

Announcement of intent to 9/10-12/105  
410

PROCESS C

PROPOSAL SCC #04-05-  
PROGRAM Name Changes  
to be implemented Spring 2006

Deadlines: October 5, 2004 to be implemented

PROPOSAL TITLE: Materials Specialization for the Chemical Engineering Curriculum  
Sponsor's: Dr. Brian Lefebvre E-Mail: lefebvre@rowan.edu Ext: 5509

DEPARTMENT: Chemical Engineering  
COLLEGE: Engineering

If Liberal Arts & Sciences CHECK:  History/Humanities  Math/Sciences  
 UNDERGRADUATE  GRADUATE

THE ATTACHED NEW PROGRAM - MAJOR PROGRAM REVISION - PROGRAM NAME CH.  
DESCRIBED BY THE ITEM(S) CHECKED.

- New degree program
- Major changes: degree requirements/major/minor or
- New Major
- Changes to College name, School, Department or Dept.
- New Minor
- Quantitative or change
- New concentration, specialization, or track
- New Certificate of Graduate Study Program (COGS & COGA)

THE FOLLOWING SIGNATURES REPRESENT APPROVAL

Department Chair: Robert P. Hesketh Date: 4/20/05  
 Department Curriculum Chair: Debbie Dworkin Date: 4/21/05  
 Academic Dean: Debbie Dworkin Date: 4/21/05

COLLEGE CURRICULUM COMMITTEE

CLOSED HEARING Date: 4/14/05 Approved:  Not Approved:   
 COLLEGE CURRICULUM CHAIR: Debbie Dworkin

UNIVERSITY CURRICULUM COMMITTEE

OPEN HEARING Date: 5/5/05 Approved:  Not Approved:   
 Senate Curriculum Chair Signature: Debbie Dworkin Date: 5/10/05  
 Comments: \_\_\_\_\_

EXECUTIVE VICE PRESIDENT/PROVOST Signature: Christy L. Turner Date: 11/29/05  
 Approved:  Not Approved:

REGISTRAR

Date: 1/31/06 Official Copy & Approval Sheet Filed  
 Date: \_\_\_\_\_ Course Description Received & Approved - Heg's Taxonomy & Course # \_\_\_\_\_  
 Course Description Received & Approved - Heg's Taxonomy & Course # \_\_\_\_\_  
 Registrar Signature: [Signature]

NOTIFICATION FORWARD

SCC Chair  Academic Dean  Department Chair  Registrar  IR  CAP  VP Student Affairs  
 VP Student Affairs  Others Turner 2/4/06

## ***Materials Specialization for the Chemical Engineering Curriculum***

**Sponsor:** Dr. Brian Lefebvre and the chemical engineering faculty.

**Details:** The chemical engineering faculty proposes to create a new optional specialization for students graduating with B.S. degrees in chemical engineering: a specialization in Materials.

A specialization is a cohesive set of courses that focus on a particular area within a major and requires at least 12 semester hours of credit. The proposed requirements to earn a specialization in materials are as follows:

<b>Course</b>	<b>Credits</b>
Materials Science (0901.281)	2
Jr/Sr Clinic Materials-related project (0901.301, 302, 401 and 402)	4
ChE or Chemistry Elective – from approved list	3
Out of Discipline Elective – from approved list	3
<b>TOTAL</b>	<b>12</b>

Materials science is an introductory course that is already required of all chemical engineering students. Junior/Senior Engineering Clinic is a required 2-credit course for students in all engineering disciplines. This course is a hallmark of the Rowan College of Engineering and provides undergraduate students with hands-on experience on practical engineering research and design problems, frequently in collaboration with local industrial sponsors. All engineering students are required to take four semesters (8 credits) of Junior/Senior Clinic. In order to earn the specialization in materials, students can earn four credits by spending at least two of their four semesters of Junior/Senior Engineering Clinic working on materials projects. These projects can be housed in any of the four engineering disciplines, but must be approved by the Chemical Engineering faculty as having substantial materials content. Note that students can also fulfill the project requirement through independent study on materials-related projects (Independent Study in Engineering 0901.391).

Students earn the remaining six credits towards the specialization by taking one elective from each of the following lists. In order to underscore the diverse applications and multidisciplinary nature of materials science, we will require students to take one chemistry or chemical engineering elective, and one materials elective outside of chemical engineering. Note that a chemistry course can be used to fulfill either requirement, but no one course can be used to fulfill both.

### **Approved Materials Electives from ChE or Chemistry**

0906.466	3	Polymer Processing
0906.490	3	Approved Special Topics Course
1905.430	3	Approved Advanced Topics in Chemistry
1907.405	3	Introduction to Polymer Chemistry
1907.475	4	Polymer Synthesis
1907.478	4	Polymer Characterization
Other Approved Courses		

### **Approved Materials Electives from outside Chemical Engineering**

0908.301	2	Civil Engineering Materials
0910.422	3	Introduction to Computational Fluid Dynamics
1905.430	3	Approved Advanced Topics in Chemistry
1907.405	3	Introduction to Polymer Chemistry
1907.475	4	Polymer Synthesis
1907.478	4	Polymer Characterization
4901.486	3	Interdisciplinary Materials Science
Other Approved Courses		

Faculty in chemical engineering and throughout the College routinely manage Junior/Senior Engineering Clinic projects in materials. Following is a list of 13 Spring 2005 Junior/Senior Clinic projects that would be acceptable for this specialization:

ME-01 Plastics Ignition Experiment Development  
ME-06 Development and Testing of Component Packaging for an Optical Filter  
ME-07 Magneto-Rheological Rubber Development and Testing  
ECE-01 Nano-Imprint Lithography  
ECE-02 Molecular Electronics  
ECE-03 Materials For Biomedical Research  
CEE-07 Measurement and Visualization of Strain Using Computer Vision  
CEE-10 Evaluation of New Pavement Design Guide  
CEE-11 Evaluating Sources of Rutting within New Pavement  
CEE-12 Evaluating Mixture Performance using Design Guide  
CEE-14 Anchorage of Rebar in Fiber Reinforced Concrete  
CHE-03 Performance Testing of Kevlar-Derakane Composites  
CHE-04 Materials Science Education

***Rationale:***

The chemical engineering faculty is proposing two new specializations, one in biological engineering and one in materials. The proposed specializations require no changes to the existing chemical engineering curriculum (beyond the commitment to continue offering bio and materials electives regularly) and no new resources. Indeed, some recent chemical engineering graduates have met the requirements for the proposed specializations. This proposal simply provides a mechanism to give such students credit for their focused study in materials or bioengineering on their transcripts. Extending this opportunity to students is valuable to them because of growing industrial interest in these areas of chemical engineering.

In South Jersey, there are a number of local industries, such as Sony, Solvay Solexis, Metrologic, DuPont, Huntsman ICI and VWR Scientific, whose success is based on the application of materials science. Within the region, there are only a limited number of schools that can supply qualified people to meet the needs of their labor force. By providing skilled graduates, this project will ensure that these companies can meet these needs and allow them to expand their enterprises. The local economy has an ever-increasing pressure for well-trained technicians, scientists, and engineers.

Materials science is inherently multidisciplinary, requiring of its practitioners a broad range of knowledge and a variety of skills. Students in the proposed program will be able to follow the complete cycle of materials science from concept to research design to synthesis, to measurement of and explanation for the physical properties of the material to successful application. Coupled with the organization of learning for chemical engineering students within the program comes a distinct and strong effort to motivate students to pursue careers in materials research. Ultimately, these efforts should help us retain a diverse pool of talented students in New Jersey instead of being lost to out-of-state institutions.

***Results of Consultations:***

We have consulted with the Chemistry department and their letter is attached.

## CHEMICAL ENGINEERING DEGREE AUDIT - Class of 2008

Name:

SSN:

Indicate Grade for Rowan Course, Transfer Course/Off-campus = TR, Advanced Placement = AP

Indicate General Education courses = GenEd; History, Humanities, Language = HHL1, HHL2;

Social & Behavioral Sciences = SBS, Art, Music, Theatre, etc = ART;

Multicultural/Global = MG, Literature intensive = LIT, Senior Clinic II = Writing Intensive, WI

### FIRST YEAR

#### FALL 2003

Composition I 1501.111  
 Calculus I 1701.130  
 Advanced College Chemistry I 1906.105  
 Fresh. Engineering Clinic I 0901.101  
**GE (World Reg Geo 2206.111 SBS/MG)**  
**Total**

3  
4  
4  
2  
3  
**16**

#### SPRING 2004

Calculus II 1701.131  
 Computer Sci & Program. 0704.103  
 Fresh. Engineering Clinic II 0901.102  
 Physics I 1902.200  
**GE (\_\_\_\_)**  
**Total**

4  
4  
2  
4  
3  
**17**

### SECOND YEAR

#### FALL 2004

Principles Chemical Processes I 0906.201  
 Math for Engineering Anal I 1701.235  
 Biological Systems & Apps 0401.210  
 Advanced College Chemistry II 1906.106  
 Soph. Engineering Clinic I 0901.201  
**Total**

2  
4  
4  
4  
4  
**18**

#### SPRING 2005

Math for Engineering Anal II 1701.236  
 Principles Chemical Processes II 0906.302  
 Fluid Mechanics I 0901.341  
 Soph. Engineering Clinic II 0901.202  
 Organic Chemistry I 1907.200  
**Total**

4  
2  
2  
4  
4  
**16**

### THIRD YEAR

#### FALL 2005

Microeconomics 2204.102  
 Process Fluid Transport 0906.309  
 Transfer Processes I - Heat 0906.311  
 Equilibrium Staged Oper- 0906.312  
 Material Science 0901.281  
 Physical Chemistry I 1908.400  
 Junior Engineering Clinic I<sup>3</sup> 0901.301  
**Total**

3  
2  
2  
2  
2  
3  
2  
**16**

#### SPRING 2006

**GE (\_\_\_\_)**  
 Chem. Engineering Thermo. 0906.310  
 Junior Engineering Clinic II<sup>3</sup> 0901.302  
 Chemical Reaction Engineering 0906.316  
 Separation Processes 0906.314  
**Total**

3  
3  
2  
4  
4  
**16**

### FOURTH YEAR

#### FALL 2006

Unit Operations Lab I 0906.403  
 Transport Phenomena 0906.402  
 Approved Chem. Eng. Elec. I<sup>2</sup> 0906.\_\_\_\_  
 Senior Engineering Clinic I<sup>3</sup> 0901.401  
 Chem. Process Component Design 0906.401  
**Gen Ed (\_\_\_\_)**  
**Total**

2  
3  
3  
2  
4  
3  
**17**

#### SPRING 2007

Unit Operations Lab 0906.404  
 Process Dynamics & Control 0906.405  
 Approved Chem. Eng. Elec. II<sup>2</sup> 0906.\_\_\_\_  
 Senior Engineering Clinic II<sup>3</sup> 0901.402  
 Approved Chemistry Elective<sup>1</sup>  
 Chemical Plant Design 0906.406  
**Total**

2  
3  
3  
2  
3  
3  
**16**

**TOTAL**

**132**

Cumulative GPA



Notes:

ART  
 LIT  
 SBS  
 HHL-1  
 HHL-2  
 M/G



*Department of Chemistry and Biochemistry*

March 7, 2005

Curriculum Committee,

This letter is in response to the proposal 410 entitled Materials Specialization for Chemical Engineering Curriculum.

We would welcome Chemical Engineering students into our courses listed below provided they meet the prerequisites for those courses. It must also be recognized that some of these courses have strict enrollment limits since they are courses with a laboratory component. We only offer the Polymer Synthesis and the Polymer Characterization courses every other year and they are limited to an enrollment of 24. If we discover the extra enrollment pressure requires us to add additional sections then we reserve the right to ask for additional faculty lines.

Introduction to Polymer Chemistry  
Polymer Synthesis  
Polymer Characterization  
Advanced Topics in Chemistry

Sincerely,

Robert Newland  
Chair

**Rowan University**  
Campbell Library

Library Resources Form

Department/School: College of Engineering/Chemical Engineering

Proposed by: Dr. Brian Lefebvre

Proposal Title: Materials Specialization for the Chemical Engineering Curriculum

Anticipated Date for Course/Program Offering: Fall 2006

522 09-25 410

**Resources that should be acquired**

No additional resources are needed at this time.

**Resources available in Campbell Library**

The library has basic holdings in the broad L.C. subject areas of Chemical Engineering. An engineering approval plan is utilized to provide current materials in the engineering disciplines.

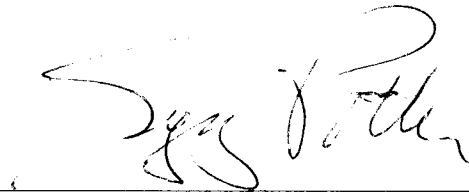
**List key periodical resources**

Campbell Library is fortunate to have access to online journal databases in a large number of academic disciplines, including chemistry and chemical engineering.

Of particular importance is the SciFinder Scholar program of the American Chemical Society and the American Chemical Society Web Package, which includes full-text articles to key journals. In addition, the library subscribes to Engineering Village, Applied Science and Technology, General Science Full-Text, and Elsevier Science Direct. These subscriptions provide a significant number of full-text journals in science and engineering. Also, MathSci + provides comprehensive coverage of international research in mathematics and mathematically related research in statistics, computer science, physics, operations research, engineering, biology, and related disciplines. Almost 2,000 journals are represented. Online journal subscriptions also are available in physics.

**Librarian remarks**

Given the library's current book holdings and online journal access, this proposal can be supported.

A handwritten signature in black ink, appearing to read "Gregory C. Potter". The signature is written in a cursive style with a large initial "G".

---

Gregory C. Potter  
Library Liaison

March 29, 2005



To: Brian LeFebvre, Chemical Engineering

From: Dianne Dorland, Dean of Engineering *Dianne Dorland*  
Jay Harper, Dean of College of Liberal Arts and Sciences *Jay Harper*

Date: August 22, 2005

Re: Consultation on the Materials Specialization for the Chemical Engineering Curriculum

Thank you for your request for a consultation on the Materials Specialization for the Chemical Engineering Curriculum. We perceive that the specialization, utilizing existing courses, allows students' depth of knowledge with the area of materials to be enhanced. The specialization avoids excessive additional course requirements in a curriculum that already requires 132 credits for degree completion. Materials science is a model interdisciplinary research area between engineering and the sciences.

There are no resource implications for our Colleges inherent in this curriculum proposal.

Copy: Robert Hesketh, ChE Chair  
Jeff Hettinger, Physics Chair

ROWAN UNIVERSITY  
BOARD OF TRUSTEES  
ACADEMIC AFFAIRS SUBCOMMITTEE

SCC Proposal # 04-05-410

Department/College: Engineering College  
Chemical Engineering Department

Action Item: Materials Specialization for the Chemical Engineering Curriculum

Submitted by: Christy L. Frank  
(Provost)

Justification: The proposed specialization requires no changes to the existing chemical engineering curriculum but provides a mechanism to give students credit for focused study in materials.

Approved: 11-22-05  
(Date)

Signed: Ronald J. Small  
(Committee Chair)

Notice of this action item will be announced at the full Board of Trustees meeting to be held on December 14, 2005 and will be forwarded to the Academic Issues Committee of the New Jersey Presidents' Council for notification.

	YES	DATE
AA/BOT	<input checked="" type="checkbox"/>	<u>11-22-05</u>
FULL BOARD	<input type="checkbox"/>	_____
STATE	<input type="checkbox"/>	_____



November 30, 2005

Dr. Carlos Hernandez  
Academic Issues Committee Chair  
President, New Jersey City University  
2039 Kennedy Blvd.  
Jersey City, NJ 07305-1597

Dear Dr. Hernandez,

Rowan University is requesting a waiver to the new degree program review process in order to convert the existing specializations in the College of Communication into separate degree programs.

From: BA: Communication, Advertising Specialization  
To: BA: Advertising

From: BA: Communication, Communication Studies Specialization  
To: BA: Communication Studies

From: BA: Communication, Journalism Specialization  
To: BA: Journalism

From: BA: Communication, Public Relations Specialization  
To: BA: Public Relations

From: BA: Communication, Radio, Television & Film Specialization  
To: BA: Radio, Television & Film

From: BA: Communication, Writing Arts Specialization  
To: BA: Writing Arts

This is being presented to the Academic Issues Committee for approval. Twenty copies are enclosed.

The following two proposals are being presented to the Academic Issues Committee as informational items:

Materials Specialization for the Chemical Engineering Curriculum

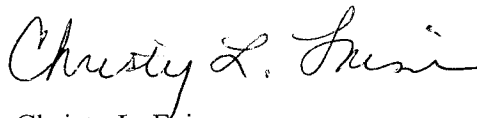
The proposed specialization requires no changes to the existing chemical engineering curriculum but provides a mechanism to give students credit for focused study in materials.

Biological Engineering Specialization for the Chemical Engineering Curriculum

The proposed specialization requires no changes to the existing chemical engineering curriculum but provides a mechanism to give students credit for focused study in bioengineering.

If you have any questions, please do not hesitate to contact me.

Sincerely,



Christy L. Faison,  
Interim Provost

rw  
Enclosures



November 30, 2005

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Academic Issues Committee Chair  
President, New Jersey City University  
2039 Kennedy Blvd.  
Jersey City, NJ 07305-1597

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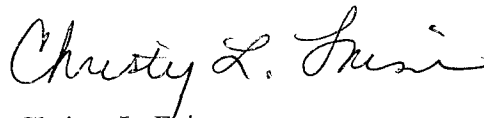
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Sincerely,



Christy L. Faison,  
Interim Provost

rw  
Enclosures