Small Watershed Modeling NREM 666

Why is this course being requested?
This course will provide students with a fundamental understanding of the watershed hydrologic processes, and approaches to modeling of these processes. Quantification and prediction of watershed hydrology is fundamental to the planning and management of renewable natural resources for sustainable use on a watershed. Students will be able to develop the ability to quantify the magnitude of hydrologic entities in small watersheds. They will be introduced to a number of watershed modeling tools. Students will study the impact of different management practices on natural resources. They will be able to predict the impact of different watershed management practices on the hydrology, the water quality of the surface and groundwater resources, and the urban flooding.

How will the content be organized?
This course has two 50-minute lecture sessions and a one-two hour laboratory session. See attached syllabus for more information.

What other courses at UHM closely parallel the proposed course and in what way the latter make a distinct contribution?
This course a unique course that does not duplicate any other course offered on campus. It makes an essential addition to the NREM major. The closest course is CEE626 which is restricted for civil and environmental engineering students. The CEE626 emphasizes the engineering of surface water management. The proposed course, NREM 491, integrates the hydrologic cycle components with agricultural best management practices, economical, and social science factors and provides the students with practical modeling skills.

Where or how does the proposed course fit into the current and future curriculum?
A typical NREM graduate will be involved in planning and managing natural resources at the watershed scale. Basic modeling skills are fundamental for the planning and management of renewable natural resources for sustainable use on a watershed. This course deals not only with basic watershed hydrology components but also with capability and suitability of land and vegetative resources to be managed for production of goods and services in a sustainable manner. The content of this course fits the needs of NREM students.

Why is the number of credits and level justified? Explain the prerequisites and the absence of thereof?
The credit number (3), and the lecture and laboratory times are equivalent to any other 3 credit course in the department. The laboratory time will be used for hands on exercises, and/or field trips that will reinforce what is covered during the lectures. The prerequisites
are core courses of NREM undergraduate degrees; they will ensure that students should have the necessary tools to fully benefit from the course.

**How will the course assist students to achieve the critical skills and competencies expected of CTAHR graduates?**

In addition to the theoretical part, the laboratory sessions will be used to give hands on experience for the students. The computer session will emphasis the use of decision supporting systems such as numerical models. The students will be exposed to Geographical Information System tools and how to use them to manage natural resources. Students will criticize, present and discuss scientific manuscripts related to the different topics the course covers. Also the term paper will serve as a good experience for the students on how to conduct and evaluated scientific research projects.

**How will students be evaluated?**

Student evaluation includes written exams (midterm and final), homework assignments throughout the semester, laboratory reports, published research paper critics and a term paper.

**What are the minimum qualifications for teaching this course? Is a qualified instructor now available?**

A qualified instructor for this course should be a person holding a Doctoral degree in Hydrology or Soil Physics. A. Fares (Ph.D.), a watershed hydrologist at NREM, is currently teaching this course and will continue teaching it next time is offered.

**How will the course be financed, assuming no further cutbacks?**

The current resources are enough to teach this course, and there is no need for additional resources.

**Has the course been offered before? Is there a demand for it?**

The course is being taught in Spring 2005 at the graduate level. As the NREM department continues to grow, there is strong demand for this course as one of the core course of NREM. Students from other departments are taking this course as well.

**Is the course cross-listed with another department?**

No, currently this course is not cross-listed with any other department; however there is interest from the following departments: TPSS, MBBE, and Geology and Geophysics.