

Biosciences 702: Research Methods  
Bull Run Hall, room 249  
Tuesdays, 7:20 pm - 10:00 pm

Karl J. Fryxell

Office hours: Wednesdays, 2-4 pm, Discovery Hall 305

Office phone: (703) 993-1069

Course web site: <http://mason.gmu.edu/~kfryxell/bios702.htm>

**Course Goals:** Graduate-level research requires that students be able to move easily from one topic to another, that is independently navigate the primary research literature and become conversant with new research topics at a high level of understanding. Students must also be able to critically evaluate and present basic research papers, as well as their own work. This course provides an introduction to these and other skills needed in graduate research - including how to find, read (and write!) scientific papers, how to design and analyze experiments, how to prepare (and present!) a talk at a scientific meeting, how to write a grant proposal (or a dissertation proposal!). We will also discuss administrative matters such as expectations for graduate students, how to utilize various GMU resources for students, and how to navigate the university bureaucracy (and graduation requirements!). Finally, we will have invited lectures by departmental faculty who will discuss their research and research opportunities in their labs.

**Grading:** Assigned readings and/or homework assignments will be posted on the course web site. Quizzes will be given during most (or all) class meetings, and will cover the material for that day (including assigned reading). Students will select a scientific paper to present and a topic for a grant proposal (both are subject to approval by the instructor), in the NIH R21 format. Grade allocation: daily quizzes, 20%; student (peer) evaluations of two presentations, 10%; acceptable topics for presentations decided on time, 10%; instructor evaluations of two presentations, 20%; written grant proposal, 40%.

August 26 - Introduction

September 2 - Scientific reading and writing (Karl Fryxell). Topics due to instructor.

September 9 - GMU program requirements & resources (Diane St. Germain)

September 16 - How to use GMU science library resources (Victoria Shelton)

September 23 - Office of Laboratory Safety (TBA)

September 30 - Experiments with human subjects and/or animal subjects (Sandy Sanford)

October 7 - faculty research talks

October 14 - Columbus Day Recess

October 21 - faculty research talks

October 28 - faculty research talks

November 4 - faculty research talks

November 11 - How to design an experiment - or a grant proposal (Karl Fryxell)

November 18 - Presentations of student research papers (time limit is 10 min each).

November 25 - Thanksgiving Recess

December 2 - Presentations of student grant proposals (time limit is 10 min each). Written grant proposals due to instructor (late penalty is 10% per day).