October 01, 2011

"+1" Dual Bachelor's/Master's Degree Program

Available through the
Department of Environmental Sciences and Engineering
Gillings School of Global Public Health
University of North Carolina at Chapel Hill

What: Opportunity for qualified students to combine a UNC-CH Bachelor's degree with a Master's degree through the Department of Environmental Sciences and Engineering (ESE). The program is designed to allow students with appropriate preparation to complete the master's degree in one year beyond completion of the bachelor's degree.

Who: Students earning a Bachelor's degree in science or public health at UNC-CH wishing to combine this degree with a master's program.

How: Students entering the +1 program must satisfy the following conditions:

a. At the time of undergraduate graduation, the student must have completed graduate coursework in excess of minimum undergraduate credit-hour requirements in courses that are not counted toward the Bachelor's degree but are acceptable to the Department of Environmental Sciences and Engineering toward the Master's degree. For a student pursuing the MS, the student must have completed nine (9) credit hours of graduate coursework beyond the Bachelor's degree requirements. For a student pursuing the MSPH, the student must have completed twelve (12) credits of graduate coursework beyond the Bachelor's degree requirements.

b. The student should complete at least one year of research experience in the laboratory or research group of an ESE faculty member while an undergraduate that provides the initial portion of the Master's degree research.

c. The student must obtain the endorsement of an ESE faculty member for admission into the +1 program. This endorsement includes willingness to advise the student in completing his/her research and a statement that the student is expected to be able to complete degree requirements based on a continuation of the observed level of effort and performance in research. This endorsement should be contained in a letter of recommendation submitted as part of the application.

d. Students applying for this program must complete a standard Graduate School application, including the GRE exam, and meet normal ESE requirements for graduate admission.

e. The student must be admitted into the +1 graduate program by the ESE Admissions Committee.

When: A student should complete an application for admission to this program at the beginning of the next-to-last semester of matriculation as an undergraduate student (for a traditional four-year Bachelor's program, this would be the beginning of fall semester of senior year). A completed application will be evaluated within 30 days with the outcome being one of the following:

a. Admission to the +1 program (assessment that the student can, with continuing effort, complete a Master's degree in one year following graduation)

b. Postponement of the decision until the end of the semester (assessment that the student is admissible for a standard Master's program but data are inadequate to determine if the student should be a +1 student)

c. Declination of admission to the +1 program with encouragement that the application will be considered as an application to a standard Master's program (assessment that the student has satisfactory credentials for graduate admission but will not have the requisite course and research experience to be a +1 student)

d. Declination of admission to the +1 program with assessment that admission to a standard master's program will be considered but is unlikely (assessment that indicators of success as a Master's student are inadequate)

Comments

- Degree requirements for +1 students are the same as those for students admitted into the regular Master's program. None of the credits are double-counted towards the requirements for both the Bachelor's and Master's degrees.
- Students admitted to the +1 program are not required to complete degree requirements within 1 year.
- Admission into the +1 program is not a guarantee that the student will complete degree requirements. This program requires an agreement of good will between the advisor and the student that, based on the student's academic record and demonstrated research ability, a continuing level of dedication will result in completion of degree requirements within a year.

Timing issues for students considering the +1 program

- Three to four semesters before anticipated completion of Bachelor's program: plan coursework to accommodate all Bachelor's degree requirements and the transferable graduate credits; meet with +1 Program Coordinator to verify program requirements; begin to identify a research advisor in ESE.
- One semester or summer before final year of Bachelor's program: take GRE.
- First semester of final year of Bachelor's program: apply to +1 program; finalize identification of research advisor in ESE.

- After admission to +1 program: begin attending ENVR 400 seminars; plan coursework for +1 year.

Summary of MS requirements

- Minimum credits required for degree: 30
- Credits completed while holding undergraduate status: 9 (these credits must not be used to fulfill undergraduate degree requirements and must be approved by the Department of Environmental Sciences and Engineering as satisfying graduate degree requirements)
- Minimum credits to be completed while holding graduate status: 21
- The 30 total credits must be composed of at least 24 credits of formal course work (with a minimum of 15 of these credits from ENVR courses), at least 3 credits of research (ENVR 991) and at least 3 credits of Master's Thesis (ENVR 993).
- All MS students are required to take ENVR 400, Seminar Series (1 credit, pass/fail), which is not counted towards the minimum 30-credit requirement. Attendance at ENVR 400 seminars will be allocated toward the attendance requirement after the student has been admitted to the +1 program. Students register for ENVR 400 in the semester during which the minimum cumulative attendance requirement (15 seminars) will be achieved.
- All MS students are required to take ENVR 401, Unifying Concepts (3 credits), which can be counted as formal coursework. It is recommended that students enroll in ENVR 401 during the final year of undergraduate status.

Summary of MSPH requirements

- Minimum credits required for degree: 42
- Credits completed while holding undergraduate status: 12 (these credits must not be used to fulfill undergraduate degree requirements and must be approved by the Department of Environmental Sciences and Engineering as satisfying graduate degree requirements)
- Minimum credits to be completed while holding graduate status: 30
- The 42 total credits must be composed of at least 24 credits of formal course work (with a minimum of 15 of these credits from ENVR courses), at least 3 credits of research (ENVR 991) and at least 3 credits of Master's Technical Report (ENVR 992).
- All MSPH students are required to take four core courses in public health: BIOS 600, EPID 600, HBHE 600 and HPM 600, or their approved substitutes. Students who enrolled in BIOS 600 and EPID 600 for the BSPH degree may not count the course credits towards fulfillment of the minimum graduate credit requirement.

- All MSPH students are required to take ENVR 400, Seminar Series (1 credit, pass/fail), which is not counted towards the minimum 42-credit requirement. Attendance at ENVR 400 seminars will be allocated toward the attendance requirement after the student has been admitted to the +1 program. Students register for ENVR 400 in the semester during which the minimum cumulative attendance requirement (15 seminars) will be achieved.
- All MSPH students are required to take ENVR 401, Unifying Concepts (3 credits), which can be counted as formal coursework. It is recommended that students enroll in ENVR 401 during the final year of undergraduate status.
- All MSPH students are required to take at least one credit of ENVR 981, Practicum, which does not count as formal coursework.

Sample ESE Faculty and Interests

Michael D. Aitken mike_aitken@unc.edu
Projects are likely to be in the following general areas: (1) the use of molecular biological tools to study the phylogenetic and metabolic diversity of pollutant biodegradation by naturally occurring microorganisms; and (2) the use of bioreactors to remove pollutants from wastes or to remediate contaminated soil. Students should have at least one year of chemistry and one year of calculus-based physics, but ideally will also have had organic chemistry, biochemistry, and introductory microbiology.

Jamie Bartram jbartram@email.unc.edu
Research interests focus on the connections between water (including sanitation and hygiene) and health - especially the links between science, policy and practice, in both developing and developed countries. Activities include: technologies for urban sanitation renewal; management systems for drinking-water safety and rural drinking-water supply; emerging issues (including climate change) and their impacts on system sustainability; health system impacts on water and sanitation; and sector capacity issues such as the costs and impacts of interventions and effective regulation and financing.

Gregory W. Characklis charack@email.unc.edu
Research involves integrated planning of water supply and treatment strategies through the consideration of both engineering and economic criteria. Specific examples include developing computer models useful in exploring the use of water transfers in mitigating drought risk and developing minimum cost strategies for water-related infrastructure. Several laboratory and field studies explore the role that particles play in pathogen and indicator organism transport, research with particular relevance in the development of water quality models used to evaluate the location and severity of public health risks posed by microbial contamination.

Orlando Coronell coronell@email.unc.edu
Projects in the Coronell Lab will likely be related to the following areas: (1) Characterization at the nano and molecular scale of the physical and chemical properties of membranes for water desalination; (2) Study of the relation between membrane physico-chemical properties and membrane performance in terms of water permeation and contaminant/salt rejection; (3) Evaluation of the effect of membrane preparation procedures on membrane properties; (4) Development of new methods for membrane characterization. For students interested in the

removal of contaminants from water by physico-chemical processes other than membranes, opportunities will also be available upon consultation with Dr. Coronell. Students should preferably have one year of chemistry, physics and/or calculus depending on the project of interest.

Rose M. Cory rmcory@email.unc.edu
Students in my lab would have the opportunity to get hands on laboratory and field research experience on water quality projects that are important for human and ecosystem health. Example projects include investigating the quality of recycled or reclaimed water as a function of storage time/storage container, with recycled water sources ranging from harvested rainwater to treated wastewater. These projects may be particularly valuable for students interested in developing country water issues. Students would also have the chance to participate in projects linking the effects of land-use change and urbanization on our drinking water quality. More information can be found on my web page http://www.unc.edu/~rmcory/index.htm

Michael R. Flynn mike_flynn@unc.edu
Professor Flynn has interest in mathematical analysis and modeling of occupational exposures related to neurological outcomes. Current work involves welder exposures to metals, especially manganese, and the association with MRI measures and neuropsychological outcomes.

Jacqueline MacDonald Gibson macdonaj@email.unc.edu
I would prefer to work with students who have strong backgrounds in mathematics and statistics, as well as strong written communication skills. Students working with me should be interested in learning how to conduct quantitative assessments of environmental risks to public health.

William G. Gray GrayWG@unc.edu
Prof. Gray has interests in environmental modeling with an emphasis on subsurface flow and transport processes. Students with interests in the formulation of environmental models, for either a theoretical or computational perspective may find an appropriate project.

Ilona Jaspers ilona_jaspers@med.unc.edu
The Jaspers' lab focuses on the adverse health effects of inhaled pollutants. The two major research areas are a.) how exposure to air pollutants modify innate immune responses and the ability to fight respiratory virus infections and b.) how atmospheric aging alters the toxicity of inhaled pollutants. A number of in vitro and clinical research models are used for her research.

David Leith david_leith@unc.edu
Our work involves the recognition, evaluation, and control of airborne contaminants. Much of the work is concerned with measurement and control of fine particles in outdoor and indoor air. We are active at developing new methods to assess exposure to these contaminants, for studies in North Carolina and overseas.

Cass T. Miller casey_miller@unc.edu
Professor Miller works on theoretical and computational aspects of conservation principles as applied to environmental systems, especially multiphase porous medium systems. The research involves the derivation and solution of appropriate mechanistic mathematical models to describe complex environmental systems. Applications of this work would include groundwater flow and transport phenomena, CO_2 sequestration, and land-atmosphere interaction.

Ivan Rusyn iir@unc.edu
This lab uses a combination of in vivo animal studies (mice) and experiments that utilize cell culture models (mouse and human cells). We aim to better understand why certain chemicals cause cancer or organ damage in rodents and whether humans in general, or any susceptible sub-population in particular, are at risk from similar exposures.

Marc Serre marc_serre@unc.edu
Broadly speaking my interests are in using spatial statistics to create maps showing the distribution of environmental pollutants and disease incidence across space. Students working in my group will learn to use these methods and apply them on on-going local and international projects. Local projects include the study of space/time patterns in water pollutants across the state of North Carolina. Other projects include the mapping analysis of air pollutants to address environmental justice issues, and infectious diseases to prevent outbreaks from turning into deadly epidemics.

Jill R. Stewart jill.stewart@unc.edu
The Stewart lab is developing novel techniques to detect and track pathogens in water. Students are also engaged in evaluating impacts of non-point source pollution, and in evaluating the manner in which human activities (development, stormwater management) can affect distribution of microbial contaminants. Current research projects include evaluation of water quality associated with (1) land application of waste products and (2) urbanization on a watershed-scale. Overall, this research is leading to a greater understanding of how environmental conditions can affect human health, and how humans themselves influence this process.

William Vizuete vizuete@unc.edu
Using high performance computers and three-dimensional models to simulate the atmosphere, I am working to improve our understanding of the formation of air pollution. Undergraduate research opportunities will include analysis of model predictions and observational data to provide scientific objective analysis for air quality managers dealing with pollution problems in large cities in the United States and the Middle East.

Howard Weinberg howard_weinberg@email.unc.edu
Students will gain field and laboratory skills in the area of water quality working on projects that support measuring the occurrence, fate, and transport of environmental micropollutants and their effects on aquatic and human health. Current projects are tracking personal care products drugs, and nanoparticles as they enter watersheds, evaluating indicators of pollution in surface and groundwater, developing new chemical, physical, and biochemical tools for monitoring water quality including techniques for assessing pollutant toxicity in the environment, and studying new approaches to treat and protect our drinking water. Most of these projects are interdisciplinary in nature and will provide students with a balance of science, risk assessment, and policy through collaborations with state and federal laboratories as well as nonprofit foundations.

Jason West jjwest@email.unc.edu
Students working with me in the +1 program would work on air pollution, climate change, and the relationships between these problems. This work will involve the use of models of atmospheric transport and chemistry, addressing topics such as the climate forcing by air

pollutants, and the long-range transport of air pollution. Other projects would also be possible, including the health and environmental impacts of air pollution, and the availability of technologies to address greenhouse gas and air pollutant emissions. Students should expect to explore the relevance of the fundamental science they are working on for informing policy decisions.

Stephen C. Whalen Steve_Whalen@unc.edu
Nearly every summer I hire an undergraduate student to assist in field and laboratory studies on lakes in the Alaskan arctic. Less frequently, I engage undergraduate students in locally funded projects in both terrestrial (forests, agroecosystems) and freshwater aquatic settings. These studies also include complementary field and laboratory components. The scope of the projects includes nutrient (C, N) cycling dynamics and microbially mediated greenhouse gas production and consumption. These projects have often supported MS (*not* MSPH) students with an interest in the functioning of natural and managed ecosystems.

Dale Whittington dwhittin@email.unc.edu
Prof. Whittington is an environmental economist who works on problems in less developed countries. His research focus is on water supply and sanitation planning in both rural and urban areas. He also conducts research on large international rivers, including the Nile and the Ganges. Prof. Whittington also works on the development and application of nonmarket valuation techniques, especially stated preference methods, in less developed countries.