National Center Partner University Highlights New Sustainable Transportation Curriculum

ATLANTA - The first of four new courses in sustainable transportation rolls out in fall 2014 at Georgia Tech, thanks to $250,000 in matching funds from the Office of the Executive Vice President of Research.

The new course will focus on transportation and energy, providing an overview of where fuels come from, how combustion works, what factors affect fuel consumption, and how emissions are formed (from well to wheel) for petroleum and alternative fuels. A second course will be under development for an initial offering in spring 2015 and may focus on lifecycle assessment in transportation sustainability analysis.

Much of the focus of all of the new courses, according to Professor Randall Guensler, will be teaching practical ways to analyze transportation systems and their potential impacts on fuel consumption and the environment so that decision-makers have better data on which to base their plans.

“Every year, departments of transportation collectively make billions of dollars in transportation planning and construction decisions that establish the transportation system we will be living with for generations,” said Guensler, who teaches in the School of Civil and Environmental Engineering. “Decisions regarding whether we should continue expanding freeways, implement managed lanes, develop new transit systems, design around automated vehicles, or shift toward electric or natural-gas vehicles all require that we have proper tools available to assess the true economic costs and lifecycle energy and emissions impacts of these technologies.”

Guensler and his team are leading the effort to create the model curriculum of multi-disciplinary courses in sustainable transportation through the National Center for Sustainable Transportation (NCST).

Each course is constructed in three five-week modules, so the elements can be mixed and matched as desired. Once developed, the course materials will be available for free to any university that wants to incorporate the modules into their undergraduate or graduate programs.

At least two courses over the next two years also will be offered to professional planners and engineers through the Georgia Tech Professional Education program. The courses will be offered through the Global Learning Center. The grant also funds the development of course lecture videos and high-tech animated graphics.

Faculty from Georgia Tech and the NCST partner universities will create the lectures, using the professional production facilities and support from Georgia Tech’s Professional Education staff. Once completed, the plan calls for the professional education courses to be made available at Georgia Tech and concurrently through University of Southern California and California State University, Long Beach professional education partnership. Ultimately, the team plans to develop a certificate program in Sustainable Transportation.
“Georgia Tech is committed to developing today’s students into tomorrow’s leaders,” said Steve Cross, executive vice president for research. “One way we can have a direct impact on society and the economy is to dramatically improve our transportation system. These new courses will help educate the men and women who will make it happen.”

Guensler and his team will create the university courses to be delivered in the traditional classroom model, but they will also build “flipped” versions for these courses, where most of the lectures are delivered through videos that students can watch outside of class time. Flipped courses allow the bulk of classroom hours to be spent on discussions, quick-response lectures, case-studies, problem-solving, and digging more deeply into the material.

“The topics are such [that] there’s more discussion of readings, there’s hands-on modeling, so a flipped version makes more sense,” Guensler said.

Decisions regarding the content of the full series of courses will be made in early fall of 2014, in consultation with NCST partner universities (University of California, Davis; University of California, Riverside, University of Vermont, the University of Southern California, and California State University, Long Beach). The third and fourth courses will roll out during the 2015-16 academic year.

Read more about the National Center for Sustainable Transportation.

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