

TITLE Fundamentals of Engineering Quality Control 0906.485

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

Hesketh@rowan ee) to:
 Pattersonis@rowan
 gephardtzo k, certificate program

Signatures Require

to Office of the Senate

Department Chair:
Department CURRIC
Academic DEAN:

[Signature] Date: 10/5/05
Date: 10-5-05
Date: 10/5/05

COLLEGE CURRICL

e: [Signature]

Signature: College Curriculum Chair [Signature]

Signature: SENATE CURRICULUM CHAIR [Signature]
Date: 2/27/06

Comments: _____

Signature: Executive Vice President/Provost: [Signature]
Date: 3/16/06

Signature: REGISTRAR [Signature]
Date: 3/20/06

Course Description Received & Approved
Hegis Taxonomy & Course # CHE 06.485

Notification Forward:
 SCC CHAIR Academic Dean
 IR Department Chair
 CAP VP/Student Affairs
 Registrar Other-

DF
3/22/06

Trans. 3/29/06

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: 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:** Fundamentals of Engineering Quality Control – 0906.485
- b) **Sponsors:** Dr. Z. Otero Gephardt and the Department of Chemical Engineering
- c) **Credit Hours:** 3 sh
- d) **Course Level:** Senior Level (400) Elective
- e) **Prerequisites:** Mathematics for Engineering Analysis I and II (1701.235 and 1701.236)
- 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 senior 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 addresses an important area of process analysis and optimization that is relevant to all engineering students. 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 covers an important area in engineering process and product evaluation. 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. Engineering graduates who have taken the proposed course, when it was offered as a Special Topics Course, have indicated that knowledge of the material was helpful in obtaining employment and that it has proved useful in their work. 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 fundamentals of engineering quality control. Upon completion of the course, students will be able to assess a process from the standpoint of quality, capability and reliability. They will be able to analyze the technical quality of products and whether products meet specifications. Students will learn basic controller design techniques. They will also obtain a general understanding of how quality control influences process and product design and development.
- b) The course topical outline is listed below
 - 1) Introduction and Rationale for Engineering Quality Control
 - 2) Modeling and Inferences About Process Quality
 - 3) Fundamentals of Engineering Process Control
 - 4) Control Charts for Variables and Attributes
 - 5) Process and Measurement System Capability Analysis
 - 6) Cumulative Sum and Exponentially Weighted Moving Average Control Charts
 - 7) Univariate Process Monitoring and Control Techniques
 - 8) Multivariate Process Monitoring and Control Techniques
 - 9) Engineering Automated Process Control and Controller Design

Results of Consultations

Letters of consultation are attached.

Catalog Description

906.485 Fundamentals of Engineering Quality Control

Prerequisites: *Mathematics for Engineering Analysis I and II (701.235 and 701.236) or equivalent*

This course will expose students to the fundamental principles of engineering quality control and process controller design. Students will learn basic control charting techniques and process capability assessment. The course will include process monitoring and control techniques routinely used in industry and expose students to the relevance of these techniques in the design and development of processes and process safety and risk assessment. The course will include numerous examples from a wide range of engineering applications and industries.



Mathematics Department

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

FROM: Ronald J. Czochor, Chairman *Ronald J Czochor*
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.