

BOARD OF HIGHER EDUCATION

REQUEST FOR COMMITTEE AND BOARD ACTION

COMMITTEE: Academic Affairs

NO: AAC 19-17

COMMITTEE DATE: March 5, 2019

BOARD DATE: March 12, 2019

**APPLICATION OF THE UNIVERSITY OF MASSACHUSETTS AMHERST TO AWARD
THE BACHELOR OF SCIENCE IN INFORMATICS**

MOVED: The Board of Higher Education hereby approves the application of the **University of Massachusetts Amherst** to award the **Bachelor of Science in Informatics**

Upon graduating the first class for this program, 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.

VOTED: Motion approved by AAC 03/05/2019; Motion adopted by the BHE 03/12/2019

Authority: Massachusetts General Laws Chapter 15A, Section 9(b)

Contact: Winifred M. Hagan, Ed.D., Associate Commissioner for Academic Affairs and Student Success

BOARD OF HIGHER EDUCATION
March 2019
University of Massachusetts Amherst
Bachelor of Science in Informatics

INTENT AND MISSION

The University of Massachusetts Amherst (UMA) intends that the proposed Bachelor of Science in Informatics (BS/Info) will focus on key areas identified by the UMass Joint Task Force on Strategic Oversight (JTFSO) as being at the intersection between campus strengths and state/regional/national priorities. One UMA goal is to create a pathway from the undergraduate through graduate level in information science and social computing. The proposed program is aligned with this goal as well as another UMA strategic initiative- to create a School of Information (iSchool) within the College of Information and Computer Sciences (CICS). The proposed program is intended to be a first step towards iSchool. The proposed BS/Info is also intended to focus on data science, computing and analytics, and computational social science and be closely tied to the Center for Data Science (CDS) within CICS. Equity and inclusion are also intended to be a significant focus of the proposed program. UMA reports that informatics attracts a greater diversity of students with a greater variety of perspectives and skills.

UMA holds that the proposed informatics program with its data science concentration addresses the highest educational priority of CDS, which is to extend data science education to the broadest range of undergraduates. UMA reports that almost every industry sector depends on information and communication technology (ICT), noting that large and small organizations and businesses require database, network and system administrators, sales representatives or user support specialists. Growing industry sectors, such as education, healthcare, energy, finance, insurance, tourism and travel, pharmaceuticals, and medical devices are cited by UMA as increasingly dependent on ICT applications. UMA finds that these sectors require domain expertise outside of computing yet rely on employees with foundational knowledge of computing. The proposed BS/Info program is expected to educate students interested in applying computing principles in these sectors, thereby filling an unserved need.

UMA anticipates that the proposed program will provide the knowledge and skills needed to effectively use computing to solve important problems in other domains. Such skills include technical knowledge of hardware, software, and programming. In addition, UMA anticipates that students will learn about tangential issues that surround computing such as ethics, security and privacy. Concentration courses and electives are planned to enable students to gain knowledge in their domain of interest. The need to process "big data" exists in nearly every industry segment, including government, health care, insurance, biotech, and pharmaceutical. UMA intends that graduates of the proposed program will be able to serve as data analyst, business analyst, or data scientist in these industry segments.

The proposed program has obtained all necessary governance approvals on campus and was unanimously approved by the University of Massachusetts Board of Trustees on December 13, 2018. The required letter of intent was circulated on October 9, 2018. No comments were received.

NEED AND DEMAND

National and State Labor Market Outlook

UMA reports that according to the U.S. Department of Labor from 2002 and 2012, ICT jobs grew nationally by 36%, while total jobs grew only 2%¹. In Massachusetts, ICT jobs grew at 40% during the same period, while total employment grew less than 1%². In 2010, the Mass Technology Leadership Council (MASSTLC) challenged its members to create 100,000 new ICT jobs in Massachusetts by 2020, stating that it would yield \$8.8 billion in incremental tech wages, listing “big data” in its list of priorities³. The BLS conservatively projects 31% growth in information and computer technology jobs from 2010 through 2020⁴.

Student Demand

The UMA Bachelor Degree with Individual Concentration (BDIC) Informatics program⁵ is cited as providing information about the demand for the proposed program, showing that the number of BDIC informatics majors has grown from 70 to 108 since the fall of 2016. In addition, UMA finds that many non-CS majors taking an introductory course to fulfill a general education requirement or meet a technical requirement of the Information Technology (IT) minor, discover that they want to learn more computing. The proposed program is expected to meet the need for some students by providing an alternate pathway into computing. Current BDIC informatics majors came from other disciplines including the CICS exploratory track (25%), Natural Sciences (26%), SBS (10%), Humanities and Fine Arts (12%), Engineering (5.5%), and the School of Public Health and Health Science (5.5%). UMA plans that the proposed curriculum will enable students to explore and integrate computing with other disciplinary interests.

OVERVIEW OF PROPOSED PROGRAM

UMA notes that the BDIC informatics curriculum has demonstrated the viability of the proposed BS/Info and has indicated significant student demand. A digital media concentration and a data science concentration indicated that 96 out of 108 students elected data science, while the

¹U.S. Department of Labor. Bureau of Labor Statistics 2002 and 2012. *Occupational Employment Statistics*.

² *Technology Workforce Analysis, Massachusetts Board of Higher Education, Spring 2014* (<https://goo.gl/7lp5vG>).

³ *MassTLC 2020 Challenge*: <http://www.masstlc.org/the-2020-challenge/>

⁴ <http://www.mass.edu/strategic/documents/2014-05-05DHETechnologyWorkforcePlan.pdf> in page 10.

⁵ *In collaboration with advisors, Bachelor's Degree with Individual Concentration (BDIC) students develop focused, interdisciplinary concentrations with classes from across UMass and the Five College Consortium.*

remaining 11 students chose digital media. The proposed informatics major will start by offering that concentration⁶.

UMA plans that the daily operation of the program will be performed by a core set of faculty members who form the informatics program committee, led by a program director. The program committee will be responsible for student recruitment, admissions, advising, and publicity for the informatics major. In addition, the program committee will be responsible for the informatics curriculum, including vetting new electives for the informatics major. Centralizing these functions within the program committee provides operational efficiency.

Duplication

A BS in Information Technology degree is offered at the University of Massachusetts Lowell and the University of Massachusetts Boston. UMA reports that the proposed program is differentiated from these programs by its focus on using computing principles in disciplines of the arts, sciences, and humanities. A BS in Informatics is offered by Northeastern University, SUNY Albany and Cornell University. UMA found that there are several programs in the region in health, clinical, or bio informatics that are narrowly focused and offered as a specialization at the graduate level. Worcester Polytechnic Institute offers a comprehensive curriculum in Interactive Media and Game Development.

ACADEMIC AND RELATED MATTERS

Admission

CICSI admissions for the proposed program degree will be handled by the UMA Admissions office. Admission to the freshman class is selective and contingent upon successful completion of required high school courses. The primary criteria for admission are the high school transcript and SAT/ACT scores. Students must submit a complete application including the UMass questions, official high school transcript, first-term senior grades, SAT I and/or ACT scores sent electronically by the testing agency, a letter of recommendation and an \$80.00 application fee. The SAT is required for all freshman applicants⁷, though UMA neither requires nor recommends the optional SAT essay. The ACT is an option for students to use in the

⁶ *The current BDIC students with the data science concentration will be transitioned into the newly-created informatics major. The current BDIC students with a digital media concentration will be given the choice of either transferring into the data science concentration of the newly-created major, or completing their current BDIC program with the digital media concentration. No new students will be recruited into the BDIC informatics program once the informatics major is created.*

⁷ *Learning-disabled Massachusetts residents who submit documentation of disability are eligible for exemption from the standardized test score requirement. A letter is required from the high school guidance counselor confirming that the student has a diagnosed learning disability.*

admissions process. All scores must be sent directly from the testing agency. Test scores are not required for students who have been out of high school for three or more years. Students already admitted to the university in another major will be eligible to declare Informatics with a grade of C or better in both courses, INFO 150 and COMPSCI 121. Transfer students are advised individually by college and program advisors to ensure that their transition to UMA is smooth.

Program Enrollment Projection

	Year 1	Year 2	Year 3	Year 4
New Full-Time	50	50	50	50
Continuing Full-Time	90	110	130	150
New Part-Time				
Continuing Part-Time				
Totals	140	160	180	200

Assumption: Of the 108 continuing students currently in the BDIC informatics program, UMA assumes 90 transfers into the informatics major. Of these students, UMA assumes 30 graduates in Year 1, 30 graduates in Year 2, and 30 graduates in Year 3. UMA assumes new students admitted directly into the major graduate in four years.

Curriculum (Attachment A)

UMA anticipates that the proposed curriculum balances the need for a strong foundation in computing with some domain expertise in a different discipline. Students achieve domain expertise by choosing a concentration. While UMA expects to broaden concentrations to include areas such as health informatics in the future, the initial focus on data science is where immediate opportunities exist. The proposed program is designed to offer seven core courses that span three broad areas: two introductory courses on large concepts and mathematical foundations, two courses on human factors and societal aspects, and three courses on problem solving and programming. UMA plans that the seven required core courses will account for 23 credits. The concentration courses account for 12 credits. Finally, the program requires four electives to be chosen from a pre-approved list of electives. The elective courses account for 12 additional credits.

Internships or Field Studies

UMA anticipates that research opportunities will be made available through CDS, and it is planned that students can leverage CDS's Industrial Affiliates⁸ Program to obtain internships and jobs through events such as the Data Science Career Fair that is organized each October.

RESOURCES AND BUDGET

Fiscal (Attachment B)

UMA assumes that 90 of the 108 students from the existing informatics track within BDIC will transfer into the proposed BS/Info program. It is further expected that 50 new students will be added each of four consecutive years. UMA plans to maintain the major at about 200 students. UMA applied current enrollment of BDIC informatics students to better estimate the fraction of in-state versus out-of-state enrollment, where roughly 20% are out-of-state. UMA applied the established tuition rate of \$15,030 per year for an in-state student and \$33,096 per year for an out-of-state student to estimate tuition revenue. The tuition rate was inflated at a rate of 4% per year.

Faculty and Administration (Attachment C)

UMA plans to hire one tenure-track (TT) associate professor and two lecturers to carry the course load of adding 50 new students per year. Faculty salaries are assumed at \$125K for associate, and \$80K for lecturer. Administrative staff consists of an undergraduate program manager budgeted with a yearly salary of \$41,500K starting in year two. In the first year, the program will be provided with partial administrative support from a staff member supporting the computer science undergraduate program. CICS will also continue to hire undergraduate peer advisors with a budget of \$5K per year. Operating expenses are assumed to be 4% of budget. Teaching assistants (TA) are based on the number of courses expected to be offered and are planned to grow from 4 to 6 in the first three years as enrollments increase. Marketing costs are estimated at approximately \$10K in each of the first two years to develop materials and channels, then \$5K per year to refresh and realign. COLA is assumed to be 3% and expenditures are inflated accordingly in successive years. The Provost's Office has committed funding for three new faculty lines over three years, with two of those being teaching faculty (lecturers). They also are committing base budget funds to hire an undergraduate program manager. Any remaining costs incurred to establish and grow the program to 200 students will come from CICS.

⁸ *Data science crosses boundaries back and forth between theory and application, between the world of universities and a myriad of private industries and government. The Center for Data Science has designed its Industry Affiliates Program to facilitate this transfer. Bidirectional interactions enable research, learning, and recruiting ultimately enriching big data industry and data science. <https://ds.cs.umass.edu/industry> Retrieved 2/8/2019.*

Facilities, Library and Information Technologies

CICS has over 1000 computer systems maintained by the Computer Science Computing Facility (CSCF). The computers are connected to a Gigabit switched network. The CSCF also maintains a wireless network (IEEE 802.11b/g/n and 802.11ac) that provides up to a 1.3Gbps connection to the department's switched ethernet network. CICS is connected to the campus via a high-speed link. The campus maintains a high-speed connection to the Internet. The computing environment is primarily made up of UNIX systems along with many Macintosh and Windows systems. Computer science services are supported by multiple virtual server environments in high availability configurations, supporting around 25 virtual machines. Additionally, there are approximately 50 research group servers including several Hyper-V and Xen virtual environments. Also supported are 5 large clusters of Linux systems the most accessible one being the Swarm Cluster which consists of 1540 cores with over 400TB file system; the other research clusters consist of 70 cores with over a 25TB file system, 310 cores, 120 cores, and 118 cores.

Over 450 desktop and laptop computers running versions of Linux, Mac OSX, or Windows operating systems are available for personal computing. Printing needs are accommodated by more than 80 laser printers, including several high-speed, high-density duplex print servers, seven full-color printers, as well as a full-color poster printer. The Educational Laboratory (EDLAB) systems are reserved for undergraduate and graduate course work. The EDLAB has 30 iMacs (triple bootable with MACOS/Windows/Linux) and five Linux systems (for remote access only) all supported by several servers. The EDLAB systems are mostly accessed remotely except during consulting office hours in rooms 223 and 225 in the Lederle Graduate Research Tower (LGRT) and five systems, located in the CS Building undergraduate space. Facilities and lab setup are one-time costs that are not included in the budget for the BS/Info program.

Affiliations and Partnerships

The proposed BS/Info program is expected to include a close relationship with CDS and the Industry Affiliates Program that includes Chan Zuckerberg, Google, IBM and MassMutual among many others. The data science symposia and seminar series organized by CDS is also expected to help students make connections to industry and broaden their knowledge and experiences.

Alignments with the K-12 system in the region include Advanced Placement courses in Computer Science and Computer Science Principles. Both courses offer high school students the opportunity to earn AP credit. AP courses in Computer Science Principles are being offered at 12 high schools across Massachusetts. In addition, through MassTransfer UMA accepts equivalencies for foundational courses from community colleges statewide.

As a university accepting credit for AP CS Principles (CSP), UMA is listed and advertised by The College Board, along with UMA's AP transfer credit policy. Because AP CSP was designed to

appeal to a broader high school student audience, UMA expects to attract new groups of students who are interested in studying informatics rather than computer science. UMA notes that AP CSP attracted a diverse population of 50,000 high school students in its first offering in 2016-17, making it the largest launch of any AP course in College Board history. UMA expects the proposed BS/Info to recruit from this diverse student body. UMA is also participating in events with community colleges that underscore the visible pathways already established for students to transfer credits into a four-year degree.

PROGRAM EFFECTIVENESS

Goal	Measurable Objective	Strategy for Achievement	Timetable
Meet student recruitment target	50 new students in each of the first four years	Advertise to local K-12 schools, active recruitment from exploratory track (ET) placement across campus, recruit transfers from community colleges, establish a presence in open house events on campus.	50 – AY 1 50 – AY 2 50 – AY 3 50 – AY 4
Meet faculty recruitment target	3 new hires in the first 3 years	Use existing CICS recruitment process for high-quality recruitment	1 Lecturer – AY18-19 1 Tenure Track – AY19-20 1 Lecturer – AY20-21.
Successful career placement for students	Job placement rates assessed via annual survey.	Use CICS career services, industrial affiliates program, and CICS-hosted career fairs. Use existing university-level services for internships and Co-ops.	Started the process in Fall 2017.

UMA plans to track time-to-completion, graduation rates, placement rates, and inclusiveness related metrics on an ongoing basis and make corrections as needed.

EXTERNAL REVIEW AND INSTITUTIONAL RESPONSE

The BS/Info program was reviewed by Dr. Abigail Gertner, Co-Department Head, Data Analytics, at the MITRE Corporation in Bedford MA; and Dr. Larry Finkelstein, Professor and Dean Emeritus in the College of Computer and Information Science at Northeastern University in Boston MA. The review included a site visit on September 17, 2018 with the Program Director and the leadership of CICS including the Director of CDS.

The reviewers found that the program is representative of a growing national trend of introducing new degree programs which are interdisciplinary in nature and combine foundational knowledge in computing with knowledge of an important application domain or cognate area. They commented that knowledge of data science has emerged in recent years as a critical skill necessary for making sense of large data sets, that arise in almost every area of human endeavor. Reviewers indicated that graduates of this program will be highly sought after by industry and government. The team noted that within CICS, the proposed program addresses CDS's highest educational priority to expand data science education to the broadest possible range of undergraduates. They emphasized that the program is well conceived and represents an important new direction for CICS and recommended that the program should be approved.

The review team recommended UMA consider the title nomenclature to differentiate the program from related areas of study. They suggested expanding electives to include additional courses in mathematics, programming and advanced topics in data science. The team also thought it would be helpful for UMA to document the advising of underprepared students and to track placement rates for internships. UMA responded that CICS does not offer similar degrees so there would be no issue of overlap or duplication. UMA indicated that the proposed program electives were designed to be flexible enough to allow the student to choose multiple pathways through the curriculum with advanced electives for more technical pathways that can deepen student programming and technical skills by choosing more advanced statistics and machine learning courses that are offered in the college. Finally, UMA responded that metrics are tracked continuously and provided details of existing placement rates. As well, plans to make modifications are underway.

STAFF ANALYSIS AND RECOMMENDATION

Staff thoroughly reviewed all documentation submitted by the **University of Massachusetts Amherst** and external reviewers. Staff recommendation is for approval of the proposed **Bachelor of Science in Informatics** program.

ATTACHMENT A: CURRICULUM

B.S. Informatics		
<i>Major Required (Core) Courses (Total courses required = 7)</i>		
<i>Course Number</i>	<i>Course Title</i>	<i>Credit Hours</i>
INFO 101	Introduction to Informatics	3
INFO 150	A Mathematical Foundation for Informatics	3
COMPSCI 121	Introduction to Problem Solving with Computers	4
COMPSCI 190D	Using Data Structures	4
INFO 203	A Networked World	3
COMPSCI 325	Introduction to Human Computer Interaction	3
COMPSCI 326	Web Programming (IE)	3
	<i>Subtotal # Core Credits Required</i>	23
<i>Concentration Course Choices (Total courses required = 4)</i>		
<i>Choose all three courses in list A. Choose one course from list B</i>		
List A: Data Science (choose 3 courses)		
STAT 240	Intro to Statistics (Also accept OIM 240 Business Data Analysis; PSYCH 240 Statistics in Psychology; SOCIOL 212 Elem Statistics; or RES-ECON 212 Intro Stats/SocSci)	3
COMPSCI 345	Practice and Applications of Data Management	3
INFO 397F	Introduction to Data Science	3
List B: Data Science (choose 1 course)		
STAT 501	Meth Applied Stats (Also accept STAT 515 (requires MATH 233) or STAT 516 (requires STAT 515))	3
PUBHLTH 490ST	Telling Stories with Data: Statistics, Modeling, and Visualization	3
JOURNAL 397DJ	Data Driven Storytelling	3
OIM 350	Business Intelligence and Analytics	3
	<i>Subtotal # Concentration Credits Required</i>	12

<p style="text-align: center;">Other/Elective Course Choices (Total courses required =6) (subject to course availability) Any course from list B that is not used as a concentration course can be used as an elective</p>		
STAT 501	Meth Applied Stats (Also accept STAT 515 (requires MATH 233) or STAT 516 (requires STATISTC 515))	3
PUBHLTH 490ST	Telling Stories with Data: Statistics, Modeling, and Visualization	3
JOURNAL 397DJ	Data Driven Storytelling	3
OIM 350	Business Intelligence and Analytics	3
MARKETING 413	Social Media and Marketing Analytics	3
COMPSCI 328	Mobile Health Sensing and Analytics	3
300 or 400-level course (Must be approved by advisor)	Operations and Information Management	3
300-level or above course (Must be approved by advisor)	Public Health	3
500-level or above course (Must be approved by advisor)	Statistics	3
300-level or above course (Must be approved by advisor)	College of SBS	3
English 379, 380, 391C, 381 or 382	Course in professional writing	3
OIM 454	Advanced Business Analytics	3
MARKETING 301	Fundamentals of Marketing	3

MARKETING 455	Internet Marketing	3
SCH-MGMT 397B	Internet Technology for e-Business	3
SUSTCOMM 297L	Visual Communication Design Skills and Principles	3
	Subtotal # Elective Credits Required	18
Distribution of General Education Requirements		# of Credits
Attach List of General Education Offerings (Course Numbers, Titles, and Credits)		
4 Social World Electives One course (AL/AT), one course (HS), one course (SB), and one course (AL, AT, SB, I, or SI)		16
Social and Cultural Diversity One course focusing on UNITED STATES diversity (U, ALU, ATU, HSU, IU, or SBU) and one course focusing on GLOBAL diversity (G, ALG, ATG, HSG, IG, or SBG)		
Biological & Physical World One course (BS) and one course (PS); Basic Mathematics One course (R1) or a passing score on the Tier 1 Math Exemption Exam		8-11
Writing ENGLWRIT 112 and COMPSCI 305		6
Sub Total General Education Credits		30-33
Curriculum Summary		
Total credit hours of required courses outlined above	83-86	
Total credit hours of other unrestricted electives	34-37	
Total credit hours required for degree	120	
Prerequisite or Other Additional Requirements:		
An overall GPA 2.0 is required for courses that count towards the major. No class counted for the major may be taken pass/fail. All electives must be majors-level courses. Seminar courses (x91) and independent studies (x96) at the 300-level (or above) are reviewed for elective credit via the independent study approval process. Informatics majors wanting to add another major may not seek both majors within CICS; Informatics majors must complete a total of 60 credits from the colleges of CNS and CICS.		
<i>Junior-Year Writing (JYW) Requirement:</i> COMPSCI 305 or other CICS approved, university-certified JYW course required to satisfy the JYW requirement.		

Residency Requirement. Two of the four concentration courses and four of the six electives that satisfy the informatics major requirements must be taken at UMass Amherst.

Notes:

- R2 Math requirement satisfied by COMPSCI 121
- Integrative Experience Requirement satisfied by COMPSCI 326
- The social and cultural diversity courses are included in the social world requirements.

REVENUE ESTIMATES BS INFORMATICS

	Year 1 2018		Year 2 2019		Year 3 2020		Year 4 2021		Year 5 2022	
<i>Full-Time Tuition Rate: In-State</i>	\$15,631		\$16,256		\$16,907		\$17,583		\$18,286	
<i>Full-Time Tuition Rate: Out-State</i>	\$34,420		\$35,797		\$37,228		\$38,718		\$40,266	
<i>Mandatory Fees per Student (In-state)</i>	\$396		\$412		\$429		\$446		\$464	
<i>Mandatory Fees per Student (out-state)</i>	\$396		\$396		\$412		\$429		\$446	
<i>FTE # of New Students: In-State</i>	40		40		40		40		40	
<i>FTE # of New Students: Out-State</i>	10		10		10		10		10	
<i># of In-State FTE Students transferring in from the institution's existing programs</i>		72								
<i># of Out-State FTE Students transferring in from the institution's existing programs</i>		18								
Tuition and Fees	Newly Generated Revenue	Revenue from existing programs	Newly Generated Revenue	Revenue from existing programs	Newly Generated Revenue	Revenue from existing programs	Newly Generated Revenue	Revenue from existing programs	Newly Generated Revenue	Revenue from existing programs
First Year Students										

Tuition										
In-State	\$625,248	\$1,125,446	\$650,258	\$0	\$676,268	\$0	\$703,319	\$0	\$731,452	\$0
Out-of-State	\$344,198	\$619,557	\$357,966	\$0	\$372,285	\$0	\$387,176	\$0	\$402,663	\$0
Mandatory Fees	\$19,812	\$35,662	\$20,446	\$0	\$21,264	\$0	\$22,114	\$0	\$22,999	\$0
Second Year Students										
Tuition										
In-State			\$650,257.92	\$1,170,464.26	\$676,268	\$0	\$703,319	\$0	\$731,452	\$0
Out-of-State			\$357,966	\$644,339	\$372,285	\$0	\$387,176	\$0	\$402,663	\$0
Mandatory Fees			\$20,446	\$36,803	\$21,264	\$0	\$22,114	\$0	\$22,999	\$0
Third Year Students										
Tuition										
In-State					\$676,268	\$1,217,282.83	\$703,319	\$0	\$731,452	\$0
Out-of-State					\$372,285	\$670,113	\$387,176	\$0	\$402,663	\$0
Mandatory Fees					\$21,264	\$38,275	\$22,114	\$0	\$22,999	\$0
Fourth Year Students										
Tuition										
In-State							\$703,319	\$1,265,974	\$731,452	\$0
Out-of-State							\$387,176	\$696,918	\$402,663	\$0
Mandatory Fees							\$22,114	\$39,806	\$22,999	\$0
Fifth Year Students										
Tuition										

In-State									\$731,452	\$1,316,613
Out-of-State									\$402,663	\$724,794
Mandatory Fees									\$22,999	\$41,398
Gross Tuition and Fees	\$989,258	\$1,780,665	\$2,057,340	\$1,851,606	\$3,209,451	\$1,925,671	\$4,450,439	\$2,002,698	\$5,785,571	\$2,082,805
Grants	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Contracts	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Campus budget allocation	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Other Revenues (specify in cell 54)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$989,258	\$1,780,665	\$2,057,340	\$1,851,606	\$3,209,451	\$1,925,671	\$4,450,439	\$2,002,698	\$5,785,571	\$2,082,805

EXPENDITURE ESTIMATES					
	Year 1 AY18-19	Year 2 AY 19-20	Year 3 AY 20-21	Year 4 AY21-22	Year 5 AY22-23

	New Expenditures required for Program	Expenditures from current resources	New Expenditures required for Program	Expenditures from current resources	New Expenditures required for Program	Expenditures from current resources	New Expenditures required for Program	Expenditures from current resources	New Expenditures required for Program	Expenditures from current resources
Personnel Services										
Faculty	\$80,000	\$0	\$211,150	\$0	\$302,357	\$0	\$311,427	\$0	\$320,770	\$0
Administrators	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Support Staff	\$0	\$18,500	\$44,027	\$5,000	\$48,110	\$5,000	\$54,148	\$5,000	\$62,772	\$5,000
Others	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fringe Benefits 2.2%	\$1,760	\$0	\$5,614	\$0	\$7,710	\$0	\$8,043	\$0	\$8,438	\$0
Total Personnel	\$81,760	\$18,500	\$260,791	\$5,000	\$358,177	\$5,000	\$373,618	\$5,000	\$391,980	\$5,000
Operating Expenses										
Supplies	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Library Resources	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Marketing/Promotional Expenses	\$10,000	\$0	\$10,000	\$0	\$5,000	\$0	\$5,000	\$0	\$5,000	\$0
Laboratory Expenses	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
General Administrative Overhead 4%	\$4,010	\$0	\$10,632	\$0	\$14,527	\$0	\$15,145	\$0	\$15,879	\$0
Other (specify) - Faculty startup	\$15,000	\$0	\$75,000	\$0	\$165,000	\$0	\$75,000	\$0	\$0	\$0
Total Operating Expenses	\$29,010	\$0	\$95,632	\$0	\$184,527	\$0	\$95,145	\$0	\$20,879	\$0

-										
Net Student Assistance										
Assistantships	\$97,412	\$0	\$125,417	\$0	\$174,685	\$0	\$159,666	\$0	\$164,456	\$0
Fellowships	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Stipends/Scholarships	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Student Assistance	\$97,412	\$0	\$125,417	\$0	\$174,685	\$0	\$159,666	\$0	\$164,456	\$0
Capital										
Facilities / Campus recharges	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Equipment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Other	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Capital	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total Expenditures	\$208,182	\$18,500	\$481,840	\$5,000	\$717,389	\$5,000	\$628,429	\$5,000	\$577,316	\$5,000
BUDGET SUMMARY OF NEW PROGRAM ONLY										
	Year 1	Year 2	Year 3	Year 4	Year 5					
	2018	2019	2020	2021	2022					
Total of newly generated revenue for the university	\$989,258	\$2,057,340	\$3,209,451	\$4,450,439	\$5,785,571					

Total of additional resources required for program	\$208,1 82	\$481,8 40	\$717,3 89	\$628,4 29	\$577,3 16
Excess/ (Deficiency) for the university	\$781,0 76	\$1,575, 500	\$2,492, 062	\$3,822, 010	\$5,208, 254
Total resources committed by the Provost's Office	\$95,00 0	\$330,1 77	\$515,4 66	\$440,5 75	\$383,5 42
Total resources committed by CICS	\$113,1 82	\$151,6 63	\$201,9 22	\$187,8 54	\$193,7 74
Total resources committed	\$208,1 82	\$481,8 40	\$717,3 89	\$628,4 29	\$577,3 16

Justification of Financial Projections:

Revenue: Assumed a 4% increase in tuition each year from current 2017-2018 rates. The 90 students coming from existing programs are now part of BDIC. These students are not all in their first year, as assumed in the revenue model.

Expenditures: Current faculty salaries assumed at \$125K for Associate and \$80K for Lecturer. Administrative staff consists of an undergraduate program manager. Added 3% COLA each year. Current support staff responsibilities will be transferred to new staff once hired, with continued funding for student workers coming from CICS. Operating expenses are assumed to be 4% of budget - no detailed breakdown by expense category is possible at this point. TAs are based on number of courses offered. Startup-costs are \$15K for Lecturers in the first year and \$300K for Associate spread over 3 years. Marketing costs will be higher in early years to development materials, then those materials and channels will need to be refreshed annually. Facilities, space and lab setup are one-time costs that are *not* considered. Any additional resources for the program that are not covered by the Provosts office, will be covered by CICS.

ATTACHMENT C: FACULTY

Name of faculty member (Name, Degree and Field, Title)	Tenured Y/N	Courses Taught Put (C) to indicate core course. Put (OL) next to any course currently taught online.	# of sections	Division or College of Employment	Full- or Part-time in Program	Full- or part-time in other department or program (Please specify)	Sites where individual will teach program courses
Anderson, Gordon PhD, Computer Science Teaching Faculty	N	• COMPSCI 121: Problem Solving with Computers (C)	(1)	College of Information and Computer Sciences	Part-Time for Informatics	Full-Time in CICS	• Main Campus
Barrington, David A. Mix PhD, Computer Science Professor	Y	• INFO 150: A Mathematical Foundation for Informatics (C)	(1)	College of Information and Computer Sciences	Part-Time for Informatics	Full-time in CICS	• Main Campus
Hudlicka, Eva PhD, CS Part-time Lecturer	N	• COMPSCI 325: Human Computer	(1)	College of Information and	Part-Time for	Part-Time in CICS	• Main Campus

		Interaction (C)		Computer Sciences	Informatics		
Liberatore, Marc D. PhD, Computer Science Teaching Faculty	N	• COMPSCI 190D: Using Data Structures (C) INFO 203: Networked World (C)	(1)	College of Information and Computer Sciences	Part-Time for Informatics	Full-Time in CICS	• Main Campus
Richards, Tim PhD, CS Teaching Faculty	N	• COMPSCI 326: Web Programming (C)	(1)	College of Information and Computer Sciences	Part-Time for Informatics	Full-Time in CICS	• Main Campus
Trim, Michelle PhD, Rhetoric, Composition, Technical Communication Teaching Faculty	N	• INFO 101: Introduction to Informatics (C)	(1)	College of Information and Computer Sciences	Part-Time for Informatics	Full-Time in CICS	• Main Campus