Hello and welcome to our 2013 edition of the CS program newsletter!

We are excited to report that we have two new lecturers on board, who greatly contribute to our high-quality instruction and who are great to work with. Steven Jacobs has been an adjunct faculty for a number of years, now hired into a full-time position. Maggie Hamill is a new lecturer specializing in software assurance, please see her interview below. We have also been running a search for a tenure-track faculty. We are proud to announce that Dr. Omar Badreddin, who will strengthen our emphasis on software engineering, just signed our offer letter and will start his career at NAU in the fall 2013 semester.

The tremendous increase we've seen in CS program enrollments over the past few years is beginning to have a significant impact on upper division courses. A good indicator is the number of students in our first of the two capstone-related classes. About the same time last year, 23 students signed up for this class, which translated into 8 capstone teams. Enrollments for next year's Capstone sequence, beginning with CS476 in fall 2013, have already reached 33 students, which translates to 12-14 Capstone teams. The good news: we will have quite an increased capacity for working on client projects.

If you have an interesting project/product idea that you would like to have tackled by a team of senior CS students for a whole year for free please contact me and we will make it happen.

As you will recall, our BS in Computer Science degree is ABET (Accreditation Board for Engineering and Technology) accredited. We are very proud of this distinction and have established, in accordance with ABET guidelines, a very rigorous process for documenting our program learning outcomes, and continually analyzing our program for flaws that could be improved. A key part of the ABET process involves in-depth audits every six years, a nearly year-long process where outside ABET evaluators carefully examine our program outcomes and improvement processes, and which culminates in a 3-day on-campus visit by the evaluation team. 2013 is such an ABET re-accreditation year for our BS in Computer Science program, and we have been preparing intensely for the upcoming campus visit next November. Some of you may, indeed, have been involved in this process yourselves, as reports from alumni and employers regarding (see Page 2)
the long-term efficacy of our program are an important piece of information that we collect for the accreditation process.

I hope you enjoy our newsletter. If you are ever in the area or passing through Flagstaff, please drop by. We are always happy to reconnect with our friends and alums and our ACM club is always looking for speakers to share insights.

All the best, Wolf-Dieter Otte, Associate Chair of the EE/CS department, dieter.otte@nau.edu

**STUDENT CHAPTER OF ACM**

NAU ACM is the NAU chapter of the Association for Computing Machinery. Computer professionals and enthusiasts are welcome to join, where they will learn about fascinating new technologies and gain a deeper understanding of existing technologies. Members of ACM have easy access to tutoring and study materials, and have a quiet area conducive to studying and completing assignments. ACM also provides unique opportunities for members, such as building and programming a robot, creating video games for the ACM game cabinet, and competing in national programming competitions.

Weekly ACM meetings are open to everyone, and are held in room 105 of the engineering building at 6:00pm every Thursday. See [http://www.nau.edu/acm](http://www.nau.edu/acm) for more details!

**BUILDING ON THE SUCCESS OF THE COMPUTER SCIENCE CAPSTONE**

**by Dr. John C. Georgas**

Our last-year capstone experience has always been a point of pride for the CS program. By adopting real-world projects and customers, team-based development, extensive presentations, and rigorous deliverables, we provide the context that allows students to build their software engineering, teamwork, and communication skills, therefore preparing them for their future careers in software development.

In the past, the course spanned one-term with all development stages, from inception and requirements elicitation to final delivery, being completed in a one-semester time period. While our students have certainly been successful in this format, the short time period has imposed significant challenges: One area that suffers in this one-term format is final deployment of software deliverables, which makes it more difficult for our external customers to reap the benefits of our students’ work. On the same vein, there is usually little time to conduct thorough user and acceptance testing. It goes without saying, of course, that the rapid pace of development is very stressful to capstone students (and faculty mentors) and sometimes lead to their other coursework suffering as they strive to meet the frequent deadlines of a one-term development effort.

These challenges combined with the CS program’s renewed focus on software engineering have led us to redesign our capstone course as a two-course, full-year sequence. The changes, however, run deeper than simply having more time for development:

- **Agility:** We’re significantly reducing the number of traditional deliverables (such as requirements and design specifications) and re-focusing capstone around agile methods, feature-driven development, and early prototyping;

- **Tools:** In order to better manage the development process, we’re going to be leveraging a variety of integrated tools for feature management, issue tracking, effort estimation, and version control;

- **Communication:** In order to provide more opportunity for students to refine their communication skills, the new capstone course design incorporates additional presentations and opportunities for student teams to present their work throughout development; and,

- **Quality assurance:** We’re adding new (see Page 3)
elements to the course that focus on software testing and user studies, in order to build skills that will help our graduates build reliable and usable software systems.

The economic challenges everyone faces today continue to put pressure on the CS program to do more with significantly less. But in this era of cutting back, we’re doubling down on committing to the quality of our program and better preparing our students for today’s software engineering practices.

**Dr. Maggie Hamill Joins NAU CS in Fall 2012**

Meet Dr. Maggie Hamill. Originally from New York State, she received her M.S. and Ph.D. degrees in Computer Science from the University of West Virginia. In industry, Dr. Hamill developed Software Assurance and Quality Assurance Courses for NASA Engineers across the country. She also was a Software/Database Architect supporting the National Energy and Technology Laboratory (NETL). Dr. Hamill also worked for KeyLogic. She has improved NASA contractors in their attainment of higher levels of the Software Engineering Institute CMMI-DEV Maturity Model.

Her specialty is software assurance --- a planned and systematic set of activities that ensures that software processes and products conform to requirements, standards, and procedures.

Dr. Hamill came to NAU because of her love of teaching and the outdoors. In her short time here, she has already received an award of recognition from the NAU Council on the Support of Women for her being a role model for women in computer science.

She has multiple publications and awards from her work at KeyLogic, as well as her research at West Virginia University and James Madison U. in Virginia (where she received her BSCS degree).

Below is a photo of Dr. Hamill relaxing (yes, on the side of a cliff) when she is not preparing lectures for her NAU classes in software assurance, database design, data structures, and more.

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**NAU CS Going Global**

**By Dr. Eck Doerry**

In the 2011 NAU-CS newsletter, I was very pleased to introduce the new Global Science and Engineering Program (GSEP), a novel internationalization initiative that I’ve been investing about half of my developing over the last two years. As you know, globalization has emerged as perhaps the most significant economic challenge as we’ve headed into the 21st century, fundamentally changing the way in which many products --- including software --- are conceived, developed, produced, and marketed. Software collaborations between developers spread across several countries, cultures, and time zones are common these days.

Just as globalization’s worldwide corporate collaborations have eroded geo-centric boundaries in the corporate world, GSEP reflects our view that higher education has changed as well, by moving away from curricular models shaped (and limited) by the ideas, strengths and resources of a single institution, to models that allow students to easily and seamlessly pursue ideas and specialty training across an international network of collaborating partners. GSEP’s novel five-year program model is a big step in this direction: In the first three years, GSEP’s science and engineering majors add language study and training in international issues (politics, economics, and business practices) into their normal degree studies on the NAU campus, then go abroad for a year-long professional immersion in their fourth year, including a semester of study at a partner institution and a six-month internship in a company or research laboratory. In their fifth year, GSEP students return to campus to finish their studies, receiving a B.S. in their science or engineering discipline, a second bachelors (or dual minor, in the case of Japanese/Chinese) in their foreign language, and NAU’s International Engineering and Natural Science certificate.

GSEP has been enormously popular so far; students seem to recognize that having this sort of deep internationalized professional training will help them compete for the choicest jobs in a globalizing labor market. I’m happy to say that Computer Science is well-represented in GSEP as well; of the nine students going out in the very first fall 2013 cohort abroad, two are computer scientists.

My work on GSEP this year has focused around establishing GSEP’s international institutional and corporate partnerships. I just recently returned from an intensive European trip to finalize those partnerships: three universities in France (Paris-Sud, Paris-Est-Creteil, and Univ. of Bordeaux; all world-class, Shanghai-ranked), three in Spain (Univ. of Madrid Carlos III, Univ. of Alicante, and Univ. of Jaen), and two in Germany (TU Dortmund, and the Univ. of Applied Sciences Dresden). (see page 4)
All of these partners have embraced GSEP with open arms, impressed by the quality and preparation for success provided by GSEP, and is eager to welcome our students in their classrooms and research labs. We are off and running in style!

Dr. D on a battlement of the Castell de Santa Barbara in Alicante, Spain, with their Director of International Relations, Jose Belda.

CAREERS
BY STEVE JACOBS, LECTURER

Computer Science majors are again heading into an excellent career. The “Best Careers in 2013” lists from U.S. News and World Report, CNN, and others point to computer science, software engineering, and related careers (such as IT) as still being in demand.

I encourage students to create and maintain a current resume. Make sure you take advantage of NAU-provided resources to aid you in your job search, such as seminars (resume writing, interview techniques, etc.) and campus recruiting events. Get a hold of the “Job Search Guide” from the NAU Gateway Student Success Center. Attend NAU on-campus Career Fairs, even if you are not graduating until much later. Often, employer representatives can give insights as to courses they need you to complete, while they share any internship and job opportunities.

And, be flexible. Keep in mind many of the jobs may not be precisely what you hoped for – for example, you may be asked to develop software in C++ when you really wanted to do Python, or you may be asked to do some web programming when you really wanted to build database applications. You may be asked to maintain (i.e. enhance or improve) existing, operational code. Be flexible both in assignments and work locations.

As an NAU CS student, you have gained the skills to learn new tools, languages and methods, and often employers will require that you apply those skills in new and ever-evolving development environments and platforms. Have fun and keep positive when faced with new technology challenges --- it is a key part of our discipline.

Outstanding Faculty Who Care

The Computer Science faculty has varying professional specialties, but all are united by a strong commitment to teaching. Among the special interests of the faculty are Groupware Systems and Intelligent Interfaces (Doerry), Graphics and Computational Geometry (Palmer), Distributed Systems and Web Technologies (Otte), Software Engineering and Robotics (Georgas), UML modeling, programming languages and code generation (Badreddin), Software Assurance and databases (Hamill), and introduction to software development and user interfaces (Jacobs).

This academic year, we have also invited some additional instructors to help out --- we appreciate their contributions to our successes: Patrick Kelley, Dr. Ronald McFarland, and Ryan Middleton.

Please come see us anytime, make an appointment, ask questions, try our interesting classes, sponsor a project, make a donation, join NAU ACM, tell a friend. There a many ways to get involved. See more about our program at:

http://www.nau.edu/cs

Dr. Omar Badreddin will join NAU CS in Fall 2013

Dr. Omar Badreddin was most recently a postdoc and a lecturer at University of Ottawa. His research interests include UML modeling, programming languages and code generation, Goal and Performance Modeling, compliance and requirements engineering. He consults regularly in the industry in topics related to Business Process Management and software engineering methodology. Dr. Badreddin is an ex-IBMer and was an IBM research scientist between 2008 and 2012. He has contributed to developing a number of products that are in widespread use today, including WebSphere and Rational tools. He has also contributed to the development of Eclipse 3.2 to 3.5. Dr. Badreddin is a contributing member at Object Management Group (OMG).

http://omarbadreddin.com/