PROFESSIONAL PROGRAM IN BIOTECHNOLOGY
BIOTECHNOLOGY PRINCIPLES AND TECHNIQUES II
BIOT 602
SYLLABUS – Spring 2012

TIME: 1-4pm Tuesday and Thursday, at block instructor’s facility

COORDINATOR: Mike Criscitiello (Block 5)
Veterinary Pathobiology
Office Hours: 372 VMR Friday 3-5pm
979 845-4207, mcricitiello@cvm.tamu.edu

INSTRUCTORS: Vince Gresham (Block 2)
Comparative Medicine Program
Office Hours: LARR building, by appointment
845-7433, vgresham@tamu.edu

Keerti Rathore (Block 4)
Soil and Crop Sciences
Office Hours: Monday 8-10am or by appointment
862-4795, rathore@tamu.edu

Terje Raudsepp (Block 3), VMRB 314
Veterinary Integrative Biosciences
Office Hours: Thursday 10-11
979-862 2879, traudsepp@cvm.tamu.edu

David Stelly (Block 3)
Soil and Crop Sciences
Office Hours: by appointment
845-2745, stelly@tamu.edu

Victor Ugaz (Block 1)
Chemical Engineering
Office Hours: Monday 3–5 PM, or by appointment
458-1002, ugas@cvm.tamu.edu

PREREQUISITES: Graduate classification and BIOT 601 or approval of the instructor.

DESCRIPTION: Application of basic theories and principles of biotechnology to team
and individual research problems in a laboratory setting.

GRADING: Instructors will assess the students’ abilities to follow the standard
operating procedures for keeping a laboratory notebook, their
participation in the laboratory and will administer a quiz or equivalent
assignment(s) to assess students’ knowledge of the topic they covered.
Each block will count 20% of the overall course grade. In this practical
course attendance is crucial, and unexcused absences will significantly
impact participation score. Discuss makeup of excused absences (for
Definition see [http://student-rules.tamu.edu/rule07](http://student-rules.tamu.edu/rule07) as soon as possible with block instructor.

100-90=A, 80-89.9=B, 70-79.9=C, 60-69.9=D, <60=F

**REQUIRED TEXT:** None. Laboratory protocols and supplementary information will be provided by the instructors.

**CALENDAR: See individual block handout for more detail**

**Block 1** (Dr. Ugaz/Meet in Jack E. Brown Bldg, Room 105) Microdevices

January 17th  Introduction to microdevices for bioanalysis  
January 19th  Photolithography and micromachining  
January 24th  Sensors and transducers, Lab #1  
January 26th  Biomedical applications  
January 31st  Microfluidic PCR, Lab #2  
February 2nd  Quiz

**Block 2** (Dr. Gresham/Meet LARR building) Animal Use in Research: the student will find and review a published article in a scientific journal that demonstrates proper use of animals in biomedical research. Articles should be current (within the past 5 years) and be in a subject area of interest to the student. A review template along with an example of a journal article review is included as a guideline. On the last day of class each student will lead an informal round table discussion of their article. Points such as the author’s experimental design, evaluation of the data, results, and conclusions will be discussed. The objective of this exercise is to help students learn to evaluate scientific literature.

February 7th  
February 9th  
February 14th  
February 16th  
February 21st  
February 23rd

**Block 3** (Drs. Stelly and Raudsepp/Meet xxx) Plant and Animal Chromosomes

Stelly:  Cytology lab, Beasley Lab. (Bldg#965, Rm 105, Agronomy Rd)  
Raudsepp:  Cytogenetics lab, Raudsepp 2, VMRB 314- Karyotyping & FISH

February 28th  Light and fluorescence microscopy.  
March 1st  Flow cytometry and closely related technologies.  
March 6th  Cytogenetics lab, Raudsepp 2, VMRB 314- Karyotyping & FISH  
March 8th  Cytogenetics lab, Raudsepp 1, VMRB 314- Karyotyping and FISH

**Block 4** (Dr. Rathore/Meet Room 117 Borlaug Center) Plant Experimentation

March 20th  Plant lab 1  
March 21st  (stop by Wednesday to transfer rice callus cultures)
March 22th Plant Lab 1, Plant Lab 2
March 27th Plant Lab 1, Lecture 1
March 29th Plant Lab 3, Lecture 2
April 2nd (stop by Monday to transfer cotton tissue)
April 3rd Plant Lab 3, Lecture 3
April 5th Quiz

Block 5 (Dr. Criscitiello/Meet 363VMR Veterinary Medical Research) Antibody Techniques

April 10th Immunology lecture, introduction to the lab
April 12th Antibody lecture, begin ELISA antigen detection experiment
April 17th Continue ELISA antigen detection experiment
April 19th Begin ELISA antibody detection experiment
April 24th Continue ELISA antibody detection experiment
April 26th Quiz

No Accumulative Final Exam

LEARNING OUTCOMES: In this class, students will develop a fundamental knowledge of laboratory principles and their application in biotechnology. Students will be exposed to methods for the analysis of DNA, RNA and protein and gene transformation methods. They will be introduced to antibody ELISA techniques and to the use of animals in research. Participation in the laboratory exercises will assist their conceptual learning. After taking this course, students will be to perform basic ELISA assays and understand antibody properties; use of reporter genes and Agrobacterium for transformation of plant materials; the rules and regulations associated with the use of animals in research; and, will receive hands-on training with a selection of laboratory animal species. The veterinary portion of the course will expose the students to the use of laboratory animals in biomedical research, rules and regulations governing animal research, selected animal models of human disease and alternatives to animal use/the three Rs. Lab portions of the class will involve handling rodents (rats and mice) and familiarize the student with various techniques (injections, blood samples, necropsy). Students will be able to document their experiments and results following the standard operating procedures for keeping a laboratory notebook. Our goal is that students will be confident in their knowledge of theory and application of these basic laboratory skills so that they can apply them in BIOT 603 or in future industry endeavors.

ADA STATEMENT: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for a reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation please contact Disability Services, Cain Hall Room B118, 845-1637. For additional information, visit http://disability.tamu.edu.

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