Soldier Supporter
Lt. Gen. Michael D. Rochelle
Deputy Chief of Staff, U.S. Army

Interview with Michael Midura National Military Manager Strayer University

Dian Stoskopf Retires ★ Student Loans Expanded Graduate School Program
Choosing an Engineering School ★ Navy Tuition Assistance Controls ★ NCPACE The Emerging Leader ★ ESO Roundtable ★ DSSTs ★ Acquisition Education Army
Features

The Emerging Leader
New Information Resources Management College workshops for DoD and federal agencies prepare workers for federal leadership roles.
By Geoffery Seaver

Boosting Work Force Professionalism
DAU's strategic partnerships with academia support acquisition community's advanced education goals.
By Marty Kauchak

Dian Stoskopf Retires
Dian Stoskopf, Director of Education, Department of the Army, retired in August after 36 years of federal civilian service.

Finding an Engineering School
Military experiences sync up with industrial engineering.
By Michael Burnett

Graduate School Expanded
The Army offers increased graduate school opportunities for officers.
By Kevin Arata

Military Education Options Come of Age
DSSTs are now made available in an Internet-based testing format.
By Colleen Caulfield

NETC News
Navy announces management controls for tuition assistance and NCPACE.

Education Afloat
Navy College Program for Afloat College Education helps sailors take college classes while at sea.
By Jennie Humes

ESO Roundtable
Three Education Service Officers talk about their work.
Interviewed by Diana McGonigle

Cover/ Q&A

Lt. Gen.
Michael D. Rochelle
Deputy Chief of Staff, U.S. Army

Departments

2 Editor's Perspective
3 People
14 Class Notes
26 Money Talks
27 Calendar, Directory

University Corner

Michael Midura
National Military Manager
Strayer University
Finding an Engineering School

Military experiences sync up with industrial engineering.

By Michael Burnett
MAE Correspondent
Military servicemembers may find post-military careers, or military career enhancement, from engineering degrees. That may sound appealing on the surface, but warfighters seeking opportunities to become scholars may become confused by the wide range of engineering disciplines and options available to them.

Once they do a bit of research and discovery, some warfighters are bound to find an appealing option they may have overlooked or misunderstood initially with industrial engineering. Industrial engineering involves the use of engineering methods to create or improve systems where people, equipment, material and structures interact. Industrial engineering involves the application of scientific principles and analysis, along with mathematics and social sciences, to qualify and quantify results from systems being used by people with the goal of creating a comfortable, efficient or productive environment.

So servicemembers with experience in rebuilding infrastructure in Iraq, for example, may find industrial engineering careers ideally suited for their past experiences.

Many engineering disciplines apply scientific techniques to specific studies, such as chemistry or computers, but industrial engineering does not apply to any specific subject area as it carries applications across various industries.

**Georgia Institute of Technology**

_U.S. News and World Report_ ranked industrial engineering colleges around the nation, just as it does with many other schools, in its 2007-2008 Graduate Rankings. This year, _U.S. News and World Report_ rated the H. Milton Stewart School of Industrial and Systems Engineering (ISyE) at the Georgia Institute of Technology as the number one graduate program in industrial and manufacturing engineering.

Industrial engineering originated with manufacturing, Paul Griffin, professor and associate chair at Georgia Tech's ISyE School, told Military Advanced Education, but it has grown beyond strictly manufacturing.

“We are concerned with building quantitative models for looking at systems, whether designing new systems or improving existing systems,” Griffin explained. “We use techniques from applied mathematics, economics and management primarily. Our view of systems is pretty broad. Industrial engineering came out of manufacturing, but really only about 10 or 15 percent of our graduates go into manufacturing.”

Perhaps the most popular option for military personnel in industrial engineering at Georgia Tech is to study logistics or supply chain systems, covering subtopics such as inventory and material, people and organizations, and transportation and distribution.

The second most popular area of focus within industrial engineering for military personnel at Georgia Tech is quality engineering, including quality control and quality assurance. Quality includes methods for monitoring processes, for improving processes, and for identifying specific problems within processes, and related concepts.

“Then we have an area called operations research,” Griffin said. “This is probably the third most popular area for military personnel. That’s really the mathematics of modeling. It includes a lot of things like optimization models and probability and statistics.

“The military might do a lot of things along these lines for modeling, when you look at trade-offs or scenarios like gaming scenarios. There are tools that can be used in operations research that can help to make those decisions,” he added.

Georgia Tech has about 1,000 undergraduate students in its industrial engineering program; about 250-300 master’s students; and about 200-250 Ph.D. students. The vast majority of military scholars are in the master’s program.

Military servicemembers pursuing degrees at Georgia Tech essentially have two options: on-campus and distance learning. With on-campus education, students attend the school in Atlanta, Ga., and follow a full-time class schedule, either after military service or while on hiatus from active duty service.

But warfighters also could pursue a degree off-campus with distance learning.

“Each semester, we have about five classes that we offer at the master’s level,” Griffin noted. “Students can either get tapes or look at video streaming. They have contact with the professor and do the same tests and the same projects and homework.”

**University of Arizona**

The Department of Systems and Industrial Engineering at the College of Engineering at the University of Arizona also has been ranked by _U.S. News and World Report_—as 20th in industrial engineering graduate programs.

But the University of Arizona offers something a little different than a traditional industrial engineering experience, Larry Head, interim department head and research professor, told MAE.

“Our industrial engineering program grew up very close to our systems engineering program. Our approach is to look at the design of systems, whether they be manufacturing or service delivery systems or transportation systems,” Head said.

“We have a wide variety of courses that we offer to students. They take some software courses, which is probably not traditional in an industrial engineering setting. They also take optimization courses and probability and statistics and things that are more traditional,” he added.

In addition, students take production and facility design courses as well as manufacturing technology courses.

“We focus on methodologies and theory more than we do on specific technologies,” Head elaborated. “We have a manufacturing class where students go to the lab and learn to do milling, and such, but that’s more familiar to them with what goes on with a manufacturing process than to teach them about milling and how computer-controlled manufacturing works.”

Students at the University of Arizona can pursue a Bachelor of Science in industrial engineering, a Master of Science in industrial engineering, or a Ph.D. in systems and industrial engineering.

The school also offers a master’s in quality and reliability engineering, where they take courses in the aerospace and mechanical engineering department but have a focus in industrial engineering.

“That’s probably the degree that we have had the most military officers participate in over the past years,” Head reported. “We had a contingent of three or four students at a time from the Canadian military that would get degrees in reliability engineering. We have had Air Force officers and Army officers go through the reliability program. We have had a couple of Army officers earn their Ph.D.s here.”

Reliability involves the study of systems and how the design of them could prevent certain failures of components from causing a failure in an overall mission or device.
"Students use probability models to analyze different systems designs and to generate designs that achieve the reliability required of a system—not just reliability but also maintainability, availability and so on. We call them the "-ilities" of a system," Head quipped.

The school is working to improve its distance learning offerings. This fall, it only offered its engineering statistics course, the first required course for industrial engineering and reliability and quality, as well as a course in system design methodology. In the spring, the distance-learning program will offer three industrial engineering courses. The university is working on offering the entire program via distance learning within the next few years.

However, Head warned, distance-learning students may miss out on some opportunities. "We are a Research-1 university," Head said, referring to the university's status in the top tier of recipients for federal science research funding. "Getting involved in some of that cutting edge research is better done on campus than it is through the distance-learning program."

**UNIVERSITY AT BUFFALO**

Some industrial engineering programs offer unique opportunities for military servicemembers. At the University at Buffalo of the State University of New York system, the Department of Industrial and Systems Engineering is closely linked to a research center called the Center for Multi-source Information Fusion (CMIF).

CMIF offers unique opportunities to students pursuing an industrial engineering degree at Buffalo, Dr. Robert Barnes, associate dean of external affairs at the department, told MAE.

"They take information coming in real time from multiple sources and try to search through it to gain some better idea of what is going on," Barnes explained. "It could be the analysis of a ground attack or anything related to the military to help make very complex decisions a little bit easier."

The Department of Defense awarded CMIF with a $1 million grant in 2006 to help it stand up as a research and development center for information fusion to boost military initiatives, such as hunting for weapons of mass destruction or gathering accurate intelligence to support operations. Information fusion, in this case, collects inputs from multiple sources—such as satellites, sensors, and personnel—to paint an accurate picture of a specific situation.

"Normally, a person going to the CMIF group would take some specialty within industrial engineering and operations research—that could be mathematical-based optimization or other things," Barnes said. "Those studies would provide an understanding of some of the tools to be used for decision-making."

Students can pursue a Bachelor of Science degree, a Master of Science or a Master of Engineering degree, or a Ph.D. at the University at Buffalo’s Department of Industrial and Systems Engineering. Graduate students at the department number about 100. Studies focus on human factors, operations research and production systems. Collaboration occurs across these three disciplines as well as with research in medicine, social science, architecture and other fields.

The National Research Council at the National Academies of Science recently ranked the industrial engineering program at the University at Buffalo at 18th overall nationwide and 15th in program effectiveness in a study of research-doctorate programs in engineering.

The university also is among those working to expand its distance learning options, Barnes acknowledged. The university must apply for approval to the state of New York and it is currently in the planning stages of that process.

"Within the next few months, we hope to file an application to get the degree fully approved for distance learning," he said. "People are now taking courses via distance learning. We had a few students activated to serve in Iraq and they were given distance-learning courses while they were there. So we do have experience in long-distance education."

**MONTANA STATE UNIVERSITY**

The College of Engineering at Montana State University includes a Department of Industrial and Management Engineering that emphasizes human factors, productions systems, operations research, and manufacturing. Students also may pursue individualized programs based on their backgrounds or goals in multiple areas.

As a small program, the Department of Industrial and Management Engineering offers a highly personalized experience with one-on-one mentoring.

Of added interest to military servicemembers, the College of Engineering also houses the university’s Reserve Officer Training Corps (ROTC) programs, one unit for the U.S. Army and one for the U.S. Air Force.

Mechanical and industrial engineering are very prominent among the college’s offerings, Elizabeth Brock, communications specialist for the college, told MAE.

"Mechanical and industrial engineering are part of a very broad department," Brock said. "Their areas of expertise in our college include design and manufacturing, energy systems, materials and structures, measurement systems and systems modeling.

"We have faculty that do things that you might not necessarily think of as engineering. They look at how health care systems work and how health care systems process patients through a system and that sort of thing," she added.

The department also offers mechanical engineering technology studies that involve hands-on exercises in building equipment. Many such studies relate closely to industrial engineering but also to civil engineering, Brock noted.

"The civil engineering department also has a construction engineering technology track," she said. "Civil engineering encompasses a lot of things that people may not necessarily think of as civil engineering, such as transportation issues and structural issues—more traditional things that you think of when you think of construction. Things like roadways and water treatment fall under civil engineering."

The close relationship of various engineering concepts lends itself to students working in multi-disciplinary teams.

"We have a program that is biosources engineering under the civil engineering department. They work a lot with another one of our colleges. They do interesting work with a lot of remediation of sites where there have been shooting ranges or bombing ranges, which would definitely interest those with military backgrounds," Brock said. ⭐

For more information, contact Diana McGonigle at diana@kerriganmedia.com or search our online archives for related stories at www.MAE-kmi.com.