UTC PROJECT DESCRIPTION

PROJECT NUMBER:
06101

PROJECT TITLE:
Transportation Systems Curriculum for High Schools

PRINCIPAL INVESTIGATOR:
Matthew E. Elam
Department of Industrial Engineering
The University of Alabama
Phone: (205)348-9658
Fax: (205)348-7162
E-mail: melam@bama.ua.edu

PROJECT OBJECTIVE:
The objective of this project is to create and implement a transportation systems curriculum for high schools. The curriculum will educate juniors and seniors in high school about transportation systems in a non-intimidating and exciting way, and will motivate and prepare them to study it or a related discipline (e.g., civil and construction engineering, operations systems management) in college.

PROJECT ABSTRACT:
This project creates and implements a transportation systems curriculum for high schools. The curriculum will initially be implemented in five Alabama high schools having large percentages of underrepresented populations. The curriculum includes learning modules covering introductory topics in highway and mass transit issues, the role of transportation in society, mobility issues, urban growth patterns and transportation, efficient and safe transportation, and ethics in transportation, each with a focus on their systems aspects. It will be taught during parts of the semester of an existing elective course. The curriculum will be delivered as a highly portable computer software developed by the investigators either downloadable from the internet or on a CD. The internet download and CD will also include lecture material (i.e., PowerPoint slides and handouts) to accompany the modules and a software tutorial developed by the investigators for high school faculty to self-learn the curriculum. Included as part of the curriculum are UA, UAB, and UAH university recruiting materials.

PROJECT TASK DESCRIPTIONS:
1. Finalize number and content of modules; develop lecture material; finalize content of tutorial.
2. Develop the logic to computer program the modules and the high school faculty tutorial.
3. Computer code the modules and the high school faculty tutorial in html.
4. Debug, verify, and validate the operation of the computer software.
5. Obtain and organize recruiting materials from UA, UAB, and UAH.
6. Implement the curriculum.
7. Evaluate the curriculum.
8. Write the UTCA final report.
MILESTONES AND DATES:
Task 4: June 1, 2006 – July 31, 2006
Task 5: June 1, 2006 – July 31, 2006

TOTAL BUDGET:
One-year project; UTCA $49,998; Total budget $99,996

STUDENT INVOLVEMENT:
One 0.50 full-time equivalent (FTE) graduate research assistant (GRA) and one scholar from the Computer-Based Honors Program at UA will be involved with this project.

RELATIONSHIP TO OTHER RESEARCH PROJECTS:
Drs. Elam and Fonseca have developed a program titled "Manufacturing Engineering Education for the Alabama Black Belt" that will establish a manufacturing engineering curriculum initially in high schools with large percentages of underrepresented populations and then in more high schools pending additional funding. The program will prepare and recruit these students to study engineering in college. The curriculum will be taught through on-site, state-of-the-art manufacturing engineering teaching laboratories. Drs. Elam, Fonseca, and Lindly have also formed an Engineering Education Research Working Group as part of a college-wide initiative at UA.

TECHNOLOGY TRANSFER ACTIVITIES:
The investigators will develop a refereed conference paper and conference presentation based on their UTCA proposal. Additionally, the investigators will submit a paper to a refereed publication to report the results of the project. The investigators will promote the curriculum and the Web site from which it can be downloaded to encourage its use at more high schools in Alabama and in other states.

POTENTIAL BENEFITS OF THE PROJECT:
This project supports UTCA's theme of management and safety of transportation systems and promotes UTCA's diversity and human resource goals because it directly addresses the first two highest priority topics, (1) Diversity and (2) Human Resources, in the UTCA Annual Research/Training Plan for 2006. It will also thrive beyond its funding period because it will be downloadable from the internet at no cost, it will not require transportation experts to implement because the internet download will include a software tutorial for instructors to self-learn the curriculum, and it will be heavily promoted.

TRB KEYWORDS:
Education and training, Transportation, Computer applications, Internet.