The Ohio State University College of Public Health

Michael S. Bisesi, PhD, REHS, CIH
Senior Associate Dean, Academic Affairs
Professor and Interim Chair, Environmental Health Sciences
(614) 247-8290 bisesi.12@osu.edu

April 18, 2017

W. Randy Smith, Vice Provost for Academic Affairs
Office of Academic Affairs
Columbus, OH 43210

RE: Support for Proposed Academic *Graduate Certificate in Biomedical Informatics* – College of Medicine

Dear Dr. Smith:

On behalf of the College of Public Health, we support the proposed academic *Graduate Certificate in Biomedical Informatics* developed by the Department of Biomedical Informatics in the College of Medicine. The proposed academic graduate certificate does not conflict with the MPH- or MS-Biomedical Informatics programs currently offered by the College of Public Health in collaboration with the College of Medicine. Indeed, we encourage this since it will be an additional program that will provide more options to students and working professionals to access graduate-level education and training in biomedical Informatics.

Sincerely,

Michael S. Bisesi
Senior Associate Dean for Academic Affairs College of Public Health

THE OHIO STATE UNIVERSITY

Department of Biomedical Informatics
College of Medicine

250 Lincoln Tower
1800 Cannon Drive
Columbus, OH 43210

614-292-4778 Phone
614-688-6600 Fax

Biomedical.informatics@osu.edu
medicine.osu.edu/bmi/

April 5, 2017

Jennifer Schlueter, PhD
Faculty Fellow for Curriculum, Graduate School
Associate Chair, Department of Theatre
Associate Professor | Lab Series Coordinator | Editor, Theatre/Practice
1108 Drake Center, 1849 Cannon Dr
Columbus, OH 43210
614-292-5821
schleuter.10@osu.edu

RE: Response requests for Biomedical Informatics (BMI) certificate program Graduate School/CAA curriculum subcommittee review

Dr. Schlueter,

We are resubmitting our BMI certificate for review after addressing specific concerns raised by the subcommittee review.

Narrative description of the proposed curriculum modification: We added a section by this title to include course numbers for all courses listed along with the course descriptions. All courses under consideration for the certificate are currently part of the approved Biomedical Informatics curriculum for our existing MPH, MS and PhD programs.

Student advising sheet modification: We have added this form as an attachment.

Articulation of special efforts to enroll and retain underrepresented groups in the discipline modification: We added this section by title to include our plan to address recruitment and retention of certificate students from underrepresented groups within our discipline.

Missing sections modification: We utilized the resource you mentioned and arranged our proposal to align with the sections outlined for “Proposing Graduate Certificates”

Plan for revising course content and timeline modification: We added verbiage to explain that the Biomedical Informatics Graduate Studies Coordinating Committee we will revisit and revise course content on a rolling basis every 12 months based on student and instructor feedback. We also included a BMI Certificate Program Timeline of course development and transitions as well as a condensed semester map for course offerings, review, and modifications.

Concurrence concern: We added verbiage to explain that we currently offer the MS (and MPH)in Biomedical Informatics through the College of Public Health, so this certificate will be a nice compliment to the Master’s we offer and no concurrence is necessary.

Please do not hesitate to contact me if you have any questions or concerns or require any additional information to process this request.

Respectfully,

Bobbie Kite, PhD, MHS
Clinical Assistant Professor, Department of Biomedical Informatics
The Ohio State University Wexner Medical Center
bobbie.kite@osumc.edu

The Biomedical Informatics Graduate Certificate Proposal

Brief Description of the disciplinary purpose, significance, and rationale

Purpose Statement:

The purpose of this graduate certificate in biomedical informatics is to prepare students with a core curriculum and then enhance this core by one of four specialization tracks. The core curriculum and specialization tracks aim to provide enrollees with training in basic biomedical informatics competencies. Upon completion, students will have an increased knowledge and understanding of biomedical informatics theories and principles and be able to interact with informatics technologies to create novel innovations in biomedical and clinical research and healthcare.

The core curriculum will consist of 9 credit hours of coursework (3 courses). The specialization curriculum, chosen from the following: Clinical Informatics (CI), Clinical Research Informatics (CRI), Health Analytics (HA), or Translational Bioinformatics (TBI) includes an additional 6 credit hours of coursework (2 courses). Students may complete a certificate that is specialized to their interests and needs.

The courses for the four tracks were chosen by faculty to give students training within specialized research areas of biomedical informatics in order to have the knowledge and applicable skillset to solve real world research problems using informatics tools.

Program Significance:

- A noticeable increase in students' knowledge of informatics and real-world applicability of topics discussed within required coursework.
- By providing this certificate, we will increase the number of in-career clinicians, IT professionals, and other individuals within the healthcare field, who are knowledgeable about biomedical informatics uses and applications. We will impact and improve patient care by training these individuals in the importance of proper biomedical data management. Individuals within the certificate program will learn about research disciplines that use biomedical data to improve patient experiences and treatments for debilitating diseases and conditions, which improves both patient care and research.
- Increased awareness of biomedical informatics programs at our university, which will cause more individuals to pursue graduate education in biomedical informatics at the master and doctoral levels.
- Increase the reputation of OSU's Department of Biomedical Informatics within the (inter)national informatics community by providing quality distance-learning educational content to a broad audience.

Rationale:

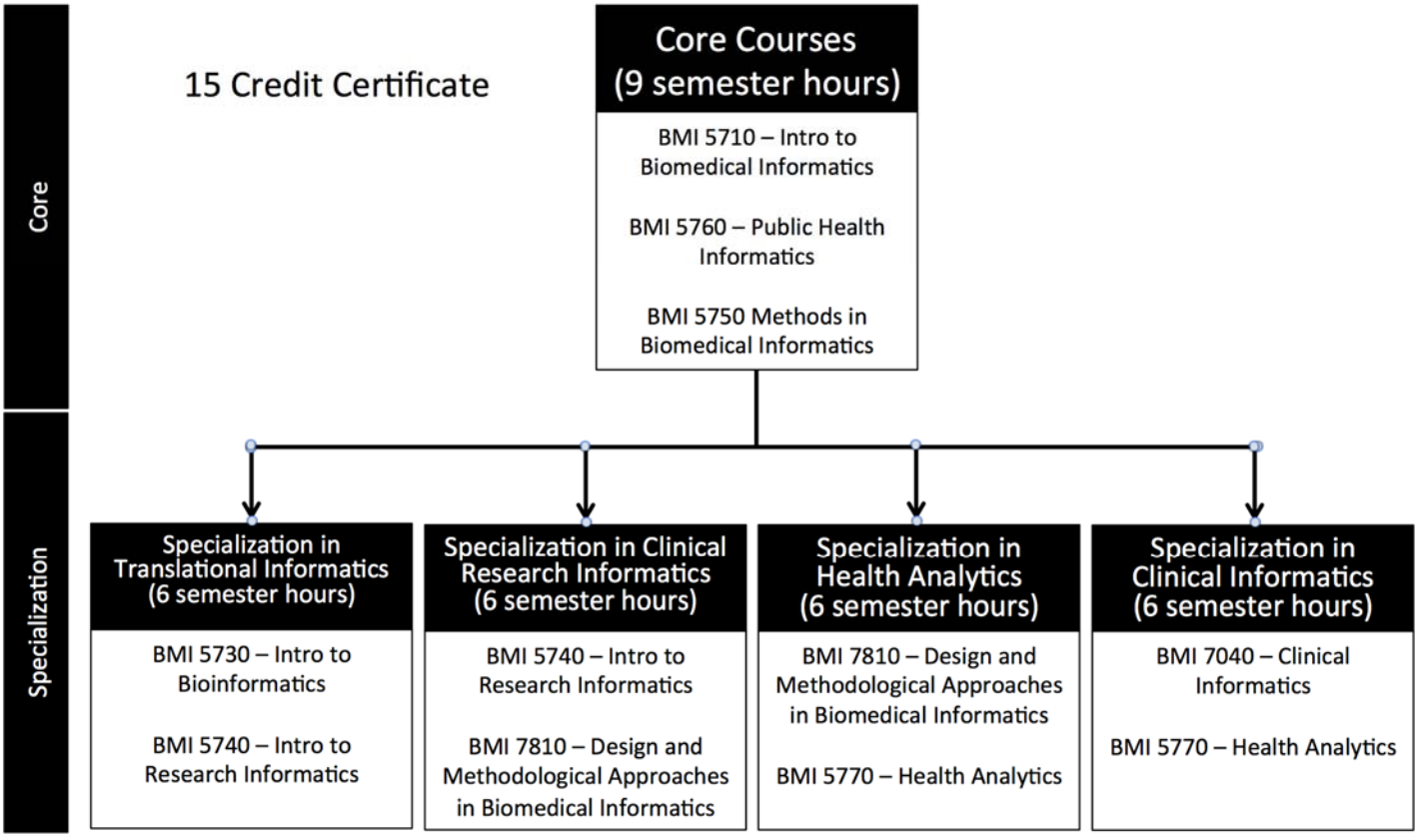
The Department of Biomedical Informatics created a graduate certificate program to meet the demand of post-baccalaureate and post-graduate individuals, who are in established careers but

require or are seeking focused informatics training online. The certificate program consists of 5 courses (15 semester hours) and has focus areas including Translational Informatics, Clinical Research Informatics, Health Analytics, and Clinical Informatics. Enrollees will be exposed to informatics training that will beneficially impact and improve their research and operational capabilities through learned competency in biomedical informatics theories, technologies, and principles. This certificate program complements our existing traditional undergraduate, master, and doctoral programs and will further the department's mission of expanding the number of individuals with informatics training who work in the biomedical and clinical domains.

Description of Proposed Curriculum:

The eight courses comprising the certificate are currently offered by the Department of Biomedical Informatics as part of the curriculums for our existing degree programs, the MPH & MS (through the College of Public Health) and the PhD (through the College of Medicine). All but one course (BMI 7040) have been offered previously multiple times. Below in Table 1 is a detailed schematic of the various paths a student can take in this certificate and afterwards is a narrative description of each course.

Table 1: Curriculum Tracks for the Certificate in Biomedical Informatics



Core Courses - The core courses do not have prerequisites

BMI 5710 - Introduction to Biomedical Informatics
Director: Courtney L. Hebert, MD, MS
Synopsis: A survey of biomedical informatics theories and methods employed in the design, implementation and management of information systems supporting basic science, clinical and translational research, clinical care, and public health. Recommended course work in computer science, statistics, anatomy, physiology, and medical terminology.

BMI 5760 – Public Health Informatics
Director: Bobbie Kite, PhD, MHS
Synopsis: Introduction to the emerging and critical field of Public Health informatics. This course will highlight the history, current and future use of informatics in the public health settings, and give students an understanding of the role and broad application of informatics to promoting health and preventing disease.

BMI 5750 - Methods in Biomedical Informatics and Data Science
Directors: Guy Brock, PhD
Synopsis: Students will gain a familiarity with methods used during the course of the design, implementation, and evaluation of Biomedical Informatics platforms, and be able to appropriately select and combine such approaches on a project-specific basis. This course will establish an application-oriented understanding of how to appropriately use such methods in order to satisfy project-specific needs and deliverables.

Specialization Track Courses – Certificate core courses are prerequisites to these specialization courses

Translational Informatics
BMI 5730 - Introduction to Bioinformatics
Director: James L. Chen, MD
Synopsis: Introduces students to basic topics of bioinformatics including sequence analyses, proteomics, microarrays, regulatory networks, sequence and protein databases. Recommended background in molecular biology and computer science.

BMI 5740 - Introduction to Research Informatics
Directors: Bobbie Kite, PhD, MHS
Synopsis: A survey of biomedical informatics theories and methods employed in the design, implementation and management of clinical and translational research programs.

Research Informatics
BMI 5740 - Introduction to Research Informatics
Directors: Bobbie Kite, PhD, MHS
Synopsis: A survey of biomedical informatics theories and methods employed in the design,

implementation and management of clinical and translational research programs.

BMI 7810 – Design and Methodological Approaches in Biomedical Informatics
Director: Po-Yin Yen, RN, PhD
Synopsis: This course is an introduction to research design and methods in Biomedical Informatics. It is organized around elements of qualitative and quantitative study design. We will be surveying aspects of research, including the formulation of research questions, testable hypotheses, the selection of appropriate research designs and methods, data collection and analysis. The course objectives are centered around the development of a full-scale research project aligned to the National Institute of Health (NIH)'s guidelines for review of grant submissions: Significance, Investigators, Innovation, Approach, and Environment.

Health Analytics
BMI 7810 – Design and Methodological Approaches in Biomedical Informatics
Director: Po-Yin Yen, RN, PhD
Synopsis: This course is an introduction to research design and methods in Biomedical Informatics. It is organized around elements of qualitative and quantitative study design. We will be surveying aspects of research, including the formulation of research questions, testable hypotheses, the selection of appropriate research designs and methods, data collection and analysis. The course objectives are centered around the development of a full-scale research project aligned to the National Institute of Health (NIH)'s guidelines for review of grant submissions: Significance, Investigators, Innovation, Approach, and Environment.

BMI 5770 - Health Analytics: Data Discovery to Dissemination
Director: Bobbie Kite, PhD, MHS
Synopsis: Health Analytics is the science of analyzing health data for knowledge discovery and decision-making. The sheer diversity of data types in health care settings results in what scholars call a DRIP environment: Data Rich-Information Poor. Data has become ubiquitous in healthcare settings from clinical decision making to operational/business planning; health decisions are now being made similarly.

Clinical Informatics
BMI 7040 – Clinical Informatics
Director: Courtney Hebert, MD, MS
Synopsis: The course provides training in the theories, methods and application of clinical informatics. Clinical Informatics is the field concerned with the use of data and information technology applied to the delivery of healthcare services. Clinical informatics has a wide array of healthcare delivery application areas in the clinical domain; including, pharmacy, nursing and patient care operational areas.

BMI 5770 - Health Analytics: Data Discovery to Dissemination
Director: Bobbie Kite, PhD, MHS

Synopsis: Health Analytics is the science of analyzing health data for knowledge discovery and decision-making. The sheer diversity of data types in health care settings results in what scholars call a DRIP environment: Data Rich-Information Poor. Data has become ubiquitous in healthcare settings from clinical decision making to operational/business planning; health decisions are now being made similarly.

Administrative Arrangements for the Proposed Program:

All certificate courses will be available online beginning in Fall 2017, and some courses will be available as an in-person format as well. Faculty can integrate online students with their in-person classes in the online environment at their discretion. Resources will be used to support the transition of in-person content to online content as follows:

- Operational and management support will be provided by Gabrielle Kokanos, the Department's Education Program Manager
- Financial support will be provided by Cameron Lindsey, the Department's Business and Operations Manager
- Content Review and Editing: The Biomedical Informatics Graduate Studies Coordinating Committee we will revisit, revise and refresh course content on a rolling basis every 12 months based on student and instructor feedback.
- Please reference Appendix 1 for the BMI Certificate Program Timeline of course development and transitions as well as a condensed semester map for course offerings, review, and modifications.

Admission process

We will house the admissions process internally, which will allow us flexibility in admitting students on a rolling basis. The Biomedical Informatics Graduate Studies Coordinating Committee will review student applications for admissions determinations. This certificate is offered entirely online, and we will have a start date window for students to begin taking their coursework in Autumn. Once we have a strong enrollment, we will open up a Spring start as well.

Evidence of Need:

The proposed biomedical informatics certificate will serve to help with the expanding fields of translational informatics, research informatics, health analytics, and clinical informatics. This certificate is specifically for those who are ready to expand their current working capacity or move into new areas of the biomedical informatics industry. Our graduate certificate focuses on those who have busy schedules or are unable to attend traditional in-person classes. This certificate allows them to attain the skills they will need for their specialization within a quick timeframe which works well for working professionals. The Bureau of Labor Statistics (BLS) predicts that the number of jobs in the healthcare informatics field will grow 22% by 2022. As healthcare informatics has been around for many decades now, the increasing use of technology such as EHRs and biological technological advances, have grown the anticipated need for training in these areas. BLS projects employment in this field will grow twice as fast as employment overall (USD, 2016). A quick search of the AMIA career center job openings in March 2017 (which are specific to our specializations) reveals 33

positions.

Prospective Enrollment:

We have anticipated enrollment numbers based off of other online educational initiatives that we have hosted at OSU that were affiliated with the American Medical Informatics Association, the primary organization affiliated with the research field of biomedical informatics (AMIA 10x10).

In addition to the growing need of informatics professionals illustrated by the BLS figures, the average salary within the informatics field in this area of the country is $103,109, and the average across the U.S. is $111,387. Considering these factors, anticipated revenue is expected to be $485,060 over the first five years, even in our most conservative estimate of enrollment of 5 students the first year and 10 students per year afterwards. Please see Appendix 2 for our program revenue projections created in conjunction with Office of Distance Education and eLearning (ODEE). We will also work with the ODEE to maximize our marketing efforts, and will specifically utilize their online programs marketing toolkit.

Special Efforts to Enroll and Retain Underrepresented Groups in the Discipline:

Both our increased course quality due to the incorporation of technologies and our rigorous quality review process are aimed toward improving the student experience to retain underrepresented groups in the discipline. Our marketing efforts will extend through conferences (both national and international) our department faculty attend with an aim to increase geographic draw, capturing non-traditional students who might not pursue education at OSU otherwise. We are committed to including diverse populations in our recruiting initiatives and will utilize best practices from the medical school.

Advising and Student Advising Sheet:

After students have completed the core curriculum, they will choose their specialization track. Upon student registration, our faculty will work with each program enrollee to determine which specialization track will best suit their needs based upon their background, career goals, job requirements, and research interests. It is required that individuals take the core curriculum before choosing or beginning any specialization coursework. This requirement ensures that all enrollees come to the advanced materials from a shared background of understanding. Students will be provided a checklist of the certificate courses that are applicable to the specialization they are interested in as well as a proposed timeline to complete the certificate in the requested timeframe. Please see Appendix 3 for the Student Advising Sheet.

Concurrence:
We currently offer the Master of Public Health (MPH) and Master of Science (MS), with specializations in Biomedical Informatics through the College of Public Health (CPH), so this certificate is not competitive with those efforts. We have received a letter of support from CPH.

Department of Biomedical Informatics

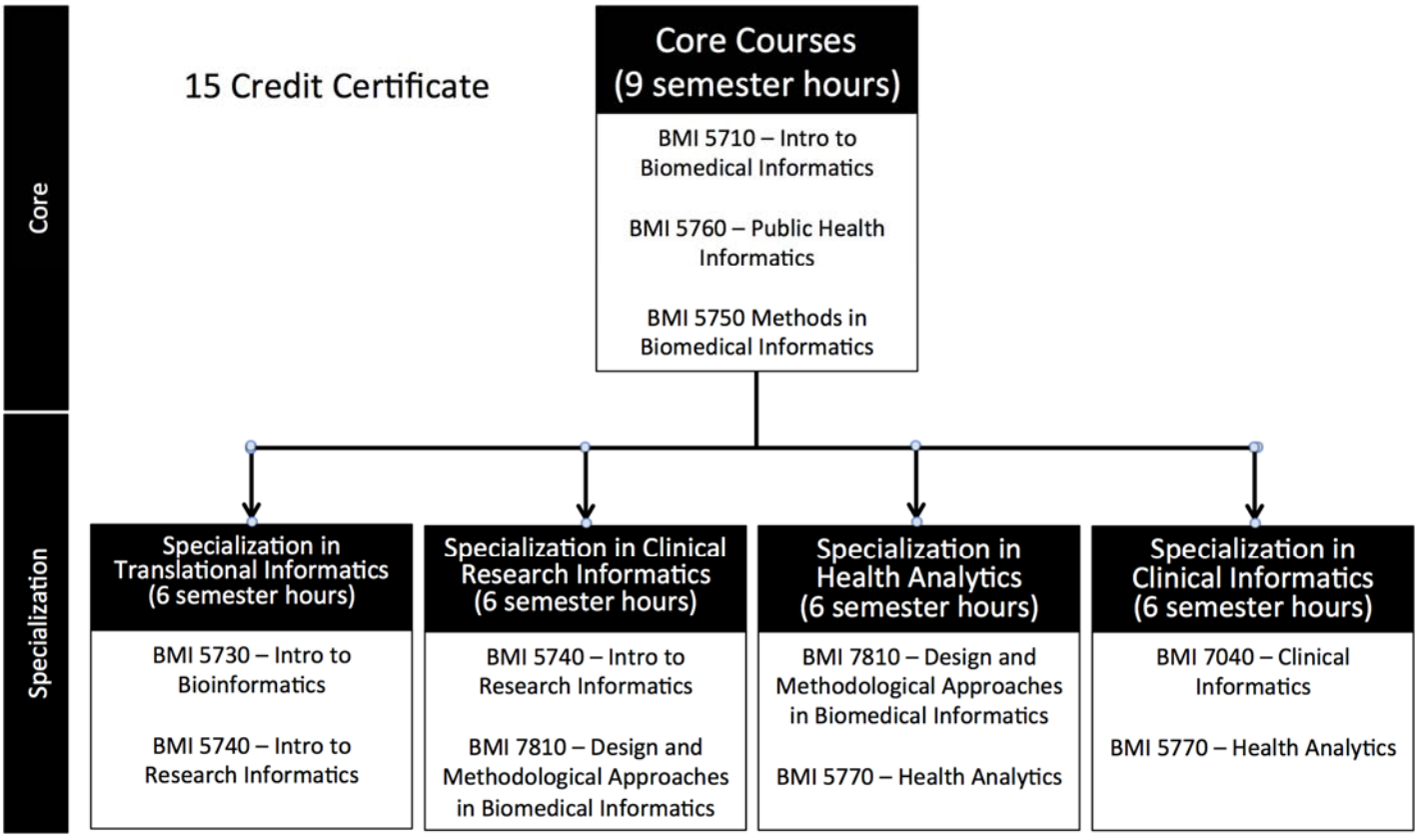
Graduate Certificate Procedures

Coursework

Below please list the courses you have taken or are planning to take for the Graduate Certificate in Biomedical Informatics. All core curriculum coursework is required for completion of the program. Specialization track courses should be chosen in conjunction with and approved by your certificate advisor.

1. This Graduate Certificate has a **minimum of 15 credits** of graduate-level coursework in the Department of Biomedical Informatics. Your advisor from the Department of Biomedical Informatics must approve the course list for the certificate.

2. A grade of B or better (or S when applicable) is required in each course comprising the Graduate Certificate.



Department of Biomedical Informatics

Dept.	Course #	Course Title	Credit #	Semester Offered	Year Taken	Grade
Department of Biomedical Informatics	**Required Coursework (9 Semester Hours of Credit)**					
	BMI 5710	Introduction to Biomedical Informatics	3	AU		
	BMI 5750	Methods in Biomedical Informatics	3	AU, SU		
	BMI 5760	Public Health Informatics	3	AU		
	Available Specialization Courses Chosen From Following:					
	BMI 5730	Introduction to Bioinformatics	3	SP		
	BMI 5740	Introduction to Research Informatics	3	SP		
	BMI 5770	Health Analytics	3	SP, SU		
	BMI 7040	Clinical Informatics	3	SP		
	BMI 7810	Design & Methodological Studies in BMI	3	SP		
	Specialization selected:					

For Office Use Only

_____ Date Received

_____ Date Sent to Grad School/GSC

_____ Original Application

_____ Updated Application

_____ Graduate Studies Coordinating Committee Chair Signature

_____ Date

For questions about the program, contact BMI Education at 614-293-0074 or BMI.education@osumc.edu.

Please complete and attach the second page of this form.

Office of Distance Education and eLearning (ODEE)
Distance Education Program Revenue Projection

05/09/17

College:	**Medicine**
Program Name:	Biomedical Informatics Certificate

Number of Courses:	**5**
Total Credit Hours	**15**
Rank	**Graduate**
Residency (in/Out State Split)	50% eligible

Rank		1st year	2nd year	3rd year	4th year	5th year
Graduate	**# of Courses**	5 Course	5 Course	5 Course	5 Course	5 Course
	# of Students	5 Students	10 Students	10 Students	10 Students	10 Students
	# of Credit Hours	15 Cr Hours	15 Cr Hours	15 Cr Hours	15 Cr Hours	15 Cr Hours
	Total Credit Hours of Instruction	75.0 hours	150.0 hours	150.0 hours	150.0 hours	150.0 hours
	Instructional Fee					
	Fees - Effective Rates		$876.11	$876.11	$876.11	$876.11
	State Subsidy		$403.56	$403.56	$403.56	$403.56
	Projected Fees		$32,850	$98,560	$131,420	$131,420
	Projected Subsidy		$7,570	$22,700	$30,270	$30,270
	Projected Revenue Generated	$0	$40,420	$121,260	$161,690	$161,690
	Marginal Revenue	$0	$40,420	$80,840	$40,430	$0
	Support Units Tax rate	24%	24%	24%	24%	24%
	Support Units Tax	**$0**	**$9,700**	**$19,400**	**$9,700**	**$0**
	Cumulative Support Units Tax	*0*	*9,700*	*29,100*	*38,800*	*38,800*
	Net Margin	***$0***	***$30,720***	***$61,440***	***$30,730***	***$0***
	Colleges Share %	70%	70%	80%	80%	80%
	Colleges Share - Annual PBA	$0	$21,500	$49,150	$24,580	$0
	Colleges Share (Cumulative Cash Generated)	$0	$21,500	$70,650	$95,230	$95,230
	ODEE Share %	30%	30%	20%	20%	20%
	ODEE Share Annual PBA	$0	$9,210	$12,280	$6,140	$0
	ODEE Share (Cumulative Cash Generated)	$0	$9,210	$21,490	$27,630	$27,630
	Current Budget Model:					
	SSA 1 - Student Service Assessment 1 - UG - *$110.45*		$0	$0	$0	$0
	SSA 2 - Student Service Assessment 2 - Grad - *$468.24*		$17,560	$52,680	$70,240	$70,240
	SSA 3 - Student Service Assessment 3 - *$4.18*		$160	$470	$630	$630
	Total Current Assessments	$0	$17,720	$53,150	$70,870	$70,870
	College Assessment savings under new model	*$0*	*$8,510*	*$31,660*	*$43,240*	*$43,240*

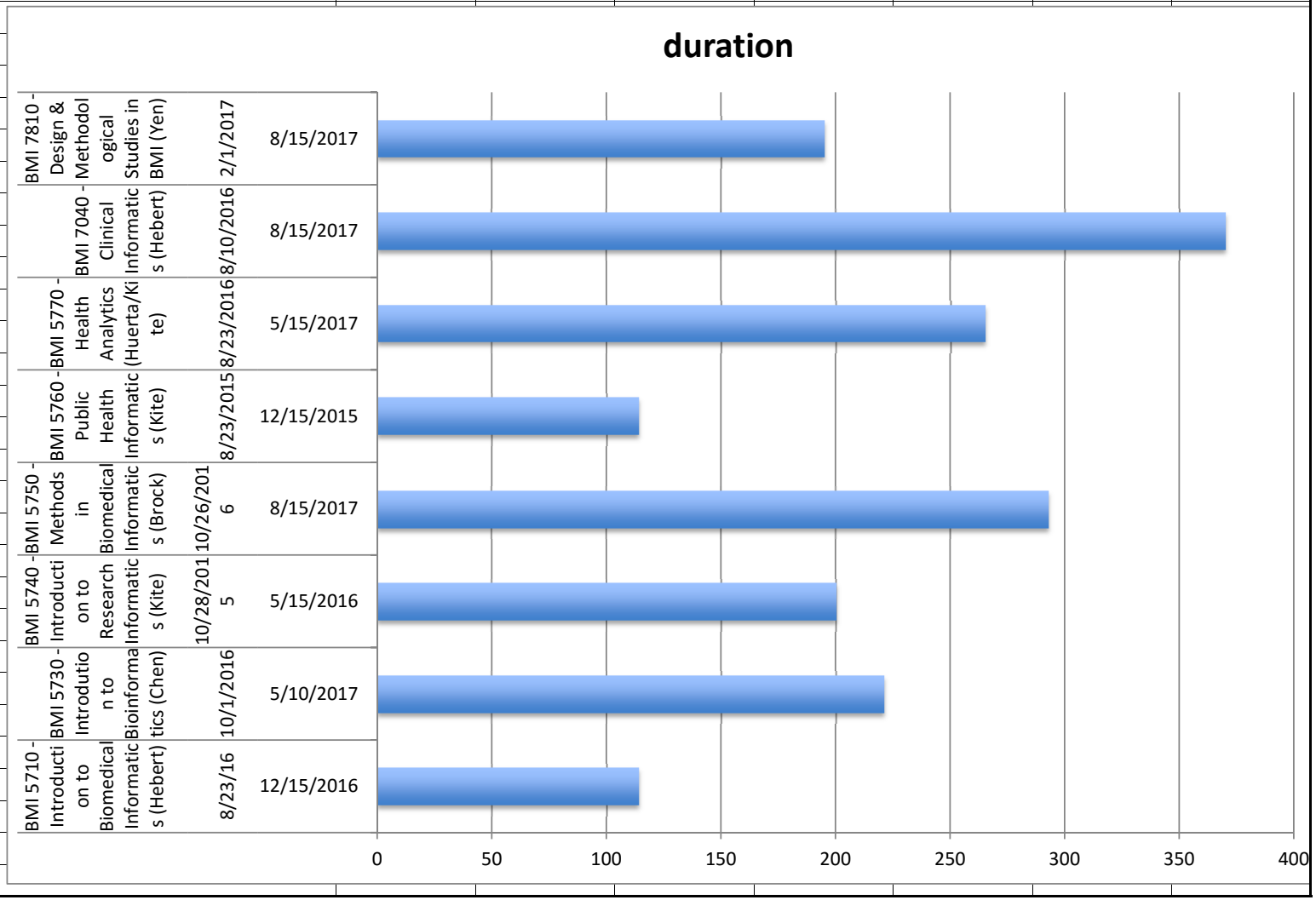
Assumptions:

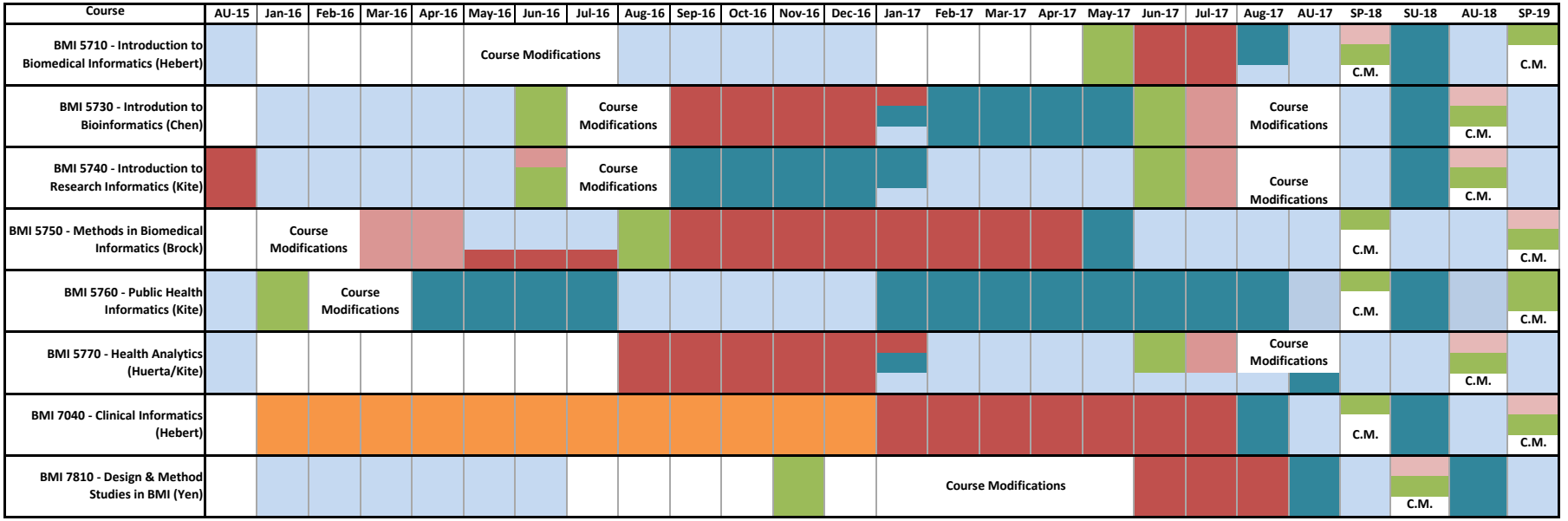
No other Student Services Assessments would apply to Colleges under this model.
The Distance Education assessment applies to marginal revenues.
The Distance Education assessment only apply to students who are 100% distance Ed.
No inflationary adjustment is taken for instructional fees.
The projected numbers in this model are best estimates and the actual allocations might be slightly different.

Revenue and Assessments Calculation is based on the following current FY17 rates:

	Fees	*Subsidy*
Undergraduate	*$374.92*	*$207.46*
Graduate	*$901.35*	*$502.70*

Course Builds until Maintenance Stage	start date	end date	duration				
BMI 5710 - Introduction to Biomedical Informatics (Hebert)	8/23/16	12/15/2016	114				
BMI 5730 - Introdution to Bioinformatics (Chen)	10/1/2016	5/10/2017	221				
BMI 5740 - Introduction to Research Informatics (Kite)	10/28/2015	5/15/2016	200				
BMI 5750 - Methods in Biomedical Informatics (Brock)	10/26/2016	8/15/2017	293				
BMI 5760 - Public Health Informatics (Kite)	8/23/2015	12/15/2015	114				
BMI 5770 - Health Analytics (Huerta/Kite)	8/23/2016	5/15/2017	265				
BMI 7040 - Clinical Informatics (Hebert)	8/10/2016	8/15/2017	370				
BMI 7810 - Design & Methodological Studies in BMI (Yen)	2/1/2017	8/15/2017	195				





Key	
Dormant Course Activity	
Course Review (owner: BMI-GSCC)	
In-person/Online Course Instruction (Owner: Course	
Course Ready for Online Teaching (Owner: Course Director/Kite)	
Course modifications	C.M.
Course Development/Creation	
Course Conversion Analysis (owner: Bobbie Kite)	
Course Conversion (owner: Kite/Course Directors)	

Courses Ready for Online Instruction	
SP 2017	BMI 5710, 5730, 5740, 5760, 5770
AU 2017	BMI 5750, 7040, 7810