

New Opportunity for RC Officers to Earn Engineering Master's Degree

By Lieutenant Colonel Steven K. Knutzen and Major James L. Bunch

It is an exciting time to be an engineer officer. Given the enormous surge in construction in Iraq and Afghanistan, technical skills for engineer officers have never been in greater demand. The United States Army Engineer School at Fort Leonard Wood, Missouri, offers an overview of construction methods in the Basic Officer Leader Course, the Engineer Captains Career Course (ECCC), and the Engineer Captains Career Course—Reserve Component (ECCC-RC). However, many of the technical skills needed to manage complex projects are gained only through civilian education. The Engineer School and the Missouri University of Science and Technology (Missouri S&T) at Rolla, Missouri, provide a way for engineer officers to hone their technical skills.

Since 1984, the Engineer School has partnered with Missouri S&T (formerly known as the University of Missouri—Rolla) to give Active Army officers the opportunity to earn master's degrees in engineering management or civil, environmental, or geological engineering while attending ECCC. Officers are granted eight hours of graduate credit for satisfactorily completing ECCC, which is applied—along with an additional four-credit course taken in the evenings—toward a graduate certificate in either military construction management or military geological engineering. Upon completion of the graduate certificate requirements and ECCC, these officers are allowed to remain at Fort Leonard Wood on permissive temporary duty for 16 weeks to complete the remaining 18 credits required to earn a master's degree. Officers are assessed a special Fort Leonard Wood tuition rate and are not required to pay for the eight hours of shared credit.

Reserve Component Opportunity

Hundreds of Active Army engineer officers have taken advantage of this program since its inception. Now, recognizing the significant number of engineer officers who are in the Army Reserve or National Guard, the Engineer School announces the addition of Reserve Component (RC) officers to the educational partnership with Missouri S&T. The RC programs will be structured similar to the Active Army programs, with the Missouri S&T portion being offered via distributed learning (dL). RC officers will receive eight credits for satisfactorily completing ECCC-RC, which will be combined with a four-credit course offered by Missouri S&T via dL to earn a graduate certificate in either military construction management or military geological



The Missouri University of Science and Technology (Missouri S&T), formerly known as the University of Missouri—Rolla, has provided Active Army officers cooperative degrees since 1984.

engineering. Officers who have an undergraduate degree in either engineering or natural science disciplines will be able to apply the certificate in military construction management toward Missouri S&T's online master of science degree in civil engineering or engineering management and the certificate in military geological engineering toward the master of engineering in geotechnics.

Currently, all these programs are being offered online as part of Missouri S&T's Distance and Continuing Education (DCE) program. For these traditional dL programs, officers will be assessed the special Fort Leonard Wood tuition rate



Inspecting dams is a typical task for a geological engineer.

for the four credits required to complete the certificate and will not be required to pay for the eight hours of shared credit. Tuition and fees for the remaining 18 credits will be assessed according to existing DCE policies.

Recognizing that a large number of engineer officers don't have the prerequisites to get into these existing programs, the Missouri S&T Department of Geological Sciences and Engineering has custom-designed a master's degree program in geological engineering for RC officers. In effect, this program will be similar to the traditional dL programs, with two significant differences. First, this program will be assessed the same tuition and fees as the resident Fort Leonard Wood program. It will be offered directly by the Department of Geological Sciences and Engineering via its Blackboard dL platform. Second, the remaining 18 credits will be provided during compressed semesters to allow completion of the entire program within one year. It is the hope of both Missouri S&T and the Engineer School that officers who have not yet earned the degree in engineering or engineering management necessary to work as a facilities/contract construction management engineer will use this opportunity to earn the credential.

Although similar to the programs already mentioned, the custom-designed geological engineering program will be accomplished in three stages:

Stage I

Admission to the Stage I program (graduate certificate in military geological engineering) requires officers to submit an application and provide a copy of their ECCC-RC Phase IV (general engineering) completion certificate, in addition to an



A subsurface exploration class observes a municipal well being drilled in Rolla, Missouri.

official transcript showing proof of having completed at least one semester of college algebra, college chemistry, and either a college biology or physics course. Officers who do not have the prerequisite college courses may be required to take a five-credit bridging course, also provided by the Department of Geological Sciences and Engineering at the same tuition rate, which is included to ensure that every officer will succeed in the program.

Once admitted to the certificate program, officers will be required to complete four credits of online course work, which will be offered during Missouri S&T's normal spring, summer, and fall semesters. Upon completion of the introductory course, officers will be awarded a certificate in military geological engineering. Officers will be given credit for the following courses upon satisfying all Stage I requirements:

- Geomorphology and Terrain Analysis
- Geologic Field Methods
- Engineering Geology and Geotechnics
- Applied Geological Engineering

Officers who have already completed a legacy advanced course or career course will be allowed to participate in the program by enrolling and completing ECCC-RC Phase IV (general engineering) as part of their admission requirements.

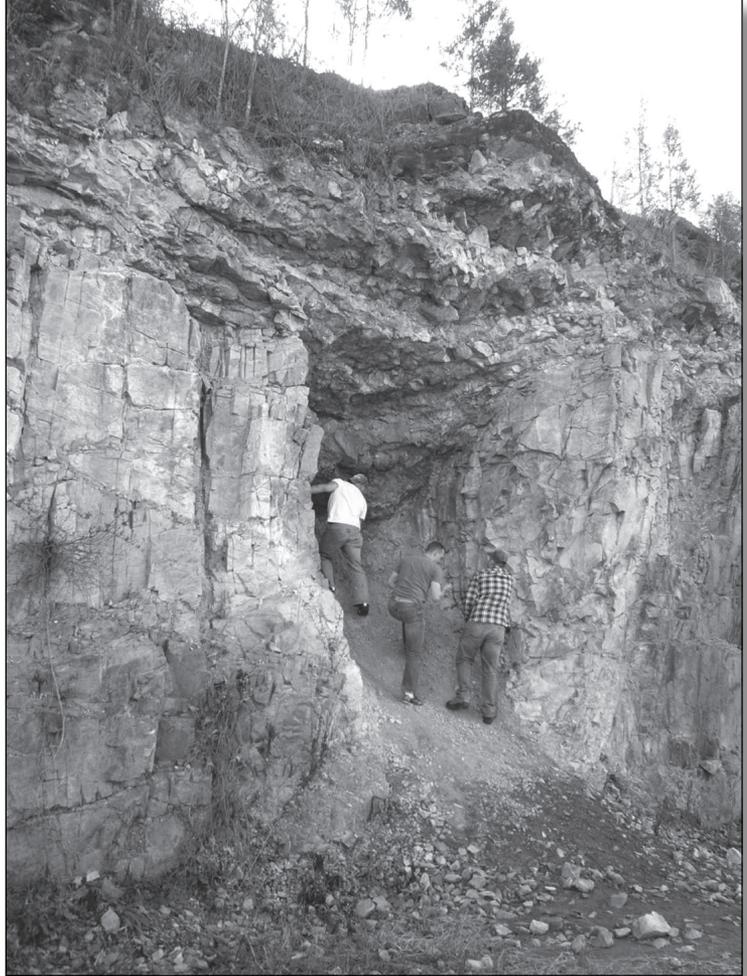
Stage II

Officers must apply, but they will be granted acceptance into Stage II of the program without the usual Graduate Record Examination if they complete Stage I with a letter grade of "B" or better. Stage II will consist of completing 15 credits of coursework, of which two three-credit classes will be offered during each special 8-week semester. Stage II courses can be taken in any order, with Stage I completion being the only prerequisite. The following courses will be completed during Stage II:

- Remote Sensing Technology
- Advanced Concepts of Environmental Geological Engineering
- Geotechnical Construction Practice
- Subsurface Exploration
- Subsurface Hydrology

Stage III

Stage III of the program will serve as the capstone exercise and will consist of a three-credit, regular semester course entitled Capstone Project in Geological Engineering. Officers will only be admitted into Stage III during their final semester of study because successful completion depends on knowledge acquired in previous stages.



Engineer officers study rock formations as part of a geological field trip.

Cutting Edge Problem-Solving

As students in the program, officers will have the opportunity to learn about the application of earth science principles to the engineering solution of critical problems facing global society, such as environmental and hazardous waste issues, natural resource protection and energy sustainability, and the design of geotechnical infrastructure such as tunnels, excavations, dams, and waste disposal sites. Geological engineering is a very broad engineering discipline focusing on applications of geology and engineering fundamentals to solve problems. Geological engineers apply their unique set of skills to protect and preserve the environment in which we live, studying geological hazards such as landslides, rock falls, earthquakes, Karst features (which create sinkholes), and dam and levee failures such as those in New Orleans during Hurricane Katrina. Geological engineers are called upon to study and clean up contaminated sites, develop water supply wells, and map hazards using geographical information systems. Across a wide spectrum of global problems, geological engineers are on the cutting edge of engineering problem-solving. For more information on the geological engineering profession, visit the Missouri S&T Geological Engineering website at <http://web.mst.edu/~gee/>.



Students gather electrical resistivity data in order to map the subsurface in support of a Missouri Department of Transportation study along a highway south of Springfield, Missouri.

To get started in the program, an RC officer must enroll in and complete the requirements for Phase IV of ECCC-RC. Officers will be briefed about the program during their ECCC-RC resident Phase III and be placed on a list of potential candidates so they can start receiving information regarding the program. Upon completion of ECCC-RC Phase IV, officers can present their Phase IV completion certificate and apply for the graduate certificate program. Once they have completed the introductory course and ECCC-RC, they can apply for admission to the program. Officers will then complete Stage II and Stage III and earn their master's in geological engineering. It is that easy!

Officers interested in the RC programs in the traditional disciplines of engineering management, civil engineering, or geotechnics should contact Lahne Black at <lahne@mst.edu> or at (800) 441-5218 or visit the Missouri S&T DCE website at <<http://dce.mst.edu/index.html>>. Officers interested in the custom-designed program in geological engineering should contact the Missouri S&T Department of Geological Sciences and Engineering RC Program coordinator at <flwgee@mst.edu> or visit the program website at <<http://mst.edu/~flwgee>>. For questions about ECCC-RC, contact Major Bunch at <james.bunch@us.army.mil>.

Future Opportunities

Engineering technical skills training has now been placed at the fingertips of the RC officer, and this is just the beginning. Missouri S&T has agreed to study the possibility of offering similar programs to engineer warrant officers and noncommissioned officers with undergraduate degrees, as well as Department of the Army civilian employees who work as part of the Regiment. These programs will be the subjects of future articles in *Engineer*.



Lieutenant Colonel Knutzen is the Deputy Assistant Commandant—Army National Guard, for the United States Army Engineer School, Fort Leonard Wood, Missouri.

Major Bunch is the Division Chief, Engineer Captains Career Course—Reserve Component, for the Department of Instruction at the United States Army Engineer School, Fort Leonard Wood, Missouri.

