

Adopted: April 29, 2008

**ACADEMIC SENATE
of
CALIFORNIA POLYTECHNIC STATE UNIVERSITY
San Luis Obispo, CA**

AS-668-08

**RESOLUTION ON
NEW MASTERS OF SCIENCE DEGREE IN
POLYMERS AND COATINGS SCIENCE**

- 1 WHEREAS, The Chemistry and Biochemistry Department is proposing the implementation of
2 a Masters of Science in Polymers and Coatings Science; and
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4 WHEREAS, The Masters of Science in Polymers and Coatings Science has been a successful
5 pilot program for the past six years; and
6
7 WHEREAS, The Chemistry and Biochemistry Department now proposes to convert this
8 program to permanent status; and
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10 WHEREAS, The existing specialization and BS degree in Polymers and Coatings Chemistry is
11 a nationally recognized program strongly supported by industry; and
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13 WHEREAS, The Academic Senate Curriculum committee has carefully considered this
14 proposal and recommends its approval; and
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16 WHEREAS, A summary of the proposal is attached to this resolution with the full proposal
17 available in the Academic Senate office; therefore be it
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19 **RESOLVED:** That the Academic Senate of Cal Poly approve the proposal for a Masters of
20 Science in Polymers and Coatings Science and that the proposal be sent to the
21 Chancellor's Office for final approval.

Proposed by: Academic Senate Curriculum Committee
Date: March 11, 2008
Revised: April 1, 2008

Cal Poly, San Luis Obispo

Summary Statement of Proposed New Degree Program for Academic Senate

March 11, 2008

1. **Title of proposed program:** MS in Polymers and Coatings Science
2. **Reason for proposing the program:** Nearly twenty years ago the Chemistry and Biochemistry Department embarked on an effort to develop a unique, high quality undergraduate concentration in Polymers and Coatings Chemistry. Through a cooperative effort with industry, this program has become recognized as one of the truly outstanding undergraduate programs in polymer chemistry in the nation, and one of only a handful of undergraduate programs that offers specialized training in the applications of polymers to modern coatings.

Through continued cooperative efforts with industry, a pilot MS in Polymers and Coatings Science was launched in 2002 and it will complete its sixth year at the end of current academic year. The program offers students a unique, focused educational opportunity closely tied to industry. Students gain academic preparation in polymers and coatings science through lecture and laboratory courses and then are expected to undertake a rigorous industrial internship or industry sponsored research. Students are prepared for challenging careers in the polymers and coatings industry, and upon graduation they are highly sought after by companies operating in the field. The program also provides excellent background for doctoral studies in areas related to polymer and coatings science. This program is unique in California; there is no other similar academic program in the western US.

3. **Anticipated student demand:**

	Number of Students		
	<u>at initiation</u>	<u>3 years after initiation</u>	<u>5 years after initiation</u>
Number of Majors	9	12	30
Number of Graduates	5	6	15

Indicate briefly what these projections are based upon: So far, the program has produced thirteen graduates, and five more are scheduled to be graduated by the end of current academic year. Enrollment will be limited for the next three-year period while the new Science Center building and the privately funded Kenneth N. Edwards Western Coatings Technology Center will be built.

- 4. Indicate the kind of resource assessment used in developing the program proposal. If additional resources will be required, the summary should indicate the extent of department and/or college commitment(s) to allocate them:** Resources in terms of faculty, equipment, library facilities, internships and research funding, and building facilities all have been addressed. No additional resources beyond what is already available and what has already been planned are needed.
- 5. If the program is occupational or professional, briefly summarize evidence of need for graduates with this specific educational background:** The global polymer and coating industry represents hundreds of billions of dollars worth products and services spanning house paints, plastic products, electronics, biomedical devices, personal care items, and so on. Within these industries, there is a high demand for graduates having an education background in the multi-disciplinary field of polymers and coatings along with a strong background in chemistry. Graduates with this combined education are rare in California and the rest of the US. Our program faculty alone receives many inquiries about graduating students by potential employers having staffing difficulties. Those who have graduated so far and decided to enter the workforce have secured significantly better compensation packages than did their counterparts having generalized degrees.
- 6. If the new program is currently a concentration or specialization, include a brief rationale for conversion:** This proposal is to convert the existing MS in Polymers and Coatings Science from pilot to permanent status. An undergraduate concentration in Polymers and Coatings is available for Chemistry and Biochemistry majors, and it will be continued.
- 7. If the new program is not commonly offered as a bachelor's or master's degree, provide a compelling rationale explaining how the proposed subject area constitutes a coherent, integrated degree major which has potential value for students. If the new program does not appear to conform to the CSU Board of Trustee policy calling for "broadly based program," provide rationale:** not applicable.
- 8. Briefly describe how the new program fits with the department/college/university strategic plans:** The key elements of the program (i.e. course work and culminating experience) are well aligned with the strategic plans of the department, college, and university. The program maintains a "learn by doing" atmosphere and promotes application of theory. The program's cross-disciplinary curriculum produces graduates who are better prepared to adapt to multi-disciplinary working environments that are becoming more commonplace.

Curriculum for Polymers and Coatings Science MS Degree

	Project Plan	Thesis Plan
CHEM 544 Polymer Physical Chemistry and Analysis	3	3
CHEM 547 Polymer Characterization and Analysis Laboratory	2	2
CHEM 545 Polymer Synthesis and Mechanisms	3	3
CHEM 548 Polymer Synthesis Laboratory	2	2
CHEM 550 Coatings Formulation Principles	3	3
CHEM 551 Coatings Formulation Laboratory	2	2
CHEM 590 Graduate Seminar (1)(1)(1)	3	3
CHEM 598 Graduate Project (3)(3)(3)	9	--
CHEM 599 Graduate Thesis (3)(3)(3)	--	9
Electives from 400- and 500- level courses*	18	18
*At least 3 units must be 500-level		
	45	45

Elective courses (18 units)


Examples of Elective Courses	Units	Prerequisite
CHEM 405 Advanced Physical Chemistry	3	CHEM 353
CHEM 420 Advanced Organic Chemistry	2	CHEM 212/312 or CHEM 216/316
CHEM 439 Instrumental Analysis	5	CHEM 231/331, CHEM 354
CHEM 441 Bioinformatics Applications	4	One course in college biology (BIO 111 or BIO 161 recommended)
CHEM 446 Surface Chemistry of Materials	2	CHEM 305 or CHEM 351 or course in engineering thermodynamics
CHEM 458 Instrumental Organic Qualitative Analysis	3	CHEM 319
CHEM 470 Selected Advanced Topics	1-4	CHEM 305 or CHEM 351 or CHEM 217/317
CHEM 471 Selected Advanced Laboratory	1-4	Consent of instructor
CHEM 500 Special Problems for Graduate Students	1-3	Graduate standing and consent of Department Chair
STAT 512 Statistical Methods or STAT 513 Applied Experimental Design and Regression Models	4	For STAT 512, graduate standing and intermediate algebra or equivalent; for STAT 513, one of the following: STAT 512, STAT 217, STAT 218, STAT 221, STAT 252, Stat 312, or equivalent
MATE/BMED 530 Biomaterials	4	BIO 213, ENGR 213, MATE 210 and graduate standing or consent of instructor

MATE 560 Thin Film Processing	3	Graduate standing or consent of instructor
BMED 450 Contemporary Issues in Biomedical Engineering or BMED 455 Bioengineering Design I or IME 556 Technological Project Management	4	For BMED 450, senior standing in BMED major or instructor consent; for BMED 455, ME 341, BMED 410 or consent of instructor; for IME 556, graduate standing or consent of instructor

State of California
Memorandum

To: Bruno Giberti
Chair, Academic Senate

Date: May 20, 2008


From: Warren J. Baker
President

Copies: W. Durgin
P. Bailey
S. Opava
D. Conn
M. Whiteford

Subject: Response to Academic Senate Resolution AS-668-08
Resolution on New Masters of Science Degree in Polymers and Coatings Science

I am pleased to approve the above-entitled Academic Senate Resolution. The proposal will now be sent to the Chancellor's office for approval.

Please express my appreciation to the Academic Senate members for their attention to this important curricular matter.