Welcome Back!
We hope you enjoyed the summer break and are ready to get back to class. There have been a number of exciting developments in our department in recent months and many more to come. Be sure to meet with your advisor at least once a semester to keep informed of the changes and how they affect you. Always bring your major form (already filled out) to advising appointments, along with an unofficial copy of your transcripts.

Congratulations Spring 2012 Grads!
Jeff Rodriguez, Mark Fox, Christina Sun, Stan Olszewski, Marilyn Rosa, Edgar Lopez, Kelly Conroy, and Samantha Peek. Good luck to all and stay in touch!

SJSU to Host California Association of Criminalists Fall Seminar
This November, SJSU will host the California Association of Criminalists 5-day conference at the Holiday Inn at San Jose Airport. Forensic science experts will hold workshops on a range of exciting topics, including:

- Forensic Evidence at the International Criminal Courts
- Forensic Anthropology
- Joint POW/MIA Accounting Command & Central Identification Laboratory
- Managing Human Factors in the Forensic Sciences
- Fire Debris
- Explosives
- Ethics for Professional Associations
- DNA

Students who volunteer at the seminar will benefit not only from the lecture and seminar content, but also from the opportunity to meet and network with many forensic science professionals. Networking may lead to internships and, someday, a job! To find out more about volunteering, please contact FS students: Kait (kait.badeaux@yahoo.com), Jasmeet (jasmeet408@yahoo.com), or Marilyn (marilynrosa01@gmail.com).

For more information, please see the event flyer at http://www.cacnews.org/events/seminar/seminarcURRENT.shtml
To find out about student (affiliate) membership in the CAC, please see https://cac1.wildapricot.org/application
The purpose of FSS is to provide a forum for forensic science students to share information on course work and scholarships, to promote mentoring, and to make available activities that reflect the interests of the group. FSS offers connection to a network of forensic science opportunities and professional contacts through participation in internships, conferences, and special events. The group is open to all majors.

**Fall 2012 Meeting Schedule**

All meetings will be held in the Guadalupe Room of the Student Union on Wednesdays from 4-5

- 8/29 General
- 9/12 General/Peer Mentor
- 9/26 General
- 10/10 General/Peer Mentor
- 10/24 General
- 11/7 General/Peer Mentor
- 11/28 General
- 12/5 General/Peer Mentor

End-of-Semester Banquet TBA!

**2012-2013 FSS Officers**

- President: Luis Sandoval
- Vice President: Becky Tilney
- Treasurer: Jesse Ramirez
- Secretary: Carlos Valencia
- PR Officer: Zachary Goecker

Contact: sjsu.fss@gmail.com

**REPORTS FROM THE FIELD: STUDENT INTERNSHIPS**

*Santa Clara County Crime Laboratory*
- Nadira Alicusic, Microbiology, 2013

Law and Order SVU, CSI, and plenty of other television shows depict Forensic Science as a simple endeavor, where obtaining evidence and interpreting laboratory results takes only a few hours. In reality, it is a lot more tedious and time consuming than one could ever imagine. Just how exactly would I know this? Well, I got the opportunity at the beginning of 2012 to intern at the Santa Clara County Crime Laboratory (SCCCL) as a Chemistry Trace Evidence intern. Not only has it been one of the most rewarding experiences of my life, it has also opened my eyes to so many career options.

Many students have asked me how I got the internship. I spent about a month contacting employees at SCCCL before I was informed that an internship had opened. A resume, cover letter, background check, and an interview were required.

At SCCCL, I got the opportunity to work with instruments such as Gas Chromatography-Mass Spectrometer (GC-MS) and Scanning Electron Microscope (SEM). Both instruments were used for different purposes; the GCMS was used to detect for ignitable liquids as being present in fire debris samples. SEM was used to detect for the presence of gunshot residue from samples. In order for me to identify if gunshot residue was present, 3 primary elements had to be present, which were lead (Pb), barium (Ba), and antimony (Sb).

As an intern, I was not allowed to handle crime scene evidence; instead I was assigned various independent projects which allowed me to be constantly hands-on. My current project is to document a collection of…” CONTINUED ON P.3
Applying Natural Product Research Methods to Forensic Science
-Zachary Goecker, FS Bio 2013

Reaching out academically beyond required class can be a challenge. Internships and research may seem too limited, especially when it comes to forensic science. The great thing about forensic science, however, is its scientific diversity. Subjects range from photography to physics, and even to computer science. When looking for hands-on experience, it can sometimes be helpful to step outside the realm of what we think of as “forensic science”. Finding a subject that interests you will help you to decide what section of crime lab you will join.

This summer I had a fantastic research experience working with the natural product Chinese star anise under the supervision of Dr. Roy Okuda in the Chemistry Department. Star Anise (Illicium verum) is commonly used as a culinary spice that tastes similar to black licorice. Besides its flavor and smell, star anise provides an essential organic compound called shikimic acid that is involved in the synthesis of the anti-viral drug Oseltamivir, or Tamiflu. As a result of the bird flu pandemic in 2005, Tamiflu was being produced rapidly, diminishing supplies of shikimic acid. Due to the high demand and price of shikimic acid, improved extraction methods are being sought out to relieve this shortage.

While organic extraction of a medical compound of little interest to the criminal justice community, the techniques used can be helpful in understanding forensic chemistry. Chromatographic and analytical methods such as thin layer chromatography (TLC), liquid chromatography-ultraviolet spectroscopy (LC-UV), nuclear magnetic resonance (NMR), and organic extractions were some of the methods I practiced in my project. All of these methods have a viable application in the field of forensic science, mostly pertaining to toxicology and controlled substances analysis.

TLC is a great way to screen for multiple compounds in a mixture. By separating trace amounts of sample, the compound of interest can be seen visually without complex instrumentation. In working with shikimic acid, a very polar molecule, the UV active blot never moves on the silica plate, separating it from other non-polar molecules. Traditional application of TLC in criminalistics is the separation of cannabinoids found in the marijuana plant Cannabis sativa. A related chromatographic method I used was LC-UV, which separates compounds based on size or polarity and then analyzes them based on their UV absorbance. To help isolate shikimic acid from higher molecular weight molecules, I used a size exclusion column connected to a UV detector and collected fractions based on absorbance peaks. Likewise, LC-UV can be used as a screening test to confirm the presence of different UV active compounds such as psilocin and psilocybin found in psychoactive mushrooms.

Non-chromatographic techniques such as NMR organic extractions can also be applied to a range of forensic science topics. NMR is a vital tool in organic structure determination. Throughout the course of different extraction trials, I used NMR to determine what adulterants were present in a sample. I found trace amounts of anethole, the fragrant compound, still existent in my samples. In a criminalist setting, NMR would similarly be used in identifying certain drug structures and possible adulterants.

Research in natural products is only one field that could apply to methods used in forensic science. San Jose State offers many undergraduate research opportunities in almost every field taught on campus. FS students should take advantage of these opportunities to acquire relevant skills. Getting involved in research, from DNA to natural product analysis, may even spark your interest in different branches of forensic science.

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...domestic animals hairs. With a digital camera, I photograph each hair, then I obtain a microscopic image of the internal structures with a Comparison Microscope.

Best of all was the opportunity to work with knowledgeable criminalists. Working side by side with scientists who have spent years in forensic science is an experience that I am grateful to have had. I always felt welcome by everyone, though at times I did feel a lot of stress working with such valuable instruments; it was very crucial that I take my time and set my samples properly and correctly.

This internship has been a great experience and recommend all students pursuing Forensic Science to intern at a forensic lab. The real world experience will help you decide if this is the right field for you!
SJSU Hosts FSEC Conference for 2nd Consecutive Year and 1st CSI Camp!
Nikki Roda, FS Bio, 2015

This summer, the Forensic Science program hosted the Forensic Science Education Conference (FSEC), which promotes the education and study of forensic science, for the second year in a row. During the same week, with the help of American Academy of Forensic Science (AAFS), SJSU offered a CSI camp for middle and high school students. I was one of the lucky fourteen student volunteers who worked with Dr. Steven Lee to organize these two programs. Though it was no easy task to combine a conference for middle and high school teachers with a CSI Camp for students ages 13-17, the results were well worth all the hard work.

The CSI camp kicked off on Monday with crime scene processing and reconstruction. Energy was high as students puzzled over evidence and pieced together the crime that had occurred. Campers worked together in teams to reconstruct the scenes. On Tuesday, campers processed the evidence collected from their crime scenes and learned about fingerprinting. They were excited to get the chance to use black magnetic finger print powder, and to lift and analyze the prints they discovered. Said one camper, “I like the fingerprinting and lifting because it provided a unique hands-on experience that you can only get at this summer camp.” Later in the week, students learned to analyze blood spatter, conduct a presumptive blood test, analyze DNA evidence, and participate in a mock trial. They also watched an episode of CSI and compared their experiences with Hollywood’s entertainment version. The students thoroughly enjoyed the hands-on activities, and many showed attributes of future CSIs!

The FSEC started on Wednesday and continued through Friday with teachers from across the United States. The participants in many of the same activities as the students, such as finger printing, blood spatter, presumptive blood tests, and DNA processing, and served as expert witnesses in the mock trial. Along with the hands on activities, teachers listened to a number of guest speakers who presented teaching strategies and lesson plans that the teachers could use in their own classrooms. One speaker, Gil Zamora, a San Jose Police Department artist, discussed the most effective questions to ask when interviewing a witness for a sketch of a suspect. His techniques lead him to draw a stunningly accurate drawing of the “suspect”, Mark Okuda, another speaker at the conference. The teachers seemed to enjoy the hands-on activities a great deal. They also had the opportunity to participate in think tanks on Wednesday and Thursday evenings, at which they drank wine and exchanged ideas and teaching methods with other teachers.

Both campers and teachers also heard from numerous expert speakers, such as Bruce Wiley, a retired homicide detective who incorporated his own stories into his lecture about blood spatter. The last speaker was Natasha Alexenko, who, unlike the other speakers, is not an expert in forensic science; rather, she is a rape victim who relied on forensic science to bring her assailant to justice. Alexenko closed both programs by telling her story and how the experience inspired her to start Natasha’s Justice Project, whose goal is to “expose and eliminate the rape kit backlog through research and education.” Alexenko’s moving speech reinforced the importance of both forensic science and education.

Both students and teachers left with a better understanding of the crime scene investigation process, and of forensic science. The week was a huge success and would not have been possible with Dr. Lee, the AAFS, and numerous student volunteers. To get involved in next summer’s camp, contact Dr Lee at steven.lee@sjsu.edu.

Campers dusting for prints on crime scene evidence.

Did you know… our wonderful SJSU librarian, Silke Higgins, has developed a Forensic Science research page just for you? http://libguides.sjsu.edu/content.php?pid=57768&sid=2450175
This summer my classmate Diana Garibay and I attended “CSI Leicester”, a 3-week course offered at at the University of Leicester in the UK. The course focuses on a crime scenario that students must solve using logical thinking and forensic science techniques. CSI television programs do not resemble the reality of the profession, and this course teaches students the real duties of a forensic scientist. Although 3 weeks may not seem very long, the program taught me new things everyday and kept the group on its toes with many surprises - including the announcement of a ‘pig dig’ being conducted by the archaeology and chemistry departments at the university.

Students in the course worked together in groups to reconstruct the events from a crime scene. Throughout the course, the investigation moved forward as new evidence items from the scene were processed. Much of the item processing was done by students, including fingerprint enhancement and lifting, footwear enhancement and comparison, blood spatter analysis, gas chromatography, and GSR analysis. In order to perform the analyses on the evidence items, students were permitted to use machines like a scanning electron microscope (SEM), electrostatic lifting apparatus (ESLA), and a gas chromatograph. After compiling all the information gathered from the evidence, the teams presented their conclusions to a panel. In addition to the presentation, each team prepared a case report that would be similar to one prepared by a forensic scientist testifying in court.

In addition to the hands-on activities, many experts in the criminal justice and forensic science fields gave lecture on topics like forensic archaeology, forensic engineering, criminology, and forensic psychology. Students also visited the police force headquarters in Northamptonshire, UK, for an in-depth tour of the forensic science department and the firearms branch.

The program gave me some insight into the justice system of the UK, and how it differs from the American system. For example, police in the UK may collect a DNA sample from anyone who is brought to the police station, even if it doesn’t result in an arrest. Also, the majority of police officers in the UK do not carry firearms. In the Northamptonshire Police force, only about 50 out of the 1100 police officers are certified to carry firearms while on duty. In fact, Northamptonshire police have never had to discharge a firearm against a suspect in the entirety of their use on the force.

Attending CSI Leicester was the best experience I could have ever imagined. Not only did I learn a lot about my future career, I was able to experience an entirely new culture and part of the world. I finished this course with greater knowledge of forensic science, and greater confidence in my lab techniques. I also took back the vacation of a lifetime: three weeks in an amazing city with a great staff who made the group feel right at home.

Next summer, CSI Leicester will hold two courses: one in Leicester, and one at SJSU. See Juno in MH 511 or Lee in MH 509 for more information.