**Fall 2015**

**F15.001: Forest History of a Site in Northern Minnesota: The Plant Macro-Fossil Record - POSTPONED**

**Describe the internship in terms of what the student intern will DO and LEARN:** Our long-term records of forests composition, and even of forest fires, are obtained from analysis of small subsamples of sediment cores extracted from lakes. The intern will take small subsamples of sediment from Bugbee Pond, sieve the sediments to extract the plant remains including charcoal particles that have been washed into the lake. If time allows, the student will assist in tallying the plant remains and may assist in charcoal analysis to statistically determine the frequency of fires at the site in the past. This project will involve no fieldwork, but instead a considerable amount of lab work with sieving the sediments, working with the plant remains, and manipulating the data. The intern will learn lab techniques and the use of a database program, as well as do some data interpretation.

**Other benefits to the student:** In addition to the above, the intern will be part of a research team, producing an important and integral piece of research. S/he will be exposed to research on the cutting edge of our field, considering that at the present time we know little about the history of the forests in this location. S/he will be required to discuss the results with other members of the team, learning what it is like to work with different individuals with different knowledge to benefit the whole - the way of Environmental Sciences.

**Additional qualifications:** The intern should have an interest in botany, and an interest in geology is also helpful.

**Faculty mentor:** Scott Anderson, SESES – Environmental and Quaternary Studies

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**F15.002: Employment Law Case Study**

**Describe the internship in terms of what the student intern will DO and LEARN:** The student will review the literature based on the legal issues in one of the cases: 1) same sex marriage and freedom of religion, OR 2) copyright law and employment/work for hire.

**Other benefits to the student:** The student will have an opportunity to draft sections of the research paper.

**Additional qualifications:** Some background in business law (completion of ACC 205) would be helpful

**Faculty mentor:** Eric Yordy, Business Law

**Intern:** Nolen Cook

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**F15.003: Wearable Teaching – Apple Watch as Learning Tool - CANCELLED**

**Describe the internship in terms of what the student intern will DO and LEARN:** The purpose would be for the student to work with designers to develop, implement, and test an Apple Watch app to reflectively measure learning and activities throughout the day. S/he will learn interactive design principles, user testing, and app development.

**Other benefits to the student:** The student would learn valuable collaborative approaches and team experience. Interaction Design is the art of effectively creating interesting and compelling experiences for others. No current knowledge of Interaction Design or Interface Design is necessary but a general understanding of communications, media, and the interactive media industry is encouraged. Since everyone has experience with experiences the student should already be amply qualified to learn more about applying what they implicitly understand to the problems of creating “interactive media.” The student will learn ways to apply these principles to their present discipline and current work.

**Additional qualifications:** To make this project successful we would need someone with programming skills and app development for the iPhone and Apple Watch. Familiarity with XCode and ObjectiveC for Cocoa a must. While this project should be stimulating and fun, its content--as well as its interaction--will be serious and valuable.
Faculty mentor: Christopher Johnson, School of Communication

F15.004: Arcosanti Marketing Research Survey Content Analysis - CANCELLED

Describe the internship in terms of what the student intern will DO and LEARN: The student intern will be specifically responsible for analyzing the previously collected data. The student will learn how to use content analysis in quantitative research. The student will perform content analysis including developing a coding scheme and summarize the information for use in a future journal article.

Other benefits to the student: Develop an understanding of Arcosanti and the opportunities tourism can afford the organization.

Additional qualifications: Interest in tourism and marketing.

Faculty mentor: Kris Swanson, School of Communication

F15.005: Suicide and Hope: Development of Messages to Prevent Suicide using Hope Theory - POSTPONED

Describe the internship in terms of what the student intern will DO and LEARN: The intern will help gather research, design messages, and develop and conduct survey research. The intern will be highly involved in the research process.

Other benefits to the student: The intern will learn about the literature, learn how to be an organized and thoughtful researcher.

Additional qualifications: The intern should have had a research methods course.

Faculty mentor: Laura Umphrey, School of Communication

F15.006: Investigating Difference: Human and Cultural Relations in Criminal Justice

Describe the internship in terms of what the student intern will DO and LEARN: For this project, the intern will help with updating statistical data within chapters including census data and other relevant data on crime and victimization. The student will also collect relevant geographical data about NAU (size, student body composition, etc.), the state of Arizona, and national data. The intern will additionally assist authors in online research including current crime and justice system statistics, legal and policy issues, and case study information as well as bibliographic and other reference work. Lastly, the intern will help with support for the editors in the form of creation of discussion questions, PowerPoint presentations, and other support materials for instructors using the text. Learning how to do online and other research is an essential tool for students wishing to continue their education into graduate programs. The intern for the project will learn valuable skills about editing a book including working with various authors and working with publishers. Additionally, the intern will learn skills related to crafting a literature review on various topics. Finally, the intern learn and/or hone valuable employable skills such as time management, editing, and other important skills which will aid in employment.

Other benefits to the student: Since there are deadlines associated with the book project, the student will benefit by developing time management skills, professional writing and editing skills, and critical thinking and analysis skills required in evaluating materials across multiple chapters and topics in the text.

Additional qualifications: The selected intern will have good attention to detail and will have effective writing and editing skills. An interest in crime, justice, and issues of diversity is not required, but would be helpful.

Faculty mentor: Sarah Prior & Lynn Jones, Criminology & Criminal Justice

Intern: Dominic Garduno
F15.007: Prime Time Portrayals of Crime and Justice: Understanding the Impacts on Viewers and Criminal Justice Professionals

Describe the internship in terms of what the student intern will DO and LEARN: The student will first become familiar with the IRB process (complete the CITI training) and the literature on fictional crime drama media. Then the student will help refine the survey instrument for delivery (create actual questions, learn about the process of what makes a good/better question). If any IRB revisions are needed the student will have an opportunity to work through that experience (do the work and learn about the IRB experience). The student will learn how to use Survey Monkey and will do some of the work involved in setting up, delivery, and managing the survey and responses. The student will learn about survey response rates, follow-ups, and other aspects of managing a successful email survey. Finally, the student will learn about basic analysis and participate in that analysis.

Other benefits to the student: The student will have the opportunity to present the work at a brown bag and at a regional conference with the other two members of the team (if the student so chooses). The student will get a very broad based experience not only about the technical aspects of research methodology and application, but the nuances and challenges of conducting the research. The students I have worked with over the last 3 semesters have found the reality check to be as informing as learning to put the technical aspects of classroom work into motion.

Additional qualifications: A student with a social science background would obviously be preferable, and an interest in media/crime dramas would be helpful. A student who has taken research methods may find the work to be a way to apply what they learned in class, but it is not a requirement for me.

Faculty mentor: Stephani Williams, Criminology & Criminal Justice

Intern: Hannah McCann

F15.008: The Virtual Southside: Creating an Online Walking Tour using Ethnography & Oral Histories - POSTPONED

Describe the internship in terms of what the student intern will DO and LEARN: The student intern will help assemble audio-visual materials, transcripts, maps and learning tools for uploading to a dedicated webpage; assist the faculty member in reviewing and researching new and existing oral histories; and assist in developing learning communities and walking tour “docents” who can engage learning online or in person at the Murdoch Community Center. The student intern will learn ethnography and audio-video techniques, the history of “segregation and congregation” in the Southside, and how a virtual walking tour can contribute to campus and community engagement.

Other benefits to the student: The intern may be able to receive academic credit for their work, and perhaps contribute to a paper or presentation reflecting the ongoing history of the Southside. The experience working with neighborhood residents, participating in research activities at a community center, and helping develop a campus/community walking tour will enrich the student’s grasp of community building and the significance of Ethnic Studies to their own personal and professional development.

Additional qualifications: Any experience or interest in audio-visual technologies, Web design, GIS mapping, or community work in the arts or education would be helpful.

Faculty mentor: Ricardo Guthrie, Ethnic Studies

F15.009: Representations of Sexual Minorities in South African Media: Does Same-Sex Marriage Matter?

Describe the internship in terms of what the student intern will DO and LEARN: An intern on this project would assist me in coding newspaper articles during this time period using the qualitative coding software MAXQDA, as well as writing a literature review of existing scholarship on the subject. The student will learn
1) what 'coding' data is and how to do it using MAXQDA,
2) how to conduct an effective literature search and write a literature review,
3) what Grounded Theory is and how to develop and apply it,
4) strengths and limitations of using media data for scholarly arguments,
5) about contemporary South African politics and media, and
6) about theories of democratization and media.

Other benefits to the student: After the internship is over, if the student wishes, s/he will become a second author on a paper to be presented at the Western Political Science Association in March 2016 in San Diego.

Additional qualifications: Few courses relating to contemporary Africa are offered on campus. The project is inherently interdisciplinary, pulling on scholarship from Political Science, History, Sociology and Women’s and Gender Studies. This type of project allows students to become exposed to many diverse literatures and help them decide on what kind of career s/he would like to pursue.

Faculty mentor: Julie Moreau, Women’s & Gender Studies

Intern: Caitlin Yates

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Spring 2015

Sp15.001: Material Witnesses: Artifacts from the Holocaust & Nazi Germany

Describe the internship in terms of what the student intern will DO and LEARN: The student would do the photographing and researching necessary for providing details about each object. The intern would then put this together as a small online "exhibit" for the Arizona Memorial Project, using the forms and software provided by the AZ Memorial Project. The project is exciting since it would involve engagement of different skills (historical research/photographing/visual digital display, cataloging, and data entry).

Other benefits to the student: This project could be of interest to students coming from the disciplines of Museum Studies, Visual Communication, History, Arts & Cultural Management, Cultural Studies, Art History, Journalism, Photography, Anthropology, Public History, or a combination of these. The student will learn to negotiate self-motivated and partially self-directed project with genuine and professional mentoring, leading up to a project that will be publicly available. This project would be a big plus in a student’s portfolio or resume.

Additional qualifications: Ability work independently; do historical research; has visual and creative design abilities; photographic skills; some skills in online data entry and design preferred.

Faculty mentor: Bjorn Krondorfer, Comparative Cultural Studies

Intern: Amanda Ekdahl

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Sp15.002: Reading, Reflecting, Storyboarding, and Designing

Describe the internship in terms of what the student intern will DO and LEARN: The student will learn how to conduct research to understand how rhetorical situations affect daily decision-making, motivations, and how we are persuaded to think and act accordingly. The student will then take these new understandings and apply rhetorical approaches as they design prototypes for actual programmatic use.

Other benefits to the student: By applying theoretical research to practical designs, the student is learning to move beyond what “feels” right to having a product that is the result of multiple drafts, intellectual revisions, as well as adapting ideas to multiple platforms.
**Additional information:** The intern will be expected to work in collaboration with the Sp15.004 intern.

**Faculty mentor:** Nancy Barron, English

**Intern:** Nicole Guardiola

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**Sp15.003: An Anthology of Navajo Fiction, Poetry, and Non-Fiction: An Edited Collection for High School and College Readers**

**Describe the internship in terms of what the student intern will DO and LEARN:** In both cases, an intern would assist with research, bibliographic work, indexing of films, corroboration of transcriptions of films and written texts, editing and formatting, and development of question sets. The student intern will have the opportunity to learn about the process of literary/filmic research and will gain extensive editorial experience, seeing a book and several chapters in various stages of production. The intern will have been exposed to work normally conducted only by graduate-level students and post-graduates, early on in their undergraduate academic careers.

**Other benefits to the student:** The intern will have the opportunity to be involved in a project invested in global learning and diversity initiatives in two projects that will make a major impact in the field of Indigenous Studies and that will command the attention of students and scholars alike. The student intern's name will be affiliated with both projects and will be mentioned in acknowledgments. I will also be willing to write a detailed, substantive letter of recommendation upon completion of the internship.

**Faculty mentor:** Jeff Berglund, English

**Intern:** Baylee Garcia

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**Sp15.004: Designing for Practice: Analysis and Application of Research to Design a Youtube Video**

**Describe the internship in terms of what the student intern will DO and LEARN:**
- The student will learn to design a project that analyzes, synthesizes and evaluates appropriate text and digital materials
- The student will learn to design a project that shows the ethical use of language in diverse academic, public, and professional communities.
- The student will learn how to address how purpose and audience influence design choices in text and digital media, showing understanding of rhetorical approaches to multimedia design
- The student will research, evaluate, and apply rhetorical principles to the project and final report paper to question current norms and dominant cultural assumptions expressed in text and digital media

**Other benefits to the student:** The student interested in this project will gain important skills in managing time, finding resources, evaluating resources, and working with faculty outside the classroom. The student will also be able to apply professional workplace skills (managing a project, setting deadlines, providing progress reports, collaborating with peers and faculty, and completing a project based on research).

**Additional information:** The intern will be expected to work in collaboration with the Sp15.002 intern.

**Faculty mentor:** Sibylle Gruber, English

**Intern:** Courtney Susan Shelton
Sp15.005: Definitions of Gamer Identity at a Videogame Symposium

Describe the internship in terms of what the student intern will DO and LEARN: A student will learn to research an issue related to cultural artifacts (videogames), identities and ideologies portrayed by those artifacts, learning in videogames, and videogame influence on identity construction. The student will then assist in designing a study based in social science methodologies, to collect survey data during a Videogame Symposium, and to then interpret and contextualize survey results to better understand how participant definitions related to 'gamer' may or may not have been impacted/influenced by gamergate.

Other benefits to the student: This student will be exposed to a broad range of social research related to videogame studies, including English, literacies, learning, psychology, biology, and cultural studies to contextualize data results within a cross-disciplinary approach to game studies.

Faculty mentor: Amber Nicole Pfannenstiel, English

Intern: Elizabeth Anderson


Describe the internship in terms of what the student intern will DO and LEARN: Our long-term records of forest fire are obtained from analysis of small subsamples of sediment cores extracted from lakes. The intern will take small subsamples of sediment from Cabin Lake, sieve the sediments to extract the charcoal generated from any forest fire and plant remains that have been washed into the lake, tally the charcoal and then use a computer program, Charanalysis, to statistically determine the frequency of fires at the site in the past. This project will involve no fieldwork, but instead a considerable amount of labwork with sieving the sediments, identifying the charcoal and any other plant remains in the sieved sediments, and manipulating the data. The intern will learn lab techniques and computer programs, as well as be able to interpret the data.

Other benefits to the student: In addition to the above, the intern will be part of a research team, producing an important and integral piece of research. S/he will be exposed to research on the cutting edge of our field, considering that at the present time we know virtually nothing about the history of fire in these forests. S/he will be required to discuss the results with other members of the team, learning what it is like to work with different individuals with different knowledge to benefit the whole - the way of Environmental Sciences.

Faculty mentor: R. Scott Anderson

Intern: Jeremiah Nickerson

Sp15.007: Use of Mosses in Mitigating Soil Erosion Post-fire

Describe the internship in terms of what the student intern will DO and LEARN: The intern will learn basic and cutting edge techniques in restoration ecology by planning, initiating, maintaining, monitoring and interpreting results from the Slide Fire projects. Specifically, s/he will learn moss identification, irrigation system maintenance, development of restoration materials, experimental design, ecology sampling techniques, microscopy and photo-monitoring and image analysis.

Other benefits to the student: These diverse experiences in project planning and implementation will be an outstanding resume builder. Our intern will be integrated into an active and collegial research laboratory, with undergraduate and graduate researchers and a post-doctoral scholar. The intern will have the opportunity to be involved in all stages of research, from development of hypotheses, to experimental implementation, data collection, analysis and interpretation. This is also a unique opportunity because our work serves the needs of land management agencies, giving the student access to diverse perspectives, an understanding of local and regional management issues, and potentially, additional internship opportunities.
Sp15.008: Adding Python to Model Oriented Programming Platform - CANCELLED

Describe the internship in terms of what the student intern will DO and LEARN: The student will be involved in the development of Python support in Umple. Umple is an active open source project, and follows a strict test driven development style. The student will learn about software development methodology by practice. S/he will learn how modeling languages are developed and will understand and appreciate the role of software design.

Other benefits to the student: The student may decide to use a modeling approach in his/her professional career as a software engineer. This can be either by adopting Umple itself or by using other modeling tools.

Faculty mentor: Omar Badreldin, Electrical Engineering

Sp15.009: Serviceability Behavior of Reinforced Concrete Discontinuity Regions

Describe the internship in terms of what the student intern will DO and LEARN: The student will assist a graduate student with fabrication and setup of testing configuration, test specimens, and data collection.

Other benefits to the student: This experience will provide an undergraduate with insight into the requirements of experimental testing. To be successful in the laboratory, researchers must be able to validate results (BEFORE and after testing), and troubleshoot when things do not appear to be working correctly. Also, experimental testing requires researchers to have ability as cross-disciplinarian ("jack-of-all trade"). For example, it isn't enough that I have expertise in my field, I also need to have knowledge of electrical and mechanical engineering when conducting an experiment and/or trouble-shooting, not to mention the communication skills that are required to be able to explain the project to an audience with wide-ranging levels of comprehension. The undergraduate will gain insight into the fact that research and experimentation requires you to not only be an expert in your field - but to have solid foundation in other fields as well.

Faculty mentor: Robin Tuchscherer, Civil Engineering

Intern: Sabrina Ballard

Sp. 15.010: Systematics of the Nominate Subgenus Eleodes (Coleoptera: Tenebrionidae) - CANCELLED

Describe the internship in terms of what the student intern will DO and LEARN: The intern will extract and sequence DNA for a mid-sized group of beetles, database the voucher specimens for the Colorado Plateau Museum of Arthropod Biodiversity, and image the voucher specimens for online publication. The intern will learn DNA extraction and amplification methods, as well as best practices for museum vouchering and online dissemination of taxonomic data.

Other benefits to the student: The intern will also associate with other students in the lab, be exposed to systematic entomology and other biodiversity studies, and gain firsthand experience in how research is performed and why.

Faculty mentor: Aaron Smith, Biological Sciences

Sp15.011: Amicable Numbers in the Ring of Eisenstein Integers

Describe the internship in terms of what the student intern will DO and LEARN: The student intern would learn (a) a little about the ring of Eisenstein integers, and (b) a LOT about programming in Mathematica.
Other benefits to the student: This internship would shed a bit of light on what is involved in “doing” mathematical research. In addition, the programming expertise the student develops in using Mathematica could benefit them in many ways in later endeavors.

Faculty mentor: Jeff Rushall, Mathematics & Statistics

Intern: Ryan Wood

Describe the internship in terms of what the student intern will DO and LEARN: Student will learn how to outline, draft and submit a qualitative research article. Specifically, the student will (a) learn about qualitative research, (b) conduct literature review, (c) understand how theoretical framework and methodology inform research; (d) learn how to do thematic analysis to code data; (e) use analysis to write “findings” section; (f) write “findings” and “recommendations” section.

Other benefits to the student: Student will be co-author for a journal article. We will submit to Journal of American Indian Education (JAIE); the editors have requested I submit an article about this study.

Additional comments or explanations that are relevant: I will provide a detailed timeline to the student at the beginning of the semester so that we can work from it. I will be ready to extend “meeting/discussion” time if more mentoring and less individual work appears more supportive.

Faculty mentor: Christine Lemley, Educational Specialties

Intern: Tyler Bean

Sp15.013: Acquisition and Management of Data Collected from Individuals with Concussions Both Prior to and Following Individualized Rehabilitation Sessions

Describe the internship in terms of what the student intern will DO and LEARN: The student will: (1) Participate in data acquisition of three different testing sessions [baseline, follow up 1 (17 days into the study), and follow up 2 (33 days into study)]. During this process the student will learn the proper steps to follow to collect reliable data and how treating each participant exactly the same is important. (2) After data acquisition, the student will learn how to maintain and organize data collection forms as well as transfer data from the hardcopy of the instrument and printed data from electronic assessments into SPSS. The use of repeated frequency and data checks will re-enforce the importance of proper coding and recording of data. A skill that is usable in a variety of research projects well beyond this one that the student will practice with the faculty mentor. (3) With practice and guidance, the student will learn the proper procedures in SPSS to run descriptive statistics, t-tests, correlations and ANOVAs on the variables of interest. (4) The students will also become comfortable, with direction from the faculty member, with the interpretation of the results from these statistical analyses. Basically, the student will discover how to determine if the results are meaningful and statistically significant. (5) Furthermore, upon reviewing of relevant statistical outcomes in the literature, familiarity with the data, and practice running simple statistics, the student will be encouraged to prepare a rough draft of the data analysis and results sections for a manuscript submission.

Other benefits to the student: The student will learn how to appropriately enter data using SPSS, how to perform general descriptive statistics, entry level statistics such as t-tests, correlations and ANOVAs, as well as the need for well-planned data management and confidentiality. The student will also establish ownership and the subsequent pride that comes from exerting control over their own learning experiences. These skills will be useful for any student looking to pursue a graduate degree regardless of the discipline.

Faculty mentor: Monica Lininger

Intern: Jessica Van Lith

Describe the internship in terms of what the student intern will DO and LEARN: Due to the breadth in the project, and the amount of interest I have received from students in Exercise Physiology or other sciences during guest lectures, the student will be able to focus on any either of the two facets they find most personally intriguing. Regardless of the facet they find most interesting, students will help facilitate participant recruitment, scheduling, lab set up (iPad, PC, and the Fit-Lights System), and an understanding of using repeatable and valid measures when conducting research. Furthermore, the student will be guided in search methods to collect relevant literature related to the area they find most interesting. Students will also gain valuable insight to the methods to assess and treat concussions and what the longer-term sequelae are for MTBI.

Facet 1) The student will learn methods to assess concussion using established tools and protocols. They will also understand how these assessments relate to daily functional task of learning and active daily living skills.

Facet 2) The student will learn the progression of and difficulty related to concussion therapy and how it progresses on ability improvement and accounts for participants signs and symptoms. We won’t progress them if the symptoms are increasing with therapy. Any student interested in this project will be intentionally limited to a focus on one of the two facets.

Other benefits to the student: Aside from the previous items listed that the student will learn and additional items they can select based on their field of study and interest, participation in research provides students the opportunity to developed ownership in the project and their learning. This further enhances their desires to continue their education and hopefully fosters future creative ideas, specifically in this case to cognitive health.

Faculty mentor: Scot Raab, Athletic Training

Intern: Zachary Fentem

Sp15.015: “Second Step” Violence Prevention and Social Skills Development Program in a Multicultural Elementary Flagstaff School

Describe the internship in terms of what the student intern will DO and LEARN: With assistance from the mentors, the intern will acquire a range of skills essential for planning and doing research, including skills specific to doing research on human subject. The intern will (a) learn how to conduct meta-data analysis of the existing research (mostly qualitative), (b) participate in the planning and development of grant proposals, (c) complete IRB training, and (d) participate in the pilot stage of data gathering. Project-related arrangements with the elementary school, which is the project site, are in place.

Other benefits to the student: In addition to developing specific skills involved in meta-analysis of research data, this internship offers opportunity for the student to acquire (a) preliminary skills in research design, (b) understanding of the research funding process, (c) understanding of ethical issues of research on human subjects, (d) IRB certification, (e) preliminary skills in conducting ethnographic fieldwork and data collection.

Faculty mentors: Janina Fenigsen and Jim Wilce, Anthropology

Intern: Brennan Copp

Sp15.016: Investigating Medical Care at Immigration Detention Centers in Arizona

Describe the internship in terms of what the student intern will DO and LEARN: The undergraduate intern will, after learning the basic rights of detainees at such centers, (1) search government filings, media reports, and the Internet more broadly for information about current conditions at detention centers in Arizona. An initial review of public filings has
already shown that the privately owned and operated ICE facility in Eloy, Arizona has the highest death rate of any such facility in the country. The undergraduate intern (2) will find, read and digest such filings and media reports. If the intern is interested, he or she will be invited to (3) draft the equivalent of a portion of the literature review for future publications of the final data (for which the student will be credited in publication).

Then, under my supervision, the intern (4) will draft Freedom of Information Act (FOIA) requests. This is not a fill-in-the-blank task. Rather, the intern will be required to use the information learned in the initial research stage to ask the best and most significant questions and request by name or description what we expect to be key documents. The government can take a significant amount of time to respond to FOIA requests, so in the meantime, until those responses are received, the student, under close supervision, will (5) identify and potentially reach out to reporters, physicians, and other individuals peripherally involved in the provision or investigation into care at these centers.

The intern will be encouraged (6) to present his or her work and findings at NAU campus events showcasing undergraduate research and (7) to attend one or more relevant conferences.

The intern’s work product will (a) help prioritize centers for further investigation; and (b) provide the foundation necessary for me to take a group of students next academic year to the highest priority centers to conduct interviews with detainees about conditions at the facilities. The intern’s work will also directly be used and relied upon in publications of findings from the completed investigation (hopefully at the conclusion of next academic year).

**Other benefits to the student:** By engaging in the kind of hands-on, applied research described above, the student will develop his or her critical thinking skills, practical research skills, and professionalism. The student will learn how to correspond, both in writing and telephonically, with government agencies, officials, and possibly reporters. In identifying and answering these important threshold questions, the student will see first-hand how applied research studies are built from the ground up. Because the project is at a more advanced stage in California and Texas, the student will also, by modeling research conducted in those states, see how his or her work will be ultimately be put to use in producing a comprehensive review of provision of care at these facilities, and hopefully accompanying comprehensive reform. In the nearer term, I expect to provide the intern opportunities to present his or her initial findings at undergraduate conferences here at NAU in the Spring. An appropriately motivated and talented student may also be credited in publications stemming from this work.

In these ways, the intern will gain experiential learning in: conducting, presenting and possibly publishing scholarly research; advocating for an disadvantaged racial, linguistic, and national/ethnic minority group; and, depending on when we are able to make the research findings publicly available (relative to the intern’s tenure with the project), engaging in or influencing civic engagement around these issues.

**Faculty mentor:** Colleen Maring, Criminology & Criminal Justice

**Intern:** Jocelyn Reyes

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**Sp15.017: Volunteer Bias in Friendship Research: Self-selection in Volunteer Convenience Samples - Implications for Friendship Research among Emerging Adults**

Describe the internship in terms of what the student intern will **DO and LEARN:** The intern will do the following: 1) conduct a thorough literature review of the topic (volunteer bias in general, gender differences, documented volunteer bias in medical and sexuality research, and in research on friendship, if any); 2) review the samples and limitations sections of empirical articles on friendship published in the last decade (cited at least 50 times in the literature) to learn about the how generalizability issues are addressed and whether potential volunteer bias is accepted; 3) develop hypotheses in light of the literature; 4) download the data sets (gathered online in the past two years), transfer them to statistical software, perform basic data cleaning; 5) conduct the analyses under my supervision and test the hypotheses and write up the results; 6) write up sections of the introduction, method section and results section; 7) contribute to the writing of the discussion section; 8) submit this work as a talk to an international conference (7th Conference on Emerging Adulthood, Fall 2015); also present this work as a poster at the NAU Undergraduate Showcase in Spring 2015; 9) work on the final aspects of the manuscript that will be submitted for publication (1st choice: *Journal of Social and Personal Relationships*; 2nd choice: *Personality and Individual Differences*; 3rd Choice: *Journal of Psychology*); and 10) contribute to the "letter
to the editor" when revising the manuscript.

The intern will learn the following: 1) how to conduct a literature review; 2) how to critically read empirical articles; 3) how to set up data sets; 4) the importance of conducting multiple studies when focusing on a specific topic; 5) how to create composite scores from the variables (responses to the items); 6) how to analyze data and test hypotheses and write up the results; 7) how to write a paper; 8) how to submit a paper to a conference; 9) how to finish a manuscript (start to finish) and submit it for publication; 10) how to communicate with editors; and 11) how to use archival data.

**Other benefits to the student:** The intern will learn the basics of how to conduct research. Although the intern will not gather data, the intern will learn the value of archival data. The intern will also learn basic and advanced skills necessary to conduct analyses and write a paper for publication. The intern will also present this work at a conference and submit this for publication. These activities would add to the intern’s CV and will help establish skills necessary for a future scholar. The intern will also learn about volunteer bias, an issue that challenges the generalizability of psychological studies conducted with convenience samples.

**Faculty mentor:** Meliksah Demir, Psychological Sciences

**Intern:** Andrew Haynes

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**Sp15.018: Simulations + Blended Learning + World Politics = "Hey, I Know What a Chechen Black Widow Wants!!"**

**Describe the internship in terms of what the student intern will DO and LEARN:** The student will gather data on the use of simulations in undergraduate courses in the US. In addition, s/he will gather data on the growth of Blended Learning courses in the US. The intern will also do careful analysis of the requirements of the journal I’d like to publish in, and help me format the paper in the appropriate manner. The intern will learn some of the basic techniques of research, including finding and analyzing data, organizing the data, writing it up in clear and accurate ways, and then preparing a paper for scholarly publication.

**Other benefits to the student:** The intern will learn how to engage in scholarly research and be exposed to interesting work on the scholarship of teaching.

**Faculty mentor:** Gretchen Knudson Gee, Politics & International Affairs

**Intern:** Sage Knapp

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**Fall 2014**

**F14.002: Studio Assistant for Digital Sculpture Fabrication**

**Describe the internship in terms of what the student intern will DO and LEARN:**

1. work with fiberglass in a mold-less composite
2. work in ZBrush to develop 3D models
3. use Photostitching to create 3d models from 2d images
4. work with 3d models on a code level to manipulate them
5. prep models for CNC and 3D printing
6. cast under pressure to create a bubble free casting
7. work the basics of Processing IDE to develop code
8. properly sand and prep for automotive painting

**Other benefits to the student:** How to run a modern sculpture studio and deal with clients, grants, and shipping. I have several shows coming in the fall and need to make several pieces for them.
Faculty mentor: David Van Ness, School of Art
Intern: Casey Mahalick

F14.004: Arsenic Exposure Affects Gene Expression in Ovarian Tissue

Describe the internship in terms of what the student intern will DO and LEARN: The student will learn about experiment design, how to carry out an experiment, state-of-the-art real time PCR techniques and analysis, and statistical data evaluation. The student will be expected to participate in the Undergraduate Symposium in Spring, 2015.

Other benefits to the student: Through our weekly laboratory meetings, the student will learn how to collaborate in an active lab environment and how to present his/her research to an educated lay and scientific audience.

Faculty mentor: Catherine Propper, Biological Sciences
Intern: Jonathan Grunwald

F14.005: Test of Bait Flavors used in Oral Rabies Vaccination of Striped Skunks

Describe the internship in terms of what the student intern will DO and LEARN: What the student will DO: 1) radio-track skunks, 2) place flavored bait packets and cameras in the field and analyze photographs to record response by animals, 3) help analyze the data collected. If motivated to do so, the student will have the opportunity to present the results as a poster at the AZ-NM Joint Meeting of the Wildlife Society in February 2015.

What the student will LEARN: 1) how to radio-track animals, 2) how to design and carry out a field experiment, 3) how to record and analyze data, 4) current management approaches for an important wildlife disease.

Other benefits to the student: The student will gain insight into the kinds of work carried out by an important wildlife agency (USDA Wildlife Services) and will have the opportunity to interact with personnel from that agency. The student will be exposed to how a major wildlife disease is managed on a nation-wide basis and how universities collaborate with other non-academic agencies to solve real-world problems. As a result, the intern experience will link the intern’s academic career with broader societal issues.

Additional relevant comments or explanations: Students may observe me radio-collaring skunks, but they will not have any direct contact with skunks themselves, therefore there is no health concern about animal contact.

Faculty mentor: Tad Theimer, Biological Sciences
Intern: Dylan Ray

F14.006: Exploring the Role of Calcium Binding Proteins in Regulation of Titin Function

Describe the internship in terms of what the student intern will DO and LEARN: This student will work closely with my current MS student and my post-doc to express and purify the three proteins we are characterizing. S/he will also assist in conducting biophysical experiments to characterize the thermodynamics of the interactions. In addition to participating in lab work, the student will also work to develop a unique aspect within this project that can be developed into a proposal for the upcoming HURA competition.

Other benefits to the student: The student will have the opportunity to interact with other undergraduate students as well as several MS students and a post-doc. This opportunity will help to introduce them into the scientific community and will help them to understand what it means to be a scientist.
Faculty mentor: Matthew Gage, Chemistry & Biochemistry

Intern: Miriam Zveitel


Describe the internship in terms of what the student intern will DO and LEARN: To accomplish the research mentioned above, it is necessary to have accurate estimates of hourly, and even sub-hourly, wind and solar power production at many locations in Arizona and the Southwest. Such data are available from the National Renewable Energy Laboratory (NREL). It is proposed that an intern be supported to work with NAU's researchers (myself and PhD student Dominique Bain) to identify the data necessary for NAU's study, obtain that data from NREL, then perform some basic analysis of the data. The student will learn what grid integration studies are, their data requirements, and the resources available at NREL. The intern will also be exposed to the large body of literature surrounding this topic.

Other benefits to the student: Working in a research group, and applying engineering skills in a real project.

Faculty mentor: Tom Acker, Mechanical Engineering

Intern: Michael Wertz

F14.011: The Cowboy Poetry Project

Describe the internship in terms of what the student intern will DO and LEARN: The student will aid me in conducting archival research, place-based research, and qualitative research. The student will learn qualitative research methods and will get to help conduct the interviews. The student may potentially help to author the production.

Other benefits to the student: Direct work with the faculty member conducting research; collaboration with a group of artists (theatre and musicians); exploration of Arizona history; performance-creation techniques.

Faculty mentor: Season Ellison, Honors Program

Intern: Carl Thomson

F14.013: NAU Student Dispute Resolution Needs Assessment: A Statistical Analysis of a Campus Survey

Describe the internship in terms of what the student intern will DO and LEARN: The student would develop a clean SPSS dataset, propose some hypotheses for testing and then statistically analyze the data in light of those hypotheses. The student will obtain knowledge about quantitative social science research and needs assessment inquiry. This knowledge will advance a career in applied social science research. Specifically, the student will be able to apply this knowledge in a social agency setting or in graduate school. Technically speaking, the student will learn how to use a virtual lab, how to use SPSS, and PREZI.

Other benefits to the student: Along the way, the student will absorb some knowledge about conflict management and dispute resolution. This hands-on learning experience will prepare him/her for a leadership role in the assessment of intervention programs for youth.

Faculty mentor: Phoebe Morgan, Criminology & Criminal Justice

Intern: Tiffany Curry
F14.014: Regional Media Coverage of Climate Change: A Comparison of German and U.S. Examples

Describe the internship in terms of what the student intern will DO and LEARN: Using such databases as Lexis-Nexis and Access World News, the student intern will find, read, and analyze selected U.S. newspaper articles about climate change and its regional manifestations. The intern will learn to do content analysis through social science coding techniques, which are of use in a wide array of research applications, and possibly through corpus linguistics techniques (if time is available). In addition, the student will learn how journalists report on a complex scientific/environmental issue and how that issue is dealt with differently in the two countries involved.

Other benefits to the student: This project should be of interest to students interested in the media, climate change and environmental studies, international affairs, and/or social science research. The intern will learn how to work with databases, how to conduct textual content analysis, and how to compare trends in media coverage. The intern will not need to have any knowledge of German, but s/he will certainly be exposed to the methods used in conducting cross-cultural media analysis, as well as to the differences between Germany and the U.S. in media coverage and public perception of an important environmental issue.

Faculty mentor: Peter Friederici, School of Communication

Intern: Anastasia Cheifetz

Spring 2014

Spring 14.001: Sinks and Retardation of Lithium Tracer in Wetland Sediments - CANCELLED

Describe the internship in terms of what the student intern will DO and LEARN: The student will conduct literature research, participate in wetland sediment sampling, participate in the experimental design of laboratory tests, setup laboratory-scale flow-through sediment columns, conduct tracer washout tests and collect samples from the columns for analysis, and assist in analyzing data.

Specific benefits to the student: The student will develop a sense of confidence and independence in working within the context of the scientific process, as well an increased capacity for critical thought.

Additional comments: Prior knowledge/experience with wetlands is desirable.

Faculty mentor: Terry E. Baxter, Civil and Environmental Engineering

14.002: Use of Mosses in Ecological Restoration

Describe the internship in terms of what the student intern will DO and LEARN: The intern will learn basic and cutting edge techniques in restoration ecology by maintaining, monitoring and interpreting results from existing experiments and helping to implement new projects. Specifically, he or she will learn moss identification, irrigation system maintenance, development of restoration materials, experimental design, ecology sampling techniques, microscopy and photo-monitoring and image analysis. There is also an opportunity to learn DNA extraction, amplification and identification methods.

Specific benefits to the student: These diverse experiences will be an outstanding resume builder. Our intern will be integrated into an active and collegial research laboratory, with undergraduate and graduate researchers and a post-doctoral scholar. The intern will have the opportunity to be involved in all stages of research, from development of hypotheses, to experimental implementation, data collection, analysis and interpretation. This is also a unique opportunity because our work serves the needs of land management agencies, giving the student access to diverse perspectives, an understanding of local and regional management issues, and potentially, additional internship opportunities.
Faculty mentor: Matthew Bowker, School of Forestry

Intern: Jeff Wright

Spring 14.003: Long-term Fire History in the Southwest

Describe the internship in terms of what the student intern will DO and LEARN: The intern would learn how to conduct a literature review on a topic timely and important to many natural resource disciplines in the Southwest. Specifically, the student would locate and assess literature related to fire history, help collect data from resource managers (for example, finding out number of spotted owls affected), create an annotated bibliography, generate graphs or tables, and assist in writing as able.

Specific benefits to the student: The student will be involved in a topic timely to the southwest, will increase skills in accessing and assessing literature appropriate to the subject, meet and work with resource professionals. I would expect the student to be involved with a group of co-authors for the paper to be generated by this research. Hopefully the student will contribute significantly and be a co-author on the paper. If interested, the student could continue work in fire and wildlife during summer by working with my Masters student on her research project.

Faculty mentor: Carol Chambers, School of Forestry

Intern: Shawnee Smith

Spring 14.004: Implementing and Evaluating Internal Sources of Data Related to Professional Education Programs - CANCELLED

Describe the internship in terms of what the student intern will DO and LEARN: The student intern will (1) receive hands on experience related survey construction, implementation of online surveys, strategies for improving response rates; (2) experience with sorting, analyzing and presenting data and findings; (3) use spreadsheet software; (4) gain experience with collaborative tools such as Google Docs/Drive in a professional setting; and (5) gain knowledge of assessment methods and accreditation in a higher education setting.

Specific benefits for the student: The student intern will gain practical experience in survey research, qualitative methodologies, data analysis, and presentation. The intern will gain experience in writing for a variety of audiences including the public, accreditation organization, and research and practice periodicals.

Additional comments: The student intern will be supporting research and data analysis efforts critical to national re-accreditation of NAU’s professional education programs.

Faculty mentor: Cynthia Conn, Acting Assistant Vice-Provost, Professional Education Programs

Spring 14.005: Volunteer Bias in Friendship Research Self-selection in Volunteer Convenience Samples: Implications for Friendship Research among Emerging Adults - CANCELLED

Describe the internship in terms of what the student intern will DO and LEARN: (1) Conduct a thorough literature review of the topic (volunteer bias in general, gender differences, documented volunteer bias in medical and sexuality research, and in research on friendship, if any). (2) Review the samples and limitations sections of empirical articles on friendship published in the last decade (cited at least 50 times in the literature) to learn about the how generalizability issues are addressed and whether potential volunteer bias is accepted. (3) Develop hypotheses in light of the literature. (4) Download the data sets (gathered online in the past two years), transfer them to statistical software, perform basic data cleaning. (5) Conduct the analyses under my supervision and test the hypotheses and write up the results. (6) Write up sections of the introduction, method section and results section. (7) Contribute to the writing of the discussion section. (8) Submit this work as a talk to undergraduate student competition at a regional conference (Southwestern Psychological
Association). (9) Work on the final aspects of the manuscript that will be submitted for publication (1st choice: Journal of Social and Personal Relationships; 2nd choice: Personality and Individual Differences; 3rd Choice: Journal of Psychology). (10) Contribute to the "letter to the editor."

Specific benefits to the student: The intern will learn the basics of how to conduct research. Although the intern will not gather data, the intern will learn the value of archival data. The intern will also learn basic and advanced skills necessary to conduct analyses and write a paper for publication. The intern will also present this work at a conference and submit this for publication, two activities that would add to the intern’s CV. Collectively, these activities will help establish skills necessary for a future scholar. The intern will also learn about volunteer bias, an issue that challenges the generalizability of psychological studies conducted with convenience samples.

Faculty mentor: Meliksah Demir, Psychology

Spring 14.006: Taking the Pulse of the Profession from the Perspective of Our Largest Employers

Describe the internship in terms of what the student intern will DO and LEARN: (1) Participate in structured question development, learning the importance of keeping a qualitative lens clear. (2) If student is available to attend the regional meeting, s/he will be encouraged to attend during the interviews but this is not required. (3) Maintain and organize data collection forms and audio recordings. Work with the faculty member to transcribe the interviews (by either hand or using PC software). (4) Become familiar with the process of thematic coding and be involved with pulling adjectives from the transcriptions and letting natural themes occur. (5) As time permits in the semester and if the student shows an aptitude, s/he can assist with member checks, the early phase of writing a manuscript, and development of quantitative questions using a Likert scale.

Specific benefits to the student: Aside from the previous items listed that the student will learn, participation in research provides students the opportunity to developed ownership in the project and their learning. This further enhances their desires to continue their education and hopefully fosters future creative ideas.

Faculty mentor: Glenn Edgerton, Physical Therapy and Athletic Training

Intern: Caroline Herrera

Spring 14.007: Applets for Calculus

Describe the internship in terms of what the student intern will DO and LEARN: The first phase of the proposed project will consist of the student surveying existing applets and assessing their overall quality. In the next phase, I will teach the student how to construct applets using a variety of tools, including GeoGebra, Sage, Desmos, and Mathematica. Once the student has developed some utility with the various tools, we will begin constructing applets aimed at illuminating key concepts in calculus. In addition, we will author inquiry-based exercises to accompany the applets. As a result of the internship, the student will (1) learn how to construct interactive simulations, (2) develop an understanding of the appropriate pedagogical use of these applets, and (3) gain experience in the creation and use of inquiry-based course materials.

Specific benefits to the student: This project will be of tremendous benefit to any student that is planning on teaching mathematics or science. Many high school teachers have the desire to incorporate interactive simulations in their teaching, but many lack the knowledge of where to find existing applets, how to effectively use the applets they do find, and certainly how to build their own applets. Unfortunately, these are not skills we typically teach future teachers. The student chosen for this internship will get hands-on training in constructing applets from scratch using a variety of tools. The student will gain expertise in the creation and use of computer-based pedagogical tools from an inquiry-based perspective. Moreover, the student will be able to share their expertise with their future teaching colleagues.

Faculty mentor: Dana Ernst, Mathematics and Statistics

Intern: Hanna Prawzinsky
Spring 14.008: Student Dispositions toward Youngspeak in Study Abroad

Describe the internship in terms of what the student intern will DO and LEARN: This student will transcribe English spoken data under my direct supervision. The data comprises study abroad undergraduate student interviews with me about multiple topics (revolving around participants' study abroad experience in Argentina and their attitudes towards the use of informal features both in English and Spanish). I will provide training on how to transcribe and code spoken data, help with the transcription and coding, and double-check for accuracy. More importantly, the student will also be involved and gain experience in data analysis -- more specifically the student will learn how to identify recurrent themes (using a recursive process) in the interviews.

List the specific benefits to the student: Data transcription and thematic analysis are two practices integral to the field of Linguistics (as well as qualitative analysis in other social sciences), making this a great opportunity for the undergraduate student intern to gain experience under the direct supervision of a faculty member with expertise in this area.

Faculty mentor: Julieta Fernandez, English

Intern: Emily Fowler

Spring 14.009: What Do Changes in Vegetation with Land Use Change Mean for Changes in Beneficial Fungi?

Describe the internship in terms of what the student intern will DO and LEARN: The student will start by filling in data on the Landfire vegetation spreadsheet about the type of beneficial fungal association found on the dominant plants of different regions of the United States. These associations are usually specific to plant families and the data are available from a small set of papers from the primary literature. The student will then work with Randy Swaty and me to create a fungal distribution map that can be overlain on the vegetation and land use history maps that already exist in the Landfire database. This map will be the first of its kind and important for long term management. The beneficial fungi are critical to plant regeneration, yet we know little about their likely fate in response to land use change.

Specific benefits to the student: The student will learn how to utilize the primary scientific literature to create a database. S/he will learn how to manipulate the data base to create a distribution map of fungal associations for the US. The intern will also be able to work with an important conservation agency in the US.

Faculty mentor: Catherine Gehring, Biological Sciences

Intern: Michael Haley

Spring 14.010: Quantification of Plant Secondary Compounds in Monkeyflower

Describe the internship in terms of what the student intern will DO and LEARN: The student will go through the entire process of compound quantification. This involves grinding leaf samples, weighing portions of each leaf sample out for compound extraction, compound extraction, quantification on an HPLC, and use of software to interpret HPLC results.

Specific benefits to the student: The student will receive one-on-one mentoring from me on the entire process of sample chemical analysis. I will provide the student with background information to understand what s/he is doing in the context of the larger project. S/he will learn what hands-on science in a laboratory setting entails.

Faculty mentor: Liza Holeski, Biological Sciences

Intern: Julia Thompson
Spring 14.011: Modern and Ancient Diet Using Stable Isotope Analysis

Describe the internship in terms of what the student intern will DO and LEARN: The student intern will clean and prepare ancient teeth and bone or modern hair for stable isotope analysis, which includes labwork in a chemical wet lab, help in gathering modern hair samples. The student intern will learn to prepare and analyze research samples that detail diet in ancient or modern people and will gain job-worthy skills in preparing samples (for a biotech or a medical lab)

Specific benefits to the student: Knowledge of stable isotope preparation on various materials, analysis of results using the anthropological perspective, preparation for presenting research for the NAU Undergraduate Symposium, gaining job-worthy skills for employment in a biological lab.

Faculty mentor: Corina M. Kellner, Anthropology

Intern: Rachel Middleton

Spring 14.012: STAR School Educators Development

Describe the internship in terms of what the student intern will DO and LEARN: An intern would (1) learn how formative and summative assessment data define individualized student instruction; (2) help the mentor define pre-assessments that NAU teacher candidates would implement; (3) maintain/share individualized student data to professors teaching science, social studies, and math methods classes to the traditional and cohort program of studies in the College of Education whose teacher candidates team with STAR school teachers to implement specific lessons; and (4) compare and contrast pre and post data to determine individual student and group progress with conclusions that will be shared with the STAR teachers, professors at the College of Education, and NAU teacher candidates.

List the specific benefits for the student: The intern would be prepared for the “common core” future for teachers of tomorrow and be ready for the new educational world of using assessment data to inform individualized instruction.

Faculty mentor: James Manley, Educational Leadership

Intern: Anaheed Hill

Spring 14.013: Evaluating the Impact of Wasted Energy

Describe the internship in terms of what the student intern will DO and LEARN: The student will (1) select one specific manner of wasting energy; (2) perform a literature review of previous research on this topic; (3) investigate the behavior patterns that lead to the wasting of energy; (4) use those behavioral patterns to estimate the amount of energy wasted on individual, regional, national, and global levels, where appropriate; (5) identify key methods of intervention (either technological or educational) to reduce the energy waste; and (6) have the option of further pursuing the method of intervention or self-identifying a new area of wasted energy.

List the specific benefits for the student: The student will be trained in quantitative analysis, critical reasoning, and technical communication. The student will learn to think independently, direct his/her own research questions, make quantitative estimates of energy usage, make appropriate assumptions to extrapolate results to larger populations, make technical presentations, write technical reports, and contribute to academic research. Additionally, the student will be a member of a research group and will experience how to work with colleagues to answer technical questions.

Faculty mentor: Brent Nelson, Mechanical Engineering

Intern: Michael O'Reilly
Spring 14.014: Assessing the Efficacy of Various Types of Sport Tape to Enhance Balance and Minimize Injury

Describe the internship in terms of what the student intern will DO and LEARN: The student will (1) participate in recruiting healthy college age students with no prior ankle injury; (2) assist in coordinating times that participants and researchers can meet to collect data; (3) maintain and organize data collection forms as well as transfer data from the pressure plate and computerized balance assessment to an Excel spreadsheet (using numerous frequency and data checks); (4) become familiar with the process of blinding subjects to their experimental condition (effect of exercise on non-taped ankle or the changes tape makes but not knowing what tape the participant is in); (5) learn the various protocols and methods to assess ankle movements, pressure, and balance while working with Athletic Trainers and Physical Therapists; (6) as time permits and if the student shows an aptitude, s/he can assist with literature reviews, the early phase of writing a manuscript, analysis of data, and if available at the time the results might be accepted for presentation, s/he would be invited to attend and participate if feasible.

Specific benefits to the student: Aside from the previous items listed above, participation in research provides students the opportunity to develop ownership in the project and their learning. This further enhances their desires to continue their education and hopefully fosters future creative ideas.

Faculty mentor: Scot Raab, Physical Therapy & Athletic Training

Intern: Elizabeth Stapleton

Spring 14.015: How the Asiatic Clam is affecting the Montezuma Well aquatic ecosystem

Describe the internship in terms of what the student intern will DO and LEARN: The intern will conduct monthly sampling surveys at Montezuma Well using a 1m³ quadrat, counting all the clams found in the sampling areas. S/he will also note any interactions with the endemic species and collect a subset of approximately 25 clams to bring back to the laboratory where the student will anesthetize in 10% ethanol and dissect at least 10 individuals, then maintain the remaining individuals in tanks to record the demography, reproductive condition and life history of these clams. The student will also survey and collect clams from Wet Beaver Creek and the ancient canal system that runs through the park to note densities and life histories of the clams in these different aquatic environments. As time permits, the student will conduct ecological co-occurrence experiments (replicated microcosms of Montezuma Well in the lab) wherein clams are maintained at different densities with endemic species from the well, including leeches and giant water beetles, to determine the nature, frequency, and outcome of interspecific interactions.

Specific benefits to the student: While working on this project the student will learn how to maintain laboratory animals, document mollusc life history traits, and test simple hypotheses using goodness of fit tests to determine if the numbers of individuals maintained in experimental tanks changes with density and species number. The student will learn field and laboratory techniques and how to gather and analyze data using appropriate statistics. The student will become part of the Shuster Laboratory and will participate in weekly meetings in which students with range of backgrounds and experience present and discuss their research. The intern will also write up the research results in poster format to present.

Faculty mentor: Stephen Shuster, Biological Sciences

Intern: Theresa Rizza

Spring 14.016: Effects of Climate Change on Western Spruce Budworm in New Mexico

Describe the internship in terms of what the student intern will DO and LEARN: The intern will learn how to estimate tree and insect phenology by acquiring and analyzing climate models. The intern will also learn how to acquire, process, and analyze remotely sensed data. Finally, the intern will learn how to find and summarize relevant peer-reviewed literature.
Specific benefits to the student: (1) Exposure to popular techniques in the fields of climate change and remote sensing. (2) Learn skills to acquire climate and remote sensing data and analyze data using software packages such as ArcGIS and ENVI. This experience will provide the student with the tools to continue a career in research while also making him/her more competitive in the job market. (3) Broad understanding of the interactions between climate, insects and forests. (4) Interaction with graduate students and faculty in the Silviculture and Applied Forest Health lab and exposure to multiple research projects.

Additional comments: This project is likely to lead directly to a publication. The graduate student does not have time to pursue both this and his primary thesis questions related to field-collected data. The intern would be mentored by both the graduate student and me.

Faculty mentor: Kristen Waring, School of Forestry

Intern: Connor Meehan

Spring 14.017: Self-Identity, Stress, and Coping in First Year College Students

Describe the internship in terms of what the student intern will DO and LEARN: The student would learn how to conceptualize a psychological hypothesis grounded in theory and test that hypothesis. To do that, the student would learn how to conduct a literature review on the question, how to organize data in SPSS (e.g., assemble scales, check reliability), analyze data in SPSS (tests, correlations, chi-square), make APA formatted charts, create and present a poster at the NAU Undergraduate Symposium, and if data publishable, co-author a publication for Psi Chi Journal (student would be first author).

Specific benefits to the student: All of the skills listed above would greatly advantage a student seeking to go on to graduate school in Psychology. In addition, student would make significant progress on the following specific aspects of our learning goals for the Psychology Major: Goal One: Knowledge Base in Psychology. Student will demonstrate fundamental knowledge and comprehension of the major concepts, theoretical perspectives, historical trends, and empirical findings on the areas of self-identity, stress, and coping. Goal Two: Scientific Inquiry and Critical Thinking. Student will develop scientific reasoning and problem-solving skills, including effective research methods (e.g., research question, data analysis, and interpretation) and understand their fundamental importance in psychology. Goal Three: Ethical and Social Responsibility in a Diverse World. Student will develop ethically and socially responsible behavior for professional and personal settings. Students will recognize, understand and respect the complexity of psychosocial and cultural diversity. Goal Four: Communication. Student will be able to demonstrate competence in writing and in oral and interpersonal communication skills. Students will demonstrate information competence and the ability to use computers and other technology for data analysis and data representation. Goal Five: Professional Development. Students will emerge from the major with abilities that sharpen their readiness for post-baccalaureate employment, graduate school, or professional school.

Faculty mentor: Heidi Wayment, Psychological Sciences

Intern: Katherine Zhang

Spring 14.018: The Tale the River Told: The Murder of Chloe Gordon (book manuscript development)

Describe the internship in terms of what the student intern will DO and LEARN: The student will learn to and conduct research on a plethora of archival materials from the Chloe Gordon case. This will include a content and thematic analysis of various documents such as trial transcripts, police files, and interview data. As such it will entail reviews of literatures, data coding and retrieval, and working in a heuristic learning environment. The intern will learn an enormous amount about interpersonal violence through the lens of a real case and from the perspective of those involved in reviewing cases with a view to developing preventive interventions. This is boots-on-the-ground engagement in research. It is simultaneously stimulating and emotionally challenging. It is not for the faint-hearted student. However, it is for the undergraduate student with passion and a deep sense of curiosity. The student will work with our Family Violence
Institute (FVI) team and me personally. The doing and the learning will go hand in hand. It is a fascinating opportunity for a committed and competent student.

**Specific benefits to the student:** The student will acquire considerable content specific knowledge, learn to conduct research, and come to appreciate complex epistemological issues that involve critically exploring how we know what we think we know.

**Additional comments:** This is exciting work. I have placed a number of our interns in jobs over the years. As we expand at the FVI we always consider our interns as possible future employees.

**Faculty mentor:** Neil Websdale, Family Violence Institute

**Intern:** Richmond Barkemeyer

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### Spring 14.019: Electroencephalographic Measures of Empathy and Free Will

**Describe the internship in terms of what the student intern will DO and LEARN:** The student will learn fundamentals about social cognitive neuroscience research, theoretical issues and how to design experiments to test theories. S/he would read some of the most critical literature in the field, help in constructing experiments, help in collecting and analyze data, and have the opportunity to present at conferences and even perhaps publish in a journal, though that would require participating in the lab beyond the one-semester internship period. More generally, the student would learn about the scientific method, the human mind/brain, and interpersonal and professional skills.

**Specific benefits to the student:** One challenge to social cognitive neuroscience research is the length of time it takes to carry an individual experiment from conception to completion. Between weeks or months spent putting stimulus sets together, to months collecting, processing and analyzing data, to writing a manuscript for publication often takes two years. Given that this internship is designed to get students engaged early in their undergraduate careers, the program is ideal for my lab as it gives students the chance to start on research earlier than is typical (junior year in the psychology department). A student with the kind of jump-start on his/her research career that would come from this internship would give him/her a distinct advantage when applying to top-notch, competitive graduate school, due to the depth in which s/he would learn the tools of neuroscience research.

**Faculty mentor:** C. Chad Woodruff, Psychological Sciences

**Intern:** Victoria Lopez

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**Fall 2013**

### Fall 13.001: Do cardiovascular risk factors explain why more socially connected people are healthier?

**Describe the internship in terms of what the student intern will DO and LEARN:** The intern will (1) learn and apply advanced statistical techniques (mostly regression) to understand the extent to which social relationships are associated with cardiovascular disease risk. Some risk factors are continuous (blood pressure) whereas others are dichotomous (diabetes) and thus the intern will learn about multivariate regression for continuous and dichotomous outcome measures; (2) evaluate regression model assumptions and develop data management and analysis skills using Stata statistical software; (3) become familiar with the literature on social relationships and health as well cardiovascular disease risk in the US population.

**Specific benefits for the student:** The student will 1) learn a set of flexible analytic techniques that are applicable across a wide range of research domains; 2) develop rigorous workflow habits to ensure results are reproducible and verifiable; and 3) also have the opportunity to prepare their results for conference submission/presentation. There may also be the opportunity to collaborate on a journal article manuscript for submission.
Additional comments: This project is part of a larger effort to understand why people with more social relationship resources are healthier than those without. My lab has shown that social relationship quantity is inversely associated with mortality and this work examines possible mechanisms for these associations, e.g., does lower blood pressure and/or cholesterol, diabetes, etc., explain the survival advantage?

Faculty mentor: Steven Barger, Psychology

Intern: Celena Leland

Fall 13.002: Molecular ecology of the nightingale reed-warbler

Describe the internship in terms of what the student intern will DO and LEARN: The student will learn and perform tissue digestion, DNA extraction, PCR, gene sequencing, and microsatellite analysis in the Biology Department’s Environmental Genetic & Genomics Lab. All of these skills are industry standards and useful in careers in a variety of life science fields, including conservation biology, health sciences, and biomedical research and engineering.

Specific benefits for the student: The student will gain hands-on work experience in a molecular biology lab, acquire advanced skills in genetic analysis, participate in cutting-edge population modeling and wildlife management techniques, and contribute significantly to the conservation of an endangered species.

Faculty mentor: Russell Benford, Biological Sciences

Intern: Liliana Ortiz

Fall 13.003: Evaluation of electrical conductivity of carbon fibers enhanced with carbon aerogels and with carbon nanotubes

Describe the internship in terms of what the student intern will DO and LEARN: The intern will (1) perform electrical conductivity measurements (following a measurement procedure developed in my lab) of carbon fiber weaves coated, at different densities, with carbon aerogels and carbon nanotubes; (2) perform tensile tests on the coated carbon fiber weaves (following a testing procedure that we routinely involve in the lab) to determine the effect of each coating on the weave’s mechanical properties; (3) assist with the experimental data analysis; and (4) be encouraged to make recommendations, based on the results of the analysis, as to which of the two additives and at which density(ies) should be adopted to achieve the best combination of electrical and mechanical properties of the weave.

Specific benefits for the student: The intern will (1) learn about carbon aerogels and carbon nanotubes, materials that are not commonly covered in UG curriculum; (2) learn to use established testing procedures to assess electrical and mechanical properties of carbon fiber weaves enhanced with carbon aerogels and carbon nanotubes; (3) learn to collect, analyze, and report on experimental data; and (4) participate in lab meetings to be exposed to all facets of the research process.

Faculty mentor: Constantin Ciocanel, Mechanical Engineering

Intern: Brett Cutler

Fall 13.004: Implementing and evaluating internal sources of data related to professional education programs - POSTPONED

Describe the internship in terms of what the student intern will DO and LEARN: The student intern will (1) receive hands on experience related survey construction, implementation of online surveys, strategies for improving response rates; (2) experience with sorting, analyzing and presenting data and findings; (3) use spreadsheet software; (4) gain experience with collaborative tools such as Google Docs/Drive in a professional setting; and (5) gain knowledge of assessment methods and accreditation in a higher education setting.
Specific benefits for the student: The student intern will gain practical experience in survey research, qualitative methodologies, data analysis, and presentation. The intern will gain experience in writing for a variety of audiences including the public, accreditation organization, and research and practice periodicals.

Additional comments: The student intern will be supporting research and data analysis efforts critical to national re-accreditation of NAU’s professional education programs.

Faculty mentor: Gypsy Denzine, Professional Education Unit, Vice Provost-Academic Affairs

Fall 13.005: Pedagogical motivation at Killip Elementary School: A study of transformation of mind and body through rock climbing

Describe the internship in terms of what the student intern will DO and LEARN: (1) data collection, transcription, coding, and analysis; (2) help organizing the other undergraduate volunteers. It is my hope that if this research is published that the student intern would be a part of that. Since the program only runs on Fridays I believe that the proposed tasks are entirely feasible within the time constraints of the intern.

Specific benefits for the student: The student will learn about (1) collection, transcription, coding, and analysis of qualitative data sets in the social sciences, (2) how programs centered on active and healthy lifestyles can contribute to student success at the elementary school level, (3) program design and implementation, and (4) the NAU IRB process and how to ethically and properly conduct a research project.

Faculty mentor: Jacob Dolence, University College
Intern: Maggie Wendt

Fall 13.006: Northern Arizona Mesonet

Describe the internship in terms of what the student intern will DO and LEARN: The intern will be working with me to (1) establish new weather stations; (2) maintain existing weather stations throughout Northern Arizona; (3) work with NAU IT staff, research faculty at MPCER, and NWS service staff to facilitate data storage, presentation, and quality control; and (4) interface with middle and high school teachers who are hosting the weather stations on their campuses.

Specific benefits for the student: The intern will gain knowledge of atmospheric sciences, weather station operation and maintenance, data processing, and K-12 science education.

Faculty mentor: Diana Elder, SESES-Environmental Programs
Intern: Geordi Alm

Fall 13.007: Regional media coverage of climate change: A comparison of German and U.S. examples

Describe the internship in terms of what the student intern will DO and LEARN: (1) Using such databases as Lexis-Nexus and Access World News, the student intern will find, read, and analyze selected U.S. newspaper articles about climate change and its regional manifestations; (2) learn to do content analysis through social science coding techniques, which are of use in a wide array of research applications, (3) learn how journalists report on a complex scientific/environmental issue and how that issue is dealt with differently in the two countries involved.

Specific benefits for the student: The intern will learn how to work with databases, how to conduct textual content analysis, and how to compare trends in media coverage. The intern will not need to have any knowledge of German, but he or she will certainly be exposed to the methods used in conducting cross-cultural media analysis, as well as to the differences between Germany and the U.S. in media coverage and public perception of an important environmental issue.
**Additional comments:** This project should be of interest to students interested in the media, climate change and environmental studies, international affairs, and/or social science research.

**Faculty mentor:** Peter Friederici, School of Communication

**Intern:** Caitlyn Kellogg

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**Fall 13.008: Relocating the Rio de Flag: Impacts on residents & environment**

**Describe the internship in terms of what the student intern will DO and LEARN:** The student will (1) gather historical information from archives, (2) collect demographic data from community meetings about the population, earnings, housing, and businesses in the Southside neighborhoods affected by the Rio de Flag relocation; and (3) learn about how community residents and organizations affect development and environmental conditions in neighborhoods.

**Specific benefits for the student:** The student intern will learn about the Southside neighborhoods of Flagstaff and develop knowledge and skills in community building, research methods in archival research, historical analysis, content analysis, and use of demographic data in formulating effective public policy. The student will contribute to a growing body of knowledge that can be utilized by students, researchers, community residents and policymakers to help analyze the effect of proposed Rio de Flag relocation projects designed to reduce flooding in the Southside and to improve development in the area.

**Additional comments:** The complex interplay between researchers, planners, residents, and developers is rarely exposed to students; the project emphasizes the importance of creating collaboration between experts and residents in solving community problems. One student worked on the Rio de Flag project in the fall 2012, but was unable to complete the project in the spring of 2013.

**Faculty mentor:** Ricardo Guthrie, Ethnic Studies

**Intern:** Alexandra Garcia

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**Fall 13.009: HRM ethics case studies - POSTPONED**

**Describe the internship in terms of what the student intern will DO and LEARN:** (1) Research sources including the popular press and other journal articles; (2) interviewing HRM Advisory Board Members; (3) canvassing other hospitality ethics programs nationwide; and (4) possible draft parts of a paper for publication.

**Specific benefits for the student:** The student will get significant writing experience and feedback as well as exposure to journal and ethics research.

**Faculty mentor:** Frances Hill, Hotel & Restaurant Management

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**Fall 13.010: Sedimentary records of environmental change**

**Describe the internship in terms of what the student intern will DO and LEARN:** The intern will (1) analyze sediment from lake cores for grain-size distribution, biogenic silica content and magnetic susceptibility; (2) learn to interpret the results in terms of past environmental and climate variability; (3) integrate her/his downcore data set with others from the same sediment core, including geochronology and visible reflectance spectroscopy; (4) use a spreadsheet to analyze and visualize the data; and (5) have the opportunity to be engaged in the broader research program, including weekly laboratory meetings.

**Specific benefits for the student:** The student will advance his/her laboratory and data-analytical skill. S/he will participate in team of international climate science researchers.
Faculty mentor: Darrell Kaufman, SESES

Intern: Taryn Schreiner

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**Fall 13.011: Designing an interactive magazine app for tablets**

Describe the internship in terms of what the student intern will DO and LEARN: This student will (1) learn and execute the design of specific interactive stories for the magazine app; (2) be responsible for executing the design, learning the features of the software, and helping to put out the magazine app.

List the specific benefits for the student: The student will learn and gain the confidence of helping to put out a multimedia magazine for the iPad, positioning them into a career for one of the most cutting-edge publication markets within journalism.

Faculty mentor: Kurt Lancaster, School of Communication

Intern: Krista Menzel

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**Fall 13.012: STAR school educators development**

Describe the internship in terms of what the student intern will DO and LEARN: An intern would (1) learn how formative and summative assessment data define individualized student instruction; (2) help the mentor define pre-assessments that NAU teacher candidates would implement; (3) maintain/share individualized student data to professors teaching science, social studies, and math methods classes to the traditional and cohort program of studies in the College of Education whose teacher candidates team with STAR school teachers to implement specific lessons; and (4) compare and contrast pre and post data to determine individual student and group progress with conclusions that will be shared with the STAR teachers, professors at the College of Education, and NAU teacher candidates.

List the specific benefits for the student: The intern would be prepared for the “common core” future for teachers of tomorrow and be ready for the new educational world of using assessment data to inform individualized instruction.

Faculty mentor: James Manley, Educational Leadership

Intern: Valerie Garcia

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**Fall 13.013: Evaluating the impact of wasted energy - POSTPONED**

Describe the internship in terms of what the student intern will DO and LEARN: The student will (1) select one specific manner of wasting energy; (2) perform a literature search to investigate previous work on the topic; (3) investigate the behavior patterns that lead to the wasting of energy; (4) use those behavioral patterns to estimate the amount of energy wasted on individual, regional, national, and global levels, where appropriate; (5) identify key methods of intervention (either technological or educational) to reduce the energy waste; and (6) have the option of further pursuing the method of intervention or self-identifying a new area of wasted energy.

List the specific benefits for the student: The student will be trained in quantitative analysis, critical reasoning, research methods, and technical communication. The student will learn to think independently, direct his/her own research questions, make quantitative estimates of energy usage, make appropriate assumptions to extrapolate results to larger populations, make technical presentations, write technical reports, and contribute to academic research. Additionally, the student will be a member of a research group and will experience how to work with colleagues to answer technical questions.

Faculty mentor: Brent Nelson, Mechanical Engineering
Fall 13.014: A new twist on muscle contraction

Describe the internship in terms of what the student intern will DO and LEARN: The student will (1) participate in experiments using mutant mice to investigate the role of titin in active muscle; (2) learn about alternative theories of muscle contraction; (3) have the opportunity to work with an interdisciplinary team of researchers including biologists, engineers, and a biochemist; (4) learn to develop hypotheses, collect and analyze data, present results to the research group and possibly at a professional meeting; and (5) prepare a report or manuscript based on his/her research.

Specific benefits for the student: Participation in research provides students with the opportunity to show leadership, motivation and creativity in designing and executing a research project. Students learn to trouble-shoot experimental methods and to place their work in a larger context. They gain confidence and motivation from presenting their results to the research group and at scientific meetings. Experience in research is also an important stepping stone to admission in graduate and professional schools.

Faculty mentor: Kiisa Nishikawa, Biological Sciences

Intern: Joey Genco

Fall 13.015: Caregiver-infant communicative interaction during play

Describe the internship in terms of what the student intern will DO and LEARN: The student will (1) assist with data coding and data analysis for this project (data coding will involve transcribing and coding audio-recorded play sessions of parents and their infants); (2) participate in weekly lab meetings with the faculty mentor and other graduate students in the Child Language Lab; (3) become proficient in the use of LENA Pro hardware and software (LENA is a new technology that is used to record and automatically analyze the natural language environment of young children); (4) become familiar with the nature of parent-infant interaction during play; (5) learn what types of communicative interactions between parents and infants promote optimal language development; and (6) gain an understanding of typical patterns of communication development in infants and toddlers.

Specific benefits to the student: The student will gain an understanding of the scientific process in the field of language acquisition research including the protection of human subjects and ways in which basic research translates to clinical practice. Additionally, the intern will gain considerable knowledge of typical patterns of early speech and language development by observing multiple interactions between parents and their young children. Finally, the student will have the opportunity to learn from and collaborate with CSD graduate students who are also working on this project.

Faculty mentor: Anna Sosa, Communication Sciences and Disorders

Intern: AnaClara Rice


Describe the internship in terms of what the student intern will DO and LEARN: The student will (1) spend the 6 hours a week in schools working with kindergarten children who are struggling to learn to read; (2) learn to administer brief language and reading tests and teach children these skills; (3) learn to implement research procedures, collect and manage data, read and critique research articles, prepare manuscripts for publication, and present at conferences.

Specific benefits to the student: The intern will be better prepared for graduate school because s/he can read research and learn to consume research. In addition, s/he will receive training in test administration and intervention delivery.

Additional comments: This is a great experience for undergraduates in psychology, education, communication disorders, and health sciences...anyone who wants to work with children. A field-based research experience in my research lab is an
amazing opportunity for undergrads. Two of the students who worked with me last year (sophomore and junior) presented an oral paper at a conference and have submitted to do the same at a large national conference.

Faculty mentor: Trina Spencer, Institute for Human Development

Intern: Madison Varney

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**Fall 13.017: The effectiveness of blended learning**

**Describe the internship in terms of what the student intern will DO and LEARN:** The intern will assist in this project by (1) working closely with the professor in the development and implementation of a survey instrument to gauge success in the blended learning courses; and (2) completing the statistical analysis of the results of the survey.

**List the specific benefits to the student:** The intern will gain experience with research methodologies, survey development and data collection, and statistical analyses.

**Additional comments:** The two blended learning courses to which this will apply are ECO 280 (Introduction to Economics) and ECO 201 (Introduction to Business Statistics).

Faculty mentor: Richard J. Szal, Economics

Intern: Blake Longfield

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**Fall 13.018: Parental bereavement attributions and compassion**

**Describe the internship in terms of what the student intern will DO and LEARN:** An intern will be mentored on the following: (1) to develop arguments in a literature review (how to make basic claims and use research/publications to support those claims); (2) to develop experimental messages that are manipulated, (3) to develop an online survey for participants to complete; (4) to analyze basic statistics using SPSS (it is a free statistical package at NAU for faculty and students), and (5) to develop plausible explanations for the findings.

**Specific benefits to the student:** An intern will learn the basics of how to conduct an experimental-design, quantitative social scientific research study.

Faculty mentor: Laura Umphrey, School of Communication

Intern: Victoria Pocknell

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**Fall 13.019: The Second Step violence prevention program at school**

**Describe the internship in terms of what the student intern will DO and LEARN:** With assistance from the mentors, the intern will learn how to (1) identify scholarly literature relevant to a research project; (2) compile an annotated bibliography; (3) participate in the development of grant proposal; (4) identify ethical issues involved in research on human subjects; and (5) fulfill regulatory compliance and the IRB requirements. There is some possibility for the student to participate in the pilot stage of data gathering as well.

**Specific benefits to the student:** In addition to developing specific skills involved in literature search and in writing an annotated bibliography, this internship is a valuable opportunity for the student to participate in the early stages of project development and to acquire some preliminary skills in research design as well as an understanding of the research funding process.

Faculty mentors: Jim Wilce and Janina Fenigsen, Anthropology
Intern: Cheyenne Franklin

Spring 2013

Spring 13.001: Perceptions of Rural Health Care for Family Nurse Practitioner Students

Describe the internship in terms of what the student will DO and LEARN: The proposed internship will provide the early career undergraduate researcher with the opportunity to: (1) identify scholarly articles, across disciplines, in rural health education through the completion of a literature review; (2) categorize literature in an annotated bibliography, with instruction and supervision from the researcher; (3) develop the online survey using the approved questionnaires, with instruction and supervision from the researcher; and (4) analyze the data collected, using SPSS 11, with instruction and supervision from the researcher.

List the specific benefits to the student that will result from this internship: The student will benefit from this internship by being involved in the data collection and analysis of the first phase of participants, and be an integral part of preparing for the dissemination of results. The researcher will acknowledge the contribution of the intern on any presentations or publications resulting from this study.

Provide any additional comments that are relevant: I believe this is a great opportunity for an undergraduate research intern to learn the basic components of the research process. I'd be excited to work with the student and have the opportunity to mentor a future researcher.

Faculty mentor: Debbie Nogueras, Nursing

Intern: Jeanette Hopper

Spring 13.002: Samples in Second Language Acquisition Research: An Examination of Statistical Power and Generalizability

Describe the internship in terms of what the student will DO and LEARN: This study systematically examines sampling in quantitative second language research which, when lacking in size or breadth/variety, introduces threats to both internal validity (via low statistical power) and external validity (i.e., generalizability). The main task of the student will be to assist with data collection. More specifically, the student will code primary studies for a number of substantive and methodological features related to sampling in second language research (e.g., sample size; learner demographics such as age; contexts of second language research such as educational level). Many of the analyses for this type of work are relatively straightforward and the student may be involved in this phase of the research as well.

List the specific benefits to the student that will result from this internship: (1) As an intern for this project, the student will have the opportunity to engage in cutting edge and highly interdisciplinary research. Specifically, this study bears relevance to a number of fields, including foreign language teaching, education, linguistics, psychology, and quantitative research methods, and this internship will position the student well for graduate studies in any of these as well as a number of other related fields. (2) The intern will become familiar with the relative strengths and weaknesses of different primary research methods as well as meta-analytic methods, which are well-established or gaining momentum as a means for reviewing previous research in many fields (e.g., education) and are the methodology par excellence in many others (e.g., medicine, psychology). (3) Depending on the intern’s interest and objectives, there may be an opportunity to co-author and publish one or more articles on this or a related topic.

Provide any additional comments that are relevant: I very much look forward to teaching the student intern the conceptual as well as procedural foundation of meta-analytic research and to seeing him/her learn from the process of collecting and analyzing data for this project.
Spring 13.003: Zircon-crystal Geochemistry as a Tool to Understand Paleotopography of the Early Mesozoic Southwestern US

Describe the internship in terms of what the student will DO and LEARN: Geochemical data are derived from a mass spectrometer that uses a laser to drill a 25-micron-width hole into the zircon crystal, mix the ablated material with a plasma, and measure the resulting concentrations of rare earth elements. The undergraduate intern will learn a relatively simple computer program called Iolite, which uses the raw data from the mass spectrometer to reduce data. What the program cannot do, however, is assess the reduced data for anomalies and understand these anomalies. The undergraduate intern will compare profiles from different crystals with three objectives. (1) Highly unlikely patterns may reflect misidentified crystals that were analysed, but that cannot contribute meaningful data (i.e., minerals other than zircon); (2) the data may reveal distinct groupings that suggest different sources areas; (3) the data may allow correlation of the crystals with intrusive remnants of the volcanic arc. Even a “null” set that shows no patterns of any kind will give the student intern experience in assessing the validity of data sets. Thus, the intern will learn a computer program, will learn to assess the quality of individual parts of a data set, and will apply these skills to interpreting patterns found in the complete sets.

List the specific benefits to the student that will result from this internship: The student intern will work with me and with my new graduate student. S/he will benefit from watching the graduate student develop a complex research project and will be encouraged to go in the field with her to collect samples and learn field research methods (although this would not be part of the I2S-funded activities). The results obtained by the intern will be a part of a peer-reviewed publication, and assuming that the student wishes to continue to be part of the project, s/he will learn how research is done from sample collection to publication. At minimum, the student will be co-author on an abstract to a professional meeting.

Provide any additional comments that are relevant: This project can easily be the basis for a Hooper Undergraduate Research Award proposal.

Faculty mentor: Nancy Riggs, SESES - Geology

Intern: Robyn Cypher

Spring 13.004: Teacher Education and the Search for Criticality

Describe the internship in terms of what the student will DO and LEARN: The student intern will (1) be engaged in a literature search and review on the topic of teacher education; (2) be mentored in constructing and administering a survey instrument for a sample of current teacher education students; and (3) assist with data analysis.

List the specific benefits to the student that will result from this internship: Through this internship the student will investigate and learn about the field of teacher education. The intern will engage in the research process through literature search and review, through construction and deployment of a survey instrument, and through analysis of literature and research data.

Provide any additional comments that are relevant: I am engaging in this project along with Dr. Jean Ann Foley, Associate Professor, Department of Teaching and Learning. We will jointly supervise and mentor the undergraduate intern.

Faculty mentor: Joseph C. Wegwert, Teaching & Learning

Intern: Chloie Stelton
Spring 13.005: Activism and Engagement among First Year Students

Describe the internship in terms of what the student will DO and LEARN: The intern will be actively involved in conducting community needs assessment and identifying local individuals/organizations. The intern will be working with a group of students by helping them create relationships to individuals and/or community organizations, helping the students identify an issue and connect this to the particular individual or organization, and helping raise questions regarding how to gain access/entree into a community, how to establish rapport, and how to navigate the complex issues of representation and research. In addition, the intern will conduct interviews and transcribe these for analysis and conference presentation. The intern will learn the following: (1) basic elements of community-based research including identifying community needs, gaining access and entree, building relationships, conducting and transcribing interviews, completing an IRB application for human subjects, addressing ethics of research particularly with more vulnerable population; (2) how to mentor students and work in collaborative teams; (3) how to connect research to activism through the use of images; (4) a better knowledge of the larger Flagstaff community and how to become involved in civic engagement; and (5) how to analyze data and write up research for conferences.

List the specific benefits to the student that will result from this internship: As a mentor, I will meet with the intern weekly to guide the student through the practical questions of conducting research. In addition, the intern will benefit from gaining a better understanding of the community, learn how to become more involved, develop a greater sense of connection to the university, and develop skills to take on leadership positions.

Provide any additional comments that are relevant: The project falls within the scope of both a scholarly and a creative project. The research questions are as follows: (1) How does focusing on social, environmental, and cultural issues in Flagstaff connect first year students to their local communities? (2) How do first year students develop their identities as activists through a “Photography as Activism” class? There will also be two Teaching Assistants helping students in this class.

Faculty mentor: Gerald Wood, Educational Leadership

Intern: Victoria VanPuyvelde

Spring 13.006: Electroencephalographic (EEG) Measures of Empathy and Free Will

Describe the internship in terms of what the student will DO and LEARN: The student will learn fundamentals about social cognitive neuroscience research, theoretical issues and how to design experiments to test theories. S/he would read some of the most critical literature in the field, help in constructing experiments, help in collecting and analyze data, and have the opportunity to present at conferences and even perhaps publish in a journal, though that would require participating in the lab beyond the one-semester internship period. More generally, the student would learn about the scientific method, the human mind/brain, and interpersonal and professional skills.

List the specific benefits to the student that will result from this internship: One challenge to social cognitive neuroscience research is the length of time it takes to carry an individual experiment from conception to completion. Between weeks or months spent putting stimulus sets together, to months collecting, processing and analyzing data, to writing a manuscript for publication often takes two years. Given that this internship is designed to get students engaged early in their undergraduate careers, the program is ideal for my lab as it gives students the chance to start on research earlier than is typical (junior year in the psychology department). A student with the kind of jump-start on his/her research career that would come from this internship would give him/her a distinct advantage when applying to top-notch, competitive graduate schools, due to the depth in which s/he would learn the tools of neuroscience research.

Provide any additional comments that are relevant: I run the NAU Social and Cognitive EEG Lab. We collect electrical brain data from the surface of the scalp in order to determine how the brain enables us to have empathy and compassion for others. The lab publishes the research in neuroscience journals and presents research at international neuroscience and psychology conferences. All students in my lab get a thorough introduction to the field and working knowledge of electrical brain recordings.

Faculty mentor: C. Chad Woodruff, Psychological Sciences
Spring 13.007: Bark Beetle Communities in Ponderosa Pine

**Describe the internship in terms of what the student will DO:** The student will learn to identify the major bark beetle species found in ponderosa pine forests in northern Arizona. The intern will assist in the identification, counting, and sorting of important pine-killing insects. The intern will also learn to identify the complex community of mites found on beetles as part of a collaborative project with scientists in Wisconsin and Georgia.

**List the specific benefits to the student that will result from this internship:** Benefits to the student include (1) experience in a research lab; (2) work on interesting research with other undergraduate and graduate students in the lab; (3) learn to identify important insect pests of pine; (4) learn the scientific method; (5) become proficient at using laboratory equipment such as microscopes; and (6) potentially be a co-author on a scientific presentation at national meetings.

**Provide any additional comments that are relevant:** The research for this project began during the summer. The student will also have the opportunity to learn about other interesting research in the mentor’s lab such as the use of sounds to deter bark beetles, termites, and other wood infesting insects.

**Faculty mentor:** Richard Hofstetter, Forestry

**Intern:** Barbara Sugarman

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Spring 13.008: Imaging Volcanic Activity in Turkey through Space and Time

**Describe the internship in terms of what the student will DO:** The student intern will work as a member of a team to use ArcGIS (the most extensively used Geographical Information Systems program) to produce a geographically referenced database for volcanic rocks of the central Anatolia region of Turkey. The student will compile a comprehensive table of geochronologic (age) and geochemical data from literature sources and field reports, under the guidance of the mentor and two graduate students. The student will import these data into ArcGIS and help to produce maps that display chemical changes in magmatic activity in space and time.

**List the specific benefits to the student that will result from this internship:** The student intern will (1) work as a member of a multidisciplinary international team, helping to produce a product of immediate interest to a broad audience; (2) learn ArcGIS and/or enhance their skills in using it (employers in many areas of sciences deem GIS-related skills highly valuable); (3) become familiar with creating maps (cartography); (4) become familiar with the methods for various age determinations of geologic materials (from compiling the age information) and for geochemical data sets; (5) become more conversant with data accuracy and precision, and with statistics; and (6) learn more about the geologic history of Turkey, specifically, and about thinking about geologic events in space and time.

**Provide any additional comments that are relevant:** A similar and widely used geographically located data set, NAVDAT, has been created for the western U.S. The database can be accessed at navdat.org. A major difference is that this is web-based rather than the target here, which is an ArcGIS base. With the GIS database, the student intern, the mentor, her graduate students, and other investigators on the project - and, eventually, all scientists - can explore the spatial and temporal variations in magmatic activity in this tectonically active and complex region. The resulting maps will help to identify whether there are geographical trends in volcanic activity that can be related to other geologic events in the region, whether there are punctuated periods of activity separated by magmatic lulls, whether there are chemical changes in time and/or space, and whether there are areas for which additional data are needed (to be generated as part of this NSF-funded project).

**Faculty mentor:** Mary Reid, SESES - Geology

**Intern:** Sarah Colombo
Fall 2012

Fall 12.001: Immune Response to Psychological Stress

Describe the internship in terms of what the student will do: The intern will work closely with the mentor to assist in collecting data for a project investigating the effects of stress on immune function in college students. In this project, the intern will (1) coordinate recruiting male volunteers to participate in an in-lab study; (2) assist in data collection for the study by actively participating in running the in-lab stress manipulation (data from female volunteers has already been collected); and (3) participate in analyzing data collected.

List the specific benefits to the student that will result from this internship: The benefits include (1) learning about how research is conducted in psychology, (2) learning about the protection of human subjects in research, (3) learning how to recruit study participants, and (4) working closely with a faculty mentor to learn the techniques used in data collection and data analysis. More specifically, the intern in this position would learn how to use equipment in the lab for physiological data collection (BioPac system for recording heart rate, skin conductance, blood pressure), immune marker analysis ("wet lab" equipment for conducting enzyme immune assays or EIAs), and statistical analysis (Excel and SPSS software). As an additional benefit, the intern will work closely with the mentor and develop a professional relationship with a faculty member.

Provide any additional comments that are relevant: This internship will be a discrete component of a larger on-going project designed to study the effects of realistic psychological stress (participating in a mock job interview) on the activity of the immune system. It is well known that stress can impair the immune system, making people more vulnerable to infections and more likely to get sick. The goal of this line of research is to better understand some of the differences between individuals and how stress affects their immune systems. For example, why might the stress of a job interview impair the immune system of one individual, but not another?

Faculty mentor: Melissa Birkett, Psychological Sciences

Intern: Lauren Johnson

Fall 12.002: The History and Future of Aging Policy and End-of-life Medical Care in the United States and Europe

Describe the internship in terms of what the student will do: This will be a research internship in the area of health policy, specifically a study on the history and future of aging and end-of-life medical care in the industrialized world. The intern will (1) become oriented to the project (working hypothesis, nature of evidence under examination) through background reading (that the mentor will supply) and discussions with the mentor; (2) learn data summary methods specific to the project and which are widely used in history and the social sciences; (3) learn literature search techniques, e.g., JSTOR; and (4) conduct independent research, summarizing a variety of sources, including articles from journals, newspapers, magazines, books, and websites.

List the specific benefits to the student that will result from this internship: The student will (1) learn about research project design; (2) learn and practice research methodology in history and the social sciences; (3) learn about health policy, specifically the history and future of aging policy and end-of-life medical care in the Europe and the United States.

Provide any additional comments that are relevant: This would be an ideal internship for a student in history, social sciences, health professions, or pre-med studies. The intern will work directly with the mentor on his third book. The mentor is just returning from a 6-month Fulbright stay in France where he conducted archival and library research on European aging politics, retirement systems, and end-of-life medical care. Further, the mentor sits on the on-campus pre-med interview committee and has often found that students know surprisingly little about the US health care system in which they intend to make a career.
Faculty mentor: Paul Dutton, History

Intern: Christina Harman

Fall 12.003: Developing an Electronic Display of Sensor/Actuator Network Activity

Describe the internship in terms of what the student will DO: The student will design and develop an electronic liquid crystal display board that will be integrated with a wireless sensor/actuator networks used for sensing and control of ecological systems. The display will plug into an existing system and show, in real time, information about what the network is sensing and actions it is performing. The intern’s second major task is to develop, under the mentor’s supervision, an interactive display about cyberinfrastructure for NAU’s Southwest Experimental Garden Array (SEGA) to be shown at NAU’s Mountain Campus Science and Engineering Day and be the project’s representative for this interactive display.

List the specific benefits to the student that will result from this internship: The selected student will learn valuable engineering skills at both the systems level and within the discipline of electrical and computer engineering. Technical skills gained will include electronic systems design, digital hardware design, computer software design, and how knowledge learned in the classroom is applied in a real engineered system. The student will also gain meta-skills that are perhaps even more important to a successful career including verbal communication, teamwork, and solving open-ended problems. The intern will benefit from a motivating and exciting research environment in the mentor’s laboratory, and especially an atmosphere that emphasizes peer mentoring and collaborative problem-solving.

Provide any additional comments that are relevant: Students are already working in the mentor’s laboratory on the cyberinfrastructure architecture, design, and implementation of the SEGA project (NSF MRI grant DBI-1126840). The project does not provide funds for public education and outreach, yet it is a high-profile international project with outstanding potential. There will be networks installed at two sites (The Arboretum at Flagstaff and The Nature Conservancy’s Hart Prairie Preserve) where this display technology will motivate visitors to learn about SEGA and how it integrates STEM disciplines to tackle critical research questions in ecology and climate change.

Faculty mentor: Paul Flikkema, Electrical Engineering & Computer Sciences

Intern: Aiden Shef

Fall 12.005: The Rio de Flag Relocation: Examining the Impact on Residents and the Environment

Describe the internship in terms of what the student will DO: For this internship, the student will gather historical information from archives and collect demographic data from the latest census about the population, earnings, housing, and businesses in the Southside neighborhoods affected by the Rio de Flag relocation.

List the specific benefits to the student that will result from this internship: The student intern will learn about the Southside and develop knowledge and skills in community building, research methods in archival research, historical analysis, content analysis, and use of demographic data in formulating effective public policy. The student will contribute to a growing body of knowledge that can be utilized by students, researchers, community residents and policymakers to help analyze the effect of proposed Rio de Flag relocation projects designed to reduce flooding in the Southside and to improve development in the area.

Provide any additional comments that are relevant: On the south side of Route 66, the Rio de Flag River flows through Southside and there is always a risk of flooding during periods of high runoff. This means development has been severely limited since FEMA (Federal Emergency Management Agency) announced the area a flood zone in 1983. The internship will provide important information that can help analyze conditions from historical, economic, and social perspectives, while learning interdisciplinary methods and methodologies. In the past four years, students taking ES 391 (Special Topics) have benefited from community research projects located in the Southside, which provided real-world opportunities for learning and engagement, resulting
in oral histories, a mural project, a virtual walking tour, lesson plans and history games focusing on the Southside, and research manuscripts.

**Faculty mentor:** Ricardo Guthrie, Ethnic Studies

**Fall Intern:** Stephanie Smith

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**Fall 12.006: Bark Beetle Communities in Ponderosa Pine**

**Describe the internship in terms of what the student will do:** The student will learn to identify the major bark beetle species found in ponderosa pine forests in northern Arizona. The intern will assist in the identification, counting, and sorting of important pine killing insects. The intern will also learn to identify the complex community of mites found on beetles as part of a collaborative project with scientists in Wisconsin and Georgia.

**List the specific benefits to the student that will result from this internship:** Benefits to the student include (1) experience in a research lab; (2) work on interesting research with other undergraduate and graduate students in the lab; (3) learn to identify important insect pests of pine; (4) learn the scientific method; (5) become proficient at using laboratory equipment such as microscopes; and (6) potentially be a co-author on a scientific presentation at national meetings.

**Provide any additional comments that are relevant:** The research for this project began during the summer. The student will also have the opportunity to learn about other interesting research in the mentor’s lab such as the use of sounds to deter bark beetles, termites, and other wood infesting insects.

**Faculty mentor:** Richard Hofstetter, Forestry

**Fall Intern:** Amanda Robinson

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**Fall 12.007: Cinematic Storytelling with 16mm RAW Cinema Cameras**

**Describe the internship in terms of what the student will do:** The student will transcribe interviews as well as go in the field to help the mentor shoot a documentary of a film crew (directed by Elle Schneider and produced by Joe Rubenstein) using a Digital Bolex 16mm digital cinema camera ([www.digitalbolex.com](http://www.digitalbolex.com)) to shoot a short Western. The documentary workflow will be a part of research for a book.

**List the specific benefits to the student that will result from this internship:** The student will get hands-on experience in helping with the book research, field observation, and documentary production. The intern will also receive valuable experience in meeting professional filmmakers and camera designers on the forefront of an emerging new technology.

**Provide any additional comments that are relevant:** The holy grail of independent filmmakers is to shoot RAW video with an inexpensive camera. Several companies are releasing cameras this summer and the mentor’s book research (for Focal Press) will include field interviews of the camera makers and filmmakers using these cameras.

**Faculty mentor:** Kurt Lancaster, School of Communication

**Intern:** Kent Wagner

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**Fall 12.008: The World's Largest Navajo Weaving**

**Describe the internship in terms of what the student will do:** The student will assist the mentor in researching a 26 x 36-foot Navajo weaving that is scheduled to be the focal point of an exhibit at a new museum in Winslow, Arizona. There is considerable archival information on the weaving due to its spectacular nature and the fact that it was
highly publicized by the Hubbell family (of Hubbell Trading Post fame) who commissioned it.

**List the specific benefits to the student that will result from this internship:** The student will learn primary archival research and curatorial skills that will aid them in a possible future museum or gallery career and/or a career as a scholar. This project provides a unique opportunity for a student to learn how primary research is done since the main object of the research is represented in a number of archives in the state of Arizona.

**Provide any additional comments that are relevant:** The new museum that will display this weaving is being organized by the Winslow Arts Trust and will reside in the old Santa Fe Railroad depot adjacent to La Posada in Winslow. This weaving, which was completed by Julia Joe in 1932, is reputed to be the largest Navajo weaving ever created. The Winslow railroad depot is being converted into a state-of-the-art museum space, which will feature Navajo weavings and contemporary art produced by artists residing along the old Route 66 corridor. It will also feature a site-specific artwork by famed contemporary artist James Turrell, who is completing a major earthwork project, Roden Crater, nearby. The mentor has been asked to curate the exhibition of weavings for this space, set to open in the summer of 2013.

**Faculty mentor:** Jennifer McLerran, Comparative Cultural Studies

**Intern:** Emily Moxley

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**Fall 12.009: Using an Atomic Force Microscope to Measure Titin-Actin Interactions**

**Describe the internship in terms of what the student will DO:** The student will assist with the preparation of biochemical protein solutions, buffers, and reagents. The student will also perform atomic force microscopy, a technique used to generate 3D topographical images of surfaces with nanoscale resolution and also measure forces with pico-Newton resolution.

**List the specific benefits to the student that will result from this internship:** The student will (1) learn how to accurately prepare chemical solutions; (2) learn how to utilize sensors, electrical signals, and actuators to measure and manipulate physical systems; (3) be exposed to various concepts outside his/her home discipline through participation in an interdisciplinary project; (4) participate within a larger, active research group; and (5) have the opportunity to work on a publication stemming from the work.

**Provide any additional comments that are relevant:** The student intern’s work would be part of an existing collaboration between the Mechanical Engineering, Chemistry, and Biology departments aimed at understanding the role of titin and actin proteins in activated muscle tissues.

**Faculty mentor:** Brent Nelson, Mechanical Engineering

**Intern:** Evan Willis

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**Fall 12.010: Field Experience in Herpetological Inventory and Monitoring**

**Describe the internship in terms of what the student will DO:** This internship is designed to familiarize an undergraduate student with many aspects of conducting fieldwork, entering data, and preliminary data analyses. The student intern will assist with projects involving rare and declining gartersnakes, and general herpetological inventories. The student will also be encouraged to assist with USGS-led herpetological projects as time permits.

**List the specific benefits to the student that will result from this internship:** A student in this internship would gain that necessary career experience, plus simple data entry and analysis skills. Depending on student interest, this could be followed with post-internship assistance in preparing and publishing a small project, another area in which students typically lack experience. Due to the mentor’s collaborations with many federal and state agencies (AZ Game and Fish Department, USGS, US Forest Service, US Fish and Wildlife Service, AZ State Parks), she is in a unique position of being able to provide students with exposure to working with multiple research and land and wildlife management agencies. The mentor will focus on fostering student career professionalism, in the context of interacting with different
state and federal agency representatives. That aspect of the internship could lead to future successful employer contacts.

Provide any additional comments that are relevant: During teaching biology classes at NAU, the mentor has heard many times from upper-level students that they lack field experience. They are thus put at a disadvantage when applying for summer or post-college jobs and internships. This kind of experience is one the faculty member would like to provide on a more formal basis, with sustained mentoring, rather than simply providing short-term volunteer experiences.

Faculty mentor: Erika Nowak, Biological Sciences

Intern: Robert Scott

Fall 12.011: Gender, Violence and Terrorism

Describe the internship in terms of what the student will DO: (1) The mentor has a book contract with Springer Press for a book on this topic; the first draft of the manuscript is due September 15. The student intern would assist with final preparation of this manuscript. In addition, the student would help with revisions that will take place September-December 2012. (2) The mentor will be beginning an experimental project related to public opinion and women terrorists in the Fall in which people will be presented mock news reports to assess the role of gender (of the attacker and respondent) in response to terrorist attacks. This is a joint project with researchers at Pepperdine University and Oklahoma State University. The student would assist with administering the experiment, background research, and some data analysis.

List the specific benefits to the student that will result from this internship: The student intern will learn research skills, data analysis skills, and writing skills. The student will be acknowledged in the mentor’s book for contributions made to the publication. The intern will be able to put what is learned in the classroom to direct and practical application on the research project. S/he will also learn to write for an academic journal and have a potential opportunity to participate in a national conference (Midwest Political Science Association conference in April 2013) and/or publishing in a top tier journal. This will greatly improve any student’s chance of graduate school in political science or related disciplines or on law school applications. In addition, the faculty mentor would be able to write a more detailed letter of recommendation for the student after working together closely on this project.

Provide any additional comments that are relevant: The mentor has experience working with undergraduate research interns and finds it particularly rewarding. In the Spring 2013, the mentor has a content analysis project to conduct. The mentor has newswires of all women heads of government and ministers of state, defense and interior where the leader acted on or spoke about terrorism. Content analysis was conducted on the European leaders last summer (with help from undergraduates). Content analysis needs to be completed on the other leaders. If this fall’s internship is successful, the student may be able to help with this content analysis and work intimately on the paper that will come out of this content analysis. Depending on the contribution of the student, he/she would have an opportunity to be a co-author on the final paper (a joint project with a faculty and student at Pepperdine University).

Faculty mentor: Lori Poloni-Staudinger, Politics & International Affairs

Intern: Kelsey Robinson

Fall 12.012: Imaging Volcanic Activity in Turkey through Space and Time

Describe the internship in terms of what the student will DO: The student intern will work as a member of a team to use ArcGIS (the most extensively used Geographical Information Systems program) to produce a geographically referenced database for volcanic rocks of the central Anatolia region of Turkey. The student will compile a comprehensive table of geochronologic (age) and geochemical data from literature sources and field reports, under the guidance of the mentor and two graduate students. The student will import these data into ArcGIS and help to produce maps that display chemical changes in magmatic activity in space and time.

List the specific benefits to the student that will result from this internship:
The student intern will (1) work as a member of a multidisciplinary international team, helping to produce a product of immediate interest to a broad audience; (2) learn ArcGIS and/or enhance their skills in using it (employers in many areas of sciences deem GIS-related skills highly valuable); (3) become familiar with creating maps (cartography); (4) become familiar with the methods for various age determinations of geologic materials (from compiling the age information) and for geochemical data sets; (5) become more conversant with data accuracy and precision, and with statistics; and (6) learn more about the geologic history of Turkey, specifically, and about thinking about geologic events in space and time.

Provide any additional comments that are relevant: A similar and widely used geographically located data set, NAVDAT, has been created for the western U.S. The database can be accessed at navdat.org. A major difference is that this is web-based rather than the target here, which is an ArcGIS base. With the GIS database, the student intern, the mentor, her graduate students, and other investigators on the project - and, eventually, all scientists - can explore the spatial and temporal variations in magmatic activity in this tectonically active and complex region. The resulting maps will help to identify whether there are geographical trends in volcanic activity that can be related to other geologic events in the region, whether there are punctuated periods of activity separated by magmatic lulls, whether there are chemical changes in time and/or space, and whether there are areas for which additional data are needed (to be generated as part of this NSF-funded project).

Faculty mentor: Mary Reid, SESES - Geology

Fall Intern: Maria Underwood

Fall 12.013: Numerical Semigroup Technology Development

Describe the internship in terms of what the student will DO: The faculty mentor has been pursuing research in numerical semigroups for several years. During that time, several technology-based tools have been developed to aid in this research, most notably a C++ program to display information about specific numerical semigroups based solely on a set of generators; a Mathematica program to compute all numerical semigroups of a fixed Frobenius number; and a “qtix” program that displays tree graphs of irreducible numerical semigroups with a common Frobenius number. The student intern would be expected to (1) become familiar with each of these technology-based tools, (2) attempt to merge the technologies into a single program, (3) become well-versed in how these technologies enhance research efforts in numerical semigroups, and (4) possibly help the mentor develop a primer to give to future undergraduate researchers or collaborators to streamline the process of becoming more familiar with how these programs work.

List the specific benefits to the student that will result from this internship: The student intern will become extremely proficient in the use of, and subsequent research involving, these technology-based tools. It is also hoped that the intern will want to continue working with the mentor as an undergraduate researcher after the I2S work is completed. The faculty mentor intends to steer the intern towards a career in mathematics.

Provide any additional comments that are relevant: The bulk of the mathematics that underlies numerical semigroups is fairly straightforward; the selective use of these technology tools makes research in this area of mathematics even more accessible and understandable. In other words, becoming fluent with these programs is important. In addition, the mentor takes his role to develop young mathematicians very seriously, and being given the opportunity to introduce undergraduates to research in mathematics is something that he values.

Faculty mentor: Jeff Rushall, Mathematics & Statistics

Intern: Taryn Laird

Fall 12.014: Endocrine Disrupting Compounds Affect Breeding and Parental Care Behaviors in Leeches

Describe the internship in terms of what the student will DO: The student will (1) help collect leeches in the field; (2) perform weekly cleaning and feeding of the lab specimens, in this case leeches; (3) set up a mating experiment where leeches are paired together in a mating pairs and placed either in source water or water contaminated with endocrine disrupting compounds; (4) make weekly observations on any behaviors presented by the leeches including parental care
behaviors; and (5) analyze these behaviors. Once the experiment is complete, the intern will perform molecular analyses to identify paternity of the offspring. This intern will be able to identify any differences in fitness and behaviors associated with contaminated water.

**List the specific benefits to the student that will result from this internship:** The student will (1) learn animal husbandry and field collection methods; (2) learn how to come up with a question and a testable hypothesis and how to create a sound experimental design; (3) become adept at observing and documenting behavioral data; (4) learn how to perform statistics on these data; (5) become proficient at molecular techniques; and (5) learn how to write up results in a scientific manner for publication.

**Provide any additional comments that are relevant:** The mentor’s research projects investigate mating and other behaviors in invertebrates. This project will help answer basic evolutionary and behavioral questions regarding the evolution of sexual reproduction and fitness in a hermaphroditic species. These basic questions contribute to our understanding of mechanisms of evolution and behaviors in humans and other mammals.

**Faculty mentor:** Stephen Shuster, Biological Sciences

**Intern:** Shayla Mulhern

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**Fall 12.015: Hypnotically-Suggested Peripheral Vasomotor Control**

**Describe the internship in terms of what the student will DO:** This study investigates the effects of suggestions presented during hypnosis to dilate (increase blood flow and temperature and decrease blood pressure) and to constrict (decrease blood flow and temperature and increase blood pressure) blood vessels in the periphery (hands/arms) as a function of hypnotic susceptibility and type of suggestions, correlating these with changes in EEG brainwaves. The intern will experience full involvement in all aspects of this study including assisting with participant recruitment, testing of hypnotic susceptibility, configuring and attaching of EEG and blood flow measures and computer monitoring equipment, recording, processing, and analysis of data, preparation of presentations and posters, and presenting results at regional and national conferences, all under the close supervision of the faculty mentor.

**List the specific benefits to the student that will result from this internship:** The student will directly experience most of the steps involved in the conduct of psychophysiological research. The intern will also be a part of an active research team assisting with this study, allowing full collaboration with all aspects of the study with the exception of the original conceptualization and design of the study, as these components have already been conducted, the project has received IRB approval, and pilot testing has been completed.

**Provide any additional comments that are relevant:** Each semester, the mentor’s research team is comprised of between 10 and 15 undergraduate and graduate students, working together on from 2-4 different research projects. They work very closely together (meeting formally as a group in weekly team meetings and informally frequently throughout the week in the lab) to support each others' responsibilities and become very collegial and nurturing, very much a "research family" devoted to carrying out the project(s) duties. This dynamic involvement in the research team is a most invigorating, stimulating, and formative process and a growth and learning experience for interns. Most leave excited about research and with a presentation or publication manuscript under their belts. The mentor’s over-arching goal is to excite students with the research process and into the continued pursuit of careers in science.

**Faculty mentor:** Larry Stevens, Psychological Sciences

**Intern:** Jasmine Benjamin

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**Fall 12.016: Tropical Deforestation and Reforestation Mapping in Nicaragua using Ground and Geospatial Data**

**Describe the internship in terms of what the student will DO:** The student’s internship for this research in Nicaragua entails activities in (1) acquisition, registration, correction, and land cover classification of satellite imagery; (2) analyses of change detection and spatial distribution patterns; and (3) organization of ground reference data, land cover
This student internship work belongs to a regional collaborative effort that aims to examine tropical deforestation in the areas that need to be prioritized for reforestation and conservation effort in western Nicaragua in order to maintain habitat connectivity. The objective of the student internship is to identify the socio-political factors that influence recent deforestation and reforestation patterns in Nicaragua.

List the specific benefits to the student that will result from this internship: This internship will prepare the student to interface research on natural and human systems to create novel analysis techniques and knowledge about processes and changes in land use and land cover. It will provide the student an opportunity to gain interdisciplinary expertise and in-depth understanding of the linkage between socio-economic conditions, human activities and drivers of land use, and land cover change.

Provide any additional comments that are relevant: In the Rivas Isthmus of western Nicaragua, colonization and agricultural practices have altered species richness and critical ecosystem functioning and processes. Paso Pacifico, a non-profit organization, and collaborators have implemented conservation efforts in order help minimize the degradation to critical areas as well as to maintain and enhance habitat connectivity in a biological corridor. These projects include conservation of the critically endangered black-handed spider monkey, restoration of native tree species, and land use and land cover mapping using remote sensing techniques. The spider monkey project included identification of spider monkey habitat, implementation of a long-term monitoring program for spider monkeys, and involvement of local people through both education and in helping to implement conservation of this species. The reforestation project has been carried out in order to provide habitat connectivity and conservation, as well as to help mitigate effects of climate change. Furthermore, a project in collaboration with NAU’s Lab of Landscape Ecology and Conservation Biology (LLECB), was put forth in order to determine changes in land cover types, in particular tropical dry forest, through geospatial analyses. The collaboration between Paso Pacifico and LLECB will utilize information from the abovementioned projects and gather other critical spatial data in order to help prioritize areas for future conservation and restoration efforts.

Faculty mentor: Yung-Ho Ophelia Wang, SESES – Landscape Ecology

Intern: Cecilia Marella

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**Fall 12.017: Physical Education Effects on Leisure Time Physical Activity**

Describe the internship in terms of what the student will DO: Several areas have been identified for the student intern in this College of Health and Human Services and Flagstaff Unified School District collaborative study. The specific duties may be tailored to the student's interests, but will definitely include data entry. Other opportunities include data collection with middle school students, meetings with faculty and teachers about the interventions, data analysis, and writing.

List the specific benefits to the student that will result from this internship: 1. Learning about the research process. 2. Participate in school-based research to understand how to operationalize an idea and identify barriers to implementation. 3. Systematic data entry and collection. 4. Learn how to work with multiple disciplines in community-based research.

Faculty mentor: Meghan Warren, Physical Therapy & Athletic Training

Intern: Araceli Olivas

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**Fall 12.018: Business Ethics Case Studies**

Describe the internship in terms of what the student will DO: The student will assist in the development and writing of business ethics cases as well as the teaching notes for the cases. Research sources will include the popular press, law review articles and other journal articles. There is opportunity to draft parts of a paper for publication.

List the specific benefits to the student that will result from this internship: The student will get significant writing experience and feedback as well as exposure to journal and law review research.
Provide any additional comments that are relevant: The mentor’s research focuses on business ethics and constitutional issues, with case studies related to finance, CIS, marketing, and corporate governance already completed. Case studies still to be developed are in economics, accounting, and management.

Faculty mentor: Eric Yordy, Accounting & Business Law

Intern: Taylor Snell