APPROVED

NOV - 7 2011

The University Of Toledo

NEW COURSE PROPOSAL

Level (check one)

Undergraduate

(•) Graduate

Will this course impact program requirements? | | If yes, a Program Modification must be completed.

Type of course (check all that apply)

| | Academic Skills Enhancement | | Writing Intensive (WAC) | | honors

| | Univ Core *English* *Hum* *Math* *Nat Sciences* *Social Sciences* *Multicultural* *Diversity of US Culture* *Non-US Culture*

| | Transfer module *Arts&Hum* *Engl* *Math* *Nat Sci & Phys* *Soc Sci*

(to be considered as core curriculum, question 18 must be completed)

1 College ENG

Department

2 Contact Person Wm Ted Evans Phone 530-3349 Email william evans@utoledo edu

3 Alpha/Numeric Code (Subject area - number) GNEN - 5700

4 Proposed title

APPLIED PROBABILITY AND STATISTICS

Proposed effective term SPRING 2012

Administrative Use Only

Code:

Approved (senate or Grad Council)

Effective Date: / / **(mm/dd/yyyy)**

CIP Code:

Sub: **Prog:** **Level:**

5 Planned enrollment per section 15 per term 15

6 Is the course cross-listed with another academic unit? | | Yes [✓] No

Is the course offered at more than one level? | | Yes [✓] No

If yes to either question, please list additional Alpha/Numeric codes, and submit a separate New Course form or Course Modification form for the course(s) referenced below

a - b - c -

Approval of other academic unit (signature)

Name and title

If course is to be offered at more than one level, attatch an explanation of the different requirements that students must meet for each level If the requirements are the same for each level, justification must be provided

7 Credit hours Fixed 3 or Variable to

8 Delivery Mode Primary Secondary Tertiary

a Activity Type* Other - DL Lecture

b Minimum Credit Hours 3

Maximum Credit Hours 3

c Weekly Contact Hours 3

*Choices are Lecture, Recitation, Seminar, Regular Lab, Open Lab, Studio, Clinic, Field, Independent Study, Workshop, Computer Assisted Instruction, Other

9 Terms offered | | **Fall** [✓] **Spring** | | **Summer**

Years offered (•) **Every Year** **Alternate Years**

10 Are students permitted to register for more than one section during a term? (•) No Yes

May the courses be repeated for credit? (•) No Yes Maximum Hours

11 Grading System

Undergraduate	Gradute
Normal Grading (A-F,PS/NC PR, I)	(•) Normal Grading (A-F,PS/NC PR, I)
Passing Grade/No Credit (A-C, NC)	Grade Only (A-F)
Credit/No Credit	Satisfactory/Unsatisfactory (G only)

Grade Only (A-F, PR, I)	Audit only
Audit only	No Grade
No Grade	

12 Prerequisites (must be taken **before**) a - b - c -

PIN (Permisson From Instructor) PDP (Permission From Department)

Co-requisites (must be taken **together**) a - b - c -

13 If course is to replace an existing, course(s) will be deleted, and when should that deletion occur?

	Course to be removed from inventory	Final Term to be offered (YYYYT i e use 20064 for Fall'06)
a	-	
b	-	
c	-	
d	-	

14 Catalog description (**30 words Maximum**)

An introduction to the application of descriptive and inferential statistics Topics include probability distributions, confidence intervals, tests of hypotheses, linear regression and correlation and the use of statistical software

15 Attach a copy of a complete outline of the major topics covered (Providing a syllabus that includes this information is acceptable)

Syllabus See Attached Click here to view the Syllabus

Attachment 1 No Attachment

Attachment 2 No Attachment

16 Where does this course fit in the University/College/Department curriculum? (Be specific by course level, if applicable) Indicate prospective demand

GNEN 5700 is a required course in the MSE program of study

17 If the proposed course is similar to another course in the College or University, please describe the difference and provide a rationale for the duplication (If this course duplicates material covered in another course within your department or college or in another college, attach a letter of endorsement from that area's dean and department chairperson indicating their support Clarify the maner in which this course will differ)

This course is applications based and, as such, does not duplicate another course

18 If the course is intended to meet a University Undergraduate **Core** requirement, complete the following and submit a course syllabus using the *template*

Please explain how this course fulfills the general education guidelines (*Guidelines* are available in *Faculty Senate Website*)

Course Approval:

Department Curriculum Authority	William T Evans	Date 10 / 25 / 2011 (mm/dd/yyyy)
Department Chairperson	Allen Zwiep	Date 10 / 26 / 2011 (mm/dd/yyyy)
College Curriculum Authority	Patricia A Kelly	Date 10 / 31 / 2011 (mm/dd/yyyy)
College Dean	Helena	Date 10 / 31 / 2011 (mm/dd/yyyy)

After college approval, submit the original signed form to the Faculty Senate (UH 3320) for undergraduate-level courses; for graduate-level courses submit the original signed form to the Graduate School (UH3240). For undergraduate/graduate dual-level courses, submit the proposals to each office.

Faculty Senate Undergrad Curriculum Comm		Date / / (mm/dd/yyyy)
Faculty Senate Core Curriculum Comm		Date / / (mm/dd/yyyy)
Graduate Council		Date 4 13 / 2011 (mm/dd/yyyy)
Office of the Provost		Date / / (mm/dd/yyyy)
Registrar's Office		Date / / (mm/dd/yyyy)

Evans, William T.

From: White, Donald B
Sent: Friday, October 14, 2011 6:21 PM
To: Evans, William T
Subject: RE. Engineering Course Proposal

We have no objections

Don White
Professor
Department of Mathematics and Statistics
The University of Toledo
(419) 530-4502

From: Evans, William T.
Sent: Thursday, October 13, 2011 12:01 PM
To: White, Donald B.
Cc: Springman, Richard A.
Subject: Engineering Course Proposal

Don,

A few months ago, I called asking your approval of a course taught in the Practice Oriented Masters of Engineering Program. The course, presently ENGT 6980 (Special Topics), is "Applied Probability and Statistics". It is to be re-numbered GNEN 5700. The name is to remain the same. It is taught Distance Learning.

This is asking for your approval via email of this course. I have attached a scanned copy of the New Course Proposal as well as the syllabus. Specific questions pertaining to the course can be asked of myself or Richard Springman, the teacher of the course.

Sincerely,

Wm Ted Evans, PhD, PE
Dir. of Practice Oriented Masters of Engineering

Evans, William T.

From: Evans, William T
Sent: Monday, September 19, 2011 9 30 AM
To: Nikolaidis, Efstratios
Cc: Hefzy, Mohamed S.
Subject: RE· New course proposal -- comments

Dr. Nikolaidis,

Thank you for your comments and support. I will pass along to the teacher of the course, Richard Springman.

Again, thanks for your time and support.

Sincerely,

Wm Ted Evans

-----Original Message-----
From: enikolai [mailto:enikolai@eng.utoledo.edu]
Sent: Sunday, September 18, 2011 2:10 PM
To: Evans, William T.
Subject: New course proposal -- comments

Dear Ted,
Thank you for sharing with me the proposal for the course "Applied Probability and Statistics in Engineering and Management Sciences" (ENGT 6980-003). This is a good course that all engineering students should take. Overall, the proposal is well thought out and I support it. Below are my comments:

1. The description of the objectives on page 2 focuses on the design of experiments, but this topic will be covered in only one week according to the course outline on page 4.
2. In the 10th week, the course will cover estimation of parameters. I assume that this refers to the parameters of a probability distribution (e.g., the mean value, standard deviation
etc.) Do you plan to cover the method of moments only, or the method of maximum likelihood too?
3. Do you plan to teach students estimation of the reliability of a system from field data in this section? If the answer is yes, will you consider censored data? This is important, because most manufacturers collect failure data only until the warranty expires.
4. In the 11th week, the course will cover the estimation of statistical intervals. It is a good idea to tell students that these intervals are not always accurate for small samples. For example, the true coverage of the Wald interval for the probability of failure of a system can be quite lower than that predicted by the equations in textbooks.
5. Frequently, we do not have enough data to estimate probabilities. In this case, an engineer has to use both judgment and data. It would be useful to explain the students the concept of
subjective probability. Please see the attachment for a definition
of this concept.

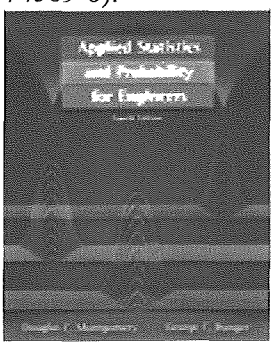
Best Regards
Efstratios Nikolaidis
Professor and graduate director
Mechanical Industrial and Manufacturing Engineering Department
4035 Nitschke Hall

The University of Toledo
Toledo, OH 43606

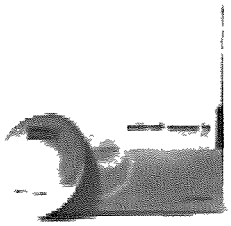
Editor-in-Chief
Engineering Design Reliability Applications: For the Aerospace, Automotive and Ship Industries
Phone: (419) 530-8216
FAX: (419) 530-8206
email: enikolai@eng utoledo edu
web page: http://www eng utoledo edu/~enikolai

University of Toledo
College of Engineering
Department of Engineering Technology
Spring Semester 2010

COURSE	Applied Probability and Statistics in Engineering and Management Sciences (GNEN 5700)
PREREQUISITE	Applied Engineering Mathematics (ENGT 3020)
CREDIT	3 semester hours
TEXT	Montgomery and Runger, *Applied Statistics and Probability for Engineers, Fourth Edition*, John Wiley & Sons, 2007 (ISBN 0-471-74589-8).



SOFTWARE (recommended)	MINITAB Student Version 14 for Windows; MINITAB, Inc., 2005.



DESCRIPTION	Introduction to applied probability, statistical inference, and design of experiments. Topics include discrete and continuous probability distributions, confidence intervals, tests of hypotheses, linear regression and correlation, analysis of variance, factorial experimental designs, and propagations of measurement uncertainty. MINITAB interactive statistical and graphical software will be utilized for display and analysis.
MEETING TIME	Distance Learning

INSTRUCTOR

Richard A Springman
NE 1623
Phone. 419-530-3276
Fax· 419-530-3068
E-mail· richard.springman@utoledo.edu
Office hours: By appointment

OBJECTIVES

To provide students with a working knowledge of statistical methods and design of experiments as applied to engineering technology problems by extensive use of illustrative examples and exercises. A designed experiment is a test or series of tests in which purposeful changes are made to the input variables of a process or system such that their effects on changes in the output response can be observed and measured (fixed effects model). Generally this involves determination of the accuracy and precision of the data collection procedures, specification of the response variables and the test sequence, and the analysis and interpretation of the experimental results. Also the course introduces students to MINITAB, a general purpose statistical analysis computer program used extensively in business, industry, government and education. This program relieves students of the computational drudgery usually associated with statistics and allows them to focus on important concepts and interpretation of results.

Students are expected to learn how to:

1. Establish frequency distributions.
2. Distinguish between populations and samples.
3. Calculate measure of central tendency, such as the mean, median or mode
4. Calculate measures of dispersion, such as standard deviation, variance or skewness.
5. Understand basic concepts of probability
6. Utilize binomial and Poisson probability distributions
7 Utilize Norman probability distributions.
8. Utilize distribution of sample means
9 Perform chi-square tests.
10 Establish confidence intervals.
11 Test hypotheses.
12. Perform correlation analysis.
13 Understand multiple linear regression analysis.
14. Perform various non-parametric tests.
15. Utilize the MINITAB computer program.

GRADING

Your grade in the course will be determined using the following weightings:

Homework	40%
Quizzes	15%
Participation	10%
Final Exam	35%

Your participation grade will be determined based upon the quantity and quality of your contributions to the discussion page. Each student will be expected to contribute to the on-going threaded discussion appearing on the *Class Discussion* page and to participate in the *Chat Room* discussions.

WITHDRAWAL

Students have until Friday of the tenth class week (March 26) of the semester to withdraw from class. Students who remain enrolled beyond that point will be issued a grade for the course. It is no longer possible for instructors to issue a grade of "IW".

ACADEMIC (DIS)HONESTY

All work submitted is expected to be your own. Any instances of plagiarism, cheating, or copying will be dealt with in accordance with the College of Engineering's Policy on Academic Dishonesty.

GRADE SCALE

Your grade in the course will be determined in accordance with the following criteria:

A	> 92	C	72 -78
A-	90 - 92	C-	70 - 72
B+	88 - 90	D+	68 - 70
B	82 - 88	D	62 - 68
B-	80 - 82	D-	60 - 62
C+	78 - 80	F	< 60

DUE DATES

All assignments are due by 11:55pm on the specified due date. Any work submitted late will be assigned a 50% penalty, if it is accepted. Acceptance of late homework is at the discretion of the instructor

ACADEMIC ACCOMODATIONS

Consistent with the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, if a student feels that he/she has a disability and requires special accommodations of any nature, the instructor will work with the student and The University of Toledo Office of Accessibility (Gilham Hall 4015) to provide reasonable accommodations to ensure a fair opportunity to perform in this class. Please advise the instructor of such disability and the desired accommodations within the first week of classes.

Course Outline

Week	Date	Topic	Practice Problems
1	Jan 11	The Role of Statistics in Engineering Chapter 1	
2	Jan 18	Probability Chapter 2 Sections 2.1 - 2.4	2 – 1,5,19,27,35,45,51, 55,63,71,79,83
3	Jan 25	Probability Chapter 2 Sections 2.5 - 2.8	2 – 89,97,101,107,115,
4	Feb 1	Discrete Random Variables and Probability Distributions Chapter 3 Sections 3.1 - 3.5	3 – 5,15,27,39,49,59
5	Feb 8	Discrete Random Variables and Probability Distributions Chapter 3 Sections 3 6 - 3.9	3 – 63,67,79,83,89, 97,103,107,115
6	Feb 15	Continuous Random Variables and Probability Distributions Chapter 4 Sections 4 1 – 4.6	4 – 1,5,11,21,2533, 39,41,45,49,53,61
7	Feb 22	Continuous Random Variables and Probability Distributions Chapter 4 Sections 4.7 – 4 11	4 – 65,69,77,81,95,101, 107,111,117,121
8	Mar 1	Joint Probability Distributions Chapter 5	5 – 1,9,17,21,23,33,47,55,61,67
9	Mar 8	Random Sampling and Data Description Chapter 6	6 – 1,7,13,15,2531,35, 47,53,59,63,65,69,
10	Mar 15	Point Estimation of Parameters Chapter 7	7 – 1,7,11,15,23,33
11	Mar 22	Statistical Intervals for a Single Sample Chapter 8	8 – 1,7,11,21,25,41,51,57,69
12	Mar 29	Tests of Hypotheses for a Single Sample Chapter 9	9 – 3,9,1,3,19,27,29, 33,41,53,7181,87,93
13	Apr 5	Statistical Inference for Two Samples Chapter 10	10 – 1,5,17,31,43,57
14	Apr 12	Simple Linear Regression and Correlation Chapter 11	11 – 1,5,25,37,51,67,77
15	Apr 19	Multiple Linear Regression Chapter 12	12 – 1,9,2741,55,67
16	Apr 26	Design of Experiments with Several Factors Chapter 14	14 – 1,7,11,13,27,37,47
17	May 3	Final Exams Week	

Notes:

1) Monday, January 18 is a University holiday (Martin Luther King Day)
2) Monday-Friday, March 8-12, is Spring Break

2) Friday, March 26, is the last day to withdraw from class
3) Friday, April 30, is the last day of classes
4) Saturday, May 8 is Spring Commencement