lec, 1 Lab) S
PREREQUISITE: BIOM 360; recommend BCH 380; credit cannot be applied towards major requirements for both BIOM 427 and BIOM 441. The study of medically important parasite and fungal pathogens. Covers the biology, taxonomy, host-parasite relationships, pathogenesis, diagnosis and treatment of protozoan and helminth parasites; as well as of pathogenic fungi; with laboratory procedures in fungal isolation and identification.
BIOM 450. Microbial Physiology. 3 Credits. (3 Lec) F
PREREQUISITE: BCH 380, BIOM 360. An in-depth examination of microbial cell structure and function, bioenergetics, intermediary metabolism and its control, and the orchestration and regulation of cellular functions that enable microbes to adapt to and survive in their environment.

BIOM 452. Soil & Environmental Microbiology. 3 Credits. (3 Lec) S
PREREQUISITE: CHMY 143, ENSC 245IN. Microorganisms in soil environments: Focuses on soil microbial ecology, emphasizing relevant aspects of: i) microbial metabolism, physiology and genetics; ii) plant-microbe interactions; and iii) biotransformations of inorganic or organic contaminants.

BIOM 455R. Research Methods in Microbiology. 4 Credits. (3 Lec, 1 Lab) F,S
PREREQUISITE: BIOM 360 and BCH 380. Fundamentals of research methodology for undergraduate and graduate students in microbiology and related disciplines. Theory and application of techniques, reagents, and instrumentation will be emphasized in the lecture and laboratory. The emphasis in the course will be on recombinant DNA methodology, and the safe and effective use of radioisotopes.

BIOM 460. Infectious Diseases Ecology and Spillover. 3 Credits. (3 Lec) F
PREREQUISITE: BIOM 360 or BIOE 370 or consent of instructor. Disease Ecology is highly interdisciplinary and merges concepts from microbiology, immunology, evolution, mathematics, epidemiology, medicine, veterinary medicine, ecology, and geography. Thus this discipline is positioned to address major global health issues. Students will study questions such as: What factors, across molecular to landscape scales, must align to allow pathogens to jump from animals to humans? Why is monkeypox spillover increasing in West Africa as immunity to smallpox wanes? Why do wolves experience periodic outbreaks of distemper in Yellowstone? Why did Ebola recently spread through multiple West African countries, whereas previous outbreaks were restricted to small regions in Central Africa?

BIOM 465. Plant-Pathogen Interactions. 3 Credits. (3 Lec) S
Alternate Even Years PREREQUISITES: BIOB 160. This course is to teach students the molecular mechanisms by which plants and pathogenesis/insects interact during the progress of pathogenesis or resistance, the understandings of how plants recognize relatively conserved microbial patterns to active defense. Co-convened with PSPP 565.

BIOM 475R. Preveterinary Internship. 2-4 Credits. (2-4 Ind; 4 cr max) F,S,Su
PREREQUISITE: Junior standing and consent of instructor. An individualized assignment arranged with an agency, business, or other organization to provide guided experience in the field.

BIOM 490R. Undergraduate Research. 1-6 Credits. (1 Ind; 12 cr max) F,S,Su
Directed undergraduate research/creative activity which may culminate in a research paper, journal article, or undergraduate thesis. Course will address responsible conduct of research. May be repeated.

BIOM 491. Special Topics. 1-4 Credits. (1-4 Lec; 1 cr max) On Demand PREREQUISITE: Course prerequisites as determined for each offering. Courses not required in any curriculum for which there is a particular one-time need, or given on a trial basis to determine acceptability and demand.

BIOM 492. Independent Study. 1-3 Credits. (1 Ind; 6 cr max) On Demand PREREQUISITE: Junior standing, consent of instructor, and approval of department head. Directed research and study on an individual basis.

BIOM 494. Seminar/Workshop. 1 Credit. (1 Sem; 4 cr max) F,S
PREREQUISITE: BIOM 360 and junior standing. Senior capstone course. Topics offered at the upper division level which are not covered in regular courses. Students participate in preparing and presenting discussion material. When taken in the senior year, this course fulfills the senior capstone course requirement.

BIOM 497. Educational Methods: Microbiology. 2 Credits. (2 Lec) F,S,Su
PREREQUISITE: BIOM 431 and BIOM 432. Instruction and practice in effective teaching methods; practice in preparing laboratory materials, assisting a class and grading.

BIOM 498R. Biotech Internship. 1-4 Credits. (1-4 Ind) S
PREREQUISITE: Junior standing, consent of instructor, and approval of department head. An individualized assignment arranged with an agency, business, or other organization to provide guided experience in the field.

BIOM 499. Biotechnology Capstone. 2 Credits. (2 Sem) F,S
PREREQUISITE: BIOM 498R. Senior capstone course. Participants in this seminar section will bring closure to the student's required internship. Students will have the opportunity to refine their public speaking and writing skills through synthesis of the goals, progress, and outcome of their industrial or research laboratory experience. Exposure to many different types of internship outcomes will broaden the student's perception of the disciplines which contribute to the field of biotechnology.
Font Notice

This document should contain certain fonts with restrictive licenses. For this draft, substitutions were made using less legally restrictive fonts. Specifically:

Times was used instead of Adobe Garamond Pro.

The editor may contact Leepfrog for a draft with the correct fonts in place.