

Minor in Technology

School of Engineering and Computer Science

Gary R. Martin

July, 2009

Technology: 1: the practical application of knowledge especially in a particular area. 2: a manner of accomplishing a task especially using technical processes, methods, or knowledge. 3: the specialized aspects of a particular field of endeavor. (Merriam Webster)

Engineering and technology are integral parts of many careers and fields of study. As "technology" has become so prevalent in our lives and careers, more and more companies are demanding that their employees have a working knowledge in such areas as design, graphics, communications, hardware and software advances, etc. Consequently, college students majoring in non-technical disciplines would be well advised to consider taking advantage of technology-related courses to bolster their knowledge and awareness in any of these areas. In order to provide a structure and formal recognition towards this end, Pacific offers a Minor in Technology.

The Technology Minor provides an introduction to various aspects of engineering and technology which will strengthen a student's employment qualifications. The University offers a number of engineering and technology-related courses which are basic enough in their content that non-engineering students can enjoy enrollment without intimidation. Two of the courses, in fact, normally do not include any engineering students since those courses (COMP 25 and 41) do not satisfy any Engineering degree requirements. Numerous other courses have only a few engineering students in them, such as PHIL 35, Environmental Ethics. Still others are available which require no advanced math or science skills.

Phrases like "The Age of Technology" and "Information era" reflect the demand for professionals with more knowledge about engineering and technology. The student who takes advantage of this structured approach to additional studies will likely enjoy much greater job and salary recognition upon college graduation.

For more information, contact: Dr. Gary Martin, 105 Baun Hall: 946-3064 or gmartin@pacific.edu

Departmental Rationale for the Minor

The reasons for students pursuing this minor will vary:

Liberal Arts: COP students could value this program purely as a liberal art which broadens the student's appreciation for the connection between science and application (i.e., technology), and the various social effects of both science and technology.

Technical Skills: A second reason would be to connect students to the career world. For example, one of the most rapidly growing employment sectors during the past decade has been in Finance/Insurance/Real Estate ("FIRE"). Here, possession of computer software skills does demonstrably provide access.

Career World: This minor would be extremely effective for students contemplating careers in the computer hardware/software industry, "heavy" industries (e.g., the steel industry) or other areas of durable goods manufacturing, specialized but emerging high-tech areas (e.g., bioengineering), telecommunications, heavy construction, and so forth, where the issues generally have a significant technical component. It appears that the majority of people working in places like Silicon Valley today are not engineers or computer scientists. Rather, most people work in other phases, from finance and accounting to human resources, sales, and marketing. However, they must be prepared to work and communicate effectively with various kinds of technologists as well. This minor could thus provide solid preparation for these kinds of students and open up a whole new employment world for many other students.

Teacher Preparation: Many Pacific students go on to teach. This minor could provide tools and insights which enable a teacher to illustrate the relevance of the basic math and science subjects taught at all levels.

A Technology Minor for Non-engineering Students

Give yourself the competitive edge in today's job market--
more job offers and higher salaries

All courses are basic in nature and
include non-engineering students

Many courses can double-count toward
general education or major requirements

Develop a valuable breadth of
technological knowledge and skills

Get ahead

Requirements

The requirements for the Technology Minor are as follows:

1. Student must not be majoring in engineering.
2. Student must complete a program, approved by the minor advisor, consisting of a minimum of twenty units with a minimum of five courses from the attached list. A minimum of twelve units must be taken at Pacific.
3. Courses that count toward a minor cannot be taken on a “pass/no credit” basis.
4. Students must maintain a minimum GPA of 2.0 in a minor program.

Course requirements include:

- ◆ A minimum of three courses from the School of Engineering & Computer Science (i.e., CIVL, ECPE, EMGT, ENGR, or MECH department prefixes), adding up to a minimum of eight units. **(It is strongly recommended that students take ENGR 10 as one of these three classes. This course is intended for the freshman year.)**

Goal: To develop and be able to articulate an understanding of the role of technology in industrial/postindustrial society.

- ◆ At least one, and no more than two of the “Computing Classes.”

Goal: To develop an understanding and significant competence in the application of software technology.

General Comments:

General Education: With careful planning, it is possible for a student to complete some General Education requirements with Technology Minor courses.

Technology Minor Application: To complete a minor, a student should submit a minor work sheet proposal to their faculty advisor. The Registrar must receive an approved copy of the work sheet before a notation of completion of a minor can be placed on the student’s transcript.

Approved Courses for the Technology Minor

Course Name	Dept/ Crs	Units	Pre-req.	General Education Category
<u>Engineering Classes</u>				
Great Ideas in Computing	COMP 41	4	Basic Math Skills ³	III-C
Dean's Seminar	ENGR 10	1	Basic Math Skills ³	
Engineering Graphics	ENGR 15	3	--	
Engineering Mechanics I	ENGR 20	3	MATH 53, PHYS 53	
Surveying	CIVL 22	3	Trigonometry or MATH 41	
Professional Practice Seminar	ENGR 25	1	--	
Electric Circuits /Lab	ECPE 41/L	4	PHYS 55 ² MATH 55 ²	
Manufacturing Processes	MECH 100	4	ENGR 45 or Permission of Instructor	
Introduction to Evt. Engr.	CIVL 132	4	CHEM 25, ENGR 19	
Engineering Administration	EMGT 170	4	--	
Water and Environmental Policy	CIVL 171	3	--	
Digital Systems Design I/Lab	ECPE 71/L	4	COMP 51, Basic Math Skills ³	
Engineering Economy	EMGT 172	3	--	
Engr. Project Management	EMGT 174	3	EMGT 170	
Professional Practice (Co-op)	ENGR 181-185	1-18	--	

General Technology Classes

Environmental Ethics <u>or</u>	PHIL 35	4	--	II-B
Tech, Ethics, & Religion	RELI 146	4	--	III-C
Env.: Concepts and Issues	BIOL 35	4	--	III-C
Great Ideas In Computing	COMP 41	4	Basic Math Skills ³	III-C

Computing Classes

At least one and no more than **two** of the following may be included:

Computer App. in Engineering	ENGR 19	3	MATH 53 ²	
Computers and Info Processing	COMP 25	4	Basic math skills ³ / MATH 5 or 35	III-B
Introduction to Computer Sci.	COMP 51	4	Basic math skills ³	III-B
Management Info. Systems	BUSI 100	4	COMP 25 or 51	
Music and Computer Tech.	MCOM 19	3	MCOM 2	

Basic Math and Science Classes

No more than **two** of the following.

(Note that these courses serve as pre-requisites for some of the above courses)

Elementary Functions	MATH 41 or 45	4	Intermediate Algebra	III-B
Calculus I	MATH 51	4	Elementary Functions	III-B
Calculus II	MATH 53	4	Calculus I	III-B
Calculus III	MATH 55	4	Calculus II	III-B
General Chemistry	CHEM 25	5	Basic Math Skills ³ / H.S. Algebra	III- A
Principles of Physics I	PHYS 53	5	H.S. Physics, MATH 51, MATH 53 ²	III-A

¹ Engineering majors do not normally enroll in these courses since the course does not satisfy a graduation requirement for them.

² Co-requisite

³ May be satisfied through the Pacific Basic Skills Math Placement Exam.

Proposal for Minor in Technology

School of Engineering & Computer Science
University of the Pacific

Student's Name: _____ 988 _____

Today's Date: _____ Email: _____

Bachelor Degree Program (Name of major): _____

Anticipated Graduation Date: _____

Phone: _____

Minor Courses	Units	Comp. Class	Took at Pacific	Engr. Class	Grade
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
Total:	_____	_____	_____	_____	_____
<i>Minimum:</i>	20	3	12	8	Avg>2.0 (3 courses)

_____ All courses were taken for letter grade (exception of co-op units)

_____ A minimum of five classes were taken

Proposal Accepted: _____
(Minor Advisor)

Requirements Completed: _____
(Minor Advisor)

Please submit upon completion to the Dean's Office in the School of Engineering & Computer Science.