

## Course Focus

### Bob Sharrock—BIOB 375 – General Genetics



BIOB375 “General Genetics” is taught by Luther Talbert, Li Huang, Adam Richman and me. It is offered in Spring and Fall but not in the summer. Class sizes are in the 100-200 students/ semester range and the course is entirely lecture in format. It is either a required class or an elective in a wide range of undergraduate majors, although an alternative course, BIOB377 “Practical Genetics”, is also taught in Spring by Luther or Norm Weeden. Unfortunately, there has never been an undergraduate genetics lab at MSU. Every instructor has their own take on the course but we all cover the same material and use the same or similar texts. I first taught the course in (oh , my...) 1990. It was a one quarter course then (MSU was on the quarter system) called BIOL324 “Principles of Genetics”. Some of us were still in the MSU Biology Department, and, for those who might remember, I traded off teaching with a wonderful former faculty member and mentor Ernie Vyse.

All areas of science are advancing in interesting new directions these days and these innovations will have enormous effects on our lives and those of generations to come. One could argue that, in the last 100 years or so, the science of genetics has changed how we think of ourselves as humans and how we deal with challenges such as feeding ourselves, keeping ourselves reasonably healthy, and understanding our environment as much as any field of endeavor. So, I think of BIOB375 as an important cornerstone class for any major related to biology and for anyone who would like to understand how living things work on a “biological information processing” level. Students come in to this class with the background of having seen some of the concepts and material in high school and in popular writing (in many cases this isn’t very much) and having taken a one semester course of 100-level or 200-level introductory cell and molecular biology. We cover a standard set of topics in basic genetics and, with each concept or structure or mechanism, I try to make connections to other ideas we’ve covered or will cover and to the big picture in biology. Cell division – you can’t understand biology unless you know where it comes from. Sex – Yea! Mendelian genetics – such a simple model to start from. Chromosomes and genes and how genetic information becomes our 3-D biological world. The origins of new gene alleles and the flow of alleles over generations in populations. Breeding, genetic engineering, and new things like RNA-mediated gene control and epigenetics.

There are many higher-level undergraduate courses at MSU that build on the background provided by BIOB375, BIOB377, or BIOH320 “Biomedical Genetics”. The field will continue to change rapidly over the coming years and expand increasingly into everyone’s lives, and I look forward to explaining and discussing these changes in BIOB 375 along the way.