

BOARD OF HIGHER EDUCATION
REQUEST FOR COMMITTEE AND BOARD ACTION

COMMITTEE: Assessment and Accountability **NO.:** AAC 08-13
COMMITTEE DATE: April 17, 2008
BOARD DATE: April 25, 2008

MOVED: The Board of Higher Education hereby approves the application of **University of Massachusetts Lowell** to award the **Bachelor of Science in Nutritional Science**.

All program descriptions and publications must indicate that the degree does not qualify the student to sit for licensure in dietetics.

One year after graduating the program's first class, the institution shall submit to the Board a status report addressing its success in reaching program goals as stated in the application and in the areas of enrollment, curriculum, faculty, resources, and program effectiveness.

Authority: Massachusetts General Laws Chapter 15A, Section 9(b)
Contact: Aundrea Kelley, Associate Vice Chancellor for Academic Policy

BOARD OF HIGHER EDUCATION

April 2008

University of Massachusetts Lowell

Bachelor of Science in Nutritional Science

INTENT

The University of Massachusetts Lowell (UML) has submitted an expedited proposal to offer a Bachelor of Science in Nutritional Science (BSNS) in the department of Clinical Laboratory and Nutritional Sciences (CLNS). The BSNS will provide a program for students seeking a college degree in Nutritional Science that emphasizes research and policy development in clinical nutrition. A preliminary application was submitted to the President's Office in November 2005, and authorization to proceed with the development of final proposal was given by the President's Office in December 2005. The proposal has been approved by all necessary levels of campus governance and is supported by the Chancellor and Provost. It was approved by the University's Board of Trustees Committee on Academic and Student Affairs on February 25, 2008, and received full approval by the Board of Trustees on March 19, 2008.

The purpose of the proposed BSNS program is to develop a regionally and nationally recognized program that: (1) is at the intersection of nutrition, clinical and analytical chemistry, and research; (2) will be readily accessible throughout the Commonwealth to individuals that want to graduate with a degree that encompasses many different disciplines addressing contemporary biomedical/health research problems; and (3) will contribute significantly to meeting the workforce needs of a larger number of economically important allied biomedical industries in Massachusetts. Students graduating from the proposed BSNS program will have an integrated knowledge base in research development, laboratory work experience, the health care industry, and nutrition, which will allow them to work in an interdisciplinary team.

Currently, CLNS offers a B.S. degree in Clinical Laboratory Sciences with 3 options: (1) Medical Technology, (2) Clinical Sciences, and (3) Nutritional Science. The option in Nutritional Science was started in September 2001 and has continuously grown since its inception. The Commonwealth's Licensing Board of Nutritionists and Dieticians lobbied that the new program be called a Nutritional Science program to better reflect the nature of the education and training provided to its students, rather than a degree that reflects the undergraduate discipline of Laboratory Medicine/Clinical Pathology.

The University believes that the proposed BSNS program will enhance existing program recognition and involvement within the University's, School's, and Department's missions compared to the current Nutritional Science option.

NEED AND DEMAND

Employer Demand

The Bureau of Labor Statistics expects that employment of dietitians and nutritionists will increase 9 percent during the 2006-16 projection decade, about as fast as the average for all occupations.

The proposed BSNS program will prepare students for careers in nutritional science, nutrition education, and biomedical sciences. Some of the career opportunities for students graduating from the proposed BSNS program will include: (1) working for the food industry in quality assurance laboratories, research, or in food product development, (2) technical services and/or sales for food ingredient suppliers or for food processing equipment manufacturers, (3) food regulation and inspection for state or local agencies, the federal government or international organizations, (4) working with a research team in pharmaceutical or biotechnology industries, medical centers or universities, and (5) preparation for graduate school to earn a M.S. or Ph.D. in nutrition, which can lead to careers in teaching, research, public health or private industry or apply to medical school or other health-related fields.

Student Demand

This application is aligned with proposed changes generated by a self-study undertaken by the previous College of Health Professions at UML as part of the restructuring of the college into the current School of Health and Environment. The self-study recognized the need for an undergraduate program that focused on Nutritional Science as a research and development discipline that is distinct from existing programs in the Commonwealth, where the primary emphasis is on dietetics, food service management, and clinical nutrition practice.

The majority of the students who would be served by the proposed BSNS at UML would be traditional non-minority students, with some ethnic diversity as seen throughout UML due to students coming from Lowell and Lawrence. Currently, four minority students are enrolled in the Nutritional Science option in CLNS. UML expects that the proposed BSNS program will attract many non-traditional students because: (1) the nutrition certificate currently serves this group, and many of these non-traditional students have expressed interest in changing careers, and (2) the field of nutrition has changed and developed over the last five to ten years with the increase of many chronic diseases, especially obesity.

Program Duplication

After UML faculty researched other nutrition programs in colleges and universities in the Commonwealth of Massachusetts and interviewed faculty in these other programs, they concluded that the proposed BSNS program is not duplicative of other programs in the Commonwealth. The UML BSNS program does not focus on training Registered

Dietitians (RD), as do many others, but instead focuses on research and development careers in health sciences and/or training students to be eligible for licensure within the state and are able to compete for a tier of state-wide positions needing a nutrition background without the recognized RD credential.

UMA currently has an undergraduate program in nutrition leading to a B.S. degree in Human Nutrition and requiring a post-graduate Dietetic Internship at a hospital or medical center. The UMA program differs greatly from the proposed BSNS because the UML program emphasizes research, analytical chemistry and clinical laboratory courses as part of the major area of Nutritional Science and will not include courses that will prepare its graduates to become registered dietitians.

Framingham State College currently offers three options within the B.S. degree in Food and Nutrition within the Department of Consumer Sciences: (1) Nutrition and Dietetics, (2) Coordinated Program in Dietetics, and (3) Applied Nutrition. The [Nutrition and Dietetics](#) concentration is very similar to the B.S. degree program at UMA without the internship. The Coordinated Program in Dietetics concentration combines academic courses and supervised practice experience requirements of the ADA into a two-year sequential program, which is similar to the DPD program at UMA. The [Applied Nutrition](#) concentration is for students who do not plan to pursue requirements for the national Registration Exam for Dietitians. These students enrolled in the Applied Nutrition concentration take basic science courses in chemistry and biology in addition to a core of food and nutrition courses that provide a general background in nutrition and health, community nutrition, and foodservice management. Students choose a minor that provides an area of specialization. The proposed BSNS at UML would be somewhat similar to the Applied Nutrition concentration at Framingham State College, as far as the basic science course work and requirements, but would offer many different courses, especially in the area of clinical and analytical laboratory nutrition and applied nutritional science research.

Simmons College currently offers a B.S. degree in Nutrition with two different options: (1) Food Science and Nutrition and (2) Dietetics. The Food Science and Nutrition program is similar to the Applied Nutrition concentration that exists at Framingham States College, and the basic science courses that would be a part of the proposed BSNS at UML. However, the upper-level undergraduate course work would be very different in the area of clinical and analytical laboratory nutrition and applied nutritional science research. The [Dietetics](#) concentration at Simmons College is very similar to the B.S. degree programs in dietetics at the UMA and Framingham State College because these students are eligible for the dietetics internship and the RD exam. Again, students majoring in the proposed BSNS will not be eligible for the dietetic internship or the RD exam.

ADMISSION AND ENROLLMENT

2001 was the first year of the NS option in the CLNS Department at UML, and it attracted seven full-time students. Currently, there are 18 full-time students enrolled; three seniors, eight juniors, five sophomores, and two are freshmen. Also, another eight students are enrolled part time in the nutrition certificate program, which was developed as a feeder program to the full-time undergraduate option.

The University estimates approximately 25 students will enroll in the proposed BSNS program at UML in September of 2008. Approximately eight will be in their senior year, five to seven will be in their junior year, two to five will be in their sophomore year, and two to five will be in their freshmen year. UML also expects to see an increase in student enrollments across the sophomore and junior classes in each of the first three years from approximately ten students during the first year of implementation to eventually 20 students in each of the senior, junior and sophomore classes after three years of the implementation of the proposed BSNS.

The majority of these new students are expected to come from the northeast region of Massachusetts and the south-central region of New Hampshire. Other new students may come as transfers from other schools, including community colleges, junior colleges, and private universities.

CURRICULUM (Attachment A)

Attachment A includes the Curriculum outline of courses for the proposed BSNS program. The curricular program was designed to conform to three criteria. First, there is a set of general requirements for a degree established by UML: 120 total credits, including the General Education Course requirements. Second, there are the specific course requirements leading to the B.S. degree in Clinical Laboratory Sciences in the Nutritional Science option that already exists and will remain after implementation of the proposed B.S. degree in Nutritional Science. These components total approximately 84 credits.

RESOURCES AND BUDGET (Attachment B)

The Department of Clinical Laboratory and Nutritional Sciences consists of 11 full-time faculty, three full-time professionals, and several clinical and adjunct faculty. No additional faculty and staff, facilities, equipment, and library resources are necessary to offer the proposed BSNS in September of 2008, since the option in Nutritional Sciences is already an existing program at UML. However, by the year 2010, when UML expects 20-25 students per class to be enrolled in the proposed program, they would need one-two additional full-time faculty, two-three more full-time staff and two-three rooms of laboratory space for full-time faculty to perform research with students enrolled in

Directed Study and Senior Research courses and to increase external funding the program.

UML does not expect that additional equipment purchases or library resources will be necessary for the implementation of the proposed B.S. degree in Nutritional Sciences in September 2008 or when steady-state is achieved in September 2011. Currently, the student laboratories for Anatomy and Physiology, Physiological Chemistry, Clinical Chemistry, Organic Chemistry, and Clinical Laboratory Instrumentation are all equipped with the needed up-to-date instruments and supplies for students enrolled in the proposed BSNS. Moreover, the research laboratories within the proposed BSNS are also equipped with the needed-up-to-date instruments and supplies for students who will be enrolled in the proposed program by September 2008 and 2011.

The majority of funding for the proposed BSNS at UML will be through the University's internal budget. However, since the proposed program is already in existence at the University, it is believed that no additional funding other than already provided to the Department of Clinical Laboratory and Nutritional Science through the School of Health and Environment will be needed for the successful implementation of the proposed program.

The University submitted a revenue and expense budget for the proposed program contained in Attachment B.

PROGRAM EFFECTIVENESS

The University will use the following quantitative measures as indices of the five-year success of the proposed BSNS. These outcomes are typically reported at the end of each academic year.

- The number of completed applications received at the beginning and over the five-year period, using the University's People Soft student module to track campus enrollment;
- The number and diversity of men and women accepted into the program;
- The average SAT score (quantitative and verbal) of applicants accepted versus all applicants;
- The average undergraduate grade point average of all students enrolled in the program at the end of each semester until graduation;
- The number of accepted applicants who matriculate in the program (goal: steady state number of 25/year);

- The number of graduates receiving the B.S. degree beginning after the first five years (goal: steady state number of 20/year);
- Exit interviews and satisfaction surveys conducted for all individuals who complete the program;
- The percentage of graduates remaining in Massachusetts after graduation (goal: 85 percent);
- The percentage of graduates successfully placed in jobs after graduation (goal: 100 percent).

EXTERNAL EVALUATION

Drs. Joanne Curran-Celentano, Professor, Animal and Nutritional Sciences, University of New Hampshire; and Teresa Fung, Associate Professor of Nutrition, Simmons College, reviewed the proposal for the BSNS program. The reviewers wrote: “The department is uniquely situated for training technically competent students with an understanding of the science of nutrition and the skills of the laboratory clinician...the strength of this program is the sophisticated training in laboratory assessment in nutritional sciences. The graduate who successfully completes the nutritional sciences and laboratory science courses with directed research experience in close collaboration with the excellent faculty in the program will likely be competitive for positions in the biomedical research industry.” The reviewers made thoughtful constructive suggestions for further improvements in the program design and the campus has responded to these suggestions.

In particular, the reviewers expressed a concern that the proposed curriculum for BSNS does not fulfill the pre-professional requirement for the American Dietetic Association or pre-medical application. The Department responded that, based on several examples in past experience, they expect their qualified Nutritional Science graduates who have met the necessary medical school requirements will also be qualified to apply to medical schools. Moreover, the Department expects that future Nutritional Sciences students who are interested in Medical School will be advised by both the Department faculty and the University Pre-Med Advisor about all requirements in a timely manner.

Lastly, the reviewers expressed concern about the availability of community programs for work study and/or internships for students in the BSNS program. The CLNS Department responded that some faculty members are currently working on making community internship placements with Directors of the Greater Lowell WIC program, the Greater Lowell CTI Headstart program, and the Lowell General Hospital Weight Loss Counseling program. In addition, the Department remarks that their Nutritional Science students work in a variety of community-related research projects with the Nutritional Science faculty for the directed study and senior research courses.

STAFF ANALYSIS AND RECOMMENDATION

After careful review and deliberation of the proposal and all supporting documentation, staff recommendation is for approval of the Bachelor of Science in Nutritional Science at University of Massachusetts Lowell. Staff at the Department of Higher Education agrees that this program is central to the mission of the University of Massachusetts Lowell, serves an important workforce need in the region and state, and represents a logical programmatic development for the campus that is well supported with current resources.

All program descriptions and publications must indicate that the degree does not qualify the student to sit for licensure in dietetics.

One year after graduating the program's first class, the institution shall submit to the Board a status report, addressing its success in reaching program goals, as stated in the application and in the areas of enrollment, curriculum, faculty, resources, and program effectiveness.

Attachment A – Curriculum Outline for BSNS
University of Massachusetts Lowell

Major Required (Core) Courses (# Total courses required = 10)		
Course Number	Course Title	Credit Hours
36.371	Advanced Human Nutrition	3
36.372	Obesity and Weight Control	3
36.406	Biochemistry of Lipids	3
36.463	Vitamins and Minerals	3
36.465	Laboratory Methods in Nutr. Assess.	3
36.472	Nutrition and Gene Expression	3
36.481	Clinical Nutrition	3
36.483	Senior Research	2
36.494	Directed Studies	3
36.496	Senior Research in Nutrition	3
	Subtotal Core Credits	29
Other Required Courses in Related Subject Areas (# Total courses required =23)		
Course Number	Course Title	Credit Hours
31.202	Community Health and Environment	3
31.303	Contemporary Health Problems	3
31.304	Politics of Health	3
31.305	Intro to Epidemiology	3
35.101	Anatomy and Physiology I	3
35.102	Anatomy and Physiology I Lab	1
35.103	Anatomy and Physiology II	3
35.104	Anatomy and Physiology II Lab	1
35.206	Human Nutrition	3
35.211	Microbiology and Pathology	3
35.213	Microbiology and Pathology Lab	1
35.251	Physiological Chemistry I	3
35.253	Physiological Chemistry I Lab	1
35.252	Physiological Chemistry II	3
35.254	Physiological Chemistry II Lab	1

35.435	Medical and Clinical Genetics	3
36.341	Organic React. and Structure	3
36.343	Organic React. and Structure Lab	1
36.350	Human Biochemistry	3
36.351	Clinical Chemistry I	3
36.353	Clinical Chemistry I Lab	2
36.361	Clinical Lab Instrumentation	3
36.363	Clinical Lab Instrument Lab	2
	Subtotal Related Credits	55
Elective Courses (# Total courses required = 2)		
Course Number	Course Title	Credit Hours
	Elective	3
	Elective	3
	Subtotal Elective Credits	6
Distribution of General Education Requirements		# of Credits
Attach List of General Education Offerings (Course Numbers, Titles, and Credits)		
Arts and Humanities, including Literature and Foreign Languages		15
Mathematics and the Natural and Physical Sciences		6
Social Sciences		9
Subtotal General Education Credits		30
Curriculum Summary		
Total number of courses required for the degree		45
Total credit hours required for degree		120

Attachment B: New Program Budget Form
University of Massachusetts Lowell
Proposed Program:
BS in Nutritional Sciences

<i>One-Time Costs</i>		<i>Annual Operating Costs</i>		
		Description	Number	Cost
0	Faculty	11 full-time Department faculty, 3 in the NS program	11 FT	\$1,084,277
		Part-time faculty	20	\$212,000
		Teaching Assistants	3-4	\$43,800
0	Staff	Full-time staff who prep and teach labs	4	\$276,745
0	Instructional Materials (Includes library resources)	Teaching supplies, lab supplies, repair, maintenance, small equipment, Educational materials		\$79,200
0	Space	Teaching labs, research labs, lecture halls, classrooms	6 3 3 1	No cost to the department
0	Equipment	pH meters, spectrophotometers, HPLC equipment, PCR, centrifuges, etc.		\$125,000
0	Field & Clinical Resources	Internship site visit travel		\$2000
	<i>Total Costs:</i>			\$1,823,022