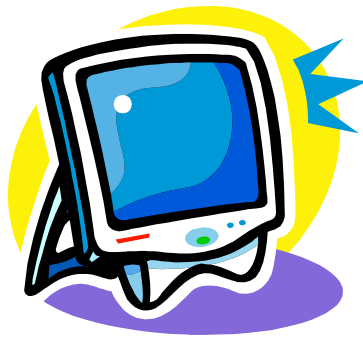


Don't forget to check out the Department of Civil and Environmental Engineering Web Site!
www.ce.lsu.edu



- Find out the latest information about the CEE Department
- Contact faculty and staff
- Get information about graduate and undergraduate programs
- Find out the most up-to-date information about student organizations
- and much more!

Contributions to the newsletter are always welcome. If you have news that would be of interest to other CEEs or your classmates, please send it to us so it can be included in a future edition.

Tel: (225) 578-8442 Fax: (225) 578-4945

Please contact Dr. George Z. Voyiadjis for more details.

Civil and Environmental Engineering
Louisiana State University
3418 CEBA Building
Baton Rouge, LA 70803-6405

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CIVIL AND ENVIRONMENTAL ENGINEERING NEWSLETTER

Message from the Chair of Civil and Environmental Engineering Addressing the Trends and Needs in our Degree Programs

It is important for the department to recognize the need to maintain current, innovative, and rigorous educational programs at both the undergraduate (Civil and Environmental) and graduate (Civil) level and ensure accreditation of their respective degrees.

The faculty needs to be creative and innovative in their research work. This will help them in conducting cutting edge research in their respective areas of specializations. They should strive to do work that will bring national and international recognition to them and the department. They should also contribute to the development of end products that could possibly enhance the economy of the State and the Nation.

The faculty will participate in service activities to their Engineering Societies, State, and Nation and attain recognition for their endeavors. The success achieved by implementing the above will lead the department to a higher ranking among the top departments in the nation. It should also lead to including the department among the top departments in the University.

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This is a dynamic time within our department in terms of academic programs. The assessment process that we have instituted for our programs encompasses not only internal type assessment but also professional community assessment through our professional advisory committee, alumni, and employers of our graduates. In the past few years, we have instituted a number of minors in structures, surveying, and environmental engineering to strengthen our graduates both in depth and in breadth. We are also encouraging our students to consider minors outside of engineering such as construction management and business administration. One of the challenges facing us now is how to respond to the policy of the American Society of Civil Engineers to adopt the M.S. degree as a first professional degree. We are working closely with our professional advisory committees to respond to this challenge. One possible response is to develop a **Five Year B.S./M.S. Program**. The purpose of this program will be to enable the undergraduate students to continue their studies in a **Professional M.S. Engineering Degree**. We will investigate such a possibility along with other suggestions

We are also investigating an **Honors Program** for our undergraduate programs. In addition to completing the requirements of a bachelor degree, students will have to complete the honors program in Civil Engineering or Environmental Engineering.

In an effort to expose our undergraduate students to the latest developments in Civil and Environmental engineering we have developed a **Research Experience for Undergraduates** program.

The National Science Foundation initiated this effort, in the last decade. This summer program exposes the student to an interdisciplinary, collaborative approach to research. The student interacts with faculty and graduate students on research topic of interest to faculty and at the end of semester, the student will make a formal presentation of the effort.

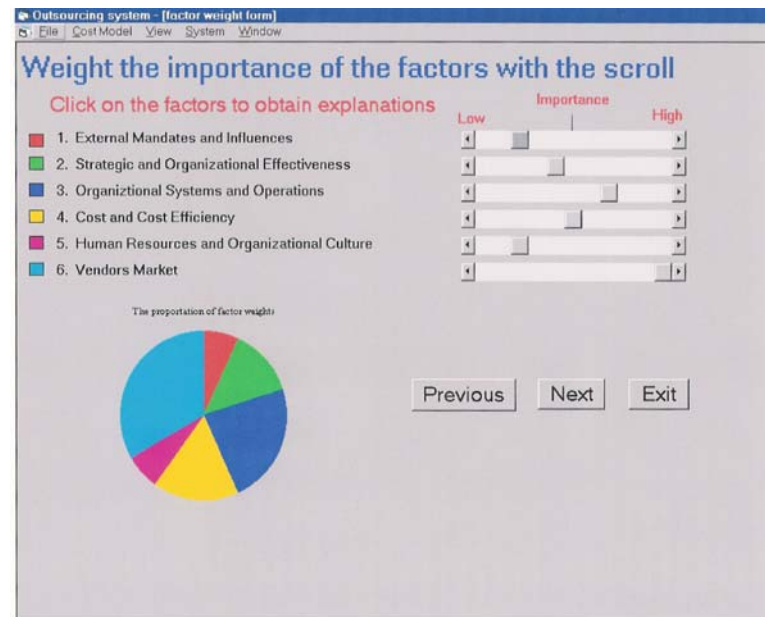
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TRANSPORTATION RESEARCH

Dr. John Metcalf

Transportation is central to our way of life; it absorbs some 15 percent of the GDP. Thus the planning, design, construction, maintenance and operation of the various systems is crucial to economic prosperity and social development. The Louisiana Department of Transportation and Development (DOTD) has long been concerned with safely and productively outsourcing appropriate activities. A joint team from CEE (Dr. Wilmot) and the E. J. Ourso College of Business, has developed a computer model that allows both subjective and objective factors to determine outsourcing potential. The model has been pilot tested by applying it to the function of maintenance of the Grand Prairie Rest Area on I-49 and to the activity of painting of lane stripes on state highways in Louisiana. Its benefit is that it systematically considers all relevant factors and ensures that a consistent process is conducted with each assessment. The model is a user-friendly, interactive program that uses graphics extensively to facilitate data input and in interpreting the output from the model. The model has already received enthusiastic response from DOTD. Following a demonstration to the Under-Secretaries of other state departments in Louisiana, all expressed interest in making use of the model.



The second focus area (Dr. B. Wolshon), is associated with evacuations which have become a critical issue in transportation and emergency management. Several recent high-profile



evacuations include those associated with Hurricanes Georges and Floyd and the September 11th terrorist attacks in New York and Washington. Research in this field includes projects in the

Alumni Update

The Department of Civil and Environmental Engineering wants to know where life has taken you. Who are you working for and what is your title? Have you received any recognition for your work? Are you working on an especially challenging project?

Please complete the following information and attach any additional comments you may have. Space permitting, we would like to use photos of you, your family or your latest project.

Please e-mail your information with attached photos to ceseal@lsu.edu. Or, you may mail your submission to: Civil and Environmental Engineering, LSU, 3418 CEBA Building, Baton Rouge, LA 70803-6405.

CEE ALUMNI INFORMATION

Name: _____ Degree: _____ Year: _____

Home Address: _____

Home Telephone: _____ Email: _____

Position Title: _____

Firm: _____ Business telephone: _____

Business Address: _____

Your News: _____

Alumni Corner

Thomas Reed Jr., BS in 1981, received his MBA from Virginia Tech. Thomas has served seven years with TRW in Washington DC. He most recently has been scheduling the deployment of the FAA's air traffic control systems. Thomas resides in Northern Virginia with his wife Katherine and his seven year old son Caleb.

Aaron Elisar, BS in 2001, is currently involved with the Rehabilitation Project on the Sunshine Bridge, where he deals with the project management. The project is to be completed in 2004.

Congratulations to **Alfred M. Lopez**, MS in 1993, who was recently engaged to be married this August.

CIVIL AND ENVIRONMENTAL ENGINEERING DEPARTMENTAL CAMPAIGN

The Department of Civil and Environmental Engineering is continuing a fundraising campaign to enrich and enhance programs in the department. Your donation will enhance the Departmental Enhancement Fund supporting new initiatives so that we may continue to produce top-quality engineers.

Our goal is to build an endowment of \$400,000 and an annual \$50,000 supplement to support the purchase of new lab equipment, computers and software, support of students, and support of faculty activities at professional meetings and conferences.

Any amount will be greatly appreciated; however, donors giving \$200 a year for five or more years or over \$1000 initially will receive special recognition in our departmental newsletter and on the Departmental Enhancement Fund plaque displayed in the department. Company matching funds will also be acknowledged. Please consider the CEE department this year in your annual giving.

DONOR INFORMATION:

(please check)

\$10,000 or more
 \$5,000 to \$9,999
 \$1,000 to \$4,999
 \$500 or more
 \$200 to \$499
 Less than \$200

I pledge \$_____ per year for the next _____ years to the CEE Departmental Enhancement Fund for a total of \$_____.

Please make your checks payable to the "CEE Enhancement Fund"

NAME: _____

ADDRESS: _____

CITY: _____ STATE: _____ ZIP: _____

TELEPHONE: _____ BUSINESS _____ HOME _____

FAX NUMBER: _____ E-MAIL: _____

GRADUATION DATE: _____ DEGREE: _____

EMPLOYER: _____

Please mail donations to: Civil and Environmental Engineering
 Louisiana State University
 3418 CEBA Building
 Baton Rouge, LA 70803-6405

You will be contacted by our development coordinator to confirm your pledge and support.

THANK YOU

development of integrated traffic/weather/road flooding monitoring and management systems, traffic simulation modeling of the evacuation routes out of New Orleans, the measurement and analysis reverse flow traffic segments, and the synthesis of transportation-focused information related to evacuation. The FHWA purchased and distributed over 1,000 copies Dr. Wolshon's recent report "National Review of Hurricane Evacuation Plans and Policies". Dr. Wolshon founded and chairs the first Transportation Research Board committee dedicated to evacuation research issues.

The third research area is centered on Dr. Ishak's expertise in the area of advanced traffic management systems (ATMS) and advanced travelers information systems (ATIS). His interest is focused on applications in traffic operations and control, as well as applications of artificial intelligence and neural networks in modeling traffic flow. The main goal of this research area is to develop models and support state-of-the-art applications that provide efficient and safe operations of traffic in the existing surface transportation networks. Additionally, the research area focuses on the role of real time and predictive traffic information in supporting both travelers' and traffic management centers' decisions. The research is also emphasizing new concepts such as transportation data warehousing for performance monitoring systems and microscopic traffic simulation for decision support system. Along this direction, Dr. Ishak has recently acquired licenses for a comprehensive parallel microscopic traffic simulation model (PARAMICS) and software for advanced artificial neural network models. A set of workstations was set up in the transportation lab to provide the necessary computing power for applications that will be developed using the acquired software tools.

The nation's physical infrastructure for transportation is a multi-billion dollar asset which justifies a substantial program of research in materials technologies to achieve cost effective construction and maintenance.

Dr. Wang's interest is in the microstructure characterization, modeling and simulation of asphalt concrete, cement concrete and geomaterials using various imaging techniques and computational techniques. This research will lead to better use of current materials and evaluation of innovative materials. The Multi-Spectrum Quantitative Imaging Laboratory houses a fifth-generation X-ray Computerized Tomography system, an Optical Imaging system, an Infrared Imaging system, and a SGI workstation. Image process software and computational software include Image Pro Plus, ACTIS, DEM program PFC^{3D} and FEM program ABAQUS. This research is conducted in close cooperation with Southern University.

The Multi-Spectrum Quantitative Imaging Laboratory



X-ray Computerized Tomography



Optical Imaging System

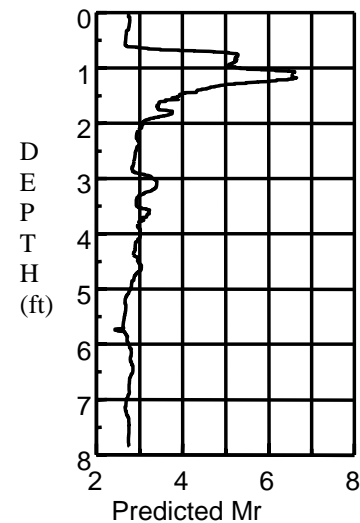
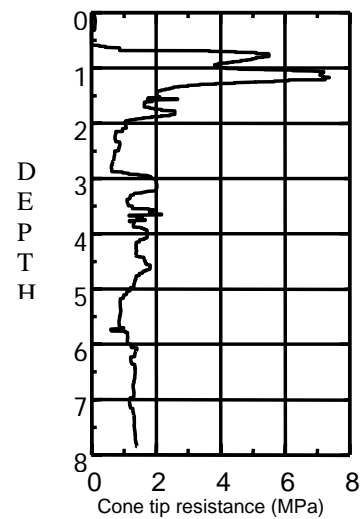


Infrared Imaging System



SGI Workstation

Currently, the design of flexible pavements is generally conducted based on static properties; these properties do not represent the actual response of the pavement layers under traffic loadings. Recognizing this deficiency it is recommended that the resilient modulus be used for characterizing the base and subgrade soil. Two general approaches are considered in the evaluation of the resilient modulus: laboratory and insitu nondestructive methods. The laboratory methods are considered laborious, time consuming, and expensive, and they require a highly sophisticated testing system. In situ nondestructive testing for estimating resilient properties appears to be affected by factors such as the testing load, the relative stiffness between layers, and environmental conditions. Recently, Dr. Mohammad completed a research study that was funded by the FHWA Priority Technology Program and the LDOTD to investigate the applicability of miniature cone penetration testing in estimating the resilient modulus of subgrade soils. Models for predicting soil resilient modulus from cone penetration test parameters, basic soil properties, and soil insitu stress conditions were developed. These models have been implemented in practice by design engineers and are showing great promise. During the LADOTD rehabilitation project of I-10 at Rayne, Louisiana, these models were used to predict the resilient modulus of the subgrade during the shoulder structural capacity analysis. The shoulder carried the diverted traffic during the two months rehabilitation stage of I-10. This evaluation resulted in a modification to the original design saving LADOTD over \$450,000.



Congratulations Dr. Rusch!



Dr. Kelly Rusch

Congratulations to Dr. Kelly Rusch who has won the University of Wisconsin-LaCrosse Rada Distinguished Alumnus Award, which will be presented at a ceremony on May 17, 2002 at UW-LaCrosse. UW-LaCrosse is her undergrad alma mater.

Dr. Kelly Rusch has also been elected to a two-year term on the Board of Directors for the Aquacultural Engineering Society (2002-2004), and has been elected the 2nd Vice President of the Aquacultural Engineering Society (2002-2003).

The refereed journal article "An Integrated System for Microalgal Production and Nursery Seed Clam Culture", T.J. Pfeiffer and K.A. Rusch has been given an honorable mention for the Journal of Aquacultural Engineering for publication year 2000.

Welcome Back Dr. Singh!

Vijay P. Singh, Department of Civil and Environmental Engineering, has returned from his sabbatical at Nanyang Technological University in Singapore. He was invited to give a keynote paper on Entropy Theory and its Application in Environmental and Water Resources Modeling at the International Conferences on Advances in Civil Engineering held January 3-6, 2002, at Indian Institute of Technology at Kharagpur in India. He was one of the four keynote speakers from the U. S. and also chaired a session on Stochastic Hydrology at the conference. Professor Singh was also invited to give a keynote paper on Uncertainty in Environmental Analysis and Modeling at the NATO-sponsored Advanced Research (ARW) Workshop on Integrated Technologies for Environmental Monitoring and Information Production held September 11-14, 2001 at Marmaris in Turkey. He was one of the two keynoters from the U. S. and he also chaired a session at the workshop. He was invited to give a keynote paper on Hydrologic Modeling at the International Conference on Civil Engineering held July 23-26, 2001, at Indian Institute of Science in Bangalore, India. He was invited to chair a session on Unsteady Flow and River Control at the 29th Congress of the International Association of Hydraulic Research held September 19-23, 2001, in Beijing, China. He was also invited to give lectures on Hydraulic Geometry, Hydrologic Modeling and Sand Boils at Tsinghua University and at the Ministry of Water Resources and Flood Control in Beijing. He was invited to give lectures on Advances in Hydrologic Modeling at the Ministry of Irrigation and Drainage Hydrology and Water Resources Center for Humid Tropics in Kuala Lumpur in Malaysia in December, 2001. In November he was invited to give a lecture on Theory of Hydraulic Geometry in the Distinguished Lecture Series at Nanayang Technological University (NTU) in Singapore and he taught a short course on Risk and reliability Analysis and gave lectures on Water Resources: Excess, Deficiency, Problems, and Management at NTU in December, 2001.

GRADUATE PROGRAM

Dr. Dean Adrian, Coordinator of Graduate Programs

Continued From Page 7

relevant biological science, and fluid mechanics to prepare them for fundamental and advanced engineering courses.

Objective 3. Students shall obtain an introductory level of knowledge of environmental issues associated with air, land, and water systems and associated environmental health impacts with the ability gained to conduct laboratory experiments and analyze and interpret data in more than one major environmental engineering focus area (air, land, water, environmental health).

Objective 4. Graduates shall have an ability to perform engineering design by means of design experiences integrated throughout the professional component of the curriculum, and be proficient in advanced principles and practice as relevant to the program objectives.

Objective 5. Graduates shall have an understanding of concepts of professional practice and the roles and responsibilities of public institutions and private organizations pertaining to environmental engineering.

The respective committees are now helping to assess the existing curriculum and courses with the goal of developing recommendations for revision of the curriculum. The target date for completion of this task is early spring 2002.

The curriculum committees are planning to use focus groups composed of practitioners to assist in identifying specific professional and technical skills vital to a successful engineering career. While the focus topic areas have not been finalized, consideration is being given to the following:

- Analytical and computational skills
- Experimental skills
- Professional/regulatory issues
- Health and safety considerations

Anyone wishing to participate in a focus group discussion should contact either John Metcalf (johnbm@eng.lsu.edu) or David Constant (hscons@lsu.edu).

Internally, the Department developed a comprehensive document describing the undergraduate program assessment, evaluation, reporting, and action process. In effect, this document summarizes the protocol the Department will follow to ensure the continual improvement of the programs. Currently, individual course assessments and exit surveys of graduating seniors are being conducted, the results of which will be considered in the curriculum revision and continual improvement process. In addition, an Undergraduate Student Advisory Committee has been organized to provide a means to obtain direct input from students concerning the programs. The Department is also in the process of developing survey instruments to solicit assessments from LSU alumni and employers of LSU graduates. It is expected that these surveys will be conducted in the spring or early summer.

The Louisiana State Board of Regents, the governing body for higher education in the state, has designated Louisiana State University as the flagship university of the state. As the flagship university it has a special mission to pursue research and graduate education in addition to its undergraduate education mission. LSU is a Research I university as ranked by the Carnegie Foundation. The legislature supports the flagship status of the university by providing a budget that provides for graduate faculty members to teach 50 % of the time and to conduct research 50 % of the time. The graduate program in the department includes over thirty faculty members, approximately 100 graduate students, and several post doctoral and visiting faculty members. The graduate students are divided in about equal numbers between MS and PhD candidates.

The number of graduate degrees awarded in recent academic years has varied from a high of 27 MS and 2 PhD to a low of 12 MS and 3 PhD during the 1995-1996 and 1997-1998 academic years, respectively. Graduate work in the department has been divided into traditional programs of study which were designated as Environmental and Water Resources Engineering, Geotechnical Engineering, Structures and Mechanics, and Transportation Engineering. The number of graduating students has been divided between the above programs in the ratio of 45%, 10 %, 20 % and 25 %, respectively.

An evolution of the names and areas of responsibility in the graduate programs is taking place as society faces new problems and needs, so that the current designations for programs of study and the designated coordinators are: Environmental and Water Resources Engineering Systems, coordinated by Vijay P. Singh; Geodesy and Geoinformatics, coordinated by Roy Dokka; Geotechnical and Geophysical Systems, coordinated by Mehmet Tumay; Intelligent Transport Information Systems, coordinated by John Metcalf; Material Modeling and Visualization, coordinated by George Z. Voyiadjis; Mechanics and Computational Simulation of Material Behavior, coordinated by George Z. Voyiadjis; and Structural Engineering and Infrastructure Systems, coordinated by R. Richard Avent. The trend is toward more interdepartmental and interdisciplinary research linkages. The department is ready to expand its enrollment as the new programs of study mature.

Research expenditures in the department are roughly \$ 2.5 million per year. Research funding has been obtained from national agencies including National Science Foundation, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, Federal Highway Administration, U. S. Geological Survey, U. S. Department of Agriculture, and the Sea Grant Program; state agencies including the Department of Transportation and Development, especially through the Louisiana Transportation Research Center, Department of Natural Resources, Department of Environmental Quality, and the Board of Regents; and local agencies which include various city and parish organizations. The department receives limited funding from private companies although private funding is a vital part of the Board of Regents industrial ties research funding program.

The department and the university are cooperating in exploring the effectiveness of traditional, new, and revised graduate student funding mechanisms. The traditional method of funding graduate student research has been for the graduate student to hold a research assistantship which nearly always involved the student's writing a thesis or dissertation which was closely related to parts of the research

project. Another traditional method of funding graduate student study was through the student holding a departmentally funded teaching assistantship. While once a major source of graduate student funding, the number of teaching assistantships has slowly declined with tighter university budgets. The Board of Regents provides Ph.D.-level graduate student funding through fellowships and through supplements. The supplements require that the incoming Ph.D. student be awarded support from a research or a teaching assistantship, then the university can provide a supplement of \$ 3,000 to \$ 5,000 per academic year, up to a maximum of four years. The supplements are intended to be a recruitment tool for attracting outstanding Ph.D. candidates. The department is in the second year of its experience with the supplements, and the program is working well. Three \$ 3,000 supplements were awarded during 2000, the program's first year, and four \$ 3,000 supplements were awarded in Fall 2001. The Hurricane Center has also awarded Civil and Environmental Engineering graduate students two supplements of \$ 5,000 in 2000 and two supplements of \$ 5,000 in 2001. The department plans to modify the university's supplement funding plan by using some of its teaching assistantship funds during the 2002 academic year to recruit outstanding Ph.D. candidates while also enhancing undergraduate laboratories. The department's plan is to support several new Ph.D. candidates during their first year of study with teaching assistantship funds. The student's duties will include working in and enhancing designated undergraduate laboratories. Then, the second and subsequent year's support for the student will come from a traditional research assistantship. In this way, the department will share in the risk and the undergraduate students will reap some of the benefits of recruiting outstanding Ph.D. candidates.

The departmental graduate program is evolving in its role as a home for an increasing number of post doctoral appointees and visiting faculty members. A decade or two ago there were few persons in either category affiliated with the department. Now the role of the post doctoral appointee has become increasingly clear. The post doctoral appointee may be a recent LSU graduate or a graduate from another university, including some international post doctoral appointees. In most cases the post doctoral appointee wants to and is encouraged to concentrate on research. A mix of post doctoral appointees and graduate students is a productive combination, with the post-docs eager to accomplish as much research, manuscript writing, research proposal writing and mentorship as they can during their tenure here, which may be one to three years, while the graduate students are learning from their close colleagues as they pursue their research and course work. The most usual aim of the post-doc is to build up their experience and success in research, publication, and successful proposal development record here so that they can compete successfully for a permanent position at a university or research center. An increasing number of visiting faculty members are joining the department for periods of affiliation that range in duration from a few months to one or two years. The duration of the visiting faculty member's residency at LSU makes it less likely that they will be developing research proposals, but they usually come with clear ideas of completing writing projects that include manuscripts and books, frequently coauthored with their departmental faculty member host. Many of the visiting faculty members are from countries other than the US. In a number of cases, they have hosted LSU colleagues at their home institutions as they engage in joint research endeavors.

Preparation for Accreditation of Undergraduate Programs Continue

Dr. Roger K. Seals, Undergraduate Advisor

Significant strides were made during the Fall Semester to develop an effective working relationship with the Civil Engineering (CPAC) and Environmental Engineering (EPAC) Programs Advisory Committees in order to address the accreditation requirements of the Accreditation Board for Engineering and Technology. These committees collaborate closely with the Civil Engineering Curriculum Committee chaired by John Metcalf and Environmental Engineering Curriculum Committee chaired by David Constant. We are thankful of the efforts of Blaise Carriere of LDOTD and Craig Gardner of URS Corporation to chair CPAC and EPAC, respectively. Their leadership was vital to the process of establishing educational objectives for the respective programs. These objectives, listed below, will be continually reviewed and revised as deemed appropriate.

CE Educational Objectives

Objective 1. To produce graduates whose education prepares them to take a leading role in the provision, upkeep and improvement of the national infrastructure in an efficient, economic, environmentally sensitive and socially responsible manner.

Objective 2. To produce graduates prepared and motivated to become registered professional engineers and continue their education through professional development and postgraduate programs.

Objective 3. To produce graduates proficient in design and analysis in a minimum of four recognized major areas selected from environmental, geotechnical, structural, transportation and water resources engineering.

Objective 4. To produce graduates with the ability to conduct and critically evaluate the results of experiments in more than one recognized area of civil engineering.

Objective 5. To produce graduates that have a basic understanding of professional practice issues.

EVEG Educational Objectives

Objective 1. A high percentage of environmental engineering graduates should become registered professional engineers and continue their education through professional development and post graduate programs.

Objective 2. Students shall have proficiency in mathematics through differential equations, probability and statistics, calculus based physics, general chemistry, a relevant earth science, a