Information on Biology Research courses (BIO 93 and BIO 193) for Fall 2015

**Biology 93 Introduction to Research.**
At least 10 hours per week of guided laboratory research, generally including one hour of consultation or seminar with the research sponsor, and a research paper. Details of the individual project to be arranged with the research sponsor. Provides students with an opportunity to participate in biological research - usually at the Tufts campus in Medford or Boston, but sometimes at other institutions by special arrangement. **Cannot** be counted as one of the eight graded courses required for a biology major. Pass/Fail grading.

**Biology 193 Independent Research.**
The department feels that the 8 biology courses required for the major should be well distributed in the field of biology. Therefore, normally one course in Biology 193, 194 will be accepted as one of these 8. The student may take courses in Biology 193, 194 beyond these limitations and count them for credit toward graduation but not toward the biology major. One course under 193, 194 can be used to fulfill the biology department requirement for laboratory courses. At the semester's end the student must deliver to his/her sponsor and members of the 193/194 review committee (4 faculty members) copies of a paper concerning his or her semester's work. This should follow the format of a scientific paper. During the reading period following the last class of the semester, the student will meet with this same review group to present and discuss his/her work, and they will jointly award the grade for the course. The presentation should be a 10-15 minute review of the work already described in the written summary followed by questions, discussion of details, etc., lasting another 5-10 minutes. The exact time for each session will be posted prior to the end of classes. The oral presentation will be open to all interested faculty and students. Normally 15 hours per week in the laboratory equals one course credit. The grade is based upon the intellectual quality of the work including the paper and oral presentation.

**Common Questions and Answers Regarding Biology Research Courses (Bio 93/94 and 193/194)**

Q. What is the difference between Biology 93 and 94? Biology 193 and 194?
A. (1)93 refers to the course in the Fall. (1)94 refers to the course in the Spring.

Q. Can I take Biology 93 and 94?
A. Yes, if you have a research mentor who has agreed to mentor you for both semesters, than you can take both classes.

Q. Do I have to take Biology 93 or 94 before I take Bio193/194?
A. No, you don’t technically have to have completed Biology 93 or 94. However, we do require that you have had a comparable research experience. Therefore, if you had a comparable experience that was not used for credit, it may count. You will need to discuss your experience with your current research mentor to determine if you are prepared for Biology 193/194.

Q. Can I take Biology 193 or 194 more than once?
A. Yes! Many students take a full year of Biology 193/194. Only one course will count towards the major.

Q. What are the main differences between Biology 93/94 and Biology 193/194?
A. Biology 93/94 is an introductory research experience. This course is appropriate for people who are new(er) to scientific research. The minimum requirement is 10 hours of research per week, totally 130 hours over the semester. At the end of the semester, you are required to submit a 5-10 page research paper to course coordinator. The course is graded pass/fail. Biology 193/194 is for students who have had previous research experience and are now prepared for a more independent project. Students work at least 15 hours per week over the course of the semester. In addition to the 8-15 page paper, students are required to give a short 15-minute presentation describing the research project to a group of Biology department faculty (and any invited guests). After the talk, students have an opportunity to field questions from the audience. The course is letter graded and fulfills the laboratory requirement for the Biology major.
Q. Does Biology 93/94 count towards the Biology major?
A. No. Biology 93/94 is graded Pass/Fail. Pass/Fail courses are not counted towards the major.

Q. Do you give credit for clinical research?
A. No, we do not give credit for strictly clinical research. If you are not sure if your research is appropriate for credit, you can email a brief description of your project to the course coordinator.

Q. What do I have to do before I sign up for Bio93/94 or Bio193/194?
A. First things first – you need to find a research mentor. If you already have a research mentor who has agreed to have you in the lab, then you need to register for the class on iSIS and complete the course information form. Once you register, the form will be available to you on the course Trunk site. If the current Trunk site is not yet available, the course coordinator will email you with the information form once registration is completed.

Q. Do I have to meet with the course coordinator?
A. No, you are not required to meet with course coordinator. If you have specific questions, you can either send an email, attend office hours, or schedule a meeting. The course coordinator’s office hours are posted on the department website.

Q. I don’t have a research mentor! How can I find one?
A. Congratulations on your decision to want to pursue a research experience. Finding a research mentor takes some time and persistence. If you are interested in working with someone in the biology department, take a look at the research interests of particular department mentors. Read their webpages. Email them expressing your interest and schedule a meeting. Some labs will be full already. Don’t get discouraged! Keep pursuing different avenues.

Q. When should I approach a professor regarding working in the lab.
A. It’s never too early! Labs can fill up early so, for example, you really want to find a lab for the Spring semester during the early Fall or even earlier.

Q. Can I work with someone outside of the Biology Department? Or even outside of Tufts?
A. Absolutely! If you are doing biology research and following the guidelines for the course, you can work in labs outside of the department. For example, students have worked with appropriate labs in Psychology, Chemistry, and Biomedical Engineering. You can also work at the downtown medical school campus. Students have also worked in labs outside of Tufts in the Boston area. The key is making sure that the commute works with your schedule.

Q. My experiments did not work very well, and I don’t have any data. Do I have to drop the course?
A. Absolutely not! This is probably the most common question we get. Experiments don’t always work (it’s science, isn’t it?). What is most important is that you can explain the research project and the goals of the project. You should be able to explain the experimental procedures and your predicted results. We are looking to see that you understand the goals of your project, the science, and the techniques behind it.

Q. I have tons of data. There is no way to fit it into the page restrictions. Can I just keep writing?
A. No! We all are given page length restrictions for any project, grant, etc. For Bio93/94, the limit is 5-10 pages double-spaced (excluding figures and references). For Bio193/194, the limit is 8-15 pages double-spaced (excluding figures and references). Longer papers will not be evaluated.

Questions? Please email the Bio 93/193 course coordinator for Fall 2015, Dr. Chew, at fchew@tufts.edu