BOARD OF HIGHER EDUCATION

REQUEST FOR COMMITTEE AND BOARD ACTION

COMMITTEE: Assessment and Accountability **NO**.: AAC 08-11

COMMITTEE DATE: April 17, 2008

BOARD DATE: April 25, 2008

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

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 Boston

Bachelor of Science in Information Technology

INTENT

The University of Massachusetts Boston (UMB) has submitted an expedited proposal to offer a Bachelor of Science in Information Technology (BSIT). Faculty from the Computer Science (CS) and Management Science and Information Systems (MSIS) departments have worked collaboratively since 2005 to develop the proposed program, which has been approved by all levels of campus governance. It was approved by the University's Board of Trustees Committee on Academic and Student Affairs on February 25, 2008, and by the Board of Trustee on March 19, 2008.

The proposed BSIT will offer an "applications-path" for students who will learn how to use IT to solve real-world problems. Graduates of the proposed program will be able to apply current technical concepts and practices to core information technologies; analyze, identify and define the requirements to address IT problems or opportunities faced by organizations or individuals; and identify emerging technologies and assess their applicability to address the users' needs. The proposed program will include two tracks: system administration and information architecture. The system administration track will prepare students for careers in system and network administration, while the information architecture track will prepare students for careers in the front-end specification (requirements and architecture) of component-based computer systems.

The proposed BSIT is consistent with the University's mission, particularly in regard to access, innovation, and economic development. The BSIT will provide transfer pathways from technology-related degree programs offered by Massachusetts community colleges into a bachelor's-level program and then on to IT positions in the public and private, profit and non-profit sectors. The proposed BSIT program will create opportunities for more industry collaboration by extending the network of an existing substantial relationship between UMB with Boston-area Advanced Technological Education Connections (BATEC) and the Massachusetts Technology Leadership Council.

NEED AND DEMAND

The Massachusetts Technology Collaborative reported Massachusetts employment concentrations in both software and communications and computer and communications hardware to be higher than in all other Leading Technology states. The Joint Venture's Index of Silicon Valley reported that out of the top 125 world-wide

regions in knowledge competitiveness, the Boston area ranked 17th for IT and computer manufacturing employment per capita in 2005.

The Bureau of Labor Statistics notes the downturn in information technology industries earlier this decade but forecasts these to be among the most rapidly expanding from 2004 to 2014. "Information contains some of the fastest-growing computer-related industries, such as software publishers, Internet publishing and broadcasting, Internet service providers, Web search portals, and data processing services. Employment in these industries is expected to grow by 67.6 percent, 43.5 percent, and 27.8 percent, respectively." The Bureau of Labor Statistics forecasts these industries to add 722,000 jobs over the same time period.

At the state level, according to the Massachusetts Department of Workforce Development, information technology jobs are also forecast to have some of the highest rates of growth in the state between 2004 and 2014. The industries consisting of computer system design, software publishing, and Internet and related services are each forecast to be among the most rapidly growing over that time period, with growth rates of 25 percent, 49 percent, and 23 percent, respectively. Local industry leaders have repeatedly stressed that educators should be teaching not just computer technology but how one *applies* that computer technology in business.

Program Duplication

Locally, there are no programs with the same technical approach to IT education as the proposed BSIT program. The table below summarizes the related program offerings by colleges and universities in greater Boston, excluding Computer Science and Information Systems degree programs.

Related Programs in the Greater Boston Area

No IT degree and no plans for an IT degree	Boston University Harvard University MIT Tufts University Wellesley College
IT Minor	Bentley College (no announced plans for major) Framingham State College
BSIT	Framingham State College (in Business Department) Northeastern University (in School of Continuing and Professional Studies) Simmons College (established in 2003 but graduated only two majors thus far)
MSIT with a focus on IT Management	Bentley College Boston College Brandeis University University of Massachusetts Boston

ADMISSION AND ENROLLMENT

Admissions standards for the proposed BSIT will be the same as other bachelor's degree programs at the University of Massachusetts Boston, which adheres to the Massachusetts Board of Higher Education Admissions Standards. Students will be required to submit a high school transcript (Transfer applicants should have official copies of transcripts for all courses completed at other colleges and universities), SAT scores, and an essay.

The projected enrollment of the BSIT is for 30 full-time students in the first year and an additional 30 in each following year, to reach a total enrollment of 120 in the fourth year.

The University has already begun to formulate articulation agreements with area community colleges that have Information Technology programs and degrees—particularly, Middlesex Community College, Bristol Community College, and Bunker Hill Community College.

CURRICULUM (Attachment A)

The proposed BSIT was designed to meet the accreditation standards required of the Computing Science Department and the College of Management, i.e., ABET and AACSB. There will be a total number of 40 courses and 120 credits for the proposed degree.

In addition to satisfying all general education requirements, the proposed BSIT will consist of a *common core* of ten courses, a *track* of four to six courses in a particular area of specialization, a *common capstone* course, and three to five professional electives. The core and capstone will foster a community of students who share the same background knowledge, one common to students in other IT programs around the nation.

The proposed program will have two tracks of specialization: System Administration (offered by the CS Department) and Information Architecture (offered by the MSIS Department). The System Administration track will prepare the student for a career in system and network administration. The Information Architecture (IA) track will prepare the student to be able to specify the requirements and overall architecture of a component-based system.

RESOURCES AND BUDGET (Attachment B)

Faculty and Staff

The proposed program introduces 12 new courses in total. It will require two new tenure-track faculty and two lecturers. Although CS and MSIS faculty can teach some

of the courses, the Departments felt it was important that the BSIT be staffed with faculty primarily assigned to its delivery. The program will also require a half-time laboratory supervisor and four teaching assistants (TAs).

Library and Facilities

The library at the University of Massachusetts Boston offers sufficient holdings for the proposed program. The Safari book program, which is regarded as a most useful resource for Information Technology programs, will be added at the cost of $15,000 per year.

Space will be needed for new offices and for the laboratory. To bring this new program to fruition, the University has committed to providing the requisite space, software and hardware; to hiring sufficient number of new tenure-track faculty and adjunct lecturers as adjusted to program size; to deploy a half-time laboratory supervisor and sufficient numbers of TAs once enrollments build; and to offer advertising monies to promote the program.

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

PROGRAM EFFECTIVENESS

Program assessment and improvement activities will include the following:

- Establish an industrial advisory board (IAB)
- Survey students on a regular basis
- Interview employment counselors and recruiters to gather feedback about BSIT graduates
- Make use of advising processes and course evaluation forms to make sure the BSIT program is meeting the objectives
- Make use of annual alumni gatherings to survey graduates as to how well prepared they report to be
- Use the capstone course (and feedback from any customers) as an assessment tool

EXTERNAL REVIEW

The program was reviewed by Drs. Robert Friedman, Associate Professor, New Jersey Institute of Technology; Sridhar Nehrur, Assistant Professor, University of Texas Austin; and Ms. Joyce Plotkin, President, Mass Technology Leadership Council. The reviewers wrote: "(We) compliment the intentions and efforts of the Departments of Computer Science and Management Science and Information Systems for bringing forth a program proposal that demonstrates in feasible and practical ways effective inter-departmental cooperation. The proposal presents a blueprint for an academic response

to industry needs, faculty interests and student demand. Equally impressive are the many ways that the program design ties into the pragmatic realities, opportunities for graduate study in the MSIT degree program, and collaboration with industry by extending the network and pathways of an already substantial relationship between UMass Boston with BATEC and the Mass Technology Leadership Council. We endorse the proposal and believe that the program, once implemented, can deliver qualified IT professionals into a workforce that is now, and will be hereafter, an essential component of our knowledge-based economy."

Recommendations for the proposed BSIT centered on curricular modifications and greater involvement with industry. The University responded by indicating where course content was covered in the curriculum and by forming an Industry Advisory Board, as well as welcoming participation by industry experts in instructional activities.

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 Information Technology at University of Massachusetts Boston.

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 Outlines
Bachelor of Science in Information Technology

Major Required (Core) Courses (# Total courses required = *11*)		
Course Number	*Course Title*	*Credit Hours*
IT 110	IT Problem Solving	3
IT 111	Managerial Statistics	3
IT 114	Introduction to Java (part 1)	3
IT 115	Introduction to Java (part 2)	3
IT 230	Databases	3
IT 240	Web Fluency	3
IT 244	Introduction to Linux/Unix	3
IT 246	Networking	3
IT 285	Societal Issues	3
IT 425	Project Management	3
IT 485	IT Capstone	3
	Subtotal Core Credits	33
Other Required Courses in Related Subject Areas (# Total courses required = 4 or 5) ***Students must choose at least one track to complete the degree.***		
Course Number	*Course Title*	*Credit Hours*
Information Architecture Track – offered in the College of Management (4 courses)		
IT 360	Enterprise Software	3
IT 426	Information Security	3
IT 460	Integration Methodologies and Tools	3
IT 461	System Analysis and Design	3
	Subtotal Related Credits	12
System Administration Track – offered in the College of Science and Mathematics (5 courses)		
IT 210	Data Structures	4
IT 341	Introduction to System Administration	3
IT 441	Network Services Administration	3
IT 442	Windows System Administration	3
IT 443	Network Security Administration	3
	Subtotal Related Credits	16

Elective Courses (# Total courses required = 10-11)		
Course Number	Course Title	Credit Hours
Elective courses can be in any subject area, at any level to make the difference between the required credits listed here and the 120 credits necessary for graduation. Students who choose the Information Architecture Track will need to take one more elective course than students who choose the System Administration Track. If students choose to do both tracks, the second track they select will be counted in the elective courses.		
	Subtotal Elective Credits	29-33
Distribution of General Education Requirements Attach List of General Education Offerings (Course Numbers, Titles, and Credits)		# of Credits
ENGL 101	Freshman English I	3
ENGL 102	Freshman English II	3
BC 290 or WPE	Professional Written Communication and Critical Analysis OR the Writing Proficiency Exam (both satisfy University Writing Proficiency Requirement)	3 *for BC 290 only*
MATH 140	Calculus I (to satisfy University Quantitative Reasoning Requirement)	3
First year or Intermediate seminar		3
Arts and Humanities, including Literature and Foreign Languages		9
Mathematics and the Natural and Physical Sciences		12
Social Sciences (ECON 101 and 102 are recommended)		6
Diversity Course		3
International Management Course		3
Note: Some of the above requirements can overlap; students are encouraged to seek advising to learn more. ***Subtotal General Education Credits***		42

Curriculum Summary	
Total number of courses required for the degree	40
Total credit hours required for degree	120

Attachment B: New Program Budget Form

Campus: UMass Boston **Proposed Program: Information Technology**

One-Time Costs		**Annual Operating Costs**			
		Description	**Cost**	**Number**	**Total Cost**
	Faculty	Tenure-track Lecturers	85,000 60,000	2 2	$170.000 120,000
	Staff	Lab Supervisor	60,000	1/2	30,000
	Library Resources	Library subscription to Safari (an on-line IT book program)	15,000	1	15,000
$30,000 3,000	Space	Furniture (one-time cost) Cabling and Wiring		1 1	30,000
6,000 18,000 6,000 2,000 2,000	Equipment	Servers Client Desktops Laptops Simple switches and hubs Tools and parts	2000 1200 1500 100	3 24 4 20	6,000 28,800 6,000 2,000
	Field and Clinical Resources				
$67,000	Total Costs:		$224,800		$407,000