



Library Resource Form Required for New Non-Gen-Ed

Submission Deadlines: Fall - October 11, 2005 Spring - February 14, 2006

TITLE Engineering Quality Control 906.585

Sponsor(s) Z. Otero Gephardt gephardtzo@rowan.edu
e-mail:
e-mail:

DEPARTMENT Chemical Engineering
College Engineering

If LAS-check: History/Humanities Social/Behavioral Sciences
 Math/Science

UNDERGRADUATE GRADUATE

New non gen-ed Major

Short-Term non gen-ed

Minor curricular changes (fewer than three) to:

Existing non gen-ed course

Non ge

Major

Minor,

Hosketh@rowan
Pattersons@rowan
gephardtzo@rowan

program

Signatures Required: represent

of the Senate

Department Chair:
Department CURRICULUM Chair
Academic DEAN:

Date: 10/5/05
Date: 10-5-05
Date: 10/10/05

COLLEGE CURRICULUM COMI

3/1/06
✓

Signature: College Curriculum C

Signature: SENATE CURRICULUM

Date: 3/27/06

Comments:

Signature: Executive Vice President/Provost:

[Signature]

Date: 4/21/06

Approved: ✓

Not Approved:

Signature: REGISTRAR

[Signature]

Date: 5/30/06

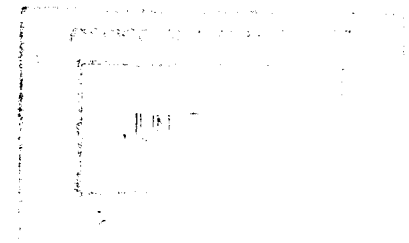
Course Description Received & Approved
Hegis Taxonomy & Course

CHE 06.585

Notification Forward:

SCC CHAIR
 IR
 CAP
 Registrar

Academic Dean
 Department Chair
 VP/Student Affairs
 Other-



This form ***MUST BE COMPLETED FOR NEW COURSE or PROGRAM PROPOSALS, and EXTENSIVE CHANGES TO A COURSE or PROGRAM.***

The purpose of this form is to provide a channel of communication between the Campbell Librarians and faculty when submitting new course or program proposals, or making extensive changes to existing courses or programs. The information will be used to assess the resources available in the library, and to identify resources the library should acquire to support the new courses/programs, or extensive changes to same. The information will also provide the rationale for institutional support for library acquisitions. This form should be completed in a coordinated effort between the course sponsor(s) and the academic department liaison librarian.

Note: Sponsor(s) complete parts A & B
 If assistance is required to complete, please notify the librarian liaison.
 Forward this form to the librarian who will complete parts C, D & E

When form is completed, attach to the original curriculum proposal before submitting to the Senate office.

A. **College:** Engineering **Department:** Chemical Engineering

Proposed by: Z. Otero Gephardt Date: 10/3/2005

COURSE TITLE: Fundamentals of Engineering Quality Control

Anticipated Date for Course/Program Offering: Fall 2006

B. List specific resources that should be acquired to support this course.

No additional resources are required.

C. Describe the resources available in the library to support this course/program, including reference, monographic, electronic databases, audio-visual materials, etc. A summary statement is sufficient.

There are at least 20 books covering the subject of engineering quality control and process control in our circulating collection, and they are fairly up to date. Electronic databases available through the library with coverage of this topic include Engineering Village, IEEE, Applied Science & Technology Index, Emerald Insight, and ABI/INFORM.

D. List key periodicals available in the library to support this course/program.

In addition to our extensive e-journal subscriptions, we have print subscriptions to Process Engineering, Technometrics, and the International Journal of Control. Topical journals such as the Journal of Quality Technology are now available online so print subscriptions are not required.

E. Librarian comments & recommendations:

The library can support this course without any additional expenditures.

LIBRARIAN LIAISON: Denise Brush

Signature: *Denise A. Brush*

Course Proposal

Details

- a) Course Title:** Engineering Quality Control – 0906.585
- b) Sponsors:** Dr. Z. Otero Gephardt and the Department of Chemical Engineering
- c) Credit Hours:** 3 sh
- d) Course Level:** Graduate Level (500) Elective
- e) Prerequisites:** Mathematics for Engineering Analysis I and II (1701.235 and 1701.236) or equivalent
- f) Suggested time and Scale of Implementation:** The course can be offered in Fall 06. It will be taught periodically as an elective

Curricular Effect

The proposed course is an interdisciplinary graduate level chemical engineering elective. This course has been taught twice as a Special Topics Course in Chemical Engineering. Students from Electrical and Computer, Mechanical and Civil and Environmental Engineering as well as Chemical Engineering have taken the course. The course exposes students to advanced process analysis and control techniques which are routinely implemented in industry. No other course will be impacted by implementation of the proposed course. Faculty are available to teach the course and no additional space or resources will be required. Library resources are adequate. A library resource form is attached.

Rationale

The proposed course will expose students to process and product quality control techniques. These techniques are essential tools in the development and operation of competitive and profitable processes. Regulatory advances as well as the increased desire by industry to consistently provide the highest quality product has significantly increased the industrial applications of engineering quality control. College of Engineering industrial partners, Clinic Sponsors, and members of the Chemical Engineering Department Advisory Board have indicated the importance of engineering quality control techniques to industry in general. They have specifically stated that the advanced techniques presented in a graduate level quality control course would make Rowan graduates more marketable. The Department of Chemical Engineering strives to

be responsive to industrial needs. Implementation of the proposed course is consistent with responsiveness to industrial needs and the needs of engineering students to be technically prepared and competitive for the marketplace. The proposed course will also enhance the process design and analysis offerings of the Department and the College. Courses in engineering process data analysis and experimental design are presently offered by the Department. The proposed course will augment these offerings and significantly benefit Rowan students.

Essence of the Course

- a)** Students will learn the theory of engineering quality control and the implementation of advanced quality control techniques. Upon completion of the course, students will be able to predict the reliability, capability and quality of processes and products. They will be able to apply continuous improvement techniques to enhance process and product reliability and capability. Students will also be able to apply experimental design techniques in combination with quality control methods to optimize processes and improve products.

- b)** The course topical outline is listed below
 - 1) Overview of Engineering Quality Control
 - 2) Engineering Process Control Charts
 - Variable and Attribute Charts
 - Cumulative Sum and Exponentially weighted Moving Average Charts
 - 3) Process Capability Analysis
 - 4) Univariate and Multivariate Engineering Process Monitoring and Control Techniques
 - 5) Engineering Automated Process Control and Advanced Controller Design
 - 6) Fundamentals of Control Systems Architecture
 - 7) Engineering Process Control Optimization Techniques
 - 8) Factorial and Fractional Factorial Experimental Designs for Process Design and Continuous Improvement
 - 9) Process Optimization with Designed Experiments

Catalog Description

0906.585 Engineering Quality Control 3 s.h.


Prerequisites: *Mathematics for Engineering Analysis I and II (1701.235 and 1701.236) or equivalent*

This course exposes students to the state of the art process and product control techniques. The course includes a strong foundation in the fundamentals of engineering quality control and its relevance to process optimization. Students will learn the theory and practical applications of control charting techniques used in industry. Process capability analysis, controller design and control systems architecture will also be included. Students will also be exposed to experimental design and process optimization techniques. The relevance of engineering process control in the safety and profitability of processes and products will be emphasized. Concepts introduced throughout the course will be illustrated with practical examples from a wide range of industries.



Mathematics Department

TO: Dr. Z. Otero Gephardt and the Department of Chemical Engineering

FROM: Ronald J. Czocho, Chairman 
Mathematics Dept.

DATE: October 10, 2005

RE: Consultation on Proposal for new courses entitled *Fundamentals of Engineering Quality Control – 0906.485* and *Engineering Quality Control – 0906.585*

Thank you for the opportunity to comment on the new courses you are proposing. Although the Mathematics Department offers courses on this level in Operations Research, there is little if any overlap among the courses. These courses should be a valuable addition to the chemical engineering curriculum and we strongly support your proposal.

We would like to add that students taking this class would benefit from preliminary work in statistics and although a prerequisite would be too restrictive for students in a program with so many requirements, a recommendation might be considered.



*College of Business
Office of the Dean*

October 10, 2005

To: Zenaida O. Gephardt, Ph.D.
Associate Professor of Engineering

From: Edward J. Schoen *Ted*
Dean, College of Business

Subject: Support for New Course Proposals: Engineering Quality Control – 0906.585 and
Fundamentals of Engineering Quality Control – 0906.485.

On behalf of the College of Business, I am very pleased to support both of the above identified course proposals: Engineering Quality Control – 0906.585 and Fundamentals of Engineering Quality Control – 0906.485

The first course, Engineering Quality Control – 0906.585, is an interdisciplinary graduate level chemical engineering elective, previously taught as a Special Topics Course in Chemical Engineering, which will expose engineering students to advanced process analysis and control techniques which are routinely implemented in industry. The second course, Fundamentals of Engineering Quality Control – 0906.485, which was previously taught as a Special Topics Course in Chemical Engineering, is an interdisciplinary senior chemical engineering elective, which addresses an important area of process analysis and optimization that is relevant to all engineering students.

These courses will respectively provide engineering students at Rowan University with (1) theory of engineering quality control and the implementation of advanced quality control techniques, and (2) the fundamentals of engineering quality control.

Accordingly, the College of Business supports both course proposals, because they will add a very important component to the engineering program.