

The University Senate of Michigan Technological University

PROPOSAL 17-04

MINOR IN POLYMER SCIENCE AND ENGINEERING

Department of Chemical Engineering

Introduction

This proposal recommends establishing a formal 'Minor in Polymer Science and Engineering'. The purpose of developing a minor in Polymer Science and Engineering is to meet demands for specialized education in polymer-related fields. Polymer-related research and education are well established at Michigan Tech, but currently there is no formal way to establish a student's breadth and depth of understanding and study in this area. Students taking this minor will be able to establish their polymer expertise to potential employers.

I. Title of Minor

Polymer Science and Engineering

II. Catalog Description

The minor in Polymer Science and Engineering prepares students for careers in the field of polymer science, polymer engineering, or polymer and composite manufacturing. Students in biomedical engineering, chemical engineering, chemistry, materials science and engineering, mechanical engineering and mathematics who wish to supplement their major education with a specialty in the field of polymers will find this minor attractive. Two paths are suggested, a polymer-science track and a polymer-engineering track.

III. Rationale

As mentioned in the introduction, the reason for the minor in Polymer Science and Engineering is the demand for graduates with a breadth of understanding of the chemical and mechanical properties of polymers, plastics, and composites. The students who will be interested in the program will be those who want to work in polymer-related organizations, including the largest chemical companies in the world, several of which are based in Michigan.

IV. List of Courses

There will be two tracks to the Polymer Science and Engineering Minor, the Polymer-Science Track and the Polymer-Engineering Track.

Polymer-Science Track (16 credits)

Required Courses (8-10 credits)

CH2400 Principles of Organic Chemistry	4 credits
	or
CH2410 Organic Chemistry I	3 credits
	and

CH2420 Organic Chemistry II*	3 credits
CH2411 Organic Chemistry Laboratory I	1 credit
CM/CH4610 Introduction to Polymer Science	3 credits or
BE4300 Advanced Polymeric Biomaterials	3 credits or
MY4600 Introduction to Polymer Engineering	3 credits
Elective Courses (Choose 7-8 credits)	
CM/CH4620 Polymer Chemistry	3 credits
CM/CH 4631 Polymer Science Laboratory	2 credits
CM/CH 4641 Polymer Chemistry Laboratory	2 credits
CM4650 Polymer Rheology	3 credits
MEEM4635 Design with Plastics	3 credits

(*) a maximum of six credits of 2000-level courses may count towards the minor

Polymer Engineering Track (18 credits)

Required Courses (9-10 credits)

MEEM2150 Mechanics of Materials	3 credits or
ENG2120 Statics/Mechanics of Materials	4 credits
MEEM3210 Fluid Mechanics	3 credits or
CM3110 Transport Processes I	3 credits or
ENG3200 Thermodynamics/Fluid Mechanics	3 credits or
MY3110 Materials Processing II	3 credits
CM/CH4610 Introduction to Polymer Science	3 credits or
MY4600 Introduction to Polymer Engineering	3 credits or
BE4300 Advanced Polymeric Biomaterials	3 credits

Elective Courses (Choose 9 credits)

CM/CH 4631 Polymer Science Laboratory	2 credits
CM4650 Polymer Rheology	3 credits
FW3067 Composite Materials I	3 credits
MEEM4635 Design with Plastics	3 credits
MY4150 Composite Materials	3 credits
MEEM4403 Computer-Aided Design Methods	3 credits
MEEM4170 Failure of Material in Mechanics	3 credits

Estimated Costs

There is no additional cost in introducing a Minor in Polymer Science and Engineering. All courses identified above are either required or elective courses available to all students who satisfy course prerequisites. All courses are offered on a regular basis. The faculty with expertise in polymer and composite science and engineering are spread across six departments

in the University, Biomedical Engineering (Wright), Chemical Engineering (Morrison, Caneba, King), Chemistry (Heiden, Williams), Mechanical Engineering (Gupta, Miskioglu), Materials Science and Engineering (Wang), and Mathematical Sciences (Kolkka, Feigl).

Adopted by Senate: 11 February 2004

Approved by President: 29 February 2004