

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, mcriscitiello@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, ugaz@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>) 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 21th
February 23th

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 22 th	Plant Lab 1, Plant Lab 2
March 27 th	Plant Lab 1, Lecture 1
March 29 th	Plant Lab 3, Lecture 2
April 2 nd	(stop by Monday to transfer cotton tissue)
April 3 rd	Plant Lab 3, Lecture 3
April 5 th	Quiz

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

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

ACADEMIC INTEGRITY STATEMENT AND POLICY: *“An Aggie does not lie, cheat or steal, or tolerate those who do.”* For additional information, please visit: <http://aggiehonor.tamu.edu>.