

**Course: FUNCTIONAL GENOMICS - BNFO 391**

**Place:** Trani Life Science Building (room 221)

**Time:** Tue, Thu, 2-4:45 pm

**Dates:** Aug 22 – Dec 11, 2023

**Instructor:** Dr. Peter Uetz  
Harris 3136  
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<http://uetz.info>

**Office hours:** by appointment

**Recommended text:** original research articles and reviews, Wikipedia articles (to be announced, also determined by students' choice of topics)

**Course Goal:** Students will learn some essential techniques for the functional analysis of genes, especially genes of unknown function. This course provides students with a true research experience. Each student will be assigned about 5-10 genes s/he will study experimentally by cloning the gene, expressing the protein in bacteria and determine how the protein effects cell growth and infection by other phage. If time permits, students will also investigate protein-protein interactions of their protein and how this allows us to study protein function. None of the proteins used in this class have been studied before, at least not experimentally, hence this is a real research project without known outcome.

In order to document their background research and the current state of knowledge, students will write and publish a **Wikipedia** page or section.

Students will also **present** their project, their progress, and the results of their study to the class.

**Student learning outcomes:** At the completion of this course, a successful student will be able to:

- Develop a hypothesis on protein function, based on bioinformatic analysis
- Conduct a research project to test a hypothesis
- Use microbiological / molecular biology techniques to study gene function
- Use appropriate methods for collecting scientific data
- Use calculations and methods to interpret and analyze data
- Actively participate as a member of a research team
- Write a research report / Wikipedia article
- Lead a discussion from the primary literature in the field
- Create an oral research presentation

**Pre-requisites.** BNFO 251/252 or other class in molecular biology, genetics, or biochemistry recommended but not required.

**Grading:** 20% - Attendance/participation / Wikipedia article  
40% - Project documentation, lab notebook, data cards  
20% - mid-term quiz  
20% - final exam (questions on phage, molecular biology, techniques)  
bonus points for good presentation(s)

**Grading Scale\*:** 90 to 100 = A  
75 to <90 = B  
60 to <75 = C  
50 to <60 = D  
Below 50 = F

\* subject to change

**Class Attendance and Time Expectations:** You are expected to attend every class / and to spend 1-2 hours every week outside of the class doing research and working on your reports and ideally, a Wikipedia article. Each student is expected to give a short presentation on their chosen subject and why their Wikipedia subject (article) needs work.

**Lab notebooks.** Your lab notebook will be a central part of this course. Students are welcome to use paper notebooks, but all experimental data will be recorded online at the SEA-GENES Wiki: <https://wiki.vcu.edu/display/phagelab/SEA+GENES>

**Wikipedia:** You will write an article, edit one substantially, or write a new section of an existing article. You are expected to add the equivalent of 1/2 page of text ( $\geq 200$  words), 2 figures or 1 figure and one table.

**Presentation:** the presentation is optional and not directly graded, but if well done, may count as a bonus and lift your grade.

**Dress Code and lab rules:** Lab work requires lab coats and goggles. Do not wear flip flops in the academic and research laboratories. Closed-toe shoes are required. No eating or drinking is allowed in the labs.

### **Full general syllabus statement**

Please visit <http://go.vcu.edu/syllabus> and review all syllabus statement information. The full university syllabus statement includes information on safety, registration, the VCU Honor Code, student conduct, withdrawal and more.