Washington State University

MAJOR CURRICULAR CHANGE FORM - - NEW/RESTORE COURSE

Please attach rationale for your request, a complete syllabus, and explain how this impacts other units in Pullman and other campuses (if applicable).

Obtain all required signatures with dates.

Provide original stapled packet of signed form/rationale statement/syllabus PLUS 10 stapled copies of complete packet to the Registrar's Office, campus mail code 1035.

Submit one electronic copy of complete packet to wsu.curriculum@wsu.edu.

Requested Future Effective Date: Spring 2016 (term/year) Course Typically Offered: every third semester

DEADLINES: For fall term effective date: October 1st; for spring or summer term effective date: February 1st. See instructions.

NOTE: Items received after deadlines may be put to the back of the line or forwarded to the following year. Please submit on time.

☐ New Course ☐ Temporary Course ☐ Restore Course

EM Risk Assessment and Management

course subject/crosslist: 568

course no.: title

3 (3 ) Credit hrs lecture hrs lab or studio prerequisite

per week hrs per week

display for catalog: risk management strategies and techniques to the design and management of engineering and technology systems.

Additional Attributes: Check all that apply.

☐ Crosslisting (between WSU departments)*

☐ Conjoint listing (400/500):

☐ Variable credit:

☐ Repeat credit (cum. max. hrs):

Special Grading: ☐ S, F; ☐ A, S, F (PEACT only); ☐ S, M, F (VET MED only); ☐ H, S, F (PHARMACY, PHARDSCI only)

☐ Cooperative with UI

☐ Other (please list request):

The following items require prior submission to other committees/depts. (SEE INSTRUCTIONS.)

☐ Request to meet Writing in the Major [M] requirement (Must have All-University Writing Committee Approval.)

☐ Request to meet UCORE in __________ (Must have UCORE Committee Approval. See instructions.)

☐ Special Course Fee __________ (Must submit request to University Receivables.)

Contact: Patti Elshafei Phone number: (509) 335-0125 Campus mail code: 2785

Email: ctm@wsu.edu Instructor, if different: Luna Magpili

Chair (if crosslisted/interdisciplinary)* Dean (if crosslisted/interdisciplinary)* UCORE Committee Approval Date

All-University Writing Com / date

Catalog Subcommittee Approval Date GSC or AAC Approval Date Faculty Senate Approval Date

*If the proposed change impacts or involves collaboration with other units, use the additional signature lines provided for each impacted unit and college.
Justification for new course in the Engineering and Technology Management curriculum

EM568 Risk Management

Washington State University’s Engineering and Technology Management (ETM) program prepares engineering and business professionals to make strategic and operational decisions and become leaders in the management of technology. Our courses provide practicing engineers with the knowledge, tools, and skills to manage projects, operations, organizations, and people. Businesses and organizations have grown not only in size but also in complexity, intricately interconnected in the global market. In this setting of an extensively dynamic and uncertain environment where businesses are expected to operate, risk management has come front and center as one of the most significant challenges organizations face. Virtually every major loss that has taken place during the past 20 years, from Enron to the subprime credit crisis, from the Deepwater Horizon oil spill to Katrina, has been driven by and large from the failure to manage risks. Further, risk management permeates many parts of our lives in financial services, civil infrastructure, energy, transportation, engineering, projects, supply chains, software and cybersecurity, and even health care. We need to make sure we manage risks so that we minimize their negative impact and maximize their potential so that an organization’s objectives are achieved.

Even with this calling to effectively deal with risk, many companies continue to believe they are not able to do all they can (Ghandi and Gorod, 2012). One reason is the limitation of engineering managers who understand risk and know how to manage them. A study by Accenture (2013) stated that 54% of the executives surveyed reported a shortage of candidates with the right skills, and 50% said that weak recruiting strategies and insufficient training programs was a problem.

The professional and academic communities have started to respond. Increasingly recognized as an important core competency, risk management is embodied in the Engineering Management Body of Knowledge (EMBOK), the Project Management Body of Knowledge (PMBOK), System Engineering Body of Knowledge (SEBOK) and the International Organization for Standardization (ISO). Professional organizations such as the Risk Management Society (RIMS), Society for Risk Analysis (SRA), and other associations actively promote careers in the area of risk management. Accordingly, the median salary as reported by Salary.com of a risk management professional is $108,000.

Accordingly, Many schools with engineering management programs have progressively instituted risk management courses as part of their curriculum and some have offered concentrations on risk management. Below is a sampling of course offerings from various schools-

- Missouri S&T - EMGT 4312 (350) Risk Assessment and Reduction

https://peer.asee.org/22071

Penn State - SYSEN 536 Decision and Risk Analysis in Engineering
Stanford University- MS&E 447: Systemic and Market Risk
Arizona State University - IEE454 Risk Management
Old Dominion University - ENMA 724 Risk Analysis
University of Maryland, Baltimore County - ENMG 672: Decision and Risk Analysis
George Washington University- EMSE 6315 Management of Risk and Vulnerability for Hazards and Terrorism, 6305 Crisis and Emergency Management (EM with Crisis, Emergency, and Risk Management focus)

For the reasons outlined above, the WSU Engineering and Technology Management Program seeks to offer a course in this area of Risk Assessment and Management. The graduate course will cover the principles and applications of risk assessment and management in the context of engineering management and systems engineering. This course is about the systematic approach to the management of risk as applied to engineering, operations, and management decisions. The course syllabus is attached.

Currently, the course has been offered as a EM595 Special Topics course this Fall. Six (6) students have registered with one student auditing the course.
Instructor: Luna Magpili, PhD  
Contact: PH 757.232.6824; luna.magpili@wsu.edu  
Course location: On-line  
Course dates: Thursdays, 5:15 – 7:45  
Office hours: Thursdays 7:45 or by appointment  
(course contact instructor to arrange day and time for virtual meeting)

Course description: Risk assessment and management is the identification, analysis, and prioritization of risks; as well as the coordinated treatment of risk to prevent, minimize, monitor, and control the probability and/or impact of undesirable events and consequences. This graduate course covers the principles and applications of risk assessment and management in the context of engineering management and systems engineering. This course is about the systematic approach to the management of risk as applied to engineering, operations, and management decisions. The goal of the course is to engage students in active discovery of risk assessment and management concepts and tools. Students will be prepared to function in a business environment, developing an awareness of the challenges, the tools, and the process of designing and implementing risk assessment and management strategies. In addition to specialized topics in risk, this course will also discuss topics in economics, statistics, decision science, social science and other fields related to managing risks, in order to provide relevant basis to the methodological development of the risk body of knowledge.

Available at Amazon and Momentum Press

Software: Spreadsheet software such as MS Excel, Statistical software

Consultation: Prefer post and use of discussion forum in Blackboard for questions and clarifications for the maximum benefit of the whole class. Extended consultations are by appointment. Emails and phone calls will be entertained during business hours, Eastern Standard time (EST).

Course webpage: Course materials (announcements, instructions, lectures, homework, exams, solutions, and readings) will be posted on Blackboard. All submission of course work will be through Blackboard or by email if Blackboard is unavailable.
Requirements and Evaluation:

Homework 30%
Case Study 30%
Midterm 15%
Final exam 15%
Participation 10%

Homework:
Weekly homework sets will be assigned and will be posted on Blackboard. Homework will be due the following week. Please submit your homework through Blackboard. Late submission will result in a 10% deduction per day late. Homework sets shall include discussion questions, problem analysis, technical reviews, and reading assignments.

Midterm:
The midterm is given after session 6. It will be open notes and open books. Answers and solutions shall be submitted through Blackboard on or before the assigned due date. Late submission will not be accepted. The midterm exam is an individual effort. No consultations among students or other individuals are allowed. If you have questions or clarifications, consult with the instructor.

Final exam:
The final exam is given on the last day of class. It will be open notes and open books. Answers and solutions shall be submitted through Blackboard on or before the assigned due date. Late submission will not be accepted. Again, the final exam is an individual effort. Consultations among students or other individuals are absolutely prohibited.

Case study:
The class is divided into teams. Each team should have at least three (3) members. Team members shall work together on assigned case problems. Please be prepared to share with the class and submit analysis and discussion points through Blackboard before class time.

Participation:
Participation covers a variety of modes. Participation shall include live class participation and contributions in the Blackboard discussion board. Class participation shall also include class exercises and class presentations when assigned. Team participation will be determined through peer evaluation.

Grading Scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>94-100</td>
</tr>
<tr>
<td>A-</td>
<td>90-93</td>
</tr>
<tr>
<td>B+</td>
<td>88-89</td>
</tr>
<tr>
<td>B</td>
<td>83-87</td>
</tr>
<tr>
<td>B-</td>
<td>80-82</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>C+</td>
<td>77-79</td>
</tr>
<tr>
<td>C</td>
<td>73-76</td>
</tr>
<tr>
<td>C-</td>
<td>70-72</td>
</tr>
<tr>
<td>D</td>
<td>65-69</td>
</tr>
<tr>
<td>F</td>
<td>0-64</td>
</tr>
</tbody>
</table>
If the final percentage is less than a whole number, the grade will not be rounded.

**Student Learning Outcomes (SLO):**

1. Students will acquire an in-depth understanding of the fundamentals of risk management.
2. Students will be able to apply risk management strategies and techniques to the design and management of engineering and technology systems.
3. Students will recognize advanced application and new research in risk management.

**Course Outline:**

<table>
<thead>
<tr>
<th>Session #</th>
<th>Alignment to SLO and Session Objectives</th>
<th>Course Topics</th>
<th>Evaluation of Outcome Coursework</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Understand the importance and value of risk management in various industries and applications</td>
<td>Course introduction, Introduction to risk, Chapter 1</td>
<td>HW1</td>
</tr>
<tr>
<td>2</td>
<td>Define and describe the fundamental processes of risk management</td>
<td>Fundamentals of Risk, Chapter 2 - risk identification - risk analysis - risk management</td>
<td>HW2</td>
</tr>
<tr>
<td>3</td>
<td>Describe various risk identification tools and apply basic steps</td>
<td>Risk Tools and Techniques, Chapter 3 - Systems Approach - Taxonomy based, risk breakdown structure, HHM, SWOT, root cause analysis, influence diagram</td>
<td>HW3</td>
</tr>
<tr>
<td>4</td>
<td>Describe various risk analysis tools and apply basic steps</td>
<td>Risk Tools and Techniques continued - PHA, HAZOP, JSA - Risk Matrix, Risk Index and Risk Ranking</td>
<td>HW4</td>
</tr>
<tr>
<td>5</td>
<td>Describe various risk analysis tools and apply basic steps</td>
<td>Risk Tools and Techniques continued - FMEA, FTA, CCA - ALARP</td>
<td>HW5</td>
</tr>
<tr>
<td>6</td>
<td>Differentiate conditions for suitability and recognize limitations of various tools and techniques; Conduct an in-depth risk analysis of a specific risk event;</td>
<td>Application of Risk Tools and Techniques Case 1 Discussion</td>
<td>Case 1</td>
</tr>
<tr>
<td>7</td>
<td>Student interim assessment and feedback</td>
<td>EXAM Session</td>
<td>MIDTERM</td>
</tr>
<tr>
<td>Session #</td>
<td>Alignment to SLO and session objectives</td>
<td>Course Topics</td>
<td>Evaluation of Outcome Coursework</td>
</tr>
<tr>
<td>-----------</td>
<td>----------------------------------------</td>
<td>---------------</td>
<td>----------------------------------</td>
</tr>
<tr>
<td>8</td>
<td>Define and describe the fundamental processes of risk treatment strategies</td>
<td>Introduction to risk treatment, Chapter 4 Fundamental risk treatment strategies Risk treatment process</td>
<td>HW8</td>
</tr>
<tr>
<td>9</td>
<td>Define and describe the fundamental processes of performance monitoring, and review of risk strategies</td>
<td>Performance Monitoring and Review, Chapter 5 ISO 3100</td>
<td>HW9</td>
</tr>
<tr>
<td>10</td>
<td>Understand and apply risk management to decision making process</td>
<td>APPLICATIONS: Decision Making Under Uncertainty Decision Trees</td>
<td>HW10</td>
</tr>
<tr>
<td>11</td>
<td>Understand and apply risk management to project management</td>
<td>APPLICATIONS: Project Risk Management</td>
<td>HW11</td>
</tr>
<tr>
<td>12</td>
<td>Understand and apply risk management to supply chain</td>
<td>APPLICATIONS: Supply Chain Risk Management</td>
<td>HW12</td>
</tr>
<tr>
<td>13</td>
<td>Describe advanced application and new research in risk management</td>
<td>SPECIAL TOPICS: Positive Risk and Opportunity, Risk and TOC, Anti-fragility, Chapter 6 and 7</td>
<td>HW13</td>
</tr>
<tr>
<td>14</td>
<td>Describe advanced application and new research in risk management</td>
<td>SPECIAL TOPICS: Continued...</td>
<td>HW14</td>
</tr>
<tr>
<td>15</td>
<td>Develop and recommend risk management processes for a specific case application</td>
<td>Enterprise Risk Management Application of Risk Treatment Strategies, performance monitoring, and review</td>
<td>Case 2</td>
</tr>
<tr>
<td>16</td>
<td>Student summative assessment</td>
<td>Exam Session</td>
<td>FINAL EXAM</td>
</tr>
</tbody>
</table>
Student Notices

Copyright Notice

The content of this program and the video transmissions of the classes are the property of Washington State University and are to be viewed and used only by persons currently enrolled in this course. The materials provided in this program are copyrighted and unauthorized duplication is not allowed without permission of the copyright holders. Any other use requires the express written consent of the Instructor.

Academic Integrity

WSU, a community dedicated to the advancement of knowledge, expects all students to behave in a manner consistent with its high standards of scholarship and conduct. WSU's Standards of Conduct for Students can be found at http://conduct.wsu.edu. Students are expected to uphold these standards both on and off campus and acknowledge the university's authority to take disciplinary action. Any student who violates WSU's Standards of Conduct for Student will be reported to the Office of Student Conduct.

Academic Integrity includes honest behavior as it relates to all academic work (for example, papers written by staff, student assignments, conduct in exams, etc.). With the exception of team assignments and approved collaborative efforts, students are expected to work independently. All work turned in should represent the students’ own and original thoughts, studies, writing, and effort. Plagiarism detection software is used in many of our classes.

ETM requires students to including the following statement on exams and other course assignments as required by the instructor:

I commit myself to Washington State University's high standards to uphold academic honesty and scholarly values as established by the WSU’s Standards of Conduct. I affirm that I have not given or received any unauthorized assistance on this assignment/examination, that the work product presented here is the work of the author(s) [myself or all team members listed], and that all materials from other sources (including books, articles, Internet, or other media), whether quoted or paraphrased, have been properly cited.

<student signature>

Typing my name above serves as my signature

Communication

All official WSU email communication with the instructor must be sent through the student's WSU email address.

Please be reminded that we also recognize the importance of courtesy and decorum during all discussions – in class, in chat rooms, email, and other conversations.
Professional Oral and Written Presentations

The WSU ETM Master’s degree is a professional graduate program. It is expected that student work be presented neatly and with correct English spelling, grammar and punctuation. Sloppy, poorly-written work will not be accepted. The professor will determine whether to ask for a re-write or assign an “F”.

There are numerous software packages available to help students present professional papers, homework and projects. The Graduate and Professional Writing Center (http://universitycollege.wsu.edu/units/writingprogram/units/writingcenter/grad&prof/) is available to help on-line students learn to revise and proofread their own work. Students must register and make an appointment on-line. You may submit up to 15 pages, double-spaced. Contact the Center (gpwc@wsu.edu) if you have questions.

Incomplete Policy

Students who desire an Incomplete (I) grade must notify the professor in writing, complete an Incomplete Grade Agreement form and provide sufficient reason for the Incomplete request. Incompletes will only be considered if at least 50% of point assignments required in the course are totally completed and submitted by the end of the course. Incompletes must be cleared by the tenth week of the following semester. Spring and summer incompletes must be cleared by the tenth week of the fall semester. Fall Incompletes must be cleared by the tenth week of the spring semester. If Incompletes are not completed by the deadline, the student must retake the class to have a grade change submitted. Students must have permission to register for future semesters if they have two or more Incompletes on their transcripts. Students will not be allowed to graduate with an Incomplete on their transcript. Incompletes will automatically change to a Failing (F) grade if not cleared within one year.

Safety Statement

WSU is committed to maintaining a safe environment for its faculty, staff, and students. Safety is the responsibility of every member of the campus community and individuals should know the appropriate actions to take when an emergency arises. In support of our commitment to the safety of the campus community, the University has developed a Campus Safety Plan, http://safetyplan.wsu.edu/

It is highly recommended that you visit this web site as well as the University emergency management web site at http://oem.wsu.edu/emergencies to become familiar with the information provided.

Disability Statement

Reasonable accommodations are available in online classes for students with a documented disability. All accommodations must be approved through the WSU Disability Services
office. If a student has a disability and need accommodations, the student should begin the process as soon as possible.

For more information contact a Disability Specialist on your home campus:

- **Pullman or WSU Online**: 509-335-3417  
  [accesscenter.wsu.edu](http://accesscenter.wsu.edu), [Access.Center@wsu.edu](mailto:Access.Center@wsu.edu)
- **Spokane**: 509-358-7534  
  [spokane.wsu.edu/students2/student-affairs/disability-resources.html](http://spokane.wsu.edu/students2/student-affairs/disability-resources.html)
- **Tri-Cities**: 509-358-7534  
  [tricity.wsu.edu/disability/](http://www.tricity.wsu.edu/disability/)
- **Vancouver**: 360-546-9238  
  [studentaffairs.vancouver.wsu.edu/access-center](http://studentaffairs.vancouver.wsu.edu/access-center)