Washington State University
MAJOR CHANGE FORM -- REQUIREMENTS
(Submit original signed form and TEN copies to the Registrar’s Office, zip 1035.)
See https://www.ronet.wsu.edu/ROPubs/Apps/HomePage.ASP for this form.

*Submit an additional copy to the Faculty Senate Office, French Administration 338, zip 1038.

Department Name: Engineering and Technology Management

1. CHECK PROPOSED CHANGES.
   - □ Change department/program name from __________________________ to __________________________
   - □ New degree or program in __________________________
   - □ Change name of degree from __________________________ to __________________________
   - □ Drop degree or program in __________________________
   - □ Extend existing degree or program to __________________________ campus
   - □ New Major in __________________________
   - □ Change name of Major from __________________________ to __________________________
   - □ Revise Major requirements in __________________________
   - □ Drop Major in __________________________
   - □ Revise certification requirements for the Major in __________________________
   - □ New Option in __________________________
   - □ Revise requirements for the Option in __________________________
   - □ Drop Option in __________________________
   - □ New Minor in __________________________
   - □ Revise Minor requirements in __________________________
   - □ Drop Minor in __________________________
   - □ New Undergraduate Certificate in __________________________
   - □ Revise Undergraduate Certificate requirements in __________________________
   - □ Drop Undergraduate Certificate in __________________________
   - □ Other: New Graduate Certificate in Facilities Management and a specialization in Construction Management

Effective term/year: Fall 2014

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<tr>
<th>Contact Person</th>
<th>Contact Phone No.</th>
<th>Contact email</th>
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<tbody>
<tr>
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<td>(509) 335-0125</td>
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</tr>
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</table>

2. GIVE REASONS FOR EACH REQUEST MARKED ABOVE. (Attach additional paper if necessary; see reverse side.) see attached

4. SIGN AND DATE APPROVALS.

Chair Signature/date: 2/19/14
Dean Signature/date: 2/21/14
General Education Com/date: SEP 11 2014
Catalog Subcom/date: Academic Affairs Com/date: Graduate Studies Com/date: Senate/Date:
February 28, 2014

The Engineering and Technology Management Program proposes to add:

- a specialization in Construction Management and
- a new graduate certificate in Facilities Management
- 5 new courses to support these.

Enclosed:

- One Major Curricular Change Form for both the new specialization and the certificate
- Justification for, and summary of, the proposed specialization
- Justification for, and summary of, the proposed graduate certificate
- Justifications Summary of the five new courses
- 5 separate Major Curricular Change forms for each course with syllabus.

- EM 521 Integrated Project Delivery Methods
- EM 523 Sustainable Construction Materials and Methods
- EM 524 Program and Facilities Management
- EM 535 Project Controls in the Construction Process
- EM 578 Conceptual Construction Estimating

Patti Elshafei
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pattielshafei@hotmail.com
Master's Degree in Engineering and Technology Management with a Construction Management Specialization

A Master’s Degree in Engineering and Technology Management with a Construction Management Specialization is designed for industry professionals who want to develop the skills to be effective managers of projects and facilities. The degree requires 30 semester hours (10 courses) of course work and two to four credits of a final non-thesis project report (E M 702).

The Construction Management Specialization requirements include taking 10 classes (30 hours) of core courses and electives, plus E M 702 (final project).

Managing Organizations and People
E M 501 Management of Organizations or
E M 522 Supervision and Leadership for Engineering and Technology Managers

Managing Financial Resources
E M 535 Project Controls in Construction Processes

Managing with Analytical Methods
E M 540 Operations Research for Managers

Managing Projects
E M 520 Construction Project Management

Managing Variability
E M 578 Conceptual Construction Estimating

Managing Strategy
E M 524 Programs and Facility Management

E M 702 Master’s Special Problems
Directed Study, Exam 2-4 Credits

ELECTIVES

E M 521 Integrated Project Delivery Methods
E M 523 Sustainability of Construction Materials and Methodology

It is strongly recommended that students take the following two electives, but individuals may petition for alternate courses from the E M curriculum.

E M 508 Legal Concepts for Engineering and Technology Managers
E M 530 Applications of Constraints Management
Specialization Justification-

Graduate Programs in Construction Management

A specialization in Construction Management within the Engineering and Technology Management Program would meet the needs of those requiring an advanced degree in construction management without establishing a whole new degree program and the associated costs. The Construction Management Program and Engineering Management Program will work together to provide course work. The administration will be done through the Engineering and Technology Management Program.

The total annual value of construction in the United States is approximately $900 billion (8% of the US Gross National Product), making the construction industry one of the most important sectors of the US economy. A Master of Construction Management offers the student a myriad of opportunities and exposure in the construction industry.

The degree targets professionals who are working in, or have experience in, the construction industry. It teaches professionals the leadership tools necessary to compete in the ever-changing and highly competitive construction management environment. It provides students with advanced skills and understanding in construction project administration and business management.

Courses are focused on business development, new and emerging technologies for construction and project delivery systems, and executive administration of construction firms. The degree prepares graduates for upper-management positions in the construction industry.

The National Center for Educational Statistics (NCES) maintains that there are about 19 programs throughout the U.S. that offer the opportunity to earn a master's in construction management. Since there are so few, if you opt to attend an online school, it will not be considered a disadvantage by employers.

The degree can position you for the most expensive projects in both public and private works, helping you rise to the top of the profession. The Bureau of Labor Statistics (BLS) finds that the profession will grow by 17% in the next decade, that most of this will be concentrated on the senior ranks of construction management, so you will reap many benefits from the degree.

When it comes to construction, most of us think hammers, nails and concrete. Who knew that an advanced degree would be in order for this largely blue-collar industry or, in this economy that it would be in demand?

Managing a construction project from start to finish is a weighty responsibility, and construction managers make comfortable salaries. In 2012, their average salary was $90,960. The median salary was $82,790, the highest-paid in the profession made $144,520 and those earning bottom-rung salaries still earned about $50,000. Salary Range- 75th Percentile $109,600, Median $82,790, 25th Percentile $63,790 according to the Bureau of Labor Statistics.

At New York University, applications for this spring's master's program in construction management were up 33 percent over last year. Numbers were even higher for the graduate certification program, which usually takes a year to complete.

James P. Stuckey, a former real estate developer who heads N.Y.U.'s Schack Institute of Real Estate, attributes the rising interest to the federal stimulus program's emphasis on building
highways, railroads and other infrastructure. At the same time, green construction requires a higher level of technological knowledge. I believe people are recognizing that there’s going to be a lot of work in those areas,” Mr. Stuckey says.

“If you do go for a master’s in construction management you’re pretty eligible to work for us,” says Peter Davoren, chairman of Turner Construction, a national company with 5,500 employees and over $10 billion in annual billings. Turner typically visits some 100 colleges and universities looking for the 250 recruits it hires every year. While the bulk of them are civil, mechanical and environmental engineers, a full 25 percent have degrees in construction management.

Kevin Haney, a project manager at Plaza Construction in New York City, worked at a variety of construction jobs after graduating from Villanova University in 1994 with a degree in civil engineering. He later enrolled in the graduate engineering program at Columbia, with a minor in construction management.

“It was definitely worthwhile, in my case,” Mr. Haney says. “I got some experience — overseas and in New York — and then I went back to school.”
GRADUATE CERTIFICATE   Facilities Management

Facilities management is a multi-discipline profession that ensures the functionality of the built environment by integrating people, place, processes, and technology throughout the lifecycle of a building. The certificate courses provide students with tools, methods, and indicators available to identify, implement, and measure performance of existing or future facilities. Through a comprehensive understanding of the aspects and processes involved in the built environment, the coursework addresses the relationships between facility stakeholders and the facility's capital resources in planning, estimating, budgeting, and evaluating a capital expansion program. With the use of complex projects and programs, the course will identify the challenges associated with the people, processes and technology in that environment. Graduates should be able to:

• Understand the key concepts regarding the conceptual framework of the facilities/project lifecycle.
• Become familiar with the specific challenges each member of the program team encounters and develop solutions to these problems.
• Evaluate contracting strategies, develop Key Performance Indicators (KPI), and identify critical project drivers for a capital expansion project.
• Understand scope development as it relates to evaluating different cost and schedule models.
• Understand the concept of Building Information Modeling (BIM) and developing a BIM Execution Plan for a project or program.

Requirements:
E M 521 – Integrated Project Delivery Methods
E M 524 – Program and Facilities Management
E M 530 – Applications of Constraints Management
Either:
E M 523 – Sustainability of Construction Materials and Methods
or E M 535 – Project Controls in the Construction Process
or E M 578 - Conceptual Construction Estimating and Variability
Certificate Justification- Facilities Management

Our proposed online certificate program is designed to give students from a variety of professions a solid foundation in facility management principles and practices. This certificate covers program management, the facility life cycle, including planning, design and construction, relocation, security control and operational issues. It also provides individuals who currently work within the facility management profession to broaden their understanding of new concepts and changing perspectives in facility management. Our course requirements for the certificate include:

- E M 524 - Program and Facilities Management
- E M 521 - Integrated Project Delivery Methods
- E M 530 - Applications of Constraints Management

Either:

- E M 523 - Sustainability of Construction Materials and Methods
- E M 535 - Project Controls in the Construction Process
- E M 578 - Conceptual Construction Estimating and Variability

According to IFMA's "Exploring the Current Trends and Future Outlook for Facility Management," the profession of facility management continues to mature and evolve globally in many facets. Facility managers today are expected to understand their company's core business and contribute to the bottom line—not only by reducing facility costs, but also by improving the productivity, revenue generating capacity and image of the entire organization.

Sustainability is critical to the environment for the company and its employees as well as corporate image. The environmental and legislative complexity of owning or leasing Facilities represents a huge risk to the company.

Based on US News University Directory the top five certificate programs that can advance your career for today's job market are:

1. Project Management
2. Financial Advising
3. Information Technologist
4. Crisis Counseling
5. Accounting

Facilities Management provides project management services for construction and design projects. The FM Project Manager works with a project's Building Committee, which makes design decisions based on user requirements.

The McMorrow Corporate Facilities Management Report states that the facility management professional of 2012, on average, is college educated, manages more than 1 million square feet of space and multiple employees, has experienced a growth in job responsibilities over the past two years, and is enjoying a base salary increase of 8 percent from 2007 levels, according to the results of an International Facility Management Association (IFMA) salary and demographics survey.

The "Profiles 2011 Salary and Demographics Report," based on a survey of 4,353 facility professionals from 45 countries around the world, points to a career path that compensates its
practitioners well. Combining base salary and bonus pay, the average facility professional now pulls in US$99,578 in total compensation annually — up from US$91,766 in 2007. Even those entering the profession do well, as practitioners with three or fewer years in facility management earn US$65,000 a year, up from US$56,000 in 2004.

While facility managers are well compensated, they are also well educated, with 83 percent having attended college and 64 percent earning a bachelor’s degree or higher. Those with college degrees largely studied business (33 percent), engineering (16 percent), facility management (14 percent) or liberal arts (9 percent). Twenty percent of facility professionals surveyed report having a master’s or doctoral degree.

More young people are entering facility management, even as the average age of a facility manager is 49. Nine percent of 2011 survey respondents were 34 or younger, up from 7 percent in 2007. Of this group, the majority are women. Twelve percent of female survey respondents were 34 or younger, compared to only 8 percent of their male counterparts. Similarly, 23 percent of women surveyed were 35 to 44 years old, as opposed to 21 percent of men.

Women are also slightly more likely to be pursuing two of IFMA’s premiere credentials — the Facility Management Professional and Sustainability Facility Professional™ designations — than men, as 12 percent of female respondents have or are working toward FMPs and 7 percent are working toward SFPs.

Program and facilities management is the process of allocating resources for the operation and maintenance of a facility to allow continued performance of the facilities intended function. A range of forces including new tools, methodologies and new roles in the design process are shaping fundamental cultural and business changes in the design and construction industry as indicated by joint effort by the National Association of State Facilities Administrators (NASFA); Construction Owners Association of America (COAA); The Association of Higher Education Facilities Officers (APPA); Associated General Contractors of America (AGC); and American Institute of Architects (AIA).

With more than 7,000 unique job titles within facility management (according to an IFMA report), it’s no surprise that Jeffrey W. Rogers, Ph.D. from Rochester Institute of Technology, says, "Facility management, as a profession is a recession-proof profession. If organizations are not expending their physical assets in good economic times, they are maintaining their existing physical assets in bad economic times. Therefore, all organizations that have physical assets must hire facility managers." - See more at: http://www.ifma.org/publications/blog-fmj/article/blog-fmj/2012/09/21/four-of-today's-top-careers-in-facility-management#sthash.WLSYMFAr.dpuf

For those seeking upper-level facility management positions, there are several education and professional considerations that should be kept in mind. Another 2011 IFMA report shows that more than two-thirds of facility managers have a bachelor’s degree or higher. Twenty percent of those FMs have a master’s degree or higher, with the most common area of study being business, followed closely by engineering. Additionally, certifications significantly boost a potential employee's specialty, credibility, and therefore, chances of ongoing success in FM employment. Some preferred credentials include the IFMA's Certified Facility Manager, HVAC certification and LEED AP. See more at: http://www.ifma.org/publications/blog-fmj/article/blog-fmj/2012/09/21/four-of-today's-top-careers-in-facility-management#sthash.WLSYMFAr.dpuf
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E M 702 Master's Special Problems
Directed Study, Exam 2-4 Credits

ELECTIVES
Students will complete the program of study with four additional courses from the classes listed above not used to satisfy the core requirements or from the following electives:

E M 508 Legal Concepts for Engineering and Technology Managers
E M 530 Applications of Constraints Management
E M 534 Contemporary Topics in Constraints Management
E M 538 Lean Agility
E M 555 Enterprise Resource Management
E M 565 Introduction to Systems Engineering
E M 566 System Engineering Analysis and Practice
E M 567 System Supportability and Logistics Management
E M 570 Six Sigma Quality Management
E M 590 Design for Product and Service Realization

E M 595 and E M 596 are topics courses that change and will be used to satisfy electives

Current Standard Requirements

Managing Organizations and People
E M 501 Management of Organizations
E M 522 Supervision and Leadership for Engineering and Technology Managers

Managing Financial Resources
E M 505 Finance for Technical Systems
E M 545 Technical Decision Analysis