

2007 MBG 8680 - Computer Applications in Molecular Genetics  
Center for Molecular Medicine & Genetics

Course Directors: Dr. David D. Womble, CMMG  
Dr. Derek Wildman, CMMG

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Ms. E. Marks, Shiffman Medical Library  
Dr. D. Wildman, CMMG  
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Location: Shiffman Medical Library, Room 217 (2<sup>nd</sup> Floor Lab)

Time: June 18 - June 29, 2007 - 9:30 a.m. to 12:00 noon

Credits: 1

This course will provide graduate students with the opportunity to become familiar with the basic use and concepts of the CMMG computer facility, the Shiffman Medical Virtual Library, and various INTERNET resources. The students will be introduced to the UNIX operating system. Access to resources on the INTERNET will utilize NETSCAPE. This intensive laboratory course will provide extensive hands-on training. Topics that will be covered include the GCG analysis suite, and the analysis of microarrays. The Virtual Library, NCBI, sequence and text-based database searching, biostatistics, identifying repetitive elements, multiple sequence alignment, computer prediction of biological meaningful sequence segments and accessing the human genome databases. Effective use of the Virtual Library will also be demonstrated where students will be introduced to the major bibliographic databases for obtaining access to the molecular biology and genetics research literature, along with methods for the efficient searching of these databases. The library staff will introduce access to major databases including PubMed (MEDLINE) and BIOSIS; citation searching and analysis; and bibliographic management (EndNote). Students will be introduced to the Perl scripting language. Basic statistical theory will be introduced using examples from modern genetic analyses. The students will also be given the opportunity to learn basic SPSS and R programming skills. Each session will begin with an overview, followed by a hands-on demonstration and an example problem. The students will then be expected to solve a related problem at the end of each daily session. Course evaluation will be based on daily assignments and the solution to a complex problem by the end of the course, including a written report. "Introduction to Bioinformatics," edited by S. A. Krawetz and D.D. Womble, Humana Press, 2003 will be used as course text. Enrollment is by permission of the instructors only. **All students are expected to possess a working knowledge of MS-Windows-based sequence editing, Email, file transfer, and Netscape prior to the first instructional session.**

EVALUATION: 50% daily assignments; 50% Final Report