



Old Westbury

M E M O R A N D U M

TO: Faculty Senate

FROM: CAP Committee

Evelyn Glantz

DATE: January 20, 1993

RE: B.S. in Biochemistry

Attached you will find a copy of the preproposal for a B.S. degree in Biochemistry. The CAP Committee approved the preproposal on December 4, 1992. After approval by the Faculty Senate, the Chemistry/Physics Department will develop a full proposal to be submitted to the Faculty.

jlh

Enclosure

Rationale

The proposed B.S. degree in Biochemistry provides students interested in majoring in the Sciences with another option. This degree is appropriate for students interested in medical school, graduate school or employment in the health field.

Resolution

Be it resolved that the Faculty Senate approve the preproposal for the B.S. degree in Biochemistry.

State University of New York / College at Old Westbury

Old Westbury
Long Island, New York 11568
Telephone (516) 876-3000

DATE: November 10, 1992

TO: The Curriculum and Academic Planning Committee

FROM: Dr. Michael Leung, Chair of Chemistry/Physics Department 

SUBJ: Pre-proposal for Undergraduate Degree in Biochemistry

A. Proposed Degree Offering:

The Chemistry/Physics Department is seeking approval from the Curriculum and Academic Planning Committee to offer a Bachelor of Science Degree in Biochemistry. We plan to offer this degree starting the Fall semester 1993.

B. Curriculum Content:

The biochemistry undergraduate degree is intended to serve three categories of students: 1) students who wish to enter graduate school for studies of biochemistry, molecular biology, pharmacology and related fields; 2) students who wish to enter biomedical professional schools such as medicine, dentistry and pharmacy; 3) students who wish to seek employment in industries in areas related to biotechnology, bioengineering and pharmaceuticals. The study of biochemistry seeks to understand the structure, organization and functions of living organisms through physical and chemical principles. It integrates the physical and biological sciences. Biochemistry provides the scientific framework for all modern day medicine and biotechnology. The main objective of our program is to provide students with a strong foundation in chemistry and biology and to integrate the two disciplines in biochemistry courses. It will emphasize both the theoretical and practical aspects of biochemistry and independent research is strongly recommended for all students majoring in biochemistry.

Proposed courses and credits

I. General Education:		36 credits
II. Chemistry Requirements:		41-2 credits
CP2120	Principles of Chemistry I	3 credits
CP2120L	Principles of Chemistry Lab. I	1 credit
CP2130	Principles of Chemistry II	3 credits
CP2130L	Principles of Chemistry Lab. II	1 credit
CP3300	Organic Chemistry I	3 credits
CP3300L	Organic Chemistry Lab. I	2 credits
CP3310	Organic Chemistry II	3 credits
CP3310L	Organic Chemistry Lab. II	2 credits
CP3400	Analytical Chemistry	5 credits
CP4700	Physical Chemistry I	3 credits
CP4720L	Physical Chemistry Lab.	2 credits
CP4510	Biochemistry	3 credits
CP4515	Advanced Biochemistry	3 credits
CP4520L	Biochemistry Lab	2 credits
CP5920	Chemistry Senior Seminar I	1 credit
CP5921	Chemistry Senior Seminar II	1 credit
One chemistry elective to be chosen from		
CP4320	Advanced Organic Chemistry	3 credits
CP4710	Physical Chemistry II	3 credits
CP4800	Advanced Chemical Methods Lab.	4 credits
CP5600	Advanced Inorganic Chemistry	3 credits
CP5900	Research	4 credits
III. Biology Requirements:		16 credits
BS2400	Basic Biological Sciences I	4 credits
BS2410	Basic Biological Sciences II	4 credits
Two biology electives to be chosen from		
BS4400	Cell Biology	4 credits
BS4420	Microbiology	4 credits
BS4460	Genetics	4 credits
BS4560	Molecular Biology	4 credits
IV. Other Requirements:		20 credits
MA2310	Calculus & Analytic Geometry I	4 credits
MA2320	Calculus & Analytic Geometry II	4 credits
CP2240	General Physics I	4 credits
CP2250	General Physics II	4 credits
CS3500	Introduction to Computing	4 credits
V. General Electives		6-7 credits
Total Credits Required		120 credits

Proposed Resources

With the exception of two courses all the courses proposed for the biochemistry degree are already currently in place and are being offered by the Chemistry/Physics or the Biological Sciences Departments. Only one of the two new courses is a required course. The other one is a recommended elective. The required course, CP4515 Advanced Biochemistry, which has been planned by the Chemistry/Physics Department for a number of years, will concentrate on the application of basic principles covered in the introductory biochemistry course to more complex biochemical processes. This course will be taught by existing faculty in the Chemistry/Physics Department. The recommended elective BS4560 Molecular Biology is currently in the planning stage in the Biological Sciences Department and is expected to be introduced into its regular teaching schedule in the near future. Recently, the Biological Sciences Department received a grant from the National Science Foundation to upgrade their teaching in molecular biology. The formal molecular biology course is a natural extension of this upgrading process. We do not anticipate the need of any additional resources for the offering of these two new courses. Thus, the implementation of an undergraduate degree in biochemistry can be complete without any additional funding or resources.

C. Impact on Faculty Approved Long Range Plan

The biochemistry degree, although offered by the Chemistry/Physics Department, can be considered to be an interdisciplinary course of study. It serves as a bridge between the two existing degree granting science programs in Old Westbury, Chemistry and Biology. With biochemistry playing an increasing important role in biotechnology and medicine, it is essential for Old Westbury to offer this degree to remain competitive in science education. At present, biochemistry is one of the most sought after areas in science. A recent survey has shown more than 300 colleges and universities in the nation are already offering an undergraduate degree in biochemistry. Student demand for this degree is expected to continue to increase. Many colleges and universities are in the process of introducing this degree into their regular curriculum.

Every economist and technology development commission has agreed that health science and biotechnology are two areas that are expected to experience tremendous growth in the foreseeable future. Both of these areas depend heavily on personnel who are trained in biochemistry. Biotechnology also plays a role which is essential to the industrial future of the Long Island region. New York State has targeted the Long Island region for the development of bioengineering industries. Several collaborative efforts are currently in existence between SUNY/Stony Brook and local biotechnology companies with the assistance of state funding. It is our hope that offering a biochemistry degree would provide us an opportunity to create collaborative relationships with local industries as well. We are certain that the demand for this degree is there since we have been receiving inquiries concerning biochemistry degrees from our science students as well as outside students. We have every expectation that this degree will be well received and subscribed to by prospective students from our surrounding communities.

The offering of the Biochemistry degree should fit perfectly in the development of the science programs at Old Westbury. Most of the faculty in the science programs are presently engaged in biomedically related research. The current funding level of biochemical research by federal agents to Old Westbury approaches half a million dollars annually. We expect our students graduating with a biochemistry degree to be well trained in the theoretical and experimental aspects of the discipline. Their training will prepare them for a smooth transition to graduate and professional schools as well as to work in the biotechnology and pharmaceutical industries. Since we already have a well-established biomedical research program and the two additional courses needed for the degree are already in their final planning stages we do not anticipate any great demand on our resources. The implementation of the degree would exert minimal burden on the operational and financial scheme of the Chemistry/Physics and Biological Sciences Departments.

criterion for the direction of the change. There is no violation of thermodynamics when we find that

$$\Delta G_f = 0$$

Acknowledgment

The preparation of this manuscript was supported in part by the National Science Foundation under Grant No. CHE-8717791.

It was only after an extensive and sometimes acrimonious correspondence with Schomaker, Waser, and Tykodi that I came to understand why generally accepted thermodynamic procedures sometimes lead to different conclusions for the same change of state. Robin Battino and Scott Wood also contributed to the correspondence about this problem. I appreciate the concurrence with my conclusion that was given by Dr. James Dye of Michigan State University, who apparently suggested this problem to Schomaker and Waser in the first place.

Literature Cited

1. Schomaker, V. J. *J. Chem. Educ.* 1988, 65, 908-909.
2. Schomaker, V. J.; Waser, J. *J. Chem. Educ.* 1986, 63, 935-937.
3. Tykodi, R. J. *J. Chem. Educ.* 1986, 63, 585-586.
4. Patterson, D. J. *J. Chem. Educ.* 1991, 68, 445.
5. Schomaker, V. J.; Waser, J. *J. Chem. Educ.* (a) 1989, 67, 384; (b) 1993, 70, 445-446.
6. Tykodi, R. J., private communication.

An Undergraduate Biochemistry Degree Recommended by the American Society for Biochemistry and Molecular Biology

In 1989, the Educational Affairs Committee (EAC) of the American Society for Biochemistry and Molecular Biology (ASBMB) began a survey of undergraduate degree programs in biochemistry at U.S. colleges and universities. Using responses obtained from the survey, the Committee proposed and published in *this Journal* (1990, 67, 748) a "typical curriculum"—an average of what at that time was offered in approximately 300 schools. Because of the tremendous response and interest in the study, the EAC sought to use this information to design a biochemistry curriculum that could be recommended by the EAC and ASBMB.

A subcommittee of the EAC, after extensive discussion and deliberation, outlined a curriculum that received unanimous support from the entire EAC. The EAC approved the distribution of the curriculum to the ASBMB membership and to individuals at colleges and universities who request information or guidance in the preparation of a biochemistry curriculum. The consensus of the EAC was that this curriculum should be referred to as "recommended", which, if all of the criteria were met, would ensure a solid base in biochemistry and should be used as a model even if the individual schools were not able to meet all of the suggested goals. The final form of the curriculum is presented in the table. The EAC has no desire to prescribe course content for the recommended classes, but, rather, allow for the discretion of the instructor to select subject matter. The American Chemical Society Committee on Professional Training has recently produced a document that provides a listing of typical topics for a survey course in biochemistry, important general techniques recommended for inclusion in the laboratory course, and suggested special topics for advanced biochemistry courses. The Educational Testing Service of Princeton, NJ recently announced the introduction of the new GRE Biochemistry, Cell and Molecular Biology Subject Test.

The biochemistry undergraduate degree as recommended by ASBMB is ideal for students who wish to attend graduate school and therefore, will need to prepare for the new GRE. The curriculum is intended to be a flexible guideline that will provide assistance to colleagues who are designing a biochemistry degree and since it is backed by the ASBMB it should give them local clout when dealing with college administration.

We are aware of over 300 colleges and universities in the U.S. now offering an identical or similar degree. (A Directory listing those programs is now in preparation.) The impressive size of this number has convinced some depart-

Recommended Biochemistry Undergraduate Degree Requirements

Course	No. of Semesters	Comments
Introductory Chemistry w lab	2	
Organic Chemistry w lab	2	
Physical Chemistry w lab	1	Biophysical Chem may substitute
Analytical/Instrum Chem w lab	1	
Biochemistry	2	
Biochemistry Laboratory	1-2	
Introductory Biology w lab	2	
Advanced Biology ¹	2	
Introductory Physics w lab	2	Calculus based
Calculus	2	
Independent Research ²		Strongly recommend where possible
Technical skills ³		

¹An advanced biology requirement of two courses should be selected from among cell biology, microbiology, genetics and molecular biology. Because of variation in course content among different colleges and universities, we expect that the student will be exposed to the material traditionally covered in these courses without having to formally study all of them.

²Students who are planning graduate work should be required to participate in research.

³Skills in statistics, computer science and written and oral communication are required in the biochemistry curriculum. These need not be separate courses if the topics are integrated in other course work.

ments and administrators of the suitability of the ASBMB recommended degree. Based on the number of calls and letters requesting information about this degree, we predict that the number of undergraduate biochemistry programs will continue to increase rapidly.

Send comments to: Rodney F. Boyer, Department of Chemistry, Hope College, Holland, MI 49423-3698, USA; or James K. Zimmerman, Department of Biological Sciences, Clemson University, Clemson, SC 29634-1904, USA.

Rationale:

Considering the case made by the Academic Policy Committee for a revision of letter grades and quality points to make them more consistent with standardized systems used by most other colleges,

Resolution:

Be it resolved that the Faculty Senate approve the Academic Policy Committee proposal to revise letter grades and quality points.



Old Westbury

DATE: December 7, 1992

TO: Professor Runi Mukherji
President
Faculty Senate

FROM: Thomas DelGiudice
Chair
Academic Policy Committee

SUBJECT: PROPOSAL FOR REVISION OF OUR
LETTER GRADES and QUALITY POINTS

In the Spring of 1992 it was brought to the attention of the Academic Policy Committee by Professor Robert M. Hoyte that there are inequities in the ranges between quality points assigned for letter grades in our current grade system. For example, a student with a B+ grade earns 0.50 points per credit more than a student with a grade of B, while a student with an A- only earns 0.25 points per credit more than the student with B+. Similar inequities exist for - and + grades associated with C and D grades. The scale in the current catalog is reproduced below on the left with a proposal for a new scale to be found on the right:

Current Quality Points

A = 4.00
A- = 3.75
B+ = 3.50
B = 3.00
B- = 2.75
C+ = 2.50
C = 2.00
C- = 1.75
D+ = 1.50
D = 1.00
D- = 0.75
F = 0.00

Proposed Quality Points

A = 4.0
A- = 3.7
B+ = 3.3
B = 3.0
B- = 2.7
C+ = 2.3
C = 2.0
C- = 1.7
D+ = 1.3
D = 1.0
D- = 0.7
F = 0.0

The current scale of grades and quality points is inconsistent internally as well as with other colleges and universities. The proposed scale has a more uniform interval of 0.3 to 0.4 quality points between all grades except for F and is consistent with grading systems used by many other colleges. And, as pointed out by Dr. Hoyte, is consistent with standardized systems used by many professional schools to compare applicants from diverse

undergraduate schools. The Academic Policy Committee is recommending to the Faculty Senate that the proposed scale be adopted and be implemented in 1994 when our new computer system comes on line. We would also like to thank Professor Hoyte for his help on this matter.

cc: K. Hall, Academic Affairs
R. Welton, Academic Affairs
R. M. Hoyte, Chemistry & Physics

TD:lh