MOLECULAR BIOLOGY, BIOCHEMISTRY AND BIOINFORMATICS (MBBB)

Courses

MBBB 201 PROGRAMMING FOR BIOLOGISTS (4)

An overview of basic programming concepts for automating biological data analysis, specifically biological sequence data. Concepts covered include computer software and hardware, operating systems, software development life cycle, data types and data representation, arithmetic and logical operations, conditional execution, iteration, functions, and arrays. Python is used to build working programs, and emphasis is placed on designing and executing programs for Bioinformatics applications. Prerequisite: declared MBBB major or department consent.

MBBB 301 INTRO TO BIOINFORMATICS (4)

Fundamental principles of bioinformatics, including searching genomic and protein databases, sequence alignment, multiple sequence alignment, protein structural analysis, graphical tools for studying protein structures, RNA databases and RNA structure prediction, functional genomics, including analysis of gene expression data. Prerequisite: BIOL 309 or CHEM 351.

MBBB 315 GENOMICS (3)

The study of genes, their expression within a cell and how they interact with cellular components. An overview that details how genes within living systems operate and affect living populations. Topics include sequencing of genomes, genome organization, evolution and genomic changes, genomic identification and annotation, gene and genome circuits, synthetic biology, proteomics and systems biology. Prerequisite: BIOL 309.

MBBB 401 ADVANCED BIOINFORMATICS (3)

Advanced topics in bioinformatics, and the use of computational tools in simulation, animation, modeling and visualization of biological data. Techniques such as statistical analysis, data mining, databases, and data warehousing are covered. Prerequisites: MBBB 301 and COSC 237.

MBBB 490 HONORS RESEARCH IN MOLECULAR BIOLOGY, BIOCHEMISTRY, AND BIOINFORMATICS (2)

Individual research under the direction of a faculty member, culminating in an honors thesis. Credit for MBBB 490 not awarded until MBBB 491 is successfully completed. Prerequisites: Open only to advanced honors candidates and by consent of MBBB Program Director. Repeatable for a total of 4 units towards the major.

MBBB 491 SENIOR THESIS IN MOLECULAR BIOLOGY, BIOCHEMISTRY, AND BIOINFORMATICS (2)

Writing of an honors thesis based on an individual research done under the direction of a faculty member. Prerequisites: Open to advanced honors candidates and by consent of MBBB program director.

MBBB 493 SEMINAR IN BIOETHICS (1)

Ethical and legal issues associated with current trends in molecular biological, biochemical and bioinformatics research. Prerequisite: BIOL 309.

MBBB 495 CAPSTONE PROJECT IN MBBB (3)

Instructor led class/group project in Molecular Biology, Biochemistry and Bioinfromatics. Projects emphasize the interdisciplinary nature of the major. Repeatable for a maximum of six units. Prerequisite: senior standing in MBBB major or department consent.

MBBB 499 HONORS THESIS IN MBBB (2)

Writing of an honors thesis based on individual research done under the direction of a faculty member. Prerequisites: open to advanced honors candidates and by consent of MBBB program director.