

REVISOR SYLLABUS

006

Washington State University
MAJOR CURRICULAR CHANGE FORM -- COURSE
(Submit original signed form and ten copies to the Registrar's Office, zip 1035)

RECEIVED

APR 02 2013

1-204

WSU Registrar

Future Effective Date: 08/19/2013
(effective date cannot be retroactive)

- New course
- Temporary course
- Drop service course
- There is a course fee associated with this course (see instructions)

- Variable credit _____
- Increase credit (former credit _____)
- Number (former number _____)
- Crosslisting (between WSU departments)
(Must have both departmental signatures)
- Conjoint listing (400/500)
- Request to meet Writing in the Major [M] requirement (Must have All-University Writing Committee Approval)
- Request to meet GER in _____ (Must have GenEd Committee Approval)
- Professional course (Pharmacy & Vet Med only)
- Other (please list request) _____
- Repeat credit (cumulative maximum _____ hours)
- Lecture-lab ratio (former ratio _____)
- Prefix (former prefix _____)
- Cooperative listing (UI prefix and number _____)
taught by: WSU UI jointly taught
- S, F grading
- Fulfills GER lab (L) requirement
- Graduate credit (professional programs only)

E M 503 Managing Variability Using Statistics
course prefix course no. title

credit	lecture hrs per week	lab hrs per week	studio hrs per week	prerequisite
3	3			

Description (20 words or less) Managing variability and uncertainty using statistics for engineering decision making involving risk.

Instructor: Luna Magpili Phone number: (757) 232-6824 Email: luna.magpili@wsu.edu
Contact: Patti Elshafei Phone number: (509) 335-0125 Email: pelshafei@wsu.edu
Campus Zip Code: 2785

- Please attach rationale for your request, a current and complete syllabus, and explain how this impacts other units in Pullman and other branches (if applicable).
- Secure all required signatures and provide 10 copies to the Registrar's Office.

John Aringo 3/21/13
Chair/date

Rob MO 3/21/13
Dean/date

OCT 10 2013
~~General Education Com~~/date
GSC

Chair (if crosslisted/interdisciplinary)*

Dean (if crosslisted/interdisciplinary)*

Graduate Studies Com/date

All-University Writing Com/date

Academic Affairs Com/date

Senate/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

E M 503 Managing Variability Using Statistics

At the last few faculty meetings, concern was expressed that incoming students were weak in the area of managing variability. This course was designed as an outcome of the program assessment to strengthen the core selectives of the program. This course focuses on analyzing and using data so the engineering and technical managers that are our student clientele will be able to make decisions when confronted with problems in which uncertainty and/or risk play a significant role. This course will be one of the core selectives in the Managing Variability area which also includes E M 580 and 585. It replaces Stat 430 as part of the curriculum. Stat 430 deals with random variables, sampling, hypothesis testing; linear, multilinear, and nonlinear regression; analysis of variance for designed experiments; statistical computing. It does not address the needs of the managers of large corporations and industry that must make decisions and actually apply the knowledge of uncertainty. E M 503 will become a required prerequisite for many of our more quantitative courses.

EM 503 (3 credits): Managing Variability Using Statistics
COURSE SYLLABUS

Instructor: Luna Magpili, PhD
Contact: PH 757.232.6824; luna.magpili@wsu.edu
Course location: On-line
Course dates: TBA
Office hours: By appointment (contact me to arrange day and time), email anytime

Course description: Engineering and technical managers are often confronted with problems dealing with variability and uncertainty. This course focuses on analyzing and using data to understand situations and processes so decisions can be made under terms of variability and uncertainty. Students learn to read and interpret statistical literature; apply statistical methods in evaluating data; make decisions based on the data collected; and identify and manage variability and uncertainty in engineering and management systems. This course prepares students with diverse technical backgrounds and objectives with fundamental probabilistic and statistical concepts, methods, and techniques for use in engineering management through a balance of theory and application involving engineering decision-making, including situations in which uncertainty and risk are important. Emphasis is placed on problem definition, solution, and interpretation of results.

Textbook: *Applied Statistics and Probability for Engineers*
By Douglas C. Montgomery, 5th Edition, John Wiley & Sons, Inc., 2011

Software: Statistical software such as Minitab

Consultation: Prefer post and use of discussion forum in Angel for questions and clarifications for 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 Angel. All submission of course work will be through Angel or by email.

Learning outcomes:

- Students will get a refresher and review of probability and statistics, specifically methods and techniques for handling randomness, variability, uncertainty, and error.
- Students will learn to apply these tools in engineering problems, particularly dealing with variability and uncertainty of systems and processes. The emphasis is not on the mechanics of the calculations, but on the basic concepts, the core mathematical ideas, and knowing which kind of techniques to use in the context of engineering management decisions.
- Students will prepare a project to experience how engineering managers can deal with variability and uncertainty.

Grade Requirements and Evaluation:

Homework	25%
Midterm	25%
Final exam	25%
Project	25%

Homework: There will be three (3) homework sets assigned and will be posted on Angel. Please submit your homework to me through Angel or via Email. Homework should be submitted on or prior to the due date. Points will be deducted for late submission. The average of the three homework set will count for 25 percent of the course grade.

Midterm: The midterm is given at the end of session 8. It will be open notes and open books. You have one week to complete the exam. The exam should be submitted through Angel. Late submission will not be accepted. Midterm exam is an individual effort. No consultations among students 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. The final exam should be submitted through Angel. Final exam is an individual effort. Again, no consultations among students are allowed. Late submission will not be accepted.

Application Project: The student will select one of the major topics in the course and apply statistical strategies or techniques to an appropriate problem in his or her own work environment (or personal situation). The application project is due on the last day of the class and will be presented and discussed. As documentation, a project report will also be submitted through Angel. Students may work individually or in groups, depending on the scope of the project (maximum 3 individuals in a group).

Grading Scale:

A [94-100]	C+ [77-80]
A- [90-94]	C [73-77]
B+ [88-90]	C- [70-73]
B [83-88]	D [65-70]
B- [80-83]	F [0-65]

Course Outline:

Session #	Topic	Coursework
1	Course Introduction	
2	Probability Concepts	HW1 given
3	Random Variables	
4	Discrete Probability Distributions	
5	Continuous Probability Distributions	HW1 due; HW2 given
6	Descriptive Statistics	
7	Estimation of Parameters	
8	Test of Hypothesis	HW2 due; MIDTERM given
9	<i>Spring Break: NO CLASS</i>	MIDTERM due
10	Simple Linear Regression	HW3 given
11	Multiple Linear Regression	
12	Design of Experiments	
13	Statistical Quality Control	HW3 due
14	Introduction to Stochastic Processes	
15	Application Project Presentations	Project report due FINAL EXAM given
16		FINAL EXAM due

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: Academic integrity is the foundation of the academic community. WSU aims to foster and preserve the scholarly values of inquiry, experimentation, critical appraisal and integrity, and to foster these values in its students. 'Academic Integrity' is a term used at WSU to describe honest behavior as it relates to all academic work (for example, papers written by staff, student assignments, conduct in exams, etc.) and is the foundation of university life. One of the main principles is respecting other people's ideas and not claiming them as your own. Anyone found to have used another person's ideas without proper acknowledgement is guilty of academic misconduct and the University considers this to be a serious matter. Cheating is defined in the Standards for Student Conduct WAC 504-26-010 (3).

<http://conduct.wsu.edu/default.asp?PageID=338>

With the exception of team assignments and approved collaborative efforts, students are expected to work independently. All work turned in should represent the fruits of the students' own thoughts, studies, writing, and effort. With the advent of the Internet and the ability to easily cut-and-paste written works in whole or in part, plagiarism is becoming a significant issue. Plagiarism is informally defined as any effort to portray the specific writings, anecdotes, thoughts, and concepts of others as if they were the work of the student. Any original work presented by the student should be comprised of at least 50% original material. Any and all work copied by cut-and-paste or any other method must be appropriately identified and attributed to the original author by proper citation. Violations of this policy may result in failure of the course, and may lead to elimination from graduate studies or expulsion. Plagiarism detection software is used in many of our classes.

We also recognize the importance of courtesy and decorum during all discussions – in class, in chat rooms, email, and other conversations.

Treatment of Sensitive Material: We recognized that many students come from industry and as such are bound to their company's policies for sharing information. **If you have sensitive proprietary material that should not be shared publicly, please do not discuss it in class or other class communications channels.** However, if you desire to use this material in submitted work to the instructor, you can indicate you have sensitive material in your submission. I will not share that information with any other individual. Some firms desire a non-disclosure agreement in these cases. Such agreements are easily possible for sensitive work. However, most of the time, a simple "sensitive material" statement is all you need.

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.

Disability: Reasonable accommodations are available for students with a documented disability. All accommodations must be approved through your WSU Disability Services office. If you have a disability and need accommodations, we recommend you begin the process as soon as possible.

Pullman or WSU On-Line: 509-335-3417. <http://accesscenter.wsu.edu> , Access.Center@wsu.edu.
Spokane: <http://spokane.wsu.edu/students/current/studentaffairs/disability/>. **Tri-Cities:** <http://www.tricity.wsu.edu/disability>. **Vancouver:** 360-546-9138
<http://studentaffairs.vancouver.wsu.edu/student-resource-center/disability-services>.

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. There are numerous software packages available to help students compose professional papers, homework and projects. Sloppy, poorly written work will not be accepted. The professor will determine whether to ask for a re-write.

On Campus Safety

Washington State University is committed to maintaining a safe environment for its faculty, staff, and students on all campuses. 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. It is highly recommended that you visit this web site <http://oem.wsu.edu/> to become familiar with the information provided as well as the site for your specific campus if applicable.

- WSU Pullman: <http://safetyplan.wsu.edu>
- WSU Spokane: <http://spokane.safetyplan.wsu.edu/>
- WSU Tri-Cities: <http://www.tricity.wsu.edu/safetyplan/>
- WSU Vancouver: <http://www.vancouver.wsu.edu/safety-plan>

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10/10/13
Final copy

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Final exam: The final exam is given on the last day of class. It will be open notes and open books. The final exam should be submitted through Angel. Final exam is an individual effort. Again, no consultations among students are allowed. Late submission will not be accepted.

Application Project: The student will select one of the major topics in the course and apply statistical strategies or techniques to an appropriate problem in his or her own work environment (or personal situation). The application project is due on the last day of the class and will be presented and discussed. Each presentation will be allocated 15 minutes. In the case where there are more presentations than the session time allows, randomly chosen projects will be selected for presentation in class. As documentation, a project report will also be submitted through Angel. Students may work individually or in groups, depending on the scope of the project (maximum 3 individuals in a group).

Grading Scale:

A 94-100	C+ 77-79
A- 90-93	C 73-76
B+ 88-89	C- 70-72
B 83-87	D 65-69
B- 80-82	F 0-64

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