

Proposal for the Creation of a Graduate Minor in Biomedical Informatics

1. Title of Proposed Graduate Minor: Graduate Minor in Biomedical Informatics

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Administered by: Department of Biomedical Informatics Graduate Studies Coordinating Committee

2. Rationale of its Development

The Department of Biomedical Informatics is creating a graduate minor in Biomedical Informatics program to meet the demand of individuals training in the basic and computational sciences, as well as medicine and public health fields who seek training in biomedical informatics approaches, technologies, and theories in conjunction with their major program of study. The graduate minor program will consist of 5 courses (15 semester hours) that are housed in the Department of Biomedical Informatics and are already being taught. This program will complement our existing portfolio of educational initiatives, including our department's in-person masters and doctoral programs, fellowships, and distance learning initiatives. It will further the department's mission to increase the number of individuals within the biomedical, clinical, computational, and public health domains that have training in informatics.

3. Brief Description of its Purpose, Including Anticipated Benefits for Participants

Graduate students who complete a Graduate Minor in Biomedical Informatics will be better equipped to work with large data sets, optimize the extraction of knowledge from big data and to make data-driven decisions in research and/or clinical settings using the learned biomedical informatics theories, tools, and applications.

By providing this graduate minor, we will increase the number of future academic researchers, clinicians, computer scientists, IT professionals, and other individuals in proximity to the healthcare field, who are knowledgeable about biomedical informatics uses and applications. We will impact and improve academic research and patient care by training these individuals in the importance of proper biomedical data management. Individuals who complete this program will learn about research disciplines that use biomedical data to improve patient care and treatment for debilitating diseases and conditions.

4. Proposed Curriculum

Required Coursework		9 Credits
BMI 5710	Introduction to Biomedical Informatics	3 credit hours
BMI 5740	Introduction to Research Informatics	3 credit hours
BMI 5760	Public Health Informatics	3 credit hours
Elective Coursework		6 Credits
BMI 5000 or 7000 Level	Chosen from the electives listing	3 credit hours
BMI 7000 Level Course	Chosen from the electives listing	3 credit hours

Available Coursework for Electives:

Course ID	Course Name	Credit Hours
BMI 5720	Imaging Informatics	3 credit hours
BMI 5730	Introduction to Bioinformatics	3 credit hours
BMI 5750	Methods in Biomedical Informatics & Data Science	3 credit hours
BMI 5770	Health Analytics	3 credit hours
BMI 5793	Private Studies in Biomedical Informatics	1-6 credit hours
BMI 7810	Design & Methodological Studies in Biomedical Informatics	3 credit hours
BMI 7820	Advanced Topics in Clinical Imaging Analysis	3 credit hours
BMI 7830	Advanced Bioinformatics Approaches for Human Diseases	3 credit hours
BMI 7840	Advanced Topics in Biomedical Data Management	3 credit hours

5. Expectations of Students in GM-BMI

Students are expected to maintain a grade of B or better (or S when applicable) in each course comprising the minor. Any grades below B will require the student retake the course or be removed from the graduate minor program of study.

6. Administrative Arrangements and Support for the GM-BMI

Per graduate school guidance, the following is the administrative process that will be adhered to for the Graduate Minor in Biomedical Informatics: go.osu.edu/GM-BMI.

- a. The student completes the graduate minor program form found in the link above, including obtaining their major program of study advisor's approval and signature. The minor program form is then submitted to the Department of Biomedical Informatics Graduate Studies Coordinating Committee (BMI-GSCC) for review and approval. This form serves as the application to enroll in the graduate minor.
- b. The BMI-GSCC's Chair sends a copy of the completed graduate minor program form to the Graduate School and to the graduate studies committee chairperson of the student's major program of study. BMI-GSCC will also send acknowledgement to the student indicating whether or not their request is approved. The Department of Biomedical Informatics will keep the original form on file.
- c. The student must adhere to the curriculum of the graduate minor program as indicated on the approved graduate minor advising form. If changes in the approved curriculum are necessary, the student must complete a new graduate minor program form following the above steps. All modifications to the GM-BMI curriculum must be submitted in writing to the BMI-GSCC Chair for review and approval by the full BMI-GSCC. Departures from the approved minor program could lead to the minor not appearing on the student's transcript.
- d. Upon completion of the minor program, the student must submit the graduate minor transcript designation form found in the link above to the graduate studies committee chair of the minor program.

7. Plan to Enroll Students / Prospective Enrollment Numbers, Including a Statement of the Maximum Number of Students Allowed at Any One Time

We will recruit graduate-level trainees who wish to gain competency in biomedical informatics to further their research capabilities in their major field. The admissions process to the GM-BMI will be run through the Department of Biomedical Informatics Graduate Studies Coordinating Committee, which leads the overall academic mission of biomedical informatics at OSU.

We envision a subset of trainees from the College of Engineering (Departments of Computer Science & Engineering, Electrical & Computer Engineering, and Biomedical Engineering), College of Public Health, College of Medicine (Biomedical Sciences Graduate Program and School of Health and Rehabilitation Sciences), and the College of Arts and Sciences (Departments of Biology, Mathematics, Molecular Genetics, and Statistics) will pursue the GM-BMI. Initial enrollment **numbers are expected to be no more than five-to-ten individuals with a maximum enrollment number of fifteen individuals at any given time. In the event we have additional interest in the program over the allotted fifteen slots, the BMI-GSCC will assess the additional students on a case-by-case basis.** The program's maximum number of slots will be evaluated on an annual basis by the BMI-GSCC and adjusted based on interest in the GM-BMI program as well as our overall enrollment totals in BMI's major programs of study (Data Analytics Undergraduate program; MS, MPH programs held jointly with College of Public Health; and our Computational Biology & Bioinformatics PhD in the College of Medicine) to ensure major students have top priority access to our courses, followed by GM-BMI students, and then the broader OSU community.

8. Biomedical Informatics Graduate Studies Coordinating Committee

The Department of Biomedical Informatics Graduate Studies Coordinating Committee is the body responsible for directing, developing, approving, and evaluating all educational activities for the Department of Biomedical Informatics. BMI-GSCC reviews all trainees for admissions into the MS and MPH degrees BMI has in conjunction with the College of Public Health, appointments to the department's various funded fellowship programs, and provides overall guidance for all BMI courses, including reviewing course evaluations and making recommendations for improvements and revisions to course content. The review of potential GM-BMI trainees will fit in well with other expected duties for members in the committee. This

committee is composed of faculty who hold primary or secondary positions in the Department of Biomedical Informatics and includes representatives from the College of Public Health and the Biomedical Sciences Graduate Program (BMS). The chair position of this committee has a two year term. All positions are assessed on a two year cycle for renewal of appointment to the group. Participants hold M or P status in at least one graduate level program in collaboration with the College of Public Health or College of Medicine. The current members of this committee as well as their roles are mentioned below:

Membership as of Academic Year 2014-2015:

Name	Title	Department/TIU	BMI-GSCC Role/Educational Focus Area	P/M-status
Ümit V. Çatalyürek, PhD	Professor & Vice-Chair of Academic Affairs	BMI, CSE, ECE, CPH	Director of BMI Educational Programs, ECE Representative	COM, CPH, COE
Peter J. Embi, MD, MS	Associate Professor & Vice-Chair of Operations and Research	BMI, Internal Medicine	PI of CTRIP Fellowship, Clinical Education, Director of OSU 10x10 Course	COM, CPH
Kun Huang, PhD	Associate Professor	BMI, CSE, CCC	BMS Computational Biology & Bioinformatics Representative; CSE Representative	COE, COM, CPH
Timothy Huerta, PhD	Associate Professor	BMI, Family Medicine	Chair, BMI-GSCC; BMI's CPH GSC Representative	COM, CPH
Albert M. Lai, PhD	Assistant Professor	BMI, CPH	BMI's Back-up BMS Representative, BMI's CPH GSC Back-up Representative	COE, COM, CPH
Philip R.O. Payne, PhD	Professor & Chair	BMI, OAA, CPH	PI of CTRIP Fellowship, BMS Translational Bioinformatics Representative	COM, CPH
Mike Pennell, PhD	Associate Professor	CPH	College of Public Health GSC's Representative in BMI-GSCC	CPH
James M. Gentry, MA	Education Program Manager	BMI	Ex-Officio Educational Staff	

9. Letters of Support from the Participating Deans

All coursework taken as a part of this graduate minor is from the Department of Biomedical Informatics, which is housed in the College of Medicine. Attached to this proposal you will find a letter of support from Jeffrey Parvin, Associate Dean for Graduate Studies in the College of Medicine.

Department of Biomedical Informatics

Graduate Minor Procedures

General Criteria Applicable to All Graduate Minors

All academic aspects of the graduate minor are subject to approval by each participating graduate program. Below are listed the general criteria applicable to all graduate minors.

Students should consult the appropriate graduate studies committees for specific information regarding the graduate minor in which they are enrolling.

Graduate Minors: A Graduate Minor involves **one program outside a student's major graduate program**. A Graduate Minor requires a minimum of 10 hours of graduate-level course work in at least three courses. Twenty hours of graduate level courses is the maximum allowance for Graduate Minors.

The student must receive a B or better (or S when applicable) in each course comprising the Graduate Minor. The completed Graduate Minor will appear on the student's transcript.

(Graduate School Handbook, Section VIII.4)

Operating Procedures

1. The student completes the Graduate Minor in Biomedical Informatics Program Form (pages 2 and 3), including obtaining their major advisor's signature. This form should be submitted as soon as possible and no later than the end of the student's first year of graduate studies. The Program Form is then submitted to the Graduate Studies Chair of the Minor Program of Study. This form serves as the application to enroll in the graduate minor.
2. The Biomedical Informatics Graduate Studies Coordinating Committee (BMI-GSCC) Chair (i.e., the minor program) will send a copy of the completed Graduate Minor Program Form to the Graduate School and to the Graduate Studies Committee Chair of the student's major program. BMI-GSCC will keep the original.
3. The graduate studies committee of the major program will send the student and BMI-GSCC Chair an acknowledgement indicating whether or not the request is approved. The chair of the minor program will send a copy of this letter to the Graduate School.
4. The student must adhere to the curriculum of the Graduate Minor Program as indicated on the approved Graduate Minor Program Form. If changes in the approved curriculum are necessary, the student must complete a new Graduate Minor Program Form following the above steps. *Departures from the approved Minor Program could lead to the specialization not appearing on the student's transcript.*
5. Upon completion of the Graduate Minor Program, the student must submit the Graduate Minor Transcript Designation Form (page 3 of gradsch.ohiostate.edu/Depo/PDF/GraduateMinorProgramForm.pdf) to the Graduate Studies Committee Chair of the minor program. The completed form will be sent to the Graduate School for posting the minor on the student's transcript.

Department of Biomedical Informatics

The Ohio State University Graduate Minor in Biomedical Informatics

Program Form

For enrollment into the program, please **print** and **complete** both pages of this form. Mail or deliver the form to: BMI Education: BMI.education@osumc.edu, 250 Lincoln Tower, 1800 Cannon Drive, Columbus, OH 43210.

Student Contact Information

Student's Name

Major Degree Program (e.g., PhD in Computer Science, PhD in Electrical Engineering; MS in Nursing, etc.)

OSU ID Number or OSU Name.#

Phone Number

Email Address (osu.edu)

Biomedical Informatics Graduate Faculty Member

One of the requirements for the Graduate Minor is that a BMI graduate faculty member must serve as a committee member in the student's thesis or dissertation proceedings. Please list and obtain the signature of the BMI graduate faculty member who has been appointed or will be appointed on your committee. This individual must have P or M status in a program on campus per Graduate School rules and procedures for candidacy, dissertation, and thesis committees.

BMI Graduate Faculty Member Name (Printed)

BMI Graduate Faculty Member Signature

Date (MM/DD/YYYY)

Signatures

Student Signature

Date (MM/DD/YYYY)

Major Program Advisor Signature

Date (MM/DD/YYYY)

Biomedical Informatics GSCC Chair Signature

Date (MM/DD/YYYY)

