Microbiology, Molecular Biology and Biochemistry

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MMBB 154 Introductory Microbiology (3 cr)
May be used with MMBB 155 as core credit in J-3-b or J-3-d when taken with MMBB 155. Carries no credit after MMBB 250. May be taken by microbiology majors, but carries no cr after MMBB 250. Introduction to microorganisms and their role in disease, health, foods, and the environment; current topics in microbiology. (Spring only)

MMBB 155 Introductory Microbiology Laboratory (1 cr)
May be used with MMBB 154 as core credit in J-3-b or J-3-d when taken with MMBB 154. May be taken by microbiology majors but carries no credit after MMBB 255. Introductory laboratory training in basic microbiology; includes sterile technique, bacterial enumeration methods, culturing techniques, yogurt preparation and analysis, recombinant DNA techniques. Three hrs of lab a wk. (Spring only)
Coreq: MMBB 154

MMBB 250 General Microbiology (3 cr)
May be used with MMBB 255 as core credit in J-3-b. Introduction to nature and activity of bacteria and other microorganisms; their importance in all life systems. Three hrs of lec per wk. (Fall only)
Prereq: Chem 101 or 111

MMBB 255 General Microbiology Lab (2 cr)
May be used with MMBB 250 as core credit in J-3-b. Training in the handling of microscopes, basic lab equipment, and manipulation of microbes. Two 2-hr labs per week.
Prereq or **Coreq:** MMBB 250

MMBB 300 Survey of Biochemistry (3 cr)
Carries no credit after MMBB 380. Survey of structure, function, and metabolism of major constituents of living systems. (Fall and Summer only)
Prereq: Chem 101 or 111
Coreq: Chem 275 or 277

MMBB 380 Introductory Biochemistry (4 cr)
Carries one credit after MMBB 300. Introduction to the structure, function, and metabolism of major constituents of living systems. Three hrs lec and one hr with interactive problem solving. Recommended preparation: Chem 253 and 372. (Fall and Summer only)
Prereq: Chem 101 or 111, and 277

MMBB 382 Introductory Biochemistry Laboratory (2 cr)
Lab training in modern methods. One 3-hr lab and one 1-hr recitation a wk. (Fall only)
Prereq: Chem 101 or 111, and 278
Prereq or **Coreq:** MMBB 380 or Equivalent

MMBB 398 (s) Internship (1-3 cr, max 3)
Supervised internship in professional, non-University of Idaho settings, integrating academic study with work experience in the fields of microbiology, molecular biology or biochemistry; requires formal written plan of activities to be approved by academic advisor and departmental head before engaging in the work; a final report will be evaluated by on-campus faculty.
Prereq: Permission

MMBB 400 (s) Seminar (1cr, max arr)
May be used as a science elective after 1 required credit, up to a maximum of 4 credits,. Graded P/F.
Prereq: Permission

MMBB 401 Undergraduate Research (1-4 cr, max 8)
Individual study.
Prereq: Permission of instructor

MMBB 404 (s) Special Topics (cr arr)

MMBB J409/J509 Immunology (3 cr)
Carries no credit after MMBB WS426. Theory and mechanisms of the cellular basis of immune response; antibody structure, function, and synthesis; cell-mediated immunity; complement; hypersensitivity; immunologic diseases; transplantation; tumor immunity. Extra oral and/or written assignments required for graduate credit. (Fall only)
Coreq: MMBB 300 or 380

MMBB J412/J513 Pathogenic Microbiology (3 cr)

Epidemiology, host-parasite relationships, pathology, host response; treatment, prevention, and control of pathogenic microorganisms. Extra oral and/or written assignments required for graduate credit. (Spring, alt/yrs)
Prereq: MMBB 250

MMBB 416 Food Microbiology (3 cr)
See FS 416. (Fall only)

MMBB 417 Food Microbiology Laboratory (2 cr)
See FS 417. (Fall only)

MMBB J421/J521 Clinical Internship (12-16 cr, max 32)
Year long rotation in a hospital clinical laboratory. Basic science information and practical knowledge of clinical diagnostic tests in the areas of hematology, chemistry, and microbiology. Additional work will be required for MMBB 521, to be determined by graduate committee.
Prereq for 421**:** Microbiology major
Prereq for 521**:** Bachelor of Science degree in Microbiology or related degree
Coreq: Admission into a hospital or equivalent internship program

MMBB J422/J522 Cellular and Molecular Basis of Disease (3 cr)
Basic principles of cell biology explored in the context of human diseases. Emphasis on molecular mechanisms of cancer, Alzheimer 's disease and prion diseases. Extra oral assignment required for grad cr. Recommended Preparation for 422: MMBB 475. Recommended Preparation for 522: MMBB 575. (Fall only)
Prereq for 422: Biol 210 or Gene 314, and MMBB 380
Prereq for 522: MMBB 541

MMBB J425/J525 Microbial Ecology (3 cr)
Same as Soil J425/J525. Biogeochemical activities and relationships of microorganisms in soil, water, plants, and animals. Extra oral and/or written assignments reqd for grad cr. Recommended Preparation: MMBB 250, Math 137 or 143. (Spring, alt/yrs)

MMBB J432/J532 Virology (3 cr)
A survey of virology, with special emphasis on the molecular basis of replication, host-pathogen interactions and diseases associated with animal viruses. Extra oral and/or written assignments reqd for grad credit. Recommended preparation: MMBB 250. (Fall, alt/yrs)
Prereq: MMBB 380, Biol 210 or Gene 314 or permission

MMBB 440 Advanced Laboratory Techniques (4 cr)
Intensive hypothesis-driven laboratory course that will prepare the student for research in molecular biology; emphasis on areas of microbial physiology, microbial genetics, immunology, and pathogenic microbiology. (Spring only)
Prereq: MMBB 250

MMBB J442/J542 Advanced Biochemistry II (3 cr)
MMBB 542 same as Chem 542. Intermediate biochemistry; metabolism, molecular physiology, and molecular biology. Extra oral and/or written assignments required for grad credit. (Spring only)
Prereq: Chem 372; MMBB 380 or Chem 302 or 306; or Permission

MMBB ID-J450/J550 Molecular Mechanisms in Microbiology (2 cr) WSU MBioS 447
In-depth discussion of molecular mechanisms and different experimental approaches in microbiology. Extra oral and/or written assignments reqd for grad cr. Recommended Preparation: MMBB 380. (Spring, Alt/yrs)
Prereq: MMBB 250

MMBB J460/J555 Microbial Physiology (3 cr)
Concepts of microbial growth, metabolism, regulation, variation, structural-functional relationships. Extra oral and/or written assignments required for graduate credit. (Fall, alt/yrs)
Prereq: MMBB 250

MMBB J463/J563 Molecular Parasitology (3 cr)
Survey course exploring the cellular and molecular mechanisms utilized by human and animal parasites to develop, interact with their hosts and cause disease. Graduate students will have to produce a final written report or presentation on a research article. Recommended preparation: Biol 210 or Gene 314, and MMBB 475/575 or MMBB 422/522. (Spring only)
Prereq: MMBB 154 or 250, and MMBB 300 or 380, or Permission

MMBB J471/J571 Advanced Pathogenesis: Host Pathogen Interactions (3 cr)
How pathogens modify, disrupt or utilize cellular functions for their own purposes and the significance of these interactions in terms of both pathogenesis and host-cell biology. Pathogens that will be examined include viruses, bacteria, parasites, fungi and protozoa. Students will learn how to critically evaluate the scientific literature, develop hypotheses and design experiments to test these hypotheses. Students will gain a working knowledge of techniques currently being used to study hot-pathogen interactions. Additional oral and/or written assignments will be required for graduate-level credit. Recommended preparation: MMBB 412 and 432. (Fall, alt/yrs)
Prereq: MMBB 541 and MMBB 485 or MMBB 585; or Biol 210, MMBB 480 and MMBB 488 or MMBB 588

MMBB J475/J575 Cell Biology (3 cr)

Introduction to the organization and function of the major components of the eukaryotic cell; emphasis on the composition of cells, the structures and assembly processes of molecules that make up cells, diversity of cell types found in multicellular organisms, and how common interacting processes are coordinately controlled. Extra oral and/or written assignments reqd for graduate credit. (Spring, Alt/yrs)
Prereq: Biol 115 and either MMBB 300 or 380

MMBB J476/J576 Biophysical Chemistry (3 cr)
Basic principles and applications of physical chemistry as applied to biological processes. An emphasis will be placed on using thermodynamics to describe protein folding and stability and quantum mechanics to describe the principle spectroscopic methods used to study biological macromolecules. Additional oral and/or written assignments required for graduate credit. (Spring only)
Prereq for 476: Chem 372, Phys 112, MMBB 380, and MMBB 382
Coreq for 476: Math 170
Prereq for 576: MMBB 541

MMBB J482/J582 Protein Structure and Function (3 cr)
Detailed analysis of protein structure and function including enzyme activity, binding, folding and stability, and techniques for structure determination. Additional projects/assignments required for graduate credit. (Fall, alt/yrs)
Prereq for 482: MMBB 380
Prereq for 582: MMBB 541

MMBB J485/J585 Prokaryotic Molecular Biology (3 cr)
Current theory and experimental basis for prokaryotic DNA, RNA, and protein synthesis, gene regulation and cell wall metabolism. Extra oral and/or written assignments required for graduate credit. (Spring only)
Prereq: MMBB 250 and MMBB 380

MMBB J486/J586 Plant Biochemistry (3 cr)
Biochemistry of higher plants with an emphasis on physiology and molecular biology. Extra oral and/or written assignments reqd for grad cr. (Alt/yrs)
Prereq: MMBB 380

MMBB J487/J587 Eukaryotic Molecular Genetics (3 cr)
Molecular basis of genetics of eukaryotes. Extra oral and/or written assignments required for graduate credit. Recommended preparation: MMBB J485/J587 and MMBB J488/J588. (Fall only)
Prereq: MMBB 380 and Biol 210 or Gene 314

MMBB J488/J588 Genetic Engineering (3 cr)
Techniques and theory underlying practical genetic modifications of plants, microbes, and animals. Extra oral and/or written assignments required for graduate credit. Recommended Preparation: MMBB 380. (Fall only)
Prereq: Gene 314 or Biol 210

MMBB 490 Senior Thesis and Research (2 cr, max 4)
Problem solving using a combination of laboratory and/or library skills.
Prereq: Senior standing

MMBB 497 (s) Practicum in Teaching (2 cr)
Teaching by advanced students under faculty supervision.
Prereq: Permission

MMBB 498 (s) Internship (1-3 cr, max 3)
See MMBB 398 for description.
Prereq: Permission

MMBB 499 (s) Directed Study (cr arr)

MMBB 500 Master's Research and Thesis (cr arr)

MMBB 501 (s) Seminar (1 cr, max arr)
A maximum of 2 cr may be counted toward an M.S. degree and a maximum of 4 cr toward a Ph.D. Graded P/F.
Prereq: Permission

MMBB 502 (s) Directed Study (cr arr)
Areas normally offered are: molecular biology, microbiology and biochemistry.
Prereq: Permission

MMBB 504 (s) Special Topics (cr arr)

MMBB 507 Master's Degree Rotation (1 cr, max 3)

Incoming MS students receive a grade for laboratory rotations. The grade is based on performance in the laboratory and on a public seminar at the end of the rotation semester. Recommended Preparation: Undergraduate degree in Microbiology, Biochemistry or related topic.

MMBB 509 Immunology (3 cr)
See MMBB J409/J509.

MMBB 511 Research and Curriculum Progress (1 cr, max arr)
Required of all graduate students one semester per year. The grade is based on preparation of an oral and written presentation of research goals and coursework for the completion of the degree. A letter grade is assigned by committee members at the time of the student's graduate committee meeting. Recommended preparation: Undergraduate degree in Microbiology, Biochemistry or related topic.

MMBB 513 Pathogenic Microbiology (3 cr)
See MMBB J412/J513.

MMBB 520 Instrumental Analysis (2 cr)
Theory and techniques involved in the use of various instruments in modern biological laboratories; topics include chromatography, spectrometry, sterilization, sample preparation, radioisotope techniques, electrophoresis, centrifugation, and fermentation. (Spring only)
Prereq: Permission

MMBB 521 Clinical Internship (12-16 cr, max 32)
See MMBB J421/J521.

MMBB 522 Cellular and Molecular Basis of Disease (3 cr)
See MMBB J422/J522.

MMBB 525 Microbial Ecology (3 cr)
See MMBB J425/J525.

MMBB 532 Virology (3 cr)
See MMBB J432/J532.

MMBB 541 Biochemistry (3 cr)
Max 7 cr in any combination of MMBB 380, 480, 541, and 542. Intermediate biochemistry; intro to metabolism and the chemical and physical properties of biomolecules. (Fall only)
Prereq: Chem 372; MMBB 380 or **Coreq:** Chem 302 or 306; or Permission

MMBB 542 Advanced Biochemistry II (3 cr)
See MMBB J442/J542.

MMBB 550 Molecular Mechanisms in Microbiology (2 cr)
See MMBB J450/J550.

MMBB 555 Microbial Physiology (3 cr)
See MMBB J460/J555.

MMBB 563 Molecular Parasitology (3 cr)
See MMBB J463/J563.

MMBB 571 Advanced Pathogenesis: Host Pathogen Interactions (3 cr)
See MMBB J471/J571.

MMBB 575 Cell Biology (3 cr)
See MMBB J475/J575.

MMBB 576 Biophysical Chemistry (3 cr)
See MMBB J476/J576.

MMBB 582 Protein Structure and Function (3 cr)
See MMBB J482/J582.

MMBB 585 Prokaryotic Molecular Genetics (3 cr)
See MMBB J485/J585.

MMBB 586 Plant Biochemistry (3 cr)
See MMBB J486/J586.

MMBB 587 Eukaryotic Molecular Genetics (3 cr)

See MMBB J487/J587.

MMBB 588 Genetic Engineering (3 cr)
See MMBB J488/J588.

MMBB 589 Advanced Topics in Molecular Biology, Microbiology and Biochemistry (2 cr, max 4)
Recent research in enzymes, hormones, complex lipids, vitamins, nucleic acids, antibiotics, viruses, and MMBB genetics.
Prereq: Permission

MMBB 590 Teaching Practicum (2 cr)
Teaching by master's students under faculty supervision.
Prereq: Permission

MMBB 591 Teaching Practicum (2 cr, max 4)
Teaching by Ph.D. students under faculty supervision.
Prereq: Permission

MMBB 598 (s) Internship (1-3 cr, max 3)
See MMBB 398 for description. Graded P/F.
Prereq: Permission

MMBB 599 (s) Non-thesis Master's Research (cr arr)
Research not directly related to a thesis or dissertation.
Prereq: Permission

MMBB 600 Doctoral Research and Dissertation (cr arr)

MMBB 607 Doctoral Degree Rotation (1 cr, max 3)
Incoming PhD students receive a grade for laboratory rotations. The final grade is based on performance in the laboratory and on a public seminar at the end of the rotation semester. Rotation students are assigned to the department head. Recommended Preparation: Undergraduate degree in Microbiology, Biochemistry or related topic.
Prereq: Enrollment in a doctoral program