

**Senate Bill No.: 0708-34**

**UNIVERSITY AT ALBANY  
STATE UNIVERSITY OF NEW YORK**

Introduced by: Undergraduate Academic Council

Date: April 24, 2008

**NEW CHEMICAL BIOLOGY EMPHASIS WITHIN THE BS IN CHEMISTRY MAJOR**

IT IS HEREBY PROPOSED THAT THE FOLLOWING BE ADOPTED:

1. That the attached proposed addition of a new Chemical Biology emphasis within the BS in Chemistry be approved by the University Senate.
2. That this proposal be forwarded to the Interim President George M. Philip for approval.
3. That this revision takes effect for students admitted to the University for Fall 2008.

**Rationale:**

March 27, 2008

To Whom It May Concern:

This cover letter provides the rationale for the Department of Chemistry's proposed new emphasis within our B.S. program, which we call the "Chemical Biology emphasis." It can be considered to be a track within the B.S. major that students who have a strong interest in chemistry, but who also have a desire to enter biochemical or molecular biology research at the graduate level or want to enter a professional (medical, dental, etc.) program after graduation. We note that we already have four emphases under the B.S. banner, namely the "Chemistry emphasis" (general track), and three specialty tracks, including "Materials emphasis", "Polymer emphasis", and our very popular "Forensics Chemistry" emphasis.

In the last half century, the areas of biochemical, biophysical and molecular biology research has exploded, particularly in the last 20 to 30 years. Recently, many of our best students in chemistry have expressed a desire to be able to complete a chemistry degree, while also enhancing their background in areas at the interface of chemistry and biology. With the recent addition of a number of faculty members whose research interests lie in the biochemical and biophysical arena, as well as the University's initiatives in Life Science in general and RNA in particular, this would seem to be a propitious moment to offer these excellent chemistry students the opportunity for such study via this proposed emphasis.

Many of our more biologically-inclined majors have opted to switch to the BCAMB (Concentration in Biochemistry and Molecular Biology) interdisciplinary program that is situated in the Department of Biology (we note that Chemistry does provide support for it), even though their heart is in Chemistry. We feel that our proposed program is significantly different from the BCAMB in the following ways: (1) the Biochemistry component in the proposed program includes two semesters of biochemistry and one semester of lab at a level and with an emphasis that is appropriate for a chemistry major who likely will be going on to research, but which still is fine for a pre-health major (400 level vs. 300-level courses for BCAMB); (2) the proposed emphasis includes intermediate and advanced laboratories (Quantitative Analysis; Physical Chemistry lab) and advanced courses (Inorganic Chemistry) appropriate for this degree to be considered for accreditation by the American Chemical Society, while the BCAMB does not; (3) students will be required to take the three lower-level Biology courses (General Biology 1 and 2; Genetics), which will allow students to consider a plethora of upper level Biology courses for general electives, if they so choose. This is important, in that (4) if a student chooses to apply to medical school, for example, they will have all that they need (via the emphasis requirements) with the ability to tailor their program to allow for such an application.

We have spoken to Prof. Robert Osuna of the Department of Biology who oversees the BCAMB program and he agrees that our proposed emphasis is different from the BCAMB and should not unfavorably impact it. We stress that we are not trying to take students from this

existing program; we are merely trying to appeal to those students who have a strong interest in chemistry, but who also have an interest in biological matters. Our Department is set up well to accommodate such a program and we are ready to provide it. The program at delineated on the next page for your convenience and as set out in the course action form, comprises 68 credits. This is a couple credits higher than our "Chemistry emphasis", but is in line with our "Forensics Chemistry" emphasis, which is set at 69 credits. As is with 68 credits, the program will prepare the students and set up them up to transition smoothly into either a research career, a career in the health fields, or immediate employment. In addition, it will allow the program to be considered for accreditation by the American Chemical Society, the main association of practicing chemists in this country.

Once again, please find included a listing of required courses for the proposed "Chemical Biology" emphasis and the course action form. If you have further questions, please do not hesitate to contact us.

Yours sincerely,

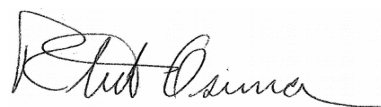
Paul Toscano  
Associate Professor of Chemistry  
and Director of UG Studies, Chem

Approval from Biology Department:  
April 11, 2008,

Upon reviewing the proposed Chemical Biology program from the Department of Chemistry, Dr. Millis (chair of the Department of Biology) and I as coordinator for the interdisciplinary program in Biochemistry and Molecular Biology (BCAMB) determined that, despite a sizeable similarity between the proposed Chemical Biology program and the existing BCAMB program, there are significant differences as outlined below:

- Chemical Biology requires Quantitative Analysis (Chm225); BCAMB does not.
- Chemical Biology requires a Physical Chemistry lab course (Chm352Z); BCAMB does not.
- Chemical Biology requires Inorganic Chemistry (Chm420); BCAMB does not.
- Chemical Biology requires two semesters of Physics laboratories; BCAMB does not.
- BCAMB requires Molecular Biology (Bio425) and Molecular Biology lab (Bio426); Chemical Biology does not.
- While both programs require two semesters of Biochemistry, the courses required by Chemical Biology (Chm442 & Chm443) are taught by faculty in the chemistry department and are regarded by these faculty to more strongly emphasize the chemistry aspects of these courses at a level deemed more appropriate for students obtaining a degree from the chemistry department compared to the biochemistry courses taught in the biology department (Bio365 and Bio366).
- While both programs require one Biochemistry lab course, Chemical Biology will require a newly developed lab course (Chm446) with topics that will be almost entirely different from those currently taught in the biochemistry lab course (Bio367) required for BCAMB students. Chm446 will be for 3 credits, while Bio367 is for 2 credits, implying that the Chm446 will more extensively expose students to biochemical laboratory methods than Bio367.
- Chemical Biology requires 68 credits; BCAMB requires 65 credits.

We find that these differences are significant enough to warrant the creation of the Chemical Biology program housed in the chemistry department, and we therefore support its creation. We have been assured by Dr. Toscano that it is not the intention of the Chemical Biology program to compete with the BCAMB program for students, but to provide a viable alternative for bonafide chemistry students desiring some exposure to biology. The department of chemistry has always supported the BCAMB interdisciplinary program and we look forward to their continued support will continue beyond the creation of the Chemical Biology program.



Robert Osuna, Associate Professor  
Coordinator for the BCAMB program  
Department of Biological Sciences

Chemical Biology emphasis

General Chem (8 total)

Chm 120 or 130 (3)  
Chm 124 (1)  
Chm 121 or 131 (3)  
Chm 125 (1)

Organic Chem (8 total)

Chm 220 (3)  
Chm 222 (1)  
Chm 221 (3)  
Chm 223 (1)

Quant Analysis (3 total)

Chm 225 (3)

Phys Chem (9 total)

Chm 350 or 444 (3)  
Chm 351 or 445 (3)  
Chm 352Z (3)

Biochem (9 total)

Chm 442 (3)  
Chm 443 (3)  
Chm 446 (3)

Inorg Chem (3 total)

Chm 420 (3)

Bio Courses (12 total)

Bio 110 (4) Gen Bio I  
Bio 111 (4) Gen Bio II  
Bio 212 (4) Genetics

Physics (8 total)

Phy 140 or 141 (3)  
Phy 145 (1)  
Phy 150 or 151 (3)  
Phy 155 (1)

Math (8 total)

Mat 111 or 112 or 118 (4)  
Mat 113 or 119 (4)

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**68 credits total**

University at Albany – State University of New York			
<b>College of Arts and Sciences</b>		<b>Course Action Form</b>	
		<b>Proposal No.</b> _____	
Please mark all that apply:			
<input type="checkbox"/>	New Course	Revision of:	<input type="checkbox"/> Number
<input type="checkbox"/>	Cross-Listing		<input type="checkbox"/> Title
<input type="checkbox"/>	Shared-Resources Course		<input type="checkbox"/> Credits
<input type="checkbox"/>	Deactivate / Activate Course (boldface & underline as _____)		<input checked="" type="checkbox"/> Other
Department: <u>Chemistry</u>		To be effective (semester/year): <u>Fall 2008</u>	
Course Number	Current	New:	Credits
	: _____	: _____	: _____
Course Title: <u>Chemical Biology emphasis</u>			
Course Description to appear in Bulletin: <b>UNDERGRADUATE BULLETIN COPY</b>			
<b>Chemical Biology Emphasis: B.S.:</b> (combined major and minor sequence) (68 credits): A Chm 120 or 130, 121 or 131, 124, 125, 220, 221, 222, 223, 225, 350 or 444, 351 or 445, 352Z, 420, 442, 443, 446; A Mat 111 or 112 or 118, 113 or 119; A Phy 140 or 141, 145, 150 or 151, 155; A Bio 110, 111, 212.			
Prerequisites statement to be appended to description in Bulletin:			
Permission of instructor.			
If S/U is to be designated as the only grading system in the course, <input type="checkbox"/>			
This course is (will be) cross listed with (i.e., CAS ###): _____			
This course is (will be) a shared-resources course with (i.e., CAS ###): _____			
Explanation of proposal:			
The Department of Chemistry would like to be able to offer a program in Chemical Biology as an emphasis under the umbrella of our B.S. program in order to retain and attract students who have a strong interest in Chemistry, but who also have interests in biological areas.			
Other departments or schools which offer similar or related courses and which have certified that this proposal does not overlap their offering:			
Prof. Robert Osuna has been contacted and he concurs that this "Chemical Biology" emphasis has significant differences from the interdisciplinary BCAMB degree program.			
Chair of Proposing Department ( <b>TYPE NAME/SIGN</b> )			Date
Charles Scholes			03-27-08
Approved by Chair(s) of Departments having cross-listed course(s) ( <b>PRINT NAME/SIGN</b> )		Date	Dean of College ( <b>PRINT NAME/SIGN</b> )
			Gregory Stevens
Chair of Academic Programs Committee ( <b>PRINT</b> )		Date	Dean of Graduate (Undergraduate) Studies ( <b>PRINT</b> )
			4-11-08

Nancy Denton	4-10-08
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