

**A COOPERATIVE 3-2 EDUCATIONAL PROGRAM**

**IN**

**LIBERAL ARTS AND ENGINEERING**

**BETWEEN**

**CANISIUS COLLEGE**

**AND**

**PENN STATE ERIE, THE BEHREND COLLEGE**

**I. PURPOSE**

Penn State Erie, The Behrend College and Canisius College agree to establish an educational program in liberal arts and engineering. Three years, or the equivalent, will be spent by an enrolling student at Canisius College, at which the student will study liberal arts subjects along with pre-engineering courses in the basic sciences; upon completion of the first three years and recommendation, the student will enter Penn State Behrend to complete the engineering course requirements as specified by that institution. Successful completion of these requirements will lead to an appropriate baccalaureate degree from each institution. Such a cooperative program is being created in an effort to fulfill the following objectives.

1. To provide cooperatively a general education in a liberal arts institution as well as an engineering education for each student enrolled so that through five years of study a student may complete what could otherwise require six or more years.
2. To allow a student who has not yet decided between engineering and other disciplines additional time to decide while the student studies both arts and sciences during the first three years at Canisius College, and during which time the student may also ascertain whether the student's abilities and interests lie in the field of engineering.
3. To provide the student with a planned sequence of liberal arts course which, if completed successfully, would guarantee the student acceptance at an engineering school.
4. To allow those qualified students to receive both a liberal and technical education at relatively low cost, and in so doing provide more well-rounded engineers.

## II. PROCEDURES

Counseling, admission and the transfer of students in this 3-2 cooperative program will be proposed through the application of the following procedures and policies:

1. Application for admission to the program will be made to Canisius College at which place the candidate will be subject to the admission requirements of that institution. An individual who has registered previously as a degree candidate at The Pennsylvania State University prior to entering the 3-2 program at Canisius College will be considered a re-enrollment candidate and must meet the Penn State Behrend re-enrollment criteria.
2. A student will indicate the desire to follow the 3-2 program either at the time of admission to Canisius College, or early enough in the student's program to permit completion of all required prerequisite courses. Results from aptitude and achievement tests, records of scholastic achievement, and other pertinent information will be exchanged between institutions to aid in both guiding and in counseling both students and prospective students.
3. At the end of the second year, a student becomes a candidate for transfer if the student has maintained a quality point average of 2.70 or better (4.0 = A) at Canisius College and is recommended (by letter) for transfer by Canisius College. The latter may require higher academic standards.

Penn State Behrend may require a higher quality point average because of space availability or changes in programs. The change in quality point average will take effect with those students entering Canisius College in the Fall after the institution has been notified.

4. The individual student requests an application from the Admissions Office of Penn State Behrend in September of the student's third year at Canisius College. The request should include a statement that the application is for the 3-2 program. The application should clearly indicate that the student is applying for the 3-2 program and should be submitted no later than November 30. The completed application should be supported by the following credentials: final high school record; two copies of the official Canisius College transcript including all grades earned through the second year; a schedule of courses for the Fall and Spring of the third year; a recommendation by a designated official of Canisius College that the student should be admitted to the 3-2 program. The application and supporting credentials will be evaluated by the Admissions Office and the School of Engineering Office at Penn State Behrend. If the applicant meets the minimum requirements, the applicant will be offered conditional admission to Penn State Behrend in the 3-2 program commencing with the Fall Semester.

Upon completion of the courses at Canisius College, two copies of the final official transcripts of work taken at Canisius College should be forwarded to

the Admissions Office at Penn State Behrend. The applicant's admission to Penn State Behrend will be changed from a conditional basis to a permanent basis if: the student has maintained an overall average of 2.70 or that which is required by the Articulation Agreement at the time the student enters the program at Canisius College; is in good standing at Canisius College; and has fulfilled all conditions, if any, specified in the student's provisional admission.

- An entering student at Canisius College who plans to follow the 3-2 cooperative program will be enrolled in a pre-engineering liberal arts curriculum which will include all of the following courses that comprise the required subjects to be taken at Canisius College for transfer to Penn State Behrend. Descriptions of these courses are published in the Canisius College and The Pennsylvania State University catalogs. These courses must be completed by all students transferring to Penn State Behrend as a 3-2 program student seeking a Mechanical Engineering baccaluaeareate degree.

CANISIUS COURSE	PENN STATE EQUIVALENT
<b>Mathematics and Computer Science</b>	
CSC 107 (3) – Programming for Engineers	CMPS 201C (3) – Introductory Programming for Engineers
MAT 111 (4) – Calculus 1	MATH 140 (4) – Calculus I
MAT 112 (4) – Calculus 2	MATH 141 (4) – Calculus II
MAT 211 (4) – Calculus 3	MATH 230 (4) – Calculus III
MAT 219 (4) – Linear Algebra	MATH 220 (2) – Matrices
MAT 222 (4) – Differential Equations	MATH 250 (3) – Differential Equations (students will need to take a 1-credit Fourier Series course at Penn State, since Math 251 is required for the ME program)
<b>Science</b>	
CHM 111 (4) – General Chemistry 1	CHEM 110 (3) Chemical Principles & CHEM 111 (1) – Experimental Chemistry
PHY 223 (4) – General Physics 1 PHY 224 (4) – General Physics 2 PHY 225 (4) – General Physics 3	PHYS 211 (4) – Physics: Mechanics PHYS 212 (4) – Physics: Electricity & Magnetism PHYS 214 (2) – Physics: Fluid and Thermal Physics or Physics: Wave Motion & Quantum
PHY 226 (4) – Introduction to Electronics	EE 220 (3) – Electrical Circuits and Machinery
<b>Engineering</b>	
EGR 111 (3) – Introduction to Engineering Design	EDSGN 100S (3) – Introduction to Engineering Design
EGR 207 (3) – Engineering Statics	E MCH 211 (3) – Statics
EGR 208 (3) – Engineering Dynamics	E MCH 212 (3) – Dynamics
EGR 211 (3) – Thermodynamics	ME 300 (3) – Engineering

	Thermodynamics
EGR 214 (3) – Strength of Materials	E MCH 213 (3) – Strength of Materials
Any 300 or 400-level Physics course	M E 4XX (3) – Engineering Elective
<b>Other</b>	
ENG 101 (3) – Composition	ENGL 015 (3) – Composition and Rhetoric
	ENGL 202C (3) – Technical Writing
	CAS 100 (3) – Speech Communications
ECO 101 (3) – Principles of Macroeconomics or ECO 102 (3) – Principles of Microeconomics	ECON 002 (3) – Microeconomics or ECON 004 (3) – Macroeconomics
	BB H/KINES (3) – Health and Physical Education
Social Sciences, Humanities, and Arts. Should select equivalent Canisius courses that meet the S/H/A requirements of Penn State, as well as the international and U.S. cultures requirements.	S/H/A (9) – Social Science, Humanities, and Arts. Students can transfer up to 18 credits of SHA electives, but will not have a full schedule their last semester at Penn State.

6. The Agreement should be reviewed every five years and the table in item 5 revised, and necessary revisions agreed to by the institutions agreed to by the institutional representatives. Lacking such a review the agreement shall terminate except that students in the program at the time will be allowed to continue in it.



## APPENDIX

### RECOMMENDED SCHEDULING FOR TWO YEARS AT PENN STATE BEHEND

#### Fall Semester -- Junior Year

ENGL 202C	(3:3:0)	Technical Writing
MATH 251	(1:1:0)	Fourier Series (1-credit version of Math 251)
M E 320	(3:3:0)	Fluid Flow
M E 345W	(4:3:2)	Instrumentation, Measurements and Statistics
M E 347	(3:3:0)	Computer-Aided Engineering
M E 380	(3:3:0)	Machine Dynamics
<b>17 cr.</b>		

#### Spring Semester -- Junior Year

CAS 100	(3:3:0)	Speech Communications
M E 410	(3:3:0)	Heat Transfer
M E 308	(1:0:2)	Fluid Flow and Heat Transfer Lab
M E 357	(3:3:0)	System Dynamics
M E 367	(3:3:0)	Machine Design
M E 368	(4:3:2)	Materials Properties and Characterizations
<b>17 cr.</b>		

#### Fall Semester -- Senior Year

M E 468	(4:3:2)	Engineering for Manufacturing
M E 448	(3:3:0)	Engineering Design Concepts
Tech Elect	(3:3:0)	<i>select from School list</i>
PHYBD 4xx	(3:3:0)	Physics elective
BB H/KINES	(1.5:0:2)	Health and Physical Education
S/H/A	(3:3:0)	<i>select from Univ Gen Ed list</i>
<b>17.5 cr.</b>		

#### Spring Semester -- Senior Year

M E 449	(3:0:6)	Mechanical Design Projects
Tech Elect	(3:3:0)	<i>select from School list</i>
Tech Elect	(3:3:0)	<i>select from School list</i>
BB H/KINES	(1.5:0:2)	Health and Physical Education
S/H/A	(3:3:0)	<i>select from Univ Gen Ed list</i>
<b>13.5 cr.</b>		