

Program Title - Undergraduate

Certificate Program in Innovation and Entrepreneurship in High Technology

Location

The certificate will be offered by the College of Engineering and Computer Science in conjunction with the Raj Soin College of Business at Wright State University.

Purpose

The purpose of this Certificate Program is to enhance the technical expertise and business acumen of undergraduate students, regardless of professional pursuit. Upon completion of this Certificate Program graduates will be knowledgeable about the technical processes that drive innovation and possess the business skills required of entrepreneurs.

Rationale

It is becoming evident that in order to maintain our economic leadership in the face of increasing globalization, the United States must concentrate on fostering innovation and entrepreneurial activities. Erica Groshen, an economist at the Federal Reserve, points out that the United States follows a fairly standard pattern of product development. "We create new products, and when they become mature, much of the production moves overseas and we move onto the next big thing." This indicates the U.S. can no longer rely on the brute force of its manufacturing sector to propel its economic growth. As the global economy has blossomed, corporations have been able to leverage the cheaper, equally effective human capital of previously untapped nations to increase productivity, dramatically reduce costs, and improve their bottom line.

This exodus of jobs to other nations is not confined to the manufacturing sector. In the technology sector U.S. corporations are finding highly educated pools of labor in developing nations such as India. This skilled labor force, much like their manufacturing counterparts in Asia or Central America, is much cheaper than the equivalent U.S. labor.

While this migration of jobs clearly has a short term impact on our national economy, a more disconcerting aspect of this labor market shift is the accompanying long term effects on our leadership position in innovation. With the breakneck pace of technological advance it is imperative that our labor force be equipped with both the skills needed to foster the innovation of "the next big thing," and the entrepreneurial knowledge to guide that innovation to market. A labor force with this unique combination of skills is what is needed to ensure that the U.S. economy retains its capacity to grow well into the future.

Currently, our educational offerings are not set up so as to seamlessly combine these skills. We are producing engineers with the technical expertise to design high quality products, and businessmen who can spot market opportunities and have the training to exploit them. What we are not producing are educated individuals who have both technical expertise and a keen understanding of the business environment.

To address this deficiency, and provide Wright State University students with the opportunity to obtain this powerful combination of skills, the College of Engineering and Computer Science, in conjunction with the Raj Soin College of Business, would like to offer this Certificate Program in Innovation and Entrepreneurship in High Technology.

Impact on Degree Programs

The Certificate Program in Innovation and Entrepreneurship in High Technology is designed to develop competencies in the technical aspects of innovation and the business aspects of entrepreneurship. These competencies will add value to the students' respective programs by enhancing their skill sets and providing them with a more comprehensive understanding of the business challenges, both technical and economic, faced by their employers. The certificate program will not negatively impact enrollment in existing University programs.

Admission and Program Requirements

This Certificate Program will be available to all junior and senior undergraduate students who are in good academic standing. Eligible students must have at least a 2.5 cumulative grade point average, formally apply to the Certificate Program and complete an interview with the Certificate Program's Director (or his representative). The application and interview process are designed to identify students likely to succeed in the program.

The certificate is comprised of 23 total credit hours. These credit hours are made up of 4 four-credit hour classes, each one quarter in duration; 1 four-credit hour team project with a company, and 3 one-credit hour seminar classes, each one quarter in duration.

Courses

Students will be required to earn a C or better in:

- ISE 490 – Technology-Based Ventures – 4 credit hours
Topics include advanced product development, protecting intellectual property, fostering strategic and creative thinking, effectively leading technology-driven teams.
- ISE 481 – Engineering Economy – 4 credit hours
Course is an introduction to analytical methods and techniques for optimizing the economic outcome of technical and managerial decisions. It includes time value of money, annual costs, present worth, future value, capitalized cost break-even analysis, and valuation and depreciation.
- MGT 480 – Special Topics in Management of Innovation – 4 credit hours
Studies fundamental concepts of strategic management and examines technological, institutional, behavioral, and management systems and their operation in the global environment.

And **one** of the following two courses:

- **MKT 475 – Entrepreneurship – 4 credit hour class**
Problems and perspectives in starting new ventures. Concepts and techniques of searching for market opportunities, screening and evaluating potentials, negotiating, and financing to initiate or purchase a company. Development of individual written business plan.
- **MKT 480 – Special Topics in New Venture Creation – 4 credit hours**
Topics to include market research, business plan development, marketing and financing strategies, organizational structure, concepts and techniques for starting or purchasing a company, including technology commercialization.

Qualified students may take MKT 475 Entrepreneurship but credit will not be given to students taking both MKT 480 and MKT 475.

Courses will require junior or senior- level standing. Students lacking a business background will be advised to take the technology-based ventures class and the engineering economics classes before taking the two business school courses.

Team Project (ISE 499 – I&E Team Project – 4 credit hours)

Teams will be multi-disciplinary and typically multi-cultural in their make-up and include a faculty member and an industrial sponsor. Partnerships will be secured to allow the teams to collaborate with Dayton area high-tech companies. Teams will be required to generate concepts for new product development and submit a business plan. Team projects will be two or three quarters in duration.

Seminar (ISE 499 – I&E Seminar Series – 3 credit hours)

Seminars will meet once a week. Guest lecturers will provide insight on entrepreneurship and innovation. Positive role models who can share both successes and failures will be sought. Over the course of the program, students will attend 30 seminars.

Program Staffing and Coordination

The curriculum for the Certificate Program in Innovation and Entrepreneurship in High Technology includes courses offered from both the College of Engineering and Computer Science and the Raj Soin College of Business. The Program's Director, Dr. Narayanan, currently professor and chair of the Department of Biomedical, Industrial, and Human Factors Engineering; will be responsible for the administration of the Program, and the coordination of program offerings between the two Colleges. Teaching assignments will be made by the appropriate department chairs.

Costs

The projected costs of creating the Certificate Program in Innovation and Entrepreneurship in High Technology will be minimal. The Program has secured external funding from the Coleman Foundation to help offset establishment, recruitment, and assessment costs. Additionally, both Colleges have the capacity and the staff to accommodate the additional enrollment created by the Certificate Program. Finally, this Certificate will not require the University's library system to expend additional resources.

Proposed Start Date

We anticipate enrolling students in the Certificate Program beginning with the Winter, 2005 quarter.

Undergraduate Catalog Description

Objective: To enhance students' understanding of the interrelated nature of the technological and financial decisions made within today's high-tech firms.

Eligibility: This certificate is available to any undergraduate student at Wright State University who has achieved junior or senior class standing. To be accepted into this Certificate Program, the student must have a 2.5 cumulative grade point average; formally apply to the certificate program; and complete an interview with the Program's Director.

Requirements: Students seeking the Innovation and Entrepreneurship Certificate must complete 23 academic credit hours. All students seeking the certificate must take the following courses: ISE 490 Technology Based Ventures; ISE 481 Engineering Economy; MGT 480 Special Topics in Management of Innovation, and either MKT 475 Entrepreneurship or MKT 480 Special Topics in New Venture Creation.

In addition, students are expected to complete 3 one-credit hour seminar courses, as well as a four-credit hour team project with a local high-tech company. For more information please contact Dr. S. Narayanan; Department of Biomedical, Industrial, and human Factors Engineering; 207 Russ Engineering Center; (937) 775-5044; email: snarayan@cs.wright.edu.