

CURRICULUM PROPOSAL COVER SHEET  
University-Wide Undergraduate Curriculum Committee

LSC Use Only  
Number \_\_\_\_\_  
Action \_\_\_\_\_  
Date \_\_\_\_\_

UWUCC Use Only  
Number 22  
Action \_\_\_\_\_  
Date \_\_\_\_\_

I. TITLE/AUTHOR OF CHANGE

COURSE/PROGRAM TITLE B.S. in Natural Science/Pre-Engineering  
DEPARTMENT Physics  
CONTACT PERSON Richard Roberts/ John Fox

II. THIS COURSE IS BEING PROPOSED FOR:

\_\_\_\_\_ Course Approval Only  
\_\_\_\_\_ Course Approval and Liberal Studies Approval  
\_\_\_\_\_ Liberal Studies Approval only (course previously has been approved by the University Senate)

III. APPROVALS

Richard A. Roberts  
Department Curriculum Committee

John H. Fox  
Department Chairperson

Richard A. Roberts  
College Curriculum Committee

W. I. Cole  
College Dean\*

\_\_\_\_\_  
Director of Liberal Studies  
(where applicable)

\_\_\_\_\_  
Provost  
(where applicable)

\*College Dean must consult with Provost before approving curriculum changes. Approval by College Dean indicates that the proposed change is consistent with long range planning documents, that all requests for resources made as part of the proposal can be met, and that the proposal has the support of the university administration.

IV. TIMETABLE

Date Submitted  
to LSC 9/89  
to UWUCC 9/89

Semester/Year to be  
implemented Fall 90

Date to be published  
in Catalog 1990

Revised 5/88

[Attach remaining parts of  
proposal to this form.]

~~22~~  
89-90

**ENGINEERING (See Department of Physics)**

**Drexel University** - the program combines the opportunity for two years of study at IUP with the remaining three years of study as part of the Drexel plan of cooperative education.

**University of Pittsburgh** - the program will allow the student to enroll at IUP for the first three years of college and conclude degree work by enrolling in an engineering program at the University of Pittsburgh for the last two years. The student will earn a BS degree in Natural Sciences from IUP and the appropriate engineering degree from the University of Pittsburgh (see Natural Science for IUP degree requirements).

## DESCRIPTION OF CURRICULUM CHANGE

The cooperative engineering program between IUP and the University of Pittsburgh will normally consist of three years of instruction at IUP followed by two years of instruction at the University of Pittsburgh. Provided that all criteria have been met, the student will receive a B.S. in Natural Science from IUP and a B.S. in Engineering from the University of Pittsburgh.

## BACHELOR OF SCIENCE IN NATURAL SCIENCE/Pre-Engineering Track

LIBERAL STUDIES: As outlined in Liberal Studies section 53  
with the following specifications:

Mathematics: MA 123

Humanities: PH 222, EN 121, HI 195

Natural Science: CH 111-112

Social Science: EC 121, Political Science elective,  
a course that meets the non-Western culture requirement  
Synthesis (requirement waived)

Liberal Studies Electives: Foreign Language III and IV, MA 124

## MAJOR:

Required courses:

CO 110	Introduction to Computer Science	3 sh	<u>27</u>
MA 171	Introduction to Linear Algebra	3 sh	
MA 241	Differential Equations	3 sh	
MA 342	Advanced Calculus for Applications	4 sh	
PY 131	Physics I-C Lecture	3 sh	
PY 132	Physics II-C Lecture	3 sh	
PY 141	Physics I-C Lab or PY 121 Lab	1 sh	
PY 142	Physics II-C Lab	1 sh	
PY 331	Modern Physics (writing-intensive course)	3 sh	
CO 250	Introduction to Numerical Methods	3 sh	

Controlled Electives: The following electives will be chosen 6-8  
according to the type of engineering degree sought.

## Civil Engineering -

MA 216	Probability and Statistics for Nat. Sciences	4 sh
	Technical Elective	3-4 sh

## Chemical Engineering -

CH 231	Organic Chemistry I	4 sh
CH 232	Organic Chemistry II	4 sh

## Electrical Engineering -

MA 216	Probability and Statistics for Nat. Sciences	4 sh
	Technical Elective	3-4 sh

Industrial Engineering -  
MA 216 Probability and Statistics for Nat. Sciences 4 sh  
Technical Elective 3-4 sh

Materials Science and Engineering -  
CH 231 Organic Chemistry I 4 sh  
CH 232 Organic Chemistry II 4 sh

Mechanical Engineering -  
Technical Electives 6-8 sh

FREE ELECTIVES 9

THREE YEARS AT IUP 95-97

\*TWO YEARS AT THE UNIVERSITY OF PITTSBURGH  
SCHOOL OF ENGINEERING Approximately 64

TOTAL DEGREE REQUIREMENTS: 159-161

\*A 2.5 grade point average is required for transfer to the University of Pittsburgh.

*Part IV, 2.*

**Rationale/Justification:**

The attached proposal for a 3/2 cooperative engineering program between IUP and the University of Pittsburgh is the result of an evolution of IUP's previous 3/2 cooperative program with the University of Pittsburgh. This program is different from the previous program in that it enables the student to earn a B.S. in Natural Science from IUP as well as an engineering degree from the University of Pittsburgh. The 3/2 program, which stresses the importance of a liberal studies program for the engineering student, will come at a crucial time. Industry leaders have come to recognize the importance of a well-rounded individual who has the fundamental writing skills necessary for today's marketplace. The proposed 3/2 program offers exactly that - an engineering degree backed with a bachelors degree from a liberal studies university. Graduates of this program should have increased opportunities for employment, and be capable of rising in the management ranks of engineering corporations.

The students for this program are already enrolled in the department's current pre-engineering program. No additional resources will be needed for this program, as it replaces a program currently in operation.

COOPERATIVE ENGINEERING PROGRAM WITH THE UNIVERSITY OF PITTSBURGH  
Course Sequencing:

Freshman Year

Fall Semester

EN 101	College Writing	4 sh
	Fine Arts	3 sh
*MA 123	Calc I for Phys&Chem	4 sh
*PY 131	Physics I-C Lec	3 sh
*PY 141	Physics I-C Lab	<u>1 sh</u>
	Total	15 sh

Spring Semester

	Health & Wellness	1½ sh
HI 195	Hist: The Modern Era	3 sh
	+Liberal Studies	3 sh
MA 124	Calc II for Phys&Chem	4 sh
PY 132	Physics II-C Lec	3 sh
PY 142	Physics II-C Lab	<u>1 sh</u>
	Total	15½ sh

Sophomore Year

Fall Semester

CH 111	General Chem I	4 sh
CO 110	Intro to Comp. Sci.	3 sh
	Foreign Language III	3 sh
	+Liberal Studies	3 sh
MA 241	Differential Eqns.	3 sh
	Total	<u>16 sh</u>

Spring Semester

CH 112	General Chem II	4 sh
CO 250	Numerical Methods	3 sh
	Foreign Language IV	3 sh
	+Liberal Studies	3 sh
MA 342	Adv. Calc. for Appl.	4 sh
	Total	<u>17 sh</u>

Junior Year

Fall Semester

**Controlled Elective	3-4 sh	
Elective	3 sh	
Health & Wellness	1½ sh	
+Liberal Studies	6 sh	
PY 331	Modern Physics	3 sh
	Total	<u>16½-17½ sh</u>

Spring Semester

Controlled Elective	3-4 sh	
Electives	6 sh	
+Liberal Studies	3 sh	
MA 171	Linear Algebra	<u>3 sh</u>
	Total	15-16 sh

\*Based upon Math Placement Test, students may be advised to enroll in MA 110, PY 111, and PY 121 instead of MA 123, PY 131, and PY 141.

\*\*Controlled Electives are technical (math or science) electives which depend on the type of engineering degree sought.

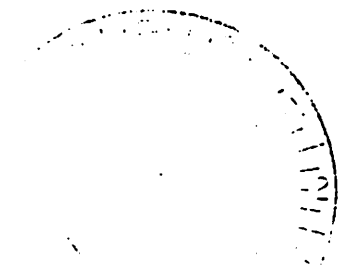
+The following Liberal Studies courses are to be scheduled during these times:

- EC 121 Principles of Economics I
- EN 202 Research Writing (Sophomore year preferred)
- EN 121 Introduction to Literature
- PH 222 Ethics
- Political Science Elective
- Social Science course that meets the non-Western culture requirement



# University of Pittsburgh

SCHOOL OF ENGINEERING  
Freshman Engineering Program  
and External Affairs Division



December 16, 1988

Dr. Douglas Ross  
College of Natural Sciences and Mathematics  
Indiana University of Pennsylvania  
305 Weyandt Hall  
Indiana, PA 15705-1087


Dear Dr. Ross:

Enclosed is the signed 3/2 agreement between Indiana University of Pennsylvania and the School of Engineering, University of Pittsburgh. Please distribute as you see fit.

Should you wish to make a joint public announcement, please contact me.

Have a nice holiday break!

Sincerely,

  
Kathleen Gaister  
Director

Enclosure

3/2 ENGINEERING PROGRAM BETWEEN  
INDIANA UNIVERSITY OF PENNSYLVANIA

AND

UNIVERSITY OF PITTSBURGH

SCHOOL OF ENGINEERING

The statements listed below constitute a general agreement between Indiana University of Pennsylvania (IUP) and the School of Engineering, University of Pittsburgh.

I. Introduction

The 3/2 engineering program between IUP and the University of Pittsburgh will normally consist of three years of instruction at IUP followed by two years of instruction at the University of Pittsburgh. Some departments may require Spring Term (Summer) attendance prior to the students first fall term at the University of Pittsburgh. Provided that all stipulated criteria have been met, the student will receive an appropriate liberal arts degree from IUP and a Bachelor of Science (engineering) degree from the University of Pittsburgh.

II. Recruitment

The availability of a 3/2 engineering program between IUP



and the University of Pittsburgh will be included in literature developed and distributed by IUP and the University of Pittsburgh. Brochures may be developed by IUP outlining the course content and the various features of this program. Recruitment will be primarily in the areas served by IUP and information concerning the program will also be distributed through IUP's Office of Admissions.

Any and all descriptive literature, promotional material or advertising material developed by IUP and the University of Pittsburgh School of Engineering describing or discussing the 3/2 Engineering Program will be submitted to the University of Pittsburgh School of Engineering for review and approval prior to publication and distribution.

### III. Criteria for Admission

Students admitted to this program should have a strong high school background in science and mathematics in order to be competitive for transfer to the University of Pittsburgh. They must complete the prerequisite courses as outlined in the attached course listing at IUP over the approximate three year period during their residency at that institution in order to be able to complete the University of Pittsburgh course work in the prescribed time period.

### IV. Financial Aid

Each institution will be responsible for providing financial assistance to its own students, consistent with policies and procedures of said institution.

## V. Course Selection

Courses of the students in the first three years of the 3/2 program between IUP and the University of Pittsburgh will include as a minimum those from the attached list. The School of Engineering of the University of Pittsburgh will advise the 3/2 Program Director at IUP of all curriculum changes in the School of Engineering curricula.

## VI. Pre-engineering Committee

Students will be advised in their course selection at IUP by an appropriate faculty member.

## VII. Transfer of Credits

Credits will be accepted for transfer to the University of Pittsburgh for all approved courses in which a grade of C or higher has been earned. In order to be considered for transfer to the University of Pittsburgh, students must receive a recommendation from Office of the Dean, College of Natural Sciences and Mathematics during their sophomore year. This letter should be directed to the Director of Freshman Program and Career Development, School of Engineering, University of Pittsburgh. The School of Engineering will conditionally reserve a place for that student. Students must maintain a minimum Quality Point Average of 2.5 (based on a 4.0) to be considered for recommendation.

During the student's third year at IUP, a letter of recommendation from Office of the Dean, College of Natural Sciences and Mathematics must accompany the transfer application by the deadline date (March 15 for spring

term and June 14 for fall term). Application materials should be sent to:

Office of Admissions and Financial Aid

Bruce Hall

University of Pittsburgh

Pittsburgh, PA 15260

All application materials should indicate that the student is a 3/2 student. Transfer guidelines are stated in the University of Pittsburgh Bulletin, School of Engineering.

#### VIII. Acceptance to the University of Pittsburgh

The School of Engineering at the University of Pittsburgh agrees to review for admissions in an expeditious and non-prejudicial manner those students who have been recommended by Office of the Dean, College of Natural Sciences and Mathematics but need not admit more than eight students per year.

#### IX. Term of Agreement

This Memorandum of Understanding should be reviewed five years from the date of signing. Attachments regarding curriculum requirements should be reviewed as required. Lacking such a review, the agreement will continue until notification of termination by either party. Either party may terminate the Memorandum of Understanding at anytime in its discretion. Students enrolled in the 3/2 engineering program at the time of termination shall be allowed to proceed according to the policies outlined previously in this agreement.

University of Pittsburgh  
Proposed 3/2 Program

Curricula

University of Pittsburgh Indiana University of  
Penn.

Freshman Year

Math 22: Analytic Geometry and Calculus I (4)	Math 123: Calculus I for Physics and Chemistry (4)
English Literature (3)	English Literature 201 (3)
Chem 96: Chemistry for Engineers I (3)	Chem 111: General Chemistry I (4)
Physics 4: Physics for Science and Engineering I (3)	Phys 131: Physics I-C lecture (3)
	Phys 121/141: Physics I/Physics I-C Lab (1)
Engrng 9: Introduction to Computing (3)	CO 110: Intro. to Computer Sci. (3)
	CO 250: Intro. to Numerical Methods (3)
Engrng 81: Freshman Seminar (0)	No Equivalent Course
Math 23: Analytic Geometry and Calculus II (4)	Math 124: Calculus II for Physics and Chemistry (4)
Philosophy (3)	Philosophy 222 or 223 (3)
Chem 97: Chemistry for Engineers (3)	Chem 112: General Chemistry II (4)
Physics 5: Physics for Science and Engineering II (3)	Physics 132: Physics II-C Lecture (4)
Physics 19: Lab. for Science and Engineering (2)	Physics 142: II-C Lab (1)
Engrng 10: Engineering Analysis (3)	No Equivalent Course
Engrng 83: Freshman Seminar (0)	No Equivalent Course
<u>Additional Courses</u>	
Math 24: Analytic Geometry Calculus III (4)	MA 342: Advanced Calculus for Applications (4)
Physics 6: Physics for Science and Engineering III (3)	Physics 331: Modern Physics (3)
Econ 11: Macroeconomics (3)	Econ 121: Principles of Economics I (3)
Math 25: Matrix Theory and Differential Eqns. (4)	Math 241: Differential Equations (3)
	Math 171: Intro. to Linear Algebra (3)
Engrng 20: Probability & Statistics for Engineers (4)	Math 216: Probability & Statistics for Natural Sciences (4)
Chem 31: Organic Chemistry I (3)	Chem 231: Organic Chem. I (4)
Chem 33: Organic Chem. Lab (1)	
Chem 32: Organic Chem. II (3)	Chem 232: Organic Chem. II (4)

Acting for our respective institutions we accept the foregoing agreement.

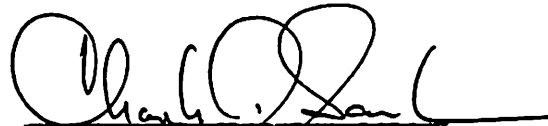
Date of Agreement \_\_\_\_\_



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President

IUP University of Pennsylvania



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Dean, School of Engineering

University of Pittsburgh

## MEMORANDUM

**DATE:** August 3, 1989

**SUBJECT:** 3/2 Pre-Engineering Program

**TO:** Dr. Charles Cashdollar, Director  
Liberal Studies

**FROM:** Richard D. Roberts *Richard D. Roberts*  
Physics Department

Enclosed is the three year Pre-Engineering program that we discussed. Because the students are on the IUP campus for just three years, it was felt that the requirement for a second writing intensive course and a synthesis course was inappropriate given the limited number of electives. We would appreciate your taking this material before your committee in an attempt to obtain a letter of support.

RDR/bb  
Enc.

LIBERAL STUDIES

Director's Office: 353 Sutton Hall  
Secretary's Office: 223 Sutton Hall  
Telephone: 357-5715

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September 15, 1989

SUBJECT: 3/2 Pre-Engineering Program

TO: Richard Roberts

FROM: Liberal Studies Committee

At our September 15, 1989, meeting, we concurred with your request to modify the Liberal Studies requirements for students in the 3/2 Pre-Engineering Program in the following ways:

- (1) waive synthesis course requirement
- (2) require one rather than two writing-intensive courses

These modifications are justified by the fact that these students will only be at IUP for three, rather than the customary four, years. This action is consistent with modifications already approved for similar, less-than-four-year programs in Allied Health.

cc: John Ford, Department Chair  
William Cale, College Dean  
Ronald Juliette, UWUCC