**MCB**

**Molecular and Cellular Biology**

**MCB 500: Directed Readings in Molecular and Cellular Biology**
Directed readings in topics of current interest, under supervision of a faculty sponsor. Prerequisite: matriculation in MCB graduate program or permission of instructor.

Fall and Spring, 1-3 credits, Letter graded (A, A-, B+, etc.)
May be repeated for credit.

**MCB 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.)

**MCB 509: Experimental Molecular & Cellular Biology**
An introduction to modern biochemical research techniques. The student spends a half term in the laboratory of each of four different members of the staff selected in consultation with the course director. In each laboratory the student participates in some aspect of the ongoing research pursued by the faculty member. Prerequisite: matriculation in MCB graduate program or permission of instructor.

Fall and Spring, 1-4 credits, Letter graded (A, A-, B+, etc.)

**MCB 510: Experimental Molecular & Cellular Biology**
An introduction to modern biochemical research techniques. The student spends a half term in the laboratory of each of four different members of the staff selected in consultation with the course director. In each laboratory the student participates in some aspect of the ongoing research pursued by the faculty member. Prerequisite: matriculation in MCB graduate program or permission of instructor.

Fall and Spring, 1-4 credits, Letter graded (A, A-, B+, etc.)

**MCB 517: Biomembranes**
Examines the molecular architecture of membranes; the structure, organization, functions, and assembly of lipids and proteins in biological membranes.

Prerequisite: Matriculation in Graduate Program or permission of instructor.

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

**MCB 520: Graduate Biochemistry I**
Several topics in modern biochemistry are treated at an advanced level. Topics covered will include protein structure, enzyme kinetics and mechanisms, and enzyme regulation.

Prerequisite: undergraduate biochemistry course, matriculation in graduate program or permission of instructor.

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

**MCB 531: Graduate Seminar in Molecular & Cellular Biology**
Seminars are given by graduate students on current literature in the fields of biochemistry, molecular biology, cell biology or developmental biology. Prerequisite: matriculation in graduate program or permission of instructor.

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

**MCB 532: Graduate Seminar in Molecular & Cellular Biology**
Seminars are given by graduate students on current literature in the fields of biochemistry, molecular biology, cell biology or developmental biology. Prerequisite: matriculation in graduate program or permission of instructor.

Spring, 1 credit, Letter graded (A, A-, B+, etc.)
May be repeated 3 times FOR credit.

**MCB 550: Entering Mentoring**
This seminar series is designed for graduate students and postdoctoral researchers of biology who may become science faculty. The goal is to help them become effective mentors through discussions, collective experiences, and novel strategies to improve mentoring skills. This course is comprised of eight one-hour sessions in which topics related to the role and responsibilities of a mentor are discussed. Topics touch on ethical, intellectual, personal, and interpersonal issues that are associated with effective mentoring. Prerequisite: Must be MCB graduate student or permission of instructor. Summer only, 1 credit, S/U grading

1 credit, S/U grading

**MCB 555: Big Data in Biology**
An introduction to big data in biology, with an emphasis on the concepts, research questions, methods, and data analysis. Particular emphasis is placed on sequencing methods and analysis, genomics, transcriptomics, proteomics, cellular networks, high-throughput phenotyping, and systems genetics.

2 credits, Letter graded (A, A-, B+, etc.)
May be repeated for credit.

**MCB 599: Dissertation Research**
Original investigation under the supervision of a member of the staff. Prerequisite: matriculation in MCB graduate program or permission of instructor.

Fall and Spring, 1-12 credits, S/U grading
May be repeated for credit.

**MCB 601: Colloquium in Molecular and Cellular Biology**
A weekly series of talks and discussions by visiting scientists covering current research and thinking in various aspects of molecular and cellular biology. Required for all MCB graduate students. Attendance is mandatory. Visitors welcome. Prerequisite: matriculation in MCB graduate program or permission of instructor.

Fall and Spring, 0-1 credits, S/U grading
May be repeated for credit.

**MCB 602: Colloquium in Molecular and Cellular Biology**
A weekly series of talks and discussions by visiting scientists covering current research and thinking in various aspects of molecular and cellular biology. Required for all MCB graduate students. Attendance is mandatory. Visitors welcome. Prerequisite: matriculation in MCB graduate program or permission of instructor.

Spring, 0-1 credits, S/U grading
May be repeated for credit.

**MCB 603: Student Seminar in Molecular and Cellular Biology**
Seminars given by MCB graduate students on the progress of their own thesis research. Required of all students every term in which they are registered in Graduate Studies in Molecular Biology and Biochemistry. Attendance is mandatory. Visitors welcome. Prerequisite: matriculation in MCB graduate program or permission of instructor.

Fall, 1 credit, Letter graded (A, A-, B+, etc.)
May be repeated for credit.

**MCB 604: Student Seminar in Molecular and Cellular Biology**
Seminars given by MCB graduate students on the progress of their own thesis research. Required of all students every term in which they are registered in Graduate Studies in Molecular Biology and Biochemistry.
Attendance is mandatory. Visitors welcome. 
Prerequisite: matriculation in MCB graduate program or permission of instructor.

Fall, 1 credit, Letter graded (A, A-, B+, etc.)
May be repeated for credit.

**MCB 656: Cell Biology**
Introduction to the structural and functional organization of cells and tissues and to the way structure relates to function. Particular emphasis is placed on nuclear and chromosomal structure, signal transduction, protein translocation, the cytoskeleton and the extracellular matrix. The interaction of cellular structures and components and their regulation is stressed as is the organization and interaction of cells in tissues. The course is comparative and includes examples of cells and tissues from vertebrates, invertebrates, plants, and prokaryotic systems. Prerequisite: matriculation in graduate program or permission of instructor.

Spring, 3-4 credits, Letter graded (A, A-, B+, etc.)
May be repeated for credit.

**MCB 657: Principles of Development**
This course deals with developing systems at all levels from the morphological to the molecular. Illustrative material from both animal and plant kingdoms is used. Special attention is given to gametogenesis, genetic control of early development, transcriptional and translational control of protein synthesis, the role of cell division and cell movements, and cell-to-cell interactions in defining developing systems.

Prerequisite: MCB 656, matriculation in graduate program or permission of instructor.

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

**MCB 699: Dissertation Research on Campus**
Prerequisite: Must be advanced to candidacy (G5). Major portion of research must take place on SBU campus, at Cold Spring Harbor, or at the Brookhaven National Lab. Prerequisite: matriculation in MCB graduate program or permission of instructor.

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

**MCB 700: Dissertation Research off Campus - Domestic**
Prerequisite: Must be advanced to candidacy (G5), matriculation in MCB graduate program or permission of instructor. Major portion of research will take place on campus, but in the United States and/or U.S. provinces. Please note, Brookhaven National Labs and the Cold Spring Harbor Lab are considered on-campus.

All international students must enroll in one of the graduate student insurance plans and should be advised by an International Advisor. 
Prerequisite: matriculation in MCB graduate program or permission of instructor.

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

**MCB 701: Dissertation Research off Campus - International**
Prerequisite: Must be advanced to candidacy (G5) in MCB graduate program or permission of instructor. 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 and Spring, 1-9 credits, S/U grading
May be repeated for credit.

**MCB 800: Summer Research**
Prerequisite: matriculation in MCB graduate program or permission of instructor.

Summer, S/U grading
May be repeated for credit.