BOARD OF HIGHER EDUCATION

REQUEST FOR COMMITTEE AND BOARD ACTION

COMMITTEE: Assessment and Accountability **NO**.: AAC 10-10

COMMITTEE DATE: March 16, 2010

BOARD DATE: March 16, 2010

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

One year after graduating the program's first class, the University 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: Francesca B. Purcell, Associate Commissioner for Academic and P-16 Policy

BOARD OF HIGHER EDUCATION

March 2010

University of Massachusetts Lowell

Bachelor of Science in Environmental Health

INTENT

The University of Massachusetts Lowell (UML) submitted an expedited proposal requesting approval to offer the Bachelor of Science in Environmental Health. Environmental health is a branch of public health that studies the effects of the environment on human health; the effects of human activities on the environment; and the ways to identify, assess, and address adverse health effects and promote public health and sustainable development. Environmental health professionals ensure safe food, safe drinking water, air quality, adequate sanitation, and emergency response, and address communicable disease outbreaks and chronic disease.

The purpose of the proposed program is to develop a regionally and nationally recognized program that prepares students for careers or graduate studies in the field of environmental health. It intends to provide students with: (1) a foundation in environmental health science and practice; (2) an understanding of the social, political, scientific, and economic underpinnings of environmental health problems, solutions, and practices; (3) research, critical thinking, and communications skills; and (4) pragmatic training and field experiences. The proposed program is practice/career-based in that students will work closely with environmental health agencies and complete a 32-hour per week internship in their senior year. It will prepare professionals for a broad range of careers in government, industry, and the non-profit sector.

The proposed program will build extensively on the current concentration in community health offered through the Department of Community Health and Sustainability. As a major, the proposed program will seek to gain accreditation through the Environmental Health Sciences and Protection Accreditation Council (EHAC). The proposed degree program, if approved, will include a five-year B.S. to M.S. option coordinated with the Department of Work Environment, which will permit students to pursue graduate environmental and occupational health studies.

The proposal has been approved by all necessary levels of the University of Massachusetts Lowell campus governance and is supported by the Chancellor and Provost. A preliminary application was submitted to the University of Massachusetts President's office in August 2008, and authorization to proceed with the development of the final proposal was given by the President's office in September 2008. It was approved by the University's Board of Trustees Committee on Academic and Student Affairs on November 18, 2009, and by the Board of Trustee on December 10, 2009.

MISSION

UML seeks to discover, integrate and transmit knowledge for the benefit of the Commonwealth and the good of society. UML's School of Health and Environment's mission is to "promote human health and development that enable people to live in safe and productive communities and environmentally sustainable economies." Consistent with this mission and the University's emphasis on the development of sustainable technologies and communities, the program seeks to prepare students with a broad understanding of the complex etiology of environmental health problems and the interdisciplinary nature of solutions.

The Department of Community Health and Sustainability in the School of Health and Environment offers science-based programs that prepare individuals to become public health professionals, health care managers, and researchers working to create a sustainable future. The proposed degree program will increase the Department's recognition and capacity for collaboration between the Departments of Community Health and Sustainability, Work Environment, and other campus departments.

NEED AND DEMAND

The field of environmental health is in a state of growth with new federal, state, and private investment in "clean tech" and renewable energy. Nationally, the U.S. Department of Labor's Bureau of Labor Statistics projects a 28 percent increase in professions categorized as "environmental health science and protection technicians, including health." They include this category among the 30 fastest-growing job categories in the U.S. Additionally, the Centers for Disease Control and Prevention estimate that as many as half of current environmental health practitioners will retire within the next ten years, resulting in a further need for environmental health professionals. As these positions fulfill legally required functions, it is unlikely that a significant percentage of them will be eliminated due to local and state budget deficits.

Of the undergraduate environmental health programs in the United States, the Association of Environmental Health Academic Programs estimates that more than 90 percent of the graduates who seek jobs find one at graduation. These skilled, career-path jobs exist in local health departments, state and federal environmental and public health agencies, non-profit advocacy organizations, consulting firms, and private industry.

There are no other programs similar to the proposed degree in environmental health at UML, within the University of Massachusetts system, or in the region surrounding UML. While environmental science and environmental studies undergraduate programs at UMass and in the region may include some environmental health content, there are no undergraduate programs dedicated to training environmental health professionals. Moreover, this will be the only program actively seeking accreditation from the Environmental Health Science and Accreditation Council. Graduation from an accredited program is required for some U.S. Centers for Disease Control and Prevention fellowships to practice environmental health in some locations (including internationally) and will increasingly be a prerequisite as the field becomes more credentialed.

A 2008 survey of Massachusetts' high school science coordinators (sent to about 65 coordinators with 20 responses) showed a direct interest in environmental health issues among high school students. Among the high school coordinators, 85 percent of respondents answered that 5 to 10 percent of their students might be interested in a degree in an environmental science or environmental health degree. The remaining 15 percent said that 10 to 15 percent of students would be interested. The primary reasons given for potential student interest in this degree are good job opportunities and an interest in environmental issues. A majority of the coordinators said that their students would be interested in attending UML. The primary reasons given were: (1) excellent reputation, (2) proximity, and (3) cost-effectiveness. Further discussions with high school teachers, educators with the Tsongas Industrial History Center, and other secondary education experts have indicated that there is a strong interest in environment and health among high school students, particularly those in vocational technical schools offering career/education tracks in natural resources and in health.

UML notes that there is increased interest in environmental health among incoming first-year and transfer students in the School of Health and Environment. This is strongest among

students taking the freshman general education community health and environment course, particularly among undeclared health students looking for the best degree path. UML expects undeclared health and liberal arts students to be a significant source of students into their program. (Currently, there are more than 100 undeclared health students.) Further, UML will continue to build articulation and research/teaching agreements with regional community colleges that will help provide a source of potential students.

ADMISSION AND ENROLLMENT

Admission
Students who want to enroll in the proposed B.S. degree in Environmental Health must meet the minimum qualifications for all students wishing to be admitted to UML. Students who contemplate transferring to the proposed B.S. degree in Environmental Health will need, as a minimum, a cumulative grade-point average of 2.70 on a 4.00 scale for all previous course work attempted. Transfer applicants for the proposed B.S. degree in Environmental Health will also be required to have achieved a minimum of 2.50 in their science courses. Students who meet school requirements but do not meet program requirements may obtain undeclared health status as they wait for acceptance into the major.

To qualify for continued matriculation in the proposed B.S. degree in Environmental Health, all students must maintain a 2.70 overall cumulative average or better and 2.50 cumulative average or better in their required science courses. Students who fail to satisfy these academic requirements may be placed on probation or dismissed from the program.

Enrollment
UML intends to enroll ten students into the first-year class and will have five students entering their senior year in the existing Environmental Health Concentration of the Community Health B.S. and five students entering their junior year in that option. UML anticipates total program size by the end of their fourth year of operation (spring 2014) will be at least 60 students. UML's recruitment strategy will focus on reaching out to regional high school students, transfer and undecided undergraduate students, and non-traditional students entering college for the first time or looking for a career change. Anticipated articulation agreements with community colleges in the area will enable UML to recruit a steady set of students who will enter the program in the third year of study (junior). Partnerships with minority worker training programs and the Lawrence and Lowell school systems will provide the new Environmental Health B.S. program with opportunities for student recruitment in communities of color.

The Department of Community Health and Sustainability will strive to retain enrolled students through innovative teaching and learning strategies and strong attention to individual student needs. The Department will work closely with students, particularly from underrepresented populations, to ensure their on-going success in the program and address any issues of academic performance at an early stage. The Environmental Health B.S. program will build a "community" of faculty, students and staff through regular student seminars, meetings, and activities (including field and leisure experiences); a one-on-one relationship with advisors in crafting a program of electives that fits professional and student needs; and regular engagement with stakeholders in the field.

CURRICULUM (Attachment A)

The course offerings and the list of course requirements for the proposed B.S. degree in Environmental Health were developed based on extensive discussion with Department of

Community Health and Sustainability and Department of Work Environment faculty, other UML faculty, the Association of Environmental Health Academic Programs, and local public health officials. The curriculum will meet the requirements for accreditation through the Environmental Health Science and Protection Accreditation Council. The course offerings contain four basic elements:

1. General requirements for a degree established by UML: 120 minimum total credits, including General Education Requirements;
2. Core foundational science, social science, and humanities courses for the major;
3. Environmental health core and detailed content and field courses;
4. Electives to build detailed understanding of specific areas of interest. These electives, at least one of which must be a science-based and one a social science or humanities-based course, will be chosen with the advisor so that each student's course of studies is tailored to his/her interests, future career directions and needs.

Two options will be available for students to from which to choose:

a. A 120-credit B.S. in Environmental Health Option
b. A 126-credit B.S. to M.S. in Environmental Health Option

Students will be also required to complete a non-credit 40-hour Hazardous Waste Worker Training Program (including disaster preparedness and emergency response planning) through the New England Consortium. Course completion provides students with a Hazardous Waste Worker certification.

Specific knowledge and skills that students should acquire upon graduation that will prepare them for an environmental health career or graduate studies include the following:

- Foundations in sciences (physics, anatomy and physiology, physiological and organic chemistry and microbiology) and environmental health science;
- Foundations in the social, legal, and political aspects of environmental health;
- Foundations in written and oral expression;
- Research and critical analysis skills;
- An ability to understand and work with a range of community organizations in assessing and solving environmental health problems.

The Department of Community Health and Sustainability at UML has working agreements with a number of local and regional community organizations and agencies that provide service learning and practicum opportunities for the students enrolled in the Environmental Health concentration. These sites will also be available as placement opportunities for students in the proposed B.S. degree in Environmental Health.

Current service learning and practicum partners include:

- Stonyfield Farms, New Hampshire
- New Balance, Massachusetts
- Lowell Health Department
- Methuen Health Department
- Danvers Health Department
- Westford Health Department
- Tewksbury Health Department
- Alliance for a Healthy Tomorrow/Clean Water Fund, Boston, Massachusetts

- Corporate Accountability International, Boston, Massachusetts
- Massachusetts Department of Public Health, Boston, Massachusetts
- Lowell General Hospital
- New England Consortium, UMass Lowell–Hazardous Waste Worker/Emergency Responder Health and Safety Training Program.
- Lowell Center for Sustainable Production, UMass Lowell
- Massachusetts Toxics Use Reduction Institute, UMass Lowell
- Andover High School
- Center for Family, Work, and Community, Healthy Homes Project, UMass Lowell

Potential new partners include the U.S. Environmental Protection Agency, Massachusetts Department of Environmental Protection, additional municipal health departments, other local businesses, and other local community groups. Students will also be eligible and highly desirable for several summer internship programs, including the national Occupational Health Internship Program (supported by the National Institute for Occupational Safety and Health) and the summer environmental science internship programs of the National Institute of Environmental Health Sciences.

RESOURCES AND BUDGET (Attachment B)

Administration
The School of Health and Environment is organized into five departments and is administered by a dean who is assisted by the department chairs. The Department of Community Health and Sustainability consists of nine full-time faculty and has no dedicated administrative support personnel. Dr. Joel Tickner coordinates the current environmental health concentration and will collaborate with other department faculty to coordinate the proposed program. Existing college and department staff and administrative resources are assumed to be sufficient to meet the new program's needs for the four-year period.

Faculty
Most faculty teaching core courses in the proposed program will be from the Department of Community Health and Sustainability and the Department of Work Environment. They will be supported by faculty from the following departments who will teach program-required courses and electives: Clinical Laboratory and Nutritional Science; History; Political Science; Environmental, Earth and Atmospheric Sciences; Biological Sciences; Philosophy; English; Psychology; and Sociology. UML will hire a full-time, tenure-track faculty member—an environmental health scientist with field/practical experience in public health, who will teach a sampling and analysis course and wet laboratory sections of other courses. This position will complement faculty research with exposure analysis capacity. The attached budget includes search expenses but not startup costs, as these will be determined based on the rank and resource needs of the successful candidate. The salary is assumed for a hire at the Assistant Professor level and a fringe rate of 30 percent. The anticipated start date is January 2011. Annual contractual salary increases have not been included in this estimate. Depending upon program success, another faculty hire will be required between the program's fifth and seventh years. UML anticipates needing to supplement teaching resources with adjunct teaching provided by local environmental health experts. UML estimates that up to one course per semester will be taught by these adjuncts, who will sustain teaching capacity as core faculty need to be temporarily replaced due to sabbatical leave and course release for research.

Library
UML library buildings include O'Leary Library on South Campus, Lydon Library on North Campus, and the Center for Lowell History in downtown Lowell. The proposed Environmental Health B.S. program would likely use the South Campus O'Leary Library and North Campus Lydon Library facilities. These facilities have a collection of textbooks, periodicals (both print and electronic), microfiche, CD-ROMs and Internet search engines, and other Internet tools in all areas of health sciences taught in the School of Health and Environment. Both libraries house media service centers, with the largest being in O'Leary Library. The Department of Community Health and Sustainability has purchased video and audio production equipment that is shared with the O'Leary Media Services Center with priority availability for students in the Department and which is then available for all other students.

One librarian is assigned as a liaison and resource person for the School of Health and Environment. This person is available for research help, as well as for assisting in student education concerning use of the library's resources, including electronic databases, interlibrary loan, and Media Services.

Facilities
UML will require a wet laboratory for teaching sampling and analysis and food safety laboratory sections. Existing School of Health and Environmental laboratory space will be sufficient within the program's first two to three years. If growth exceeds capacity, the Environmental Health program will require dedicated space as early as the program's third year. An environmental health scientist hired into the program for fall 2013 will require laboratory facilities for her/his research. Should that be needed, UML anticipates startup costs for a new lab facility not exceeding $25,000.

UML will need an increase in the Department's equipment budget for sampling, analytical, and computer equipment. Initially, existing resources will be used to purchase enough equipment to start the program. As enrollment increases, additional equipment will need to be purchased annually. UML will also need this additional budget for equipment repair and maintenance, requiring an annual equipment budget increase of $3,000 to $5,000.

Estimates for instructional materials, equipment, and field resources are based on those for other science-based health programs within the SHE (nutrition, exercise physiology, nursing) and adjusted for anticipated student enrollment and specific program requirements.

PROGRAM EFFECTIVENESS

Student-Related Goals:
- Prepare graduates to successfully complete graduate school or seek employment in the environmental health field (goal of 100 percent placement);
- Prepare professional practitioners who will be able to provide environmental health services that will assist communities in maintaining a better quality of life;
- Prepare students to successfully pass the Registered Sanitarian Exam;
- Publish at least one abstract of their research or work in a student research forum;
- Attend/participate in at least one regional/national professional society meeting.

Program/Campus-Related Goals:
- Increase the number and quality of students applying to and accepted into the program;

- Create an interdisciplinary network of faculty and professionals who teach and serve as internship preceptors;
- Graduate the first group of B.S. recipients in Environmental Health in May 2013 and first B.S.-to-M.S. students in May 2014;
- Increase the amount of extramural research funding secured by Department faculty to support the student research projects and internships;
- Increase the number of service learning projects/internships available to undergraduates;
- Develop enhanced linkages to UMass Amherst and Worcester in environmental health teaching, service, and research.

STUDENT LEARNING OUTCOMES

Upon completion of the B.S. degree program in Environmental Health, UML expects that graduates will be able to:

- Have a core understanding of environmental health problems and their causes;
  - Understand basic principles of environmental systems and their relationship to health, such as air and water
  - Understand fundamental impacts of human activities on human and environmental health and the processes by which these activities cause damage

- Understand the relationship between environmental and workplace exposures and acute and chronic disease in humans;
  - Understand the complexity of social, environmental, and genetic factors in disease etiology
  - Understand the following environmental health problems, their sources, and implications for human health:

    - Indoor and ambient air pollution
    - Global climate change
    - Overpopulation
    - Natural disasters
    - Bioterrorism
    - Noise
    - Radiation
    - Water pollution – surface, ground water, and drinking water
    - Hazardous and solid waste
    - Pests and pesticides
    - Toxic substances
    - Food contamination
    - Infectious and communicable disease
    - Occupational illness

- Apply knowledge from physiology, chemistry, toxicology and epidemiology to understand the physiological processes involved in environmentally related illness;
  - Describe and analyze approaches to the study of environmental health impacts, particularly epidemiological and toxicological research

- Understand options and tools for the evaluation of and prevention of local environmental health problems;

- Understand basic field investigation, risk assessment and alternatives assessment concepts
- Be able to apply tools for mapping environmental health problems and sampling environmental media
- Understand basic principles of emergency/disaster response and environmental clean-up
- Understand the functioning of and potential problems with basic environmental health infrastructure, such as waste water treatment plants, water treatment facilities, wells, septic systems, landfills, air pollution control systems, and incinerators
- Be able to conduct a restaurant food safety inspection
- Be able to conduct a beach/pool inspection
- Be able to conduct an indoor air quality inspection
- Be able to assess Integrated Pest Management options
- Be able to conduct a septic system and well inspection
- Be able to conduct a pollution prevention/waste reduction audit.

- Identify prevention strategies for a range of environmental health problems, including the pros and cons of various control technologies and approaches
  - Competently solve environmental health problems, applying critical analysis and reasoning skills;

- Address environmental health concerns with different stakeholder groups;
  - Appropriately communicate risk information to different stakeholder groups;
  - Utilize verbal and written communication skills effectively for diverse audiences

- Understand the economic, historical, and political/legal contexts of environmental health problems and solutions;
  - Understand the daily operations of an environmental health agency
  - Understand the historical underpinnings of past and current environmental health problems

- Be able to identify and access resources for researching environmental health problems;
  - Understand the basic steps of the research process and different types of environmental health research
  - Be able to critically evaluate research
  - Be able to conduct literature review on scientific peer-reviewed journal and government literature and discriminate scientifically valid and less reputable sources;

- Study for and pass the Registered Sanitarian exam;
- Successfully undertake graduate study in an environmental health field;
- Initiate work in local public health with minimal on-the-job training;
  - Utilize scientific and other knowledge with current methodology, tools and techniques relevant to the performance of service.

EXTERNAL REVIEW AND INSTITUTIONAL RESPONSE

The Review Committee consisted of:

- Len Broberg, Ph.D., J.D., Professor and Director, University of Montana, Environmental Studies Program;

- Barbara Sattler, RN, DrPH, FAAN, Professor and Director, Environmental Health Education Center, University of Maryland School of Nursing; and
- Larry Ramdin, MA, REHS, CHO, President Massachusetts Environmental Health Association and Health Services Administrator, Reading Health Division.

Following a review of the proposal, Committee members had meetings with faculty and administrators at UML, discussions with current students and alumni of the Department of Community Health and Sustainability, and reviewed other similar programs across the United States.

Findings
The review team found that "the proposed Environmental Health Bachelor of Science degree program, housed in the Department of Community Health and Sustainability within the School of Health and Environment, is very sound academically and fills substantial need for government, industry and non-profits" and summarized its findings as follows:

1) *Consistence with Relevant Academic Standards:* We find the proposed Environmental Health degree program meets or exceeds all applicable academic standards.

2) *Appropriateness to Institutional, Segmental, and System Missions and Priorities:* Environmental Health is a well-recognized field of study with concrete professional structure, reflected by the existence of well-established national and state-based professional associations and accreditation standards. The program is consistent with those at other universities and meets professional training needs. The curriculum provides the basic training necessary to produce well-qualified professionals in the field and meets the criteria necessary to achieve accreditation.

3) *Need:* The program meets a dire need for professional training in the state, region and nationally. There is no other environmental health undergraduate degree offered in Massachusetts or the New England region. It is anticipated that, in the near future, half of the environmental health professionals will retire, creating very high demand for qualified graduates to fill those positions. In addition, current trends likely will create new jobs in the field.

4) *Ability to Mount the Program:* The proposal is cogent and realistic, and the Department of Community Health and Sustainability, Department of Work Environment, School of Health and Environment, and UMass Lowell have existing programs of very high quality to serve as a base for the program. Environmental health is a natural extension of existing faculty expertise, and the departments named above have extensive experience with closely related programs. The Department of Community Health has offered bachelor-degree programs for many years successfully and is well equipped to do so successfully in this area as well.

5) *Resources:* There are adequate resources in place currently to support initiation of the program. Enrollment growth projections appear very reasonable or understated. Library resources are more than adequate to support the program.

In sum, the degree proposal is very well done and promises a successful new program at the University Massachusetts Lowell.
The review team offered recommendations to strengthen the proposal, including the following:

- Hire a faculty member that has passed the registered sanitarian examination and explore future faculty hires who have expertise in food safety;
- Restructure the curriculum to increase environmental health courses in the first two years, formalize assessment data collection of student learning in the practicum experience, and add an infectious disease component; and
- Train a staff person to assist students on a regular basis.

Response
UML will identify and hire at least one adjunct faculty member who holds the RS certification and has expertise in food safety. The Department of Community Health and Sustainability is developing assessment data for its community health program, which is designed to meet specific professional competencies set forth in the Certified Health Education Specialist Examination (CHES). The Department will use this assessment model to address the competencies set forth by the National Environmental Health Science & Protection Accreditation Council (EHAC). The Department of Community Health and Sustainability's new administrative assistant has been training to provide services to students who will enroll in the proposed program.

STAFF ANALYSIS AND RECOMMENDATION

Staff agrees with the overall consensus of the team that the degree proposal is very well done and promises a successful new program at the University of Massachusetts Lowell. Recommendation is for approval of the request of University of Massachusetts Lowell to award the Bachelor of Science in Environmental Health.

One year after graduating the program's first class, the University 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.

Appendix A: Curriculum

Major Required (Core) Courses (Total courses required = *21*)		
Course Number	Course Title	Credit Hours
31.201	Community Health and Environment	3
35.101	Anatomy and Physiology I	3
35.103	Anatomy and Physiology I Lab	1
42.101	College Writing I	3
48.101	Introduction to Sociology (Gen ED SS)	3
92.125	Calculus 1A	4
35.102	Anatomy and Physiology II	3
35.104	Anatomy and Physiology Laboratory II	1
48.101	General Psychology (Gen ED SS)	3
42.102	College Writing II	3
95.141	Physics I	3
96.141	Physics I Laboratory	1
35.251	Physiological Chemistry I	3
35.253	Physiological Chemistry I Laboratory	1
92.283	Introduction to Statistics	3
31.313	Principles of Environmental Health	3
35.211	Basic Clinical Microbiology	3
35.213	Basic Clinical Microbiology Lab	1
35.252	Physiological Chemistry II	3
35.254	Physiological Chemistry II Laboratory	1
31.206	Research Methods in Public Health	3
	Subtotal Core Credits	52
Other Required Courses in Related Subject Areas (# Total courses required = 16 BS and 17 BS to MS		
Course Number	Course Title	Credit Hours
31.302	Computer Methods in Health Education	3
31.301	Program Planning in Health Promotion	3
36.341	Organic Reactions and Structure	3
36.343	Organic Reactions and Structure Lab	1
31.316	Environmental Health in Practice	3
31.304	Politics of Health	3

19.503	Toxicology and Health	3
19.550	Environmental Law	3
31.409	Service Learning	3
31.305	Introduction to Epidemiology	3
31.416	Environmental Health Practicum	7
31.414	Program Management in Environmental Health	3
31.306	Socio-ecological Health Assessment	3
31.405	Communication Techniques in Health Promotion	3
XX.XXX	Food Safety and Agriculture	3
XX.XXX	Chemicals and Health	3
19.525	Introduction to Occupational and Environmental Health (BS to MS only)	3
	Subtotal Related Credits	[50 BS and 53 BS to MS]
	Elective Courses (# Total courses required = 2 (BS) or 3 (BS to MS)	
Course Number	Course Title	Credit Hours
19.557	Toxics Use Reduction	3
19.659	Cleaner Production	3
43.316	American Environmental History	3
43.328	Global Environmental History	3
45.327	Environmental Philosophy	3
49.315	Introduction to Environmental Economics	3
57.211	Sustainable Development	3
57.218	Regional Health and Environment	3
57.518	Comparative Environmental Study	3
81.315	Principles of Ecology	3
81.468	Biology of Climate Change	3
89.314	Hydrology	3
89.315	Environmental Geochemistry	3
85.306	Environmental Problem Solving	3
83.236	Sociological Approaches to the Environment	3
36.541	Introduction to Public Health/Public Health Laboratory	3
	Subtotal Elective Credits	6 total BS, 9 BS to MS
Distribution of General Education Requirements Attach List of General Education Offerings (Course Numbers, Titles, and Credits)		# of Credits
Arts and Humanities, including Literature and Foreign Languages		9
Mathematics and the Natural and Physical Sciences		[11]

Social Sciences	9
Subtotal General Education Credits	29 (Note all Gen eds except 1 SS and 3 AH – 11 credits – included above)
Curriculum Summary	
Total number of courses required for the degree	39 plus 3 Gen Ed AH, plus one additional Gen Ed social sciences.= 43 BS only, plus two additional classes = 45 for BS to MS
Total credit hours required for degree	120 (126 BS to MS option)
Prerequisite or Other Additional Requirements:	

Appendix B: Budget

NEW ACADEMIC PROGRAM BUDGET – Environmental Health – UMass Lowell

One Time/ Start Up Costs		***Annual Expenses***			
	Cost Categories	**Year 1**	**Year 2**	**Year 3**	**Year 4**
$6,000 for search expenses	**Full Time Faculty** *Assume fringe rate of 30%* *Assume no contractual raises* $75,000 salary $22,500 fringe	**$97,500**	**$97,500**	**$97,500**	**$97,500**
Establish an environmental health laboratory – in the 3rd-4th years of the program ~$25,000	Part Time/Adjunct Faculty Adjunct faculty – local environmental health professionals / practitioners. One per year.	$3500	$3500	$3500	$3500
	Guest lecturers: $100 for up to 1 hour 15 minute class. Up to 12 per semester x two semesters	$2400	$2400	$2400	$2400
	Staff	0	0	0	0
	General Administrative Costs	0	0	0	0
	Instructional Materials (Includes library resources) Books, journals, subscription publications, reports, video/movies, laboratory and field sampling equipment, software (GIS, web subscriptions, etc.)	$2000	$2000	$2000	$2000
	Equipment Sampling and analysis laboratory	**$4000**	**$4000**	**$4000**	**$4000**
	Field & Clinical Resources Student field trips: bus rental (1 per semester). Maintenance for laboratory and field equipment	**$2000**	**$2000**	**$2000**	**$2000**
	Marketing	0	0	0	0
	Other (Specify)	0	0	0	0
$31,000 plus faculty startup package	**TOTALS**	**$111,400**	**$111,400**	**$111,400**	**$111,400**

One Time/Start-Up Support	**Environmental Health, UMass Lowell**	***Annual Income***			
	Revenue Sources	**Year 1**	**Year 2**	**Year 3**	**Year 4**
$6,000 for search expenses	Grants (no current grants to support program operations)	0	0	0	0
	Tuition	$12,757	$27,026	$39,467	$59,178
	Fees	$64,493	$137,601	$210,149	$322,164
	Departmental	0	0	0	0
	Reallocated Funds	0	0	0	0
	Other (specify)	0	0	0	0
	TOTALS	**$77,250**	**$164,627**	**$249,616**	**$381,342**

Basis For Revenue Estimates – Environmental Health BS degree Program, UMass Lowell

	2010	**2011**	**2012**	**2013**
New Freshmen	5	10	10	15
Transfer Students	5	7	7	10
Returning Students	4	12	26	39
Total	**14**	**29**	**43**	**64**
Degrees Received			5	12
Tuition				
Residents	$9,669	$20,630	$29,698	$44,202
Non-Residents	$3,088	$6,397	$9,769	$14,976
	$12,757	**$27,026**	**$39,467**	**$59,178**
Fees				
Residents	$59,637	$127,240	$194,327	$297,907
Non-Residents	$4,856	$10,360	$15,823	$24,257
	$64,493	**$137,601**	**$210,149**	**$322,164**
Total Student Revenue	$77,250	$164,627	$249,616	$381,342
Tuition Estimate Basis				
Resident	$727	$749	$771	$794
Non-Resident	$4283	$4411	$4544	$4680
Fees Estimate Basis				
Resident	$4484	$4619	$4757	$4900
Non-Resident	$6937	$7145	$7359	$7580