CENTER FOR INFRASTRUCTURE ENGINEERING STUDIES

University Student Design Competition Center (USDCC)

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UTC
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16. Abstract

Establish a fully-operational coordination office for the University Student Design Competition Center (USDCC). The goal is to establish a facility that would be consistent with a professional working environment or a corporate research and design entity. The coordination office will serve as a consolidated facility for the eight student design teams, the USDCC Director, Assistant Director, and the Manager. The office serves as a reference library of technical publications, the communications hub for students' internet research, and telephone and computer facilities to contact manufacturers, suppliers and donors. Each team maintains a consolidated records file, progress charts, historical performance data, and sponsor lists. Consolidation of multiple teams in one facility will enable the student groups to share information, copy the successful practices of the more-established teams, and prevent repetition of mistakes made in previous competition strategies.

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Renovation of Student Design and Experiential Learning Center (SDELC)

The Experiential Learning Center serves approximately 30-40 students on a recurring basis, primarily team officers. These team leaders represent roughly 150 students, many of whom participate in design and strategy meetings in the office settings.

The objective of the Experiential Learning Center is to provide a state-of-the-art resource center for the eight student design teams on the UMR campus.

The University of Missouri-Rolla Student Design and Experiential Learning Center (SDELC) is the umbrella organization for UMR's nationally recognized multi-disciplinary engineering design teams. Eight student design teams, seven of which design transportation-related projects, form the core of the design center and operate with technical, administrative, and marketing assistance from faculty, staff and administrators at UMR. These established groups participate in annual industry- or government-sponsored competitions, and reflect UMR's emphasis on experiential learning, outside the classroom as well as inside. Additional Ad Hoc design teams are established on an as-needed basis for nonrecurring studies.

TEAMS: Two teams (Steel Bridge and Concrete Canoe), have long been associated with the American Society of Civil Engineering, and provide direct experience with systems at the core of infrastructure evaluation and improvement. Five additional teams, including national champions Solar Car and Human Powered Vehicle groups, as well as highly competitive Advanced Aero Vehicle, FSAE (Formula Society of Automotive Engineers) racecar, and Robotics teams build projects that are directly impacted by the condition of the existing and projected air and highway transportation infrastructure, or have a role in developing mechanisms applicable to infrastructure service and evaluation.

The SDELC also supports special limited-duration design teams, targeted at non-recurring projects such as the UMR Hydrogen Fueling Station team, which took top national honors in its research into the technological and infrastructure challenges of automotive fuel cell use.

FACILITIES: The SDELC consists of three facilities, the core of which is the newly-renovated offices at 112 Engineering Research Lab. Replacing scattered, make-do team offices around campus, the consolidated center offices will be an important part of the chancellor's "Million-Dollar Walk", where prospective students, alumni, and prominent university donors are shown the sophistication and professional atmosphere of the shared facilities. Several teams share the administrative offices, which provide meeting space, a document center, sophisticated computer design assets, and ready access to supporting faculty and staff.

Consistent with the goal of having an organizational facility comparable to industry, the offices will be provided with new, color-coordinated furnishings.

The other two facilities are housed in two former Bureau of Mines surplus workshop buildings, located on the west side of campus. Team members work in a cooperative business environment, not only sharing work areas and vehicle support, but drawing on the skills and experience of students on other design teams, sharing equipment and labor, and thinking more as an element of a larger organization. Each project combines the real-world complexity of starting a project from scratch. From developing a business plan, to getting their hands dirty, pragmatically solving problems, learning flexibility, planning competition logistics, and working with people of varied backgrounds, design team students learn critical organizational processes that get them more involved in real-world experiences that make them highly attractive to prospective employers.