

List of 2007 Labs
Tuesday, March 27, 9:00-10:50 a.m.

Lab # **Lab Title and Description**

T1 VAN Small Mammal Livetrapping

Accompany investigator checking grid of live traps. Learn about different trap types, species of small mammals in forested habitat, marking techniques and handling, and how information is used to answer questions about population dynamics, competition, home range and movement, microhabitat use, etc.

Live trap a state-endangered species and discuss on-going research involving transplanting individuals to several other places throughout the state. Also see a unique natural area: Larue-Pine Hills.

T2 VAN Zooarchaeology

Learn about the analysis of animal bones from archaeological sites and what kinds of information can be gained from such studies. Hands-on work with modern comparative skeletal collections and zooarchaeological materials will give participants an opportunity to try out their identification skills. This lab also includes a tour of the Center for Archaeological Investigations, Curation Facility and short talks by Anthropology graduate students about their current research projects.

T3 VAN Coal Development Park Tour

Tour the Coal Development Park and see coal mine simulations. Learn about current clean coal technology projects.

T4 VAN Composting Food Waste with Worms

Learn about the process of vermicomposting and why and how it is part of sustainability and sustainable agriculture. Dig in with worms if you wish.

T5 Friction Material Testing Labs

E13: Thermophysical Properties Laboratory contains an analytical balance, laser flash thermal diffusivity, helium pycnometry, thermogravimetric analysis, gas mass flow controllers, and differential scanning calorimetry.

E17: Friction Materials Fabrication Laboratory - automotive brake pad molds, carbonization furnace, small 10-ton hot press

E18: Sample Preparation Laboratory - fully-computerized friction tester, diamond saw and polishing equipment

E21: Microscopy Lab - polarized light microscopes, ion mill, surface thermal diffusivity, and

T6 Light and Lasers

This session features a short lecture on light, lasers, and their applications, and a demonstration of laser operation, polarization of light, and display and storage technologies. This researcher is developing an optical storage technology in 3D.

List of 2007 Labs
Tuesday, March 27, 9:00-10:50 a.m.

Lab # **Lab Title and Description**

T7 Computer Intelligence - Robots and Softbots

A short introduction to Artificial Intelligence--can machines think, and if so, how? And if not, why not?-- and a presentation on autonomous mobile robotics and software robots (softbots) will be given. Then, students will interact with robots that will be programmed to chase or to avoid the students. Finally, students will play a game with softbots.

T8 Developmental Science Lab

9-9:50: The Development Science Lab conducts research on the development of perception and motor skill. Our research includes studies with infants, young children, and adults. Recent work focuses on memory, attention, and the perception of moving objects. We also conduct computer simulation studies that investigate the brain mechanisms that make visual attention and perception possible.
10-10:50: TBD

T9 Animal Evolution Lab

A major component of Charles Darwin's theory of evolution is descent with modification—the idea that all organisms on Earth are genealogically related to one another in a grand “tree of life.” Genetic and anatomical comparisons among animals are being used to reconstruct this tree. Learn how comparative genetic data are collected from various invertebrates, extract and visualize mollusk DNA, and see how gene sequences can be analyzed to estimate evolutionary relationships.

T10 Bacterial Neat Freaks: Finding Bacteria That Clean Up the Environment

Participants in this lab will extract DNA from environmental samples, perform PCR analysis, and run agarose gels in order to identify bacteria capable of breaking down environmental contaminants such as benzene and perchlorate. A short lecture on bioremediation and the unique abilities of bacteria to degrade a variety of pollutants will also be presented.

T11 Molecular Biology and Cancer Biology

Participants will rotate through 3 lab stations:
1) Isolation of plasmid DNA from bacteria, 2) DNA sequencing and gel electrophoresis, and 3) microscopy - to identify cell structures and protein localization

T12 Forensic DNA Fingerprinting

DNA fingerprinting is often used nowadays to connect a suspect to a particular crime scene. In this hands-on lab activity the participants will be given several DNA samples and use a version of DNA fingerprinting to determine which suspect was at the crime scene. The technique and approaches will be discussed in terms of modern molecular biology and different approaches that are used for DNA fingerprinting. The student will get to use some fundamental tools used in molecular biology such as gel electrophoresis and micropipetors

List of 2007 Labs
Tuesday, March 27, 9:00-10:50 a.m.

Lab # **Lab Title and Description**

T13 Nanotechnology: A Tiny World--Clusters of Atoms & Artificial Cells

Learn how to make extraordinarily bright fluorescent nanoparticles of any color that will replace electric bulbs and fluorescent light soon in the future. Also, see how to fabricate wires made up of various metals (such as gold and silver) that are thousands of times thinner than your hair.

T14 Nanostructure Growth and Materials Science Lab

8:00 a.m. Pristine metal oxide nanowhiskers will be grown from oxide powder in high temperature oven under specific gas environment. The students will load powder in the ceramic crucible and place the targets inside the tube oven where the condensation and growth of nanowhiskers is expected.

8:30 a.m. Dr. Migone, Chair of the Department of Physics, will do a short presentation in Rm 456 on research in the department.

T15 Forensic Ink and Fiber Analysis

Students will learn some basics about forensic ink and fiber analysis and then will perform a variety of hands-on experiments in this area. For ink analysis, students will examine a document to determine if two different sections were written with the same pen or not. This will be done by first performing a microscopic analysis of the ink to search for color differences or bleed patterns. The ink samples will then be extracted from the paper and the components will be separated using thin layer chromatography. Fiber analysis is similar in that a visual inspection is performed, but it is followed by a "burn test" which observes burn characteristics for fiber identification. These activities involve dangerous chemicals and flame.

T16 Genomics Lab

Use of automated technology to prepare samples for genome analysis, e.g., use of the microarrayer robot to produce genome array slides, use of Pipetting Robot to fill in the 384 microtiter-plates.

T17 Biotech & Genomics Core Facility

A. DNA Sequencing & DNA Marker Analysis Facility

Provides next-day DNA sequencing services for plasmid, PCR, and BAC DNA. The facility has PE377 gel sequencers and CEQ8000 capillary sequencers. Sequences are derived from DNA or colonies in tubes or plates. Provides fragment size analysis with fluorescent labelled probes for microsatellites and other genetic markers. Real-time PCR available. Visible or UV light excited fluors used.

B. Genomics & Robotics Services Facility

List of 2007 Labs
Tuesday, March 27, 9:00-10:50 a.m.

Lab # **Lab Title and Description**

T18 **Glass Studios**

Tour our glass studio while people are working, including hotshop, coldshop, and classroom. There will be people working on glass blowing (no hot casting today). A visiting artist will do a demo on mold making.

T19 **Group Decision Making and Personality**

Students play the role of mock participants in a group decision making study. First they will complete a questionnaire assessing individual differences in beliefs about groups (whether they feel groups are enjoyable and productive versus annoying and unproductive). Then they will complete a decision task individually. Next they will discuss the problem as a group and come to a group consensus. Finally they will complete a brief questionnaire assessing reactions to the group discussion. Because the decision task has a correct solution provided by experts, it allows individual and group error scores to be computed to see if the group performance is better than that of average and best individuals. and makes for a discussion

T20 **SIU Gambling Research and Treatment Program**

The SIU Gambling Research and Treatment Program Lab is a fascinating place to learn about the most recent advances in understanding pathological gambling. From basic science inquiries to real world treatment of problem gamblers, the SIU lab has something to offer everyone interested in any aspect of gambling. With rising numbers of persons suffering from gambling addiction, the research in this lab is timely, and has changed people's lives through effective treatment. Come explore a real casino simulation featuring actual slot machines, a roulette reel, a craps table, a blackjack table, as well as a variety of computerized casino games. Participants will have the chance to meet the lab director, a few graduate students, and

T21 VAN **Cardiac Surgery**

Watch open heart surgery (if surgery occurs during our lab time). Otherwise, meet with the cardiac surgeon and tour the facilities.