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# Glassboro State College Senate Curriculum Committee

## Approval Form

Proposal Title: Introduction to Engineering Program

Sponsor(s) Dr. L. DeLaney Dept.: Physical Sciences / Chemistry Ext. 6521

Dr. L. DeLaney Physical Sciences / Chemistry 6521

Check one:  Course  Specialization  Concentration  Minor  Achievement Certificate  
 Certification Program  Major Program  Minor Change (please name, deletion or credit/title/catalog change)

Undergraduate  Graduate 3 Credit Hours

<p><b>Step 1 (Department)</b></p> <p><input checked="" type="checkbox"/> Approved <u>October 7, 1987</u> Date</p> <p><input type="checkbox"/> Not Approved</p> <p><u>L. DeLaney</u> Dept. CC Chairperson</p> <p><input checked="" type="checkbox"/> Reviewed <u>10/8/87</u> Date</p> <p><u>R. A. ...</u> Dept. Chairperson</p>	<p><b>Step 2 (Receipt)</b></p> <p><input type="checkbox"/> SCC# <u>87-88-29</u></p> <p>Proposal Received <u>11/19/87</u> Date</p> <p><u>Brenda A. Bely</u> SCC Chairperson</p>	<p><b>Step 3 (School CC)</b></p> <p>Reviewed <u>2/9/88</u></p> <p><input checked="" type="checkbox"/> Approved <input type="checkbox"/> Not Approved</p> <p><b>Comments:</b></p> <p><u>A. H. ...</u> School Curr. Comm. Chairperson</p>
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**Step 4 (Academic Dean)** **Comments:**

Recommend  
 Not Recommend  
 Conditionally Recommend (see comments)

Reviewed 2-10-88  
Date

Maria ...  
Signature, Dean of School

**Step 5 (SCC)**

Open Hearing 3/2/88  Approved by Senate Curriculum Committee 4/21/88  
Date Date

Returned to sponsor(s) for the following reasons:  
table for ...  
... and ...  
... and ...  
... to ...

**Step 6 (Senate)**

Presented to Senate 4/22/88  Approved  Not Approved  
Date

Notification to Vice-President for Academic Affairs 4/28/88 Brenda A. Bely  
Date Signature, SCC Chairperson

**Step 6 (Senate)**

Received 5/4/80  
Date

Approved  YES  No

If no, reasons are as follows:

Student credit hours 3

Faculty load hours 3

Equalized credit hours 3

Official copy and approval sheet filed \_\_\_\_\_  
Date

[Signature]  
Signature, Vice-President for Academic Affairs

**Registrar**

Approved course description received \_\_\_\_\_  
Date

Hegis Taxonomy and Course Number assigned 1901-2-11

[Signature]  
Signature, Registrar

1/10/80  
Date

**Notification forwarded:**

- Senate Curriculum Committee Chairperson
- Department Chairperson(s)
- Academic Dean(s)
- Registrar
- Sponsor(s)

GLASSBORO STATE COLLEGE

COURSE PROPOSAL

I. DETAILS

- A. Title: Introduction to Engineering Principles
- B. Department: Physical Sciences/Pre-Engineering  
Sponsors: Z. Otero Neil and Lawrence Delaney
- C. Level: Undergraduate - sophomore level; 3.0 s.h..credit
- D. Effects on Curricular pattern: The course is one of the required courses for the Pre-Engineering Program. It will also be available to other majors.
- E. Prerequisites: Successful completion of the following: Calculus I and II, Physics I and II (with calculus), and Introduction to Computer Science.
- F. Time frame: Implemented in the Fall of 1990, but not required of all Pre-Engineering majors until Fall of 1991.
- G. Adequacy of resources: Sufficient staff, facilities, and library holdings are available.

II. RATIONALE

This course is unique at the College and is a response to the demand for a more comprehensive Pre-Engineering Program. This course meets this demand by giving students an overview of engineering in general. Students will have an opportunity to develop an understanding of engineering curricula available at the institutions to which they will transfer. In addition, this course will assist students in choosing an engineering field. Presently, students transfer and must choose an engineering discipline with little information compared to students who attend the transferring institution for the first two years of their education.

Courses of this type are offered by many institutions with engineering programs. In general, students take such courses during their sophomore year. Students in the Pre-Engineering Program presently have access to these courses after transferring for their junior year. It is often not possible for them to include a course of this type in their schedule. As a result, it is more difficult for them to choose an engineering discipline and to have an understanding of the engineering profession in general. This course complements the goals of the college in increasing the exposure of students to engineering and technology.

The course contains a general introduction to engineering. It focuses on developing problem solving skills that will enhance the chances of students successfully completing an engineering program after they transfer. The course will involve two special projects and extensive use of computers.

### III. ESSENCE

#### A. Objectives of the Course:

Upon completion of the course, students will

1. have a general understanding of the engineering profession and of what engineers do.
2. be able to discern between engineering disciplines.
3. have the information necessary to choose an engineering major at the transferring institution.
4. demonstrate problem solving skills and techniques.
5. have improved their computer skills and be able to demonstrate the relationship between computer skills, problem solving and engineering.

#### B. Topical outline of the course:

1. Introduction to Engineering Analysis
  - Analysis logic
  - Identifying problems
  - Identifying the physical situation
  - Developing solution mechanisms

## 2. Introduction to Engineering Basics

- Chemical Engineering Basics
- Mechanical Engineering Basics
- Civil Engineering Basics
- Electrical Engineering Basics

Each specialty will be discussed. The work and the technology involved in each engineering specialty will be presented in detail. Sample technical problems with industrial and practical significance will be assigned and discussed.

Engineering Technology - This aspect of the course will focus on the engineering technologist as part of the engineering team. Problems typically solved by technologists will be assigned and discussed in class. This part of the course will be developed with the Industrial Arts and Engineering Technology Department.

## 3. The Engineering Profession

- Aspects of the engineering profession
- engineers in unusual markets and companies

## C. Grading procedures:

Grades will be based on two exams during the semester (25%), homework assignments (25%), two special problems (25%), and a final (25%).

## IV. CONSULTATIONS

We have consulted with chemists who took the Chemical Engineering Principles for Chemists course (Spring 1987) and have obtained a supporting letter from Mr. Terrence Sherlock of Graphics Control. Graphics Control hires Pre-Engineering students for summer projects. We have also consulted with the institutions that accept Pre-Engineering student transfers and with T.W.F. Russell who has taught Introduction to Chemical Engineering Principles at the University of Delaware. Our consultation with Dr. Russell involved discussions on the course structure and content. Correspondence resulting from the consultations are attached.

## V. ADDITIONAL INFORMATION

### A. Prior curricula

The course is a new addition to make the Pre-Engineering Program more comprehensive. There have been no courses of this type offered.

### B. Resource Materials

Journals of engineering education  
technical journals  
Introduction to Chemical Engineering Analysis by  
T.W.F. Russell and M.M. Denn  
Vector Mechanics for Engineers by F.P. Beer and  
E.R. Johnston, Jr.  
Basic Electronics for Scientists by J.J. Brophy  
Foundations of Applied Mathematics by M.D. Greenberg

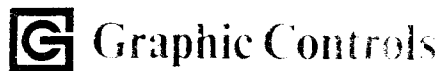
## VI. CATALOG DESCRIPTION

### XXXX.XXX Introduction to Engineering Principles

Prerequisites: sophomore successful completion of

1701.130	Calculus I
1701.131	Calculus II
1902.200	Physics I (with calculus)
1902.201	Physics II (with calculus)
0701.102	Introduction to Computer Science

This course is designed to give students a review of engineering principles and the engineering profession in general and to develop problem solving skills. The course includes an introduction to engineering analysis and covers the basic principles of the four engineering disciplines. The course also covers engineering applications from various areas.



Industrial Department

May 8, 1987

Zenaida Otero Keil, Ph.D.  
Physical Science Department  
Glassboro State College  
Glassboro, New Jersey 08028

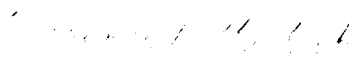
Dear Dr. Keil:

This letter is in reference to a proposed Introductory Engineering course to be offered at G.S.C.

Our Engineering department has hired five students in the past two years through a cooperative education program. The typical student is a sophomore Chemical Engineering major from Drexel University or a Chemistry major from G.S.C.

Our staff consists of Mechanical and Electrical Engineers as well as Chemists. Thus, a student with a background in interdisciplinary Engineering would be a strong candidate for a temporary position at Graphic Controls.

Very truly yours,

  
Terrence P. Sherlock  
Chemist



College of Engineering

(215) 895-2210

Drexel University • Philadelphia, Pennsylvania 19104

July 10, 1987

Professor Lawrence Delaney  
Department of Physical Sciences  
Glassboro State College  
Glassboro, NJ 08028

Dear Professor Delaney:

This letter is in response to your letter of June 17, 1987 in which you inquired about the transferability of the proposed "Introduction to Engineering Principles" for your Pre-Engineering Program. I have reviewed the material and the proposed content seems very reasonable. As proposed, it would transfer to Drexel as four (4) credits of Freshman Electives which our students take to fulfill the same objectives as this proposed course has identified.

As for my suggestions, I would be less concerned about doing problems in mechanics, electronics, etc. as indicators of what ME's, EE's, etc. do as that is not a true representation. I would be more concerned about the areas from which their problems arise, how their problems are defined and solved (e.g., cross-disciplinary teams, etc), the commonalities of their disciplines (e.g., system dynamics and control is a multi-disciplinary area) and show design as the essential purpose of engineering that requires constant learning in order to stay abreast of their field.

If you have any questions or want any further input, please contact me.

Sincerely,

Donald H. Thomas  
Associate Dean of Engineering

DHT:tjd  
cc: Mrs. V. Cavalcanto



THE STATE UNIVERSITY OF NEW JERSEY  
**RUTGERS**

College of Engineering • Office of Academic Affairs  
P.O. Box 909 • Piscataway • New Jersey 08854 • (201) 932-2212/2213

July 7, 1987

Lawrence Delaney  
Department of Physical Science  
Glassboro State College  
Glassboro, New Jersey 08028

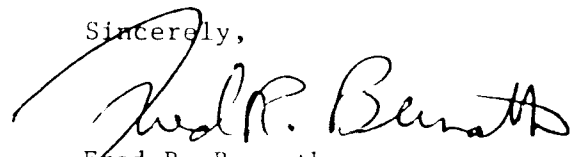
Dear Dr. Delaney:

I have read your course proposal for "Introduction to Engineering Principles," and am pleased to report that we would accept it for transfer credit as a general elective. It should prove to be a valuable addition to your pre-engineering curriculum.

I am enclosing for your information a copy of our newest undergraduate catalog. As you can see the number of general elective credits varies from three to nine, depending on the particular major.

If I can be of any further service, please feel free to contact me.

Sincerely,



Fred R. Bernath  
Associate Dean

FRB/en

## VI. CATALOG DESCRIPTION

### Introduction to Engineering Principles

Prerequisites: sophomore standing and successful completion of Calculus I and II, Physics I and II and Introduction to Computer Science

This course is designed to give students a review of engineering principles and the engineering profession in general and to develop problem solving skills. The course includes an introduction to engineering analysis and covers the basic principles of the four engineering disciplines. The course also covers engineering applications from various areas.