December 2009

BIOOrhythms
Washington University Biology Department Newsletter
December 2009

“Winter is the time of promise because there is so little to do ~ or because you can now and then permit yourself the luxury of thinking so” ~Stanley Crawford

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BIOOrhythms is a publication of the Washington University Biology Department for Undergraduate Majors

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BIO 2960 & BIO 2970: Principles of Biology I & II
Principles of Biology I and II are prerequisites for completing courses required for the Biology major and the Biology major tracks: Ecology and Evolution, Genomics and Computational Biology, Molecular Biology and Biochemistry, and Neuroscience. The courses consist of three one-hour lectures and one 2-hour lab per week. Details about the courses can be found on the NSLC (Natural Sciences Learning Center) website.

BIO 2960: Principles of Biology I

This course is offered in the Spring and provides an introduction to cellular, molecular and developmental biology. An understanding of cellular architecture and the properties of biological macromolecules will be integrated with a discussion of the flow of genetic information within cells. The final section of the course will cover investigation and manipulation of genetic information by molecular genetic technologies, as well as a discussion of developmental strategies employed by multicellular eukaryotes. Weekly labs reinforce concepts from lecture and explore common laboratory techniques and computer-based resources. Prereq: Chem 111 and Chem 112 (concurrently). 4 units. Taught by professors Tuan-hua Ho and John Majors.

LABS:

* Protein Structure Lab
* Cell Organelles and Microscopy
* DNA structures
* DNA Gel Electrophoresis and Restriction
* Genetic code elucidation
* 16s rRNA Gene Sequence Analysis
* BLAST completion of cloning (Analysis of Yeast Insert Sequences)

Labs taught by Kathy Hafer, Wil Cruz and Sharon Young —cont’d on p. 3
Faculty Spotlight: Wil Cruz, Biology Lab Instructor and Advisor to the Biology Club

For the past 9 years, Wilhelm (“Wil”) Cruz has been teaching undergraduate labs for the Biology Department at Washington University. A native of the St. Louis area since age 7, Wil completed his undergraduate and graduate education at St. Louis University (B.A., Biology, 1992 and Ph.D., Biochemistry and Molecular Biology, 1999). His graduate dissertation focused on oxidant-mediated acute lung injury. Subsequently, Wil examined diabetes and lipid storage in beta cells in the laboratory of Dr. Michael McDaniel, in the Department of Pathology and Immunology at the Washington University School of Medicine. Having a compelling desire to teach, Wil found his “perfect niche” and joined the Wash. U. Biology Department in the fall of 2001 as Laboratory Course Coordinator in Biology.

Wil currently teaches the labs for Principles of Biology I/II (L41 BIO 2960/2970), General Biology I/II (U29 BIO 101/102), and assists with Introduction to Biochemistry (U29 BIO 406). In addition, starting in the spring of 2010, he will teach BIO 4522: Laboratory in Protein Analysis, Proteomics, and Protein Structure with Professor Joe Jez. As Faculty Advisor to the Biology Club, Wil helps organize various meetings and events. The most popular event is the Biology Club’s “Lunch with a Professor” in which students have the unique opportunity to sit down with Biology faculty, in a casual setting (outside of the classroom) to learn about them, their research, courses taught, and other interesting tidbits. The fall 2009 semester events have included a lunch with Dr. Garland Allen, a presentation by former student Colin Malone about Cold Spring Harbor Laboratory, and a tour of the Anatomy Lab at the Washington University School of Medicine. For more information about the Biology Club and their events, please contact Wil at cruzws@biology.wustl.edu.

Wil has always been active in student organizations. At SLU, he was a founding member of the Filipino Student Association and on the executive board of the Graduate Student Association. Now, as a faculty member at Wash. U., he participates in the Bowling Club, Biology Club, and, in previous seasons, the Biology Department softball team. In his free time, he manages two bowling leagues, “dominates” fantasy sports leagues (baseball and football), and plays guitar/ukulele. His Hawaiian band, Na Mele Pumehana (Hawaiian for “affectionate, warm-hearted songs”), performs at a variety of events in the St. Louis area including the Wash. U. Hawaii Club annual luau. If you hear Hawaiian music in the halls of 1st floor Rebstock, that would be Wil subjecting his students to the “Sounds of the Islands”.

Study Abroad in South Africa

The Organization for Tropical Studies is a Duke University based program, originally founded as an effort to introduce Undergraduate and Graduate students to tropical biology field research. The program has evolved and expanded, adding a semester-long program for Undergraduates in South Africa, specific to Savannah Ecology. This program can easily be characterized as a non-traditional experience. Students spend the semester based in the Kruger National Park, and travel to a variety of other parks and reserves throughout the country. Some time is spent exploring the culture of Johannesburg, and spring break is spent relaxing on the shores of Cape Town. —cont’d on p. 3
BIO 2970: Principles of Biology II

This course is offered in the fall and provides a broad overview of genetics, including Mendelian assortment, linkage, chromosomal aberrations, variations in chromosome number, mutation, developmental genetics, quantitative genetics, population genetics, mechanisms of evolution, and phylogenetics. The course does not count toward the laboratory requirement of the biology major. Students must sign up for a lab during preregistration.

Prerequisite: Biol 2960, or permission of instructor. Large class and small lab sections. Credit 4 units. Taught by professors Ian Duncan and Allan Larson.

LABS:

* Corn Samples
* Karyotype Lab
* Mitosis and Meiosis
* Slides
* Instructions for using the KaleidaGraph program
* Fly Data- All sections (data will be updated daily)
* Tetrads Data- All sections (data will be updated daily)
* TPA-25 Alu Class Genotype Totals
* Artificial Selection Materials Details
* HIV Lab and ClustalW
* T. Sax Worksheet

Labs taught by Kathy Hafer, Wil Cruz and Sharon Young

Student Review of BIO 2970 by Christen Elledge

“Basic genetics principles are taught in this class along with genetic research techniques in the lab. The properties of DNA are introduced in the prereq class BIO 2960, i.e. replication, transcription, translation. BIO 2970 elaborates on and reinforces these principles. The 2970 lab gives students the opportunity to apply their knowledge toward problem solving. They get to explore what DNA actually is and what it does through experiments involving gene mapping and interaction, PCR electrophoresis gels and more. BIO 2970 is a more enlightening, exciting and hands-on followup to BIO 2960.

My favorite lab was when we did gene mapping in the Drosophila. We examined three genes from a cross of an all Wild Type fly with a triple mutant fly. The ratios of the progeny were not in the ratios one would expect for independently assorting genes on chromosomes, so we knew that the genes were linked. We then figured out the map distance between the genes using recombination frequencies. In one of my other favorite labs, we extracted DNA from our cheek cells to see if anyone in the class had an ALU insert. We then did a PCR on the DNA to replicate copies of the DNA segment of interest. After we loaded the DNA into a gel and ran it, we could see if we contained the ALU insert. This is important to population genetics because the ALU insert is relatively new in evolutionary history and not all people in a population have the insert.”

Study Abroad in South Africa cont’d— The academics of the course are loosely based off 4 separate courses, with the major focus on Savannah Ecology. Ecological field skills, as well as conservation and managing biodiversity. There is time spent in lecture format, but also a large amount of time is spent exploring field research projects. Visiting lecturers from South African universities bring day-long field projects that give a window into each of their specialties: whether it be examining tortoise spatial ecology, determining plant defense allocation due to herbivory, or behavior techniques of geckos. The semester is highlighted by two major independent projects based on the students’ hypotheses, and several days in the field for data collection.

The logistics of the program are based on a relatively small-group of 20-30 students. The living quarters varies greatly based on location, anything from dormitory style and bunk beds to semi-luxury in cottages. The food is cooked by on-site staff, and the only concern would be an expanding waistline. Finally, there is plenty of time for exploration and fun. Students regularly play pick-up soccer games, watch the sun go down with an adult beverage and wake up early to catch site of the lions and elephants that roam around your classroom.—Steve Borson

Left: Shores of Cape Town in South Africa
Right: An elephant greets visitors at Kruger Nat’l Park
Biology Club: Professor Lunch with Gar Allen

On November 20, Professor Gar Allen joined the Biology Club for another one of the popular Professor Lunches. With an intimate attendance of twelve or so prospective scientists, Dr. Allen, who has taught classes such as “Topics in the History of Eugenics” and “Race and Science in America” among others, answered questions and cracked some jokes over subs and soda. The topic that most interested everyone at the lunch was the professor’s research in how the major advancements of biology have impacted the values, morals, and history of society as a whole. Dr. Allen shared insight into how he became interested in the historical side of biology, rather than the experimental side; described his research; and plugged his course in the spring, “A History of Genetics in the Twentieth Century.” To receive emails from Bio club about upcoming student/faculty lunches, field trips, and other exciting opportunities, be sure to email us at wubioclub@gmail.com!

--Ira Blau, Dan Feng, Sophia Li

CO-SIGN Events

College Student Interest Group in Neuroscience (CO-SIGN), as the name suggests offers an opportunity for students who are interested in Neuroscience to gather and learn. The club has an intellectual yet fun atmosphere where students interested in medical and graduate schools can mingle. The Physician Shadowing Program is a unique experience that CO-SIGN offers. Whether the students are specifically interested in becoming a pediatric psychiatrist or just wanted to learn the daily routine of neuroscientists, the club organizes the opportunity for them to shadow doctors in the fields of neurology, neurosurgery, and psychiatry. Earlier this semester, CO-SIGN sponsored a physician discussion panel, featuring a neuroradiologist, a pediatric neurosurgeon, and a psychiatrist. Students learned the clinical works and lifestyles of the guests as well as getting their questions answered by the doctors.

CO-SIGN also offers an opportunity for students to give back to the community through the newly established outreach program, Synapse. Adam Eltorai, one of the founders of Synapse, explained “the goal of the program is to help spark and promote science literacy among students and to encourage the pursuit of careers in science by introducing them to one particular area of scientific study, neuroscience.” In the fall semester, Synapse is working alongside with the Wash U Medical School’s Young Scientist Program’s Neuro Teaching Team. Through the use of interactive classroom demonstrations, Synapse is teaching basic neuroscience principles at middle and high schools in the Saint Louis community.

Other events that CO-SIGN offers in the spring are the graduate school students panel, dinner with SIGN group (the club’s medical school counterpart) and a visit to Wash U’s anatomy lab, where students are given a tour of the facilities and a chance to see cadavers! Email washucosign@gmail.com for info.–Yan Wang, Vice President, CO-SIGN

Volunteer Opportunities

Science Outreach: Washington University Science Outreach, in partnership with the Edison Theatre, will host student groups for a morning of activities on the “Physics of Sound”. The students will then be attending the 12:00 performance of “Scrap Arts Music”.

Date: Friday, January 22, 2010 Times: 9 am to 12 pm

We are looking for volunteers to help with the activities and escort groups. No experience necessary. Undergraduate (and graduate) students from all majors welcome to help. Contact Chris Mohr, mohr@wustl.edu, 935-8271

Other Volunteer Opportunities: subscribe to the Community Service Connection, an email newsletter: http://www.communityservice.wustl.edu/csconnection/
Biology Department Calendar

Links to General Calendars and Regular Events:

Washington University Record Calendar:  http://record.wustl.edu/calendar

Biology Department Seminars, Mondays, 4:00pm, Rebstock 322, check the website for topics/schedule:  http://www.biology.wustl.edu/seminars/nexsemester.html

Evolution, Ecology, & Population Biology Seminars, Thursdays, 4:00pm, Rebstock 322, check the website for topics/schedule:  http://www.biology.wustl.edu/seminars/evpop.html

Bioforum, alternating Fridays, 4:00pm, McDonnell 361, check the website for topics/schedule:  http://www.biology.wustl.edu/seminars/biologyforum.html

Plant Lunches: most Tuesdays at noon (1st Tuesday of month @ DDSPC, others @ McDonnell 212)
Contact Professors Tuan-hua David Ho or Mark Running for topics/schedule.

Donald Danforth Plant Science Center (DDSPC), Weekly Seminar Series—Wednesdays, 4:00pm, AT&T Auditorium, check the website for topics:  http://www.danforthcenter.org/opportunities/seminars.asp

Division of Biology and Biomedical Sciences (DBBS), all lectures and seminars:  http://dbbs.wustl.edu/dbbs/website.nsf/SDN

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December 2009

7th  Last day of classes
8th  Reading Period: December 8-10th
11th  FINAL EXAMS: December 11-17th

January 2010

19th  First day of classes
22nd  Science Outreach Event: “Physics of Sound”, 9am-12pm, contact Chris Mohr <mohr@wustl.edu> for location details

February 2010

2nd  Last day to add/wait/change SP10 course
3rd  Last day to drop/D SP10 Courses
8th  Last day to change option on a course to “P” or “A” (pass/fail or audit)