TO: The Faculty of the College of Engineering

FROM: The Faculty of the School of Industrial Engineering

RE: Change to Undergraduate-Level Course IE 33000 Prerequisites, Term Offered, and Description

From: IE 33000 – Probability And Statistics In Engineering II
Term Offered: Fall, Spring, Lecture 3, Cr. 3

Prerequisites: ENGR 13100 or ENGR 14100 or ENGR 12600 or ENGR 12100; and IE 23000 or BME 20500
Description: Continuation of IE 23000. Introduction to statistical inference and experimental design. Correlation, regression, single and multi-factor ANOVA, non-parametric methods. Applications to statistical quality control.

To: IE 33000 – Probability And Statistics In Engineering II
Term Offered: Fall, Spring, Summer; Lecture 3, Cr. 3

Prerequisites: ENGR 13100 or ENGR 14100 or (EPCS 11100 and EPCS 12100) or ENGR 12600 or ENGR 12100;
Description: Introduction to statistical inference and experimental design. Correlation, regression, single and multi-factor ANOVA, non-parametric methods. Applications to statistical quality control.

Reasons: (a) The current prerequisites for IE 33000 do not reflect the changes in the instructional methods of IE 33000. The faculty no longer view the course as a continuation of IE 23000, and that students who have not completed IE 23000, but have completed the other prerequisites are adequately prepared. This has been piloted within the School of IE, and student performance confirms this notion. (b) additionally, the prerequisites have been updated related to changes in the First-Year Engineering pathways.

Abhi Deshmukh 11/3/16

Abhijit Deshmukh
Professor and Head
School of Industrial Engineering

Approved for the faculty of the Schools of Engineering by the Engineering Curriculum Committee
ECC Minutes # 8 Date 12/13/16
Chairman ECC

Office of the Registrar
FORM 40 REV. 5/11

PURDUE UNIVERSITY

REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

Print Form

DEPARTMENT Industrial Engineering

EFFECTIVE SESSION Spring 2017

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- [ ] 1. New course with supporting documents
- [ ] 2. Add existing course offered at another campus
- [ ] 3. Expiration of a course
- [ ] 4. Change in course number
- [ ] 5. Change in course title
- [ ] 6. Change in course credit/type
- [ ] 7. Change in course attributes (department head signature only)
- [ ] 8. Change in instructional hours
- [x] 9. Change in course description
- [x] 10. Change in course requisites
- [x] 11. Change in semesters offered (department head signature only)
- [ ] 12. Transfer from one department to another

PROPOSED:	EXISTING:
Subject Abbreviation	Subject Abbreviation IE
Course Number	Course Number 33000
Long Title Probability And Statistics In Engineering II	
Short Title Prob & Stat In Engr II	

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

TERMS OFFERED
Check All That Apply:
[x] Fall [x] Spring [x] Summer

CAMPUS(ES) INVOLVED
- [ ] Calumet
- [ ] Cont Ed
- [ ] Ft. Wayne
- [ ] Indianapolis
- [ ] N. Central
- [ ] Tech Statewide
- [x] W. Lafayette

CREDIT TYPE
1. Fixed Credit: Cr. Hrs. 3.000
2. Variable Credit Range: Minimum Cr. Hrs
(Check One) To [ ] Or [ ]
Maximum Cr. Hrs.
3. Equivalent Credit: Yes [ ] No [ ]

COURSE ATTRIBUTES: Check All That Apply
1. Pass/Not Pass Only [ ]
2. Satisfactory/Unsatisfactory Only [ ]
3. Repeatable [ ]
Maximum Repeatable Credit: [ ]
4. Credit by Examination [ ]
5. Fees: [ ] Coop [ ] Lab [ ] Rate Request
Include comment to explain fee
6. Registration Approval Type
Department [ ] Instructor [ ]
7. Variable Title [ ]
8. Honors [ ]
9. Full Time Privilege [ ]
10. Off Campus Experience [ ]

ScheduleType	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	50	3	15	100
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):
Introduction to statistical inference and experimental design. Correlation, regression, single and multi-factor ANOVA, non-parametric methods. Applications to statistical quality control.
ENGR 13100 or ENGR 14100 or (EPCS 11100 and EPCS 12100) or ENGR 12600 or ENGR 12100;

*COURSE LEARNING OUTCOMES:
Be able to: use statistical software packages (e.g. Minitab, R) to perform statistical tests; compute and interpret statistical confidence, tolerance, and prediction intervals given engineering and scientific data; conduct and interpret parametric statistical tests (e.g. t-•--test, ANOVA) on engineering and scientific data; conduct and interpret non–parametric statistical tests on engineering and scientific data; conduct and interpret regression analysis on engineering and scientific data; determine the appropriate statistical test or procedure to use on engineering and scientific data; design basic factorial experiments; and conduct basic statistical process control analysis.

Calumet Department Head	Date	Calumet School Dean	Date
Fort Wayne Department Head	Date	Fort Wayne School Dean	Date
Indianapolis Department Head	Date	Indianapolis School Dean	Date
North Central Faculty Senate Chair	Date	Vice Chancellor for Academic Affairs	Date
West Lafayette Department Head	Date	West Lafayette College/School Dean	Date

West Lafayette Registrar Date

OFFICE OF THE REGISTRAR

IE 330: Probability and Statistics in Engineering II

Course notes to accompany:

Montgomery and Runger's Applied Statistics and Probability for Engineers, 6^{th} edition

Roshi Nateghi, Ph.D.

Assitant Professor

Purdue Univerity

Office: GRIS 264

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Fall 2016

- Please save your conversations for outside of class. This is a large class; even if you whisper, it is disruptive to me and distracting to other students.
- Turn off phones (and anything else that makes noise) before coming into class.
- You should have received an invitation from Piazza. Please post all your questions and comments there instead of emailing me or the TAs. We will respond through Piazza so everyone can see the questions/answers.
- Please read the syllabus very carefully; I will answer any questions you may have about it on Piazza.
- This class is important, there is a lot of work, and it can be difficult. DO NOT FALL BEHIND.
- The course grading is 100% objective and NOT scaled. Carefully read and understand the grading structure, including how to challenge a grade.
- I do not take attendance, but there is something due almost every period, so plan on being here. There are free drops for everything; this is in place of makeups. There are no makeups for anything except for the final. There are also opportunities to ear extra credits
- I have no tolerance for cheating. Cheat and you will be reported to the Dean of Students and fail the course.
- I encourage you to work with others on your homework/lecture assignments, but each person must submit their own work. Simply copying another person's homework or lecture assignment is not allowed, and will be considered cheating. Similarly, cutting and pasting solutions from the book or websites will also not be accepted.
- Copying, looking around during a test/quiz, plagiarizing, using cellphones or calculators are among the things considered unethical and will result in you receiving an F for ethics and being reported to the Dean of Students. Do not do it.
- If you do very well, you will be able to skip the final.

0.1.2 Accommodations

All students seeking accommodations should coordinate their accommodations in this class through the DRC. Any students requiring accommodations should notify me as soon as possible. Two weeks advance notice is required for accommodations on tests/exams so that I have time to make appropriate arrangements.

0.1.3 Emergency Preparedness

Please visit the emergency preparedness website:
`http://www.purdue.edu/ehps/emergencypreparedness/`
Also, please see the additional information on emergency preparedness posted on Black Board.

0.1.4 Tentative Course Calender

The course calender on Blackboard contains all the details for this course. Please refer to the calender to find out about homework due dates, dates of tests, lab sessions etc.
Class: MWF, 1:30-2:20 in Hampton Hall 1144

0.2 SYLLABUS

This course covers chapters 8 through 15 of Montgomery & Runger, 6^{th} Edition.

0.2.1 Basic Course Information

Instructor:

Prof. Roshi Nateghi
rnateghi@purdue.edu

Instructor Office Hours: Wednesday 7:10-8:10 PM in BRWN 1154 except for 09/07 and 12/07 where the office hours will be in ME 1061.
There will be no office hours on Aug 24th (first week), Oct 5th (test week) and Nov 30th (test week).

Teaching Assistants:

Name: Esmaeil Bahalkeh
Email: ebahalke@purdue.edu

TA Office Hours:
Monday 9:00-10:29 AM in GRIS 157D
Wednesday 9:00-10:29 AM in GRIS 157E

Name: Bikram Kishore Mahajan
Email: bmahaja@purdue.edu

TA Office Hours:
Monday 12:15-1:00 PM in GRIS 157E
Friday 9:00-9.45 AM 157C

0.2.2 Learning Outcomes

Upon the completion of this course students should be able to

1. Use statistical software packages (e.g. *R* or Minitab) to perform statistical tests;
2. Compute and interpret statistical confidence, tolerance, and prediction intervals given engineering and scientific data;
3. Conduct and interpret parametric statistical tests (e.g. t-test, ANOVA) on engineering and scientific data;
4. Conduct and interpret non-parametric statistical tests on engineering and scientific data;
5. Conduct and interpret regression analysis on engineering and scientific data;
6. Determine the appropriate statistical test or procedure to use on engineering and scientific data;
7. Design basic factorial experiments; and conduct basic statistical process control analysis.

0.2.3 Assignments

- There will be nine homework, eight quizzes, and many lecture assignments and in-class exercises during the semester. Homework is usually due by 6 pm on Saturdays with the exception of one (Homework 8). The lecture assignments (LA) will typically be assigned the night before the lab sessions and will be due in class. Lecture assignments should be submitted at the beginning of the class (late submissions won't be accepted). Lecture assignments and in-class exercises will count towards your class participation.
- There will be three 50-minute in-class tests, and a two-hour final. Make sure you always have your full name (that matches with your name on Blackboard). We have a no name; no grade policy.
- Tests are always closed book, closed notes, and NO calculators.

0.2.4 Grading

- 25% graded homework problems (9 sets of homework problems, the lowest dropped)
- 10% quizzes (1 per chapter, the lowest dropped)
- 5% class participation (in-class exercises, can miss 20% of them)
- 15% test 1 (Oct 5^{th}, in class, 50 minutes)
- 15% test 2 (Oct 31^{th}, in class, 50 minutes)
- 15% test 3 (Nov 30^{th}, in class, 50 minutes)
- 15% test 4 (TBA, 1 hour, *NOT* optional)
- 15% makeup/cumulative (final, 1 hour, optional), replaces lowest of test 1,2 of 3
- There are no makeup tests. When computing your final grade, I will drop the lowest of the following four tests: the three in-class tests and the cumulative part of the final. (The first part of the final cannot be dropped.)
- **There is also a grade for ethics. This is Pass-Fail. Not cheating and not being involved in any other unethical behavior according to the student honor code will be considered Pass. (Otherwise, it is a failure). Failing ethics will result in you getting an F for the course.**
- If you need less than a 75 on the final to get an A, without dropping your lowest test score, then you will be excused from (both parts of) the final and will get an A+ for the course.
- The following procedure will be used at the end of the semester for grading:
  I will start by setting thresholds (e.g., ≥ 90 is an A, ≥ 80.0 is a B, etc.), and assign a non-modified A, B, C, D, or F to each person.
  If you are within one point of getting an A, etc. (e.g., high B+), and you have not missed more than one homework and one quiz, you will be bumped to the next highest grade with a minus modifier (e.g., an A-). So the only way to get an A-, for example, is to get bumped up to it from below the threshold for an A, but only if you meet all the conditions indicated above.

- End of semester "negotiations":
  You can only question your grade regarding accuracy. Accuracy problems include such things as missing grades and incorrect grades, but not: "but I really tried hard and turned everything in." I will not give you extra work, I will not bump you up if you are 0.1 below a threshold, and I will not change the threshold. If you dont́ want to "just miss" an A, dont́ be close to the threshold. The time to worry about your grade is during the semester, not at the end of it.

- Homework should be uploaded on Blackboard on the date noted; do not wait until the last minute to do or turn in the homework. NO questions about the homework will be answered on the day it is due. The lowest homework will be dropped.

- Homework turned in by noon the next day is late and will have 15 points deducted. No homework will be accepted later than noon of the day after the homework is due.

- If you feel a mistake was made in grading your assignment:

  Within 1 week of its return, email a written explanation of what you think was wrong and why.

  No in-person discussions about grading are permitted.
  The TAs (or I) will re-grade the entire assignment, so your grade could go up or down. Change requests are submitted to the TAs that graded the work, unless I graded the assignment (tests). If you dont́ like the TAs´ answer, come to me.