**HBM 503: Molecular Genetics**

Introduces the classical work and current developments in lower and higher genetic systems. Covers gene structure and regulation in prokaryotic and eukaryotic organisms, mutational analysis and mapping, transposable elements, and biological DNA transfer mechanisms. Bacteriophage as well as lower and higher eukaryotic systems are used to illustrate aspects of molecular genetic structure and function. This course is offered as both MCB 503 and HBM 503. Prerequisite: matriculation in graduate program or permission of instructor.

**Fall**, 3 credits, Letter graded (A, A-, B+, etc.)

**HBM 509: Experimental Microbiology and Immunology**

An introduction to modern microbiological research. The selection of laboratories is made in consultation with the student's advisory committee. By taking part in ongoing projects the student will learn experimental procedures and techniques and become acquainted with research opportunities in the department. Prerequisites: Matriculation in a graduate program and permission of the graduate studies director and the lab director.

**Fall**, 1-8 credits, S/U grading

**HBM 522: Biology of Cancer**

A short course with the emphasis on cancer as a disease of man. Lectures address human cancer as seen by the clinician and as basic research relates to human disease. This course provides students with a link between courses in cell and molecular biology and the application of this basic information to tumor management. Offered as HBM 522 and HPH 659. Offered Spring.

2 credits, Letter graded (A, A-, B+, etc.)

**HBM 599: Graduate Research in Microbiology and Immunology**

Original investigations under faculty supervision. Prerequisite: Permission of instructor.

Fall and Spring, 1-9 credits, S/U grading. May be repeated for credit.

**HBM 640: Molecular Mechanisms of Microbial Pathogenesis**

This course covers the principles and molecular mechanisms of pathogenesis of a selected group of the best understood viral and bacterial pathogens. A major focus of the course relates to pathogen modification of host extracellular and intracellular signalling events, as well as pathogen-host interactions pertaining to the innate, humoral and cellular responses to infection. The material is presented by invited lecturers who are leaders in their fields. This course is directed to graduate students, post-doctorate and medical fellows, and advanced medical students, who are contemplating careers in infectious disease research. Prerequisite: HBM, BMO 503 and BMO 520.

3-4 credits, Letter graded (A, A-, B+, etc.)

**HBM 691: Readings in Microbiology and Immunology Literature**

Readings in microbiology literature covering areas of molecular biology and genetics. Prerequisite: Permission of instructor. Fall, 1 credit. Letter graded (A, A-, B+, etc.) May be repeated for credit.

**HBM 692: Experimental Methods in Microbiology and Immunology**

The goal of this course is to introduce students to the rationale underlying the wide array of new methods in biology, as well as to promote the critical analysis of scientific literature. Lectures will be given about various scientific methods and approaches, and journal articles relating to the concepts introduced will be assigned. A separate discussion section will be held to review and critique the articles, to be led by the students.

1 credit, Letter graded (A, A-, B+, etc.)

**HBM 693: Research Proposal Preparation in Molecular Genetics and Immunology**

A course, based upon the literature in molecular genetics and microbiology, to instruct students in scientific writing and the preparation of research proposals. The course will be organized in three parts. In the first section of the course, students will become familiar with the components of the research proposal and will read and evaluate proposals written by the training faculty. Lectures given by the course co-directors will cover the basics of scientific writing, research proposal preparation and the problems and concerns commonly voiced by reviewers of research proposals. In the second section, students will develop two short proposals in the area of molecular genetics and microbiology that are unrelated to their graduate research. One of these short proposals will be selected for development into a full proposal. In the third section, students will develop and write the full proposal. The students’ skills in proposal preparation will be enhanced by critiquing the short and full proposals presented by other students in the second and third sections of the course.

Offered Spring, 1-3 credits, Letter graded (A, A-, B+, etc.)

**HBM 696: Professional Development in Microbiology and Immunology**

In a joint credit-bearing course, 12 students (at the advanced Bachelor and beginning Master level) from three partner institutions will develop a 360°-view of six different pandemics that occurred in human history: Tuberculosis, Influenza, Dengue, SARS/Covid 19, HIV, antimicrobial resistance. Each pandemic will be covered by one expert who also serves as a mentor for the students. Expert-mentors will be recruited from the partners' networks. Six international student pairs will each explore one pandemic and compare its consequences as well as measures taken against them in different parts of the world. In addition, students will gain insights into public health institutions (WHO, CDC, RKI etc.). Students will get different perspectives on pandemics, which are of global concern, while measures against them are usually taken on a national level.

0-1 credits, Letter graded (A, A-, B+, etc.) May be repeated 6 times FOR credit.

**HBM 697: Pandemics in Human History**

In a joint credit-bearing course, 12 students from three partner institutions will develop a 360°-view of six different pandemics that occurred in human history: Tuberculosis, Influenza, Dengue, SARS/Covid 19, HIV, antimicrobial resistance. Each pandemic will be covered by one expert who also serves as a mentor for the students. Expert-mentors will be recruited from the partners' networks. Six international student pairs will each explore one pandemic and compare its consequences as well as measures taken against them in different parts of the world. In addition, students will gain insights into public health institutions (WHO, CDC, RKI etc.). Students will get different perspectives on pandemics, which are of global concern, while measures against them are usually taken on a national level.

1-2 credits, Letter graded (A, A-, B+, etc.)
HBM 700: Dissertation Research off Campus - Domestic
Prerequisite: Must be advanced to candidacy (G5). Major portion of research will take place off-campus, but in the United States and/or U.S. provinces. All international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor.

Fall, Spring, Summer, 1-9 credits, S/U grading
May be repeated for credit.

HBM 701: Dissertation Research off Campus - International
Prerequisite: Must be advanced to candidacy (G5). Major portion of research will take place outside of the United States and/or U.S. provinces. Domestic students have the option of the health plan and may also enroll in MEDEX. International students who are in their home country are not covered by mandatory health plan and must contact the Insurance Office for the insurance charge to be removed. International students who are not in their home country are charged for the mandatory health insurance. If they are to be covered by another insurance plan they must file a waiver by second week of classes. The charge will only be removed if other plan is deemed comparable.

All international students must receive clearance from an International Advisor.
Fall, Spring, 1-9 credits, S/U grading
May be repeated for credit.

HBM 800: Full-Time Summer Research
Full-time laboratory research projects supervised by staff members.
0-1 credits, S/U grading
May be repeated for credit.