

**PROGRAM PLANNING SUMMARY**

**Master of Science with a Major in Engineering Management  
And  
Master of Science with a Major in Engineering Management, Concentration in  
International Engineering Management  
College of Engineering and Computing**

**University of South Carolina – Columbia Campus**

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**President Harris Pastides**

**Date**

## Commission on Higher Education Program Planning Summary

**Name of Institution:** University of South Carolina – Columbia Campus

**Designation:** New Program Proposal

**Name of Degree:** Master of Science

**Name of Program:** Engineering Management

**Number of credit hours in program:** 30 hours (MS in Engineering Management)

39 hours (MS in Engineering Management, concentration in International Engineering Management)

**If undergraduate, designation as four- or five-year program:** N/A

**Program qualifies for supplemental Palmetto Fellows Scholarship/LIFE Scholarship awards:** No

**Proposed date of implementation:** Fall 2012

**CIP Code:** 15.1501

### **Justification of need for the proposed program:**

Engineering managers supervise and lead teams of engineers and other technical personnel and perform a wide variety of activities. These include product development, manufacturing and marketing; the planning, design and construction of project components and structures; participation in the analyses for making economic decisions; optimized utilization of available resources to meet project objectives; leadership and/or participation in the negotiation teams for acquiring new projects; and undertaking various activities for ongoing projects at the local, state and international level. In addition to the technical knowledge and expertise in the related area of specialization, these activities require knowledge of accounting, economics, finance, marketing, human resources, contract and environmental law and other legal issues, operations research, environmental impact of the project, sustainability issues, public relations, etc.

Almost all undergraduate engineering programs in the United States concentrate mainly on the technical subjects in the area of specialization and include some university mandated material on arts and humanities. However, the topics listed above that are necessary for management are usually not covered in a typical undergraduate curriculum. Thus, a significant number of engineers who are called upon to fill the managerial roles in their organization as they attain seniority lack suitable training in management-related activities and learn by trial-and-error once they are on the job. As expected, this could have disastrous consequences for the organization as well as the morale of personnel involved. Similarly, globalization and inter-dependence of countries in recent years for

trade, commerce and economic development require exposure to different social and cultural settings for developing successful partnerships. For this purpose, several educational institutions in the United States have started to offer an MS degree in Engineering Management in recent years.

No other institution in South Carolina offers a program for engineers and technical personnel that leads to a Masters degree in Engineering Management, except the Project Management program at the Citadel which has different a emphasis, as is discussed below. The proposed program is planned to fill this gap to produce necessary, qualified manpower for the economic development of the state. It will be modeled after a very successful program at the Cockrell School of Engineering at the University of Texas in Austin, Texas (created by USC's new Dean of Engineering and Computing during his tenure at UT Austin). Ideally, this will be offered leveraging multiple modes of learning, but will emphasize a distance education format nationally and internationally and provide options for international experiential activities, as discussed below. The members of the College of Engineering and Computing external Advisory Board, representing different engineering concerns in the state and region, emphasized their strong support for the program at their meeting on April 20, 2011.

#### **Anticipated program demand and productivity:**

The proposed program should be of interest to a wide group of engineers whose career goals are to assume technical managerial positions and encompass all engineering disciplines, e.g., chemical, civil, electrical, mechanical, and nuclear engineering in South Carolina as well as in the neighboring states of North Carolina and Georgia. The distance education component will attract students nationally and internationally as well as US citizens on overseas deployment. The program will be offered as an executive program, offered in synchronous and asynchronous delivery modes during each semester to make it attractive to practicing engineers employed full-time.

Once fully developed, we anticipate enrollment of about 40 for in-class instruction and about 20 through distance education.

#### **Assessment of extent to which the proposed program duplicates existing programs in the state:**

To the best of our knowledge, there is no other program in the state leading to a Masters of Science degree in Engineering Management. Different institutions may have individual courses in management, accounting, economics, etc. but not a coherent program leading to a degree in Engineering Management.

The proposed program is different from the Project Management program offered at the Citadel in that it has significantly more emphasis on the management-related courses than on the technical courses as structured by the Citadel program; the proposed program is an executive/professional program with instruction on two days/month as well as offered utilizing multiple timing and delivery methods to meet working professional needs as compared to instruction during regular office hours or evenings. We are having

discussions with the Citadel for developing a collaborative relationship that will allow the Citadel students to take USC classes since the latter has a wider variety of existing courses than those available at the Citadel. In addition, as indicated in their proposal to the Commission, the program at the Citadel appears to be mainly geared for the engineers in the Low Country.

**Relationship of the proposed program to existing programs at the proposing institution:**

The proposed program will complement the existing graduate programs of the College of Engineering and Computing by making more graduate courses available to the full-time graduate students as well as those enrolled in the distance education program. For this MS program in Engineering Management, plans are to provide courses on system design, engineering economics, marketing, managing people and organizations, projects and processes, legal issues concerning contracts, human resources, environment, intellectual property, art and science of negotiations, public relations and interaction with the public in addition to technical-related courses on risk analysis, sustainability, environmental impact, planning and scheduling, operations research, human factors etc. A number of these courses will be developed for this program. To expose the students to different cultural and social settings and different working conditions, and for learning a foreign language, sponsoring companies will be encouraged to provide an option for international experience for short periods in different countries.

The College of Engineering and Computing has been running successful distance-education graduate programs in all five departments for about four decades. This planned program in engineering management will be a good addition to the existing programs and provide additional options to the graduate students in the future.

The Darla Moore School of Business, the School of Law, and the College of Journalism and Mass Communications will participate in the proposed program by providing overall design support and instruction via several courses on accounting, economics, risk management, human capital management, marketing, communications, legal issues, and environmental law. This collaborative effort will increase interaction of these colleges with the College of Engineering and Computing and will be helpful for multi-disciplinary research and instruction in the future.

**Relationship of the proposed program to other institutions via inter-institutional cooperation:**

Discussions are underway with the Citadel for close collaboration with their Project Management program which will allow their students to take courses from this proposed program.

**Total new costs associated with implementing the proposed program (general estimates):**

It will be possible to develop this program with the present facilities and with the previously approved increase in faculty and staff, and no additional resources will be required or requested from the state.