

## **BIOLOGY 618: Biotechnology, Bioinformatics, Bioethics**

**June 21-25, 2010**

### INTRODUCTION

Recent federal funding awarded to the Greenwood Genetic Center (GGC) from the National Human Genome Research Institute at NIH targets genetics education. The GGC is using the grant to create two genetics education centers: an on-campus center which will be used for the summer course for teachers and a mobile science lab. The mobile lab will be available for the 2010-2011 school year and will focus on serving those schools too distant to travel to Greenwood for field trips.

Specific lab activities used in this summer course will be available for students' use in both the on-campus and mobile centers. Teachers attending this course will satisfy the requirement that a teacher must have completed a specific lab activity in order to schedule a mobile lab visit.

### COURSE DESCRIPTION

The newest GGC course focuses on three key areas of 21<sup>st</sup> century science education: biotechnology, bioinformatics, and bioethics. The course is designed to introduce teachers to each of these areas through didactic instruction, the use of clinical case studies, laboratory, and computer activities. Lab work includes techniques and analysis of results in cytogenetics, molecular genetics, and biochemical genetics. Computer activities include the use of National Centers for Biotechnology Information databases, University of California at Santa Cruz Genome Browser, and the Protein Data Bank. Ethical, legal, and social implications are woven throughout the clinical cases and provide the basis for group discussions. In the bioethics portion of the course, attendees will be asked to identify the key questions in specific scenarios and to support their positions in the cases.

### CURRICULUM

The course is five days (approximately 40 hours) and includes didactic instruction, lab activities, and group discussions. This graded course carries three graduate credit hours which may be applied to teacher re-certification or to a graduate program of study for South Carolina teachers. Out-of-state teachers may use the hours for CEU requirements but in order to receive the graduate credits, teachers must satisfy out-of-state fees to Lander University.

### LEARNING OUTCOMES

- To recognize the historical perspective of each instructional area
- To demonstrate aptitude in laboratory skills, computer skills and test analyses
- To integrate technology with human conditions and to assess bioethical concerns
- To translate course experiences to the classroom in order to promote student literacy and interest in the life sciences

## COURSE REQUIREMENTS

Assessments and evaluations will utilize post-activity questions, participant interviews, surveys, and observations of laboratory techniques. Teachers will complete daily and end-of-course evaluations. Evaluations will be used to make any needed course improvements. Each teacher will be required to use one course activity in the classroom during the school year, providing the GGC with their students' evaluations of the activity.

## SELECTED LECTURE TOPICS INCLUDE

- Laboratory safety
- What is biotechnology? Why is it important and what is its association to healthcare?
- Historical perspectives of bioinformatics
- Copy number variants and human variation
- Exploring bioethics

## ACTIVITIES

Major emphasis is on lab activities. Teachers attending this course will meet the requirement of having to complete a specific activity before scheduling that same activity for his/her students on a mobile lab visit during the school year. There are 12 lab modules developed for the education centers and this course will use four of the 12.

## REGISTRATION

Registrations are invited from science faculty at the high school and undergraduate levels. Course instruction assumes the registrant has some background in biology and genetics. Graduate hours will be given through the Department of Biological Sciences at Lander University.

## ACCOMMODATIONS

A block of rooms will be reserved at the Fairfield Inn & Suites in Greenwood. Dormitory housing at Lander University may also be available. Additional information will be available at a later date.

## COST

A fee of \$150.00 is due with the registration form. This fee covers all course materials, daily continental breakfast and lunch, one dinner, and graduate credits for South Carolina teachers.

**Class size is limited to 25 participants.**

**Registration deadline is May 21, 2010. Registration fee after May 22<sup>nd</sup> is \$175.00.**

***Any cancellations made after June 4<sup>th</sup> will be reimbursed less \$75.00 for processing costs.***