EGR 503: Statistical Engineering using Six Sigma DMAIC Process

In Workflow

1. 14EH GR Director of Curriculum (mdevets@ncsu.edu)
2. COE CC Coordinator GR (rfillin@ncsu.edu)
3. COE CC Chair GR (reeves@ncsu.edu; rfillin@ncsu.edu; mdevets@ncsu.edu)
4. COE Final Review GR (rfillin@ncsu.edu)
5. COE Dean GR (reeves@csc.ncsu.edu)
6. ABGS Coordinator (george_hodge@ncsu.edu; lian_lynch@ncsu.edu; mlnosbis@ncsu.edu)
7. ABGS Meeting (george_hodge@ncsu.edu; lian_lynch@ncsu.edu; mlnosbis@ncsu.edu)
8. ABGS Chair (george_hodge@ncsu.edu; lian_lynch@ncsu.edu; mlnosbis@ncsu.edu)
9. Grad Final Review (george_hodge@ncsu.edu; lian_lynch@ncsu.edu; mlnosbis@ncsu.edu)
10. PeopleSoft (ldmihalo@ncsu.edu; blpearso@ncsu.edu; Charles_Clift@ncsu.edu; jmharr19@ncsu.edu; Tracey_Ennis@ncsu.edu)

Approval Path

1. Tue, 06 Oct 2015 14:33:51 GMT
   Mihail Devetsikiotis (mdevets): Approved for 14EH GR Director of Curriculum
2. Wed, 20 Jan 2016 19:56:17 GMT
   Robyn Fillinger (rfillin): Approved for COE CC Coordinator GR
3. Tue, 26 Jan 2016 17:48:57 GMT
   Robyn Fillinger (rfillin): Approved for COE CC Chair GR
4. Tue, 26 Jan 2016 18:01:11 GMT
   Robyn Fillinger (rfillin): Approved for COE Final Review GR
5. Tue, 26 Jan 2016 20:30:00 GMT
   Douglas Reeves (reeves): Approved for COE Dean GR
6. Mon, 01 Feb 2016 20:55:54 GMT
   George Hodge (george_hodge): Approved for ABGS Coordinator
7. Mon, 08 Feb 2016 16:48:01 GMT
   George Hodge (george_hodge): Approved for ABGS Meeting

New Course Proposal

Date Submitted: Sat, 05 Sep 2015 02:59:49 GMT

Viewing: EGR 503 : Statistical Engineering using Six Sigma DMAIC Process

Changes proposed by: tclapp

Course Prefix

EGR (EGR-Engineering Master's)

Course Number

503

Dual-Level Course

No

Cross-listed Course

No

Title

Statistical Engineering using Six Sigma DMAIC Process

Abbreviated Title

STAT ENGR using Six Sigma

College

College of Engineering

Academic Org Code

College of Engineering (14EH)

CIP Discipline Specialty Number

14.0101

CIP Discipline Specialty Title

Engineering, General.

Term Offering

Fall and Spring

Year Offering

Offered Every Year

Effective Date

Fall 2016

Previously taught as Special Topics?

Yes

Number of Offerings within the past 5 years

7

Course Prefix/Number	Semester/Term Offered	Enrollment
EGR 590 608	SPG 2015	14
EGR 590 603	SPG 2015	19
EGR 590 603	Fall 2014	22
EGR 590 603	SPG 2014	24
EGR 590 001	SPG 2014	25
EGR 590 603	SPG 2013	25
EGR 590 001	SPG 2013	26

Course Delivery

Online (Internet)

Grading Method

Graded/Audit

Credit Hours

3

Course Length

16

weeks

Contact Hours
(Per Week)

Component Type	Contact Hours
Lecture	3

Course Is Repeatable for Credit

No

Instructor Name

Dr. Timothy G. Clapp

Instructor Title

Adjunct Professor, Textile Engineering

Grad Faculty Status

Full

DELTA/Online Enrollment:

Open when course_delivery = distance OR course_delivery = online OR course_delivery = remote

Delivery Format	Per Semester	Per Section	Multiple Sections?	Comments
LEC	35	20	Yes	No comment

Course Prerequisites, Corequisites, and Restrictive Statement

ST 361 or ST 370 or Entry Level Statistics

Is the course required or an elective for a Curriculum?

No

Catalog Description

Statistical Engineering: systematic approach (Six Sigma DMAIC methodology) for improving manufacturing and business processes and products using advanced graphical and statistical methods. Defining the improvement opportunity, measurement system analysis (MSA), Failure Mode and Effects Analysis (FMEA), data collection, graphical and statistical analysis, design of experiment (DOE) methods, and statistical process control (SPC) methods. Application of statistical engineering to business and manufacturing case studies.

Justification for new course:

EGR 503, Statistical Engineering using Six Sigma DMAIC Process, is uniquely designed to prepare the engineer with knowledge to analyze and improve manufacturing and business processes and products using modern, statistical-based problem solving tools. The Six Sigma DMAIC methodology has been adopted by leading U.S. and international organizations as a recognized and proven approach for identifying and solving process improvement challenges.

The need for the course has been demonstrated by enrollment of on-campus graduate students and Engineering-On-Line graduate and professional students.

Does this course have a fee?

No

Consultation

College(s)	Contact Name	Statement Summary
Poole College of Management	Dr. Steve Allen	Mohamed: I have conferred with the deans and department heads here in PCOM. Although there is close overlap between some of the courses you propose and some of the courses we offer, we are prepared to sign off on the four course action consultations as long as we have an explicit understanding on one important matter. That matter concerns any possible launch of a Master of Engineering Management program with premium tuition. We insist on having the option to be a full partner in such a degree. With the growth of our own online offerings, we have much more capacity than we did 3-4 years ago when these matters last came up. As long as we have such an understanding, I will go into the system and endorse all four proposals. Best regards, Steve Steven Allen Associate Dean for Graduate Programs and Research Poole College of Management NC State University Raleigh NC 27695-7229 (919) 515-6941 office
College of Textiles	Dr. Jeff Joines	
College of Sciences	Jo-Ann Cohen	the course is not a statistical methods course, but a case studies course, so I do not have objection to its offering as proposed. Montse

Instructional Resources Statement

Dr. Clapp has been offering this course as special topics therefore no new resources are needed.

Course Objectives/Goals

Student Learning Outcomes

Students will be able to:

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- explain and apply Statistical Engineering: a discipline that utilizes multiple graphical and statistical tools using state-of-the-art statistical software to drive greater impact for improving business and manufacturing processes,
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- outline and apply Six Sigma DMAIC methodology to solve challenging engineering management problems,
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- apply, evaluate, and interpret statistical methods including graphical analysis, measurement systems analysis, process capability studies, hypothesis testing, and Statistical Process Control (SPC),
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- design experiments to optimize processes
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- apply the Six Sigma Black Belt Body of Knowledge (BOK) required for the American Society for Quality (ASQ) Six Sigma Green/Black Belt certification exam.
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-
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Student Evaluation Methods

Evaluation Method	Weighting/Points for Each	Details
Multiple exams	30	Two Exams
Project	20	Independent project selected by student
Homework	10	Assignments to reinforce lectures
Final Exam	40	Comprehensive exam

Topical Outline/Course Schedule

Topic	Time Devoted to Each Topic	Activity
Intro to Statistical Engineering Management	5 hours	Lecture, reading assignments, homework
Statistical Sampling and data modeling	7.5 hours	Lecture, reading, data collection, graphical analysis, introduction to JMP software, data modeling, homework, quiz
Statistical Hypothesis Testiing	10 hours	Lecture, reading, data collection, graphical analysis, application of JMP software, data modeling and statistical analysis, homework, quiz
Design of Experiments	5 hours	Lecture, reading, design experiments, data collection, graphical analysis, application of JMP software, data modeling and statistical analysis, homework
Continuous Improvement Tools	5 hours	Lecture, reading assignments, homework
Statistical Process Control	2.5 hours	Lecture, reading assignments, homework, use of JMP Software to set up and interpret Statistical Process Control charts.
Design For Six Sigma	2.5 hours	Lecture, reading assignments, homework

Syllabus

EGR 503 001 Syllabus SPG 2016.pdf

Additional Documentation

Additional Comments

mlnosbis 1/27/2016: Consultation with statistics is noted above. No further consultation needed.

ghodge 2/1/2016 No response from College of Textiles is shown. This course would seem to have some overlap with Textile Engineering 6 sigma. Should this be cross listed with TE? Send to ABGS reviewers, but confirm no comment from textiles

ghodge 2/6/2016 Send to ABGS

Course Reviewer Comments

Key: 7539