

# Biochemistry and Molecular Genetics (BCMG)

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## Courses

### **BCMG 307. Fundamentals of Biochemistry. 3 hours.**

Includes the chemistry of cellular constituents, enzymology, metabolism, and intracellular control and elements of molecular biology. Course Information: Prerequisite(s): General and organic chemistry. Lecture course intended primarily for advanced undergraduate students in associated health sciences.

### **BCMG 399. Undergraduate Laboratory Research. 1-4 hours.**

Laboratory research for advanced undergraduates. Course Information: Animals used in instruction. Satisfactory/Unsatisfactory grading only. May be repeated. Application of credit toward the degree is contingent upon the approval of the student's college and/or department. Prerequisite(s): Junior standing or above and consent of the instructor.

### **BCMG 411. Introduction to Biological Chemistry. 4 hours.**

Includes chemistry of cellular constituents; enzymology; metabolism of sugars, proteins, lipids, and nucleic acids; and regulation of metabolism. Course Information: Prerequisite(s): Organic chemistry. Lecture course designed primarily for students in the College of Dentistry. Class Schedule Information: To be properly registered, students must enroll in one Conference and one Lecture.

### **BCMG 501. Faculty Research Seminars. 1 hour.**

Faculty presentation of research areas within molecular genetics. Course Information: Satisfactory/Unsatisfactory grading only. Should be taken in the first year in the Ph.D. in Biochemistry and Molecular Genetics program. Prerequisite(s): Graduate standing in the Ph.D. in Biochemistry and Molecular Genetics program or consent of the instructor.

### **BCMG 502. Somatic Cell and Human Genetics. 4 hours.**

The genetics of somatic cells and advanced human genetics. Gene transfer, mutagenesis, drosophila genetics, genetic linkage and human disease, cancer genetics, and gene therapy. Course Information: Prerequisite(s): GCLS 501 or consent of the instructor.

### **BCMG 503. Research Methods in Biochemistry and Molecular Genetics. 5 hours.**

Laboratory course in experimental methods in biochemistry and molecular genetics. Course Information: May be repeated to a maximum of 10 hours. Prerequisite(s): Consent of the instructor. Open only to students entering as Ph.D. students in Biochemistry and Molecular Genetics.

### **BCMG 512. Experimental Design and Analysis in Molecular Genetics. 4 hours.**

Methods and logic in the analysis of gene function, gene cloning, analysis of genetic changes, studies of gene expression, design of experimental controls. Course Information: Prerequisite(s): GCLS 501 or consent of the instructor.

### **BCMG 513. Principles of Structure Determination and Analysis. 3 hours.**

Explores the relationship between structural stability, kinetic properties and function of biopolymers, with particular emphasis on proteins and nucleic acids. Course Information: Same as PMPG 513. Prerequisite(s): GCLS 501 and one year of physical chemistry, or consent of the instructor.

### **BCMG 514. Structure and Function of Nucleic Acids. 4 hours.**

Describes the structure and function of nucleic acids. Unravels the basic molecular mechanisms underlying heredity, including replication, transcription and recombination. Course Information: Prerequisite(s): GCLS 501 or consent of the instructor.

### **BCMG 515. Journal Club. 1 hour.**

Student presentation and critical analysis of recent journal articles and current topics in biochemistry and molecular genetics. Course Information: May be repeated. Prerequisite(s): Consent of the instructor.

### **BCMG 522. Strategies for Effective Scientific Communication. 1 hour.**

Development of critical skills for evaluation, development, and execution of forms of scientific communication, including research and grant proposals, manuscripts describing original research, and review summaries. Course Information: Satisfactory/Unsatisfactory grading only. Prerequisite(s): Consent of the instructor.

### **BCMG 526. Molecular and Genetic Analysis of Development. 3 hours.**

Examines developmental mechanisms used in animal model systems. Course Information: Same as BIOS 526. Prerequisite(s): Graduate standing or consent of the instructor.

### **BCMG 531. Medical Biochemistry and Nutrition. 3 hours.**

Chemistry of Biopolymers; enzymology; metabolism of carbohydrates, Lipids, amino acids and proteins; molecular biology. Course Information: Intended for first year medical students. Prerequisite(s): Membership in the College of Medicine (COM) M1 medical school class. Intended/available only for first year medical students registered in the COM.

### **BCMG 533. Nutrition for Medical Students. 2 hours.**

Biochemical and nutritional basis of disease including heart disease, hypertension, obesity, malnutrition, and cancer. Course Information: Prerequisite(s): BCMG 531 and BCMG 532 and membership in the medical school or consent of the instructor. Intended primarily for medical students.

### **BCMG 561. Biochemistry of Cellular Regulation. 3 hours.**

Membrane structure and function, transport, receptor and signal transduction mechanisms and growth factors. Cytoskeleton and motility, cell-cell communication, enzyme cascades and cellular control mechanisms.

### **BCMG 563. Principles of Molecular Medicine. 3 hours.**

A lecture/discussion/writing course which integrates biochemical and molecular biological concepts into a clinical context. Diseases will be described in terms of molecular mechanisms. Course Information: Prerequisite(s): Consent of the instructor.

### **BCMG 575. Topics in Biochemistry and Molecular Genetics. 3 hours.**

Students will be exposed to, present, and discuss recent scientific literature in biochemistry and molecular genetics. Course Information: May be repeated. Prerequisite(s): Completion of the first year of the program and consent of the instructor. Class Schedule Information: To be properly registered, students must enroll in one Discussion and one Lecture.

### **BCMG 594. Special Topics in Biochemistry and Molecular Genetics. 1-3 hours.**

Topics of current interest in the field of biochemistry and molecular genetics, and may include protein structure, membrane proteins and trafficking, development and gene regulation, signal transduction, and cancer biology. Course Information: May be repeated to a maximum of 6 hours. Students may register in more than one section per term. Prerequisite(s): Consent of the instructor.

**BCMG 595. Student Research Seminars. 1 hour.**

Research presentations by graduate students in the biochemistry and molecular genetics program. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. Prerequisite(s): Consent of the instructor.

**BCMG 598. Masters Thesis Research. 0-16 hours.**

Investigation carried out by M.S. candidate under the direction of a faculty member leading to the M.S. in Biochemistry and Molecular Genetics. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. Prerequisite(s): Consent of the instructor.

**BCMG 599. Ph.D. Thesis Research. 0-16 hours.**

Independent dissertation research by the student, under the guidance of the adviser. Course Information: Satisfactory/Unsatisfactory grading only. May be repeated. Prerequisite(s): Advanced standing in the Ph.D. in Biochemistry and Molecular Genetics program.