

**Shelagh Campbell, Associate Professor, Department of Biological Sciences**

**GENET275, Course title: Advanced Genetic Analysis.**

The objective of this course is for students to learn how genetic techniques are used for studying fundamental biological processes, focusing on examples of animal development and disease. The course content emphasizes practical strategies for effectively using genetic strategies and techniques that are relevant to many different areas of biological and biomedical research.

**Goals for improving the course:**

I taught this course for the first time last winter after substantially revising the course content to make it more current and less redundant with other Genetics courses in our program. Consequently, I was able to develop my syllabus from the beginning to incorporate the student response system technology.

After teaching with these “clicker” student response systems for one term, I am already convinced that this is an excellent tool for encouraging students to engage in-class in “active learning” by asking them questions that make them have to “think” like a geneticist. The increase in student involvement was quite obvious, including many more questions raised to clarify concepts that students realized they didn’t really understand. I found this made the classes more interesting and helped me to identify points that I needed to make more clearly, though some students found the question breaks disruptive (they could get rowdy).

There is still plenty of room for improvement in course content and development of the questions used for the student response system, as well as my delivery. My goal for this coming year (when I hope to be supported by the TTI program) is to develop an optimized set of lectures coupled with student response questions appropriate for this course, that could also be used by other lecturers. I am hoping that the dedicated GA and facilities available at the Telus Center, will be able to help me attain these goals.

**Proposed teaching methods:**

I propose to use a combination of standard lecture and student response system questions. These would be embedded in PowerPoint presentations, which would show images and information relevant to the topic and question. Each student would have their own transmitter (we already have enough of these for the class) and I would collect their answers with a receiver (also have this already).

The dual digital projection facilities will enable me to run PowerPoint and the student response system off one computer and use a digital writing tablet/Visualizer on the other side for illustration and notes- this was a problem in the classroom I used before, where I had to switch between these two technologies from a single console, which involved a substantial (7 second) temporal delay and was easily disrupted by my forgetting to make the switch on the computer.

**Information and communications technologies that will be used to enhance learning outcomes and/or increase access:**

Use of student response systems to encourage active learning in a large classroom setting. Genetics is a topic that cannot be mastered simply by memorization and many students require considerable help learning how to apply genetic concepts they have learned in earlier courses to practical situations. Using “clicker questions” delivered in class, I hope to encourage students to learn these techniques in a non-threatening (ie anonymous) environment. I have also found that this technology really helps to gauge whether or not a concept has been grasped by the majority of the students at the time I discuss it, rather than finding out weeks later on the exam that they didn’t.

**Proposed evaluation methodology:**

In collaboration with the TTI-assigned GA as well as the Biological Sciences teaching assistantships, I would develop survey questions to assess whether the students perceive that they are benefiting from this approach and feel that their learning outcomes are actually improving. I am also open to suggestions for other approaches for evaluating this project.

**A description of how the project might contribute to improving teaching within their Department and Faculty:**

I hope that my participation in this initiative will enable me to improve the content and delivery of one of our core Molecular Genetics program courses, GEN275. I also hope to convince other members of our Department and Faculty to try out student response systems in their courses, both by my enthusiasm for this approach and by my experience in developing new course content suitable for this format that I would be happy to share.