

**WORCESTER POLYTECHNIC INSTITUTE**  
**November 8, 2018**

To: The WPI Faculty  
From: Tanja Dominko  
Secretary of the Faculty

The third Faculty meeting of the 2018-2019 academic year, will be held on November 8, 2018 at 3:15 pm in Olin Hall 107.

1. Call to Order T. Dominko
  - Approval of the Agenda
  - Consideration of the Consent Agenda  
(Including the Minutes from October 4, 2018)
2. Announcements T. Dominko
3. President's Report L. Leshin
4. Provost's Report W. Soboyejo
5. Reading of Memorial Resolution: **Professor Francis Lutz** T. El-Korchi
6. Committee Business
  - Committee on Academic Policy (CAP) D. Olinger
    - **Motion to change grade replacement policy for repeated undergraduate courses**
  - ~~Committee on Governance (COG) D. Spanagel~~
    - ~~• **Motion to change department name**~~
7. Committee Reports
  - Committee on Academic Policy (CAP) and Committee on Graduate Studies and Research (CGSR) G. Heineman
    - **Ad Hoc Steering Committee for Online Course Reports**
8. Special Report
  - ADVANCE Adaptation: Advancing toward Equity for STEM faculty J. Skorinko
    - **Addressing gender equity in promotion – producing systemic change**
9. Old Business
10. Adjournment and Reception at *the quorum*

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## CONSENT AGENDA

WORCESTER POLYTECHNIC INSTITUTE

### Faculty Meeting Minutes

October 4, 2018

Summary:

1. Call to Order
2. Opening Announcements
3. President's Report
4. Provost's Report
5. Reading of Memorial Resolution: President Edmund T. Cranch
6. Committee Business: COG/COAP
7. Committee Reports: COG
8. Adjournment

Detail:

#### **1. Call to Order**

The second Faculty meeting of the 2018-2019 academic year was called to order in Olin Hall 107 by **Prof. Dominko (BBT)**. Prof. Dominko reminded everyone that while speaking, to please speak clearly, state their name and department and she reminded everyone that the meeting was being recorded for the purpose of accuracy in transcribing the minutes for each meeting.

The minutes from the September 13, 2018 Faculty meeting, and the consent agenda for this meeting, were approved as distributed. Prof. Dominko thanked **Prof. Hanlan (HUA)**, who serves as Parliamentarian, and **Prof. Vassallo (FBS)**, who will serve as Parliamentarian in B Term while Prof. Hanlan is at an off-campus project center.

#### **2. Opening Announcements**

**Prof. Dominko** introduced **Prof. Richman (ME)**, for a brief presentation on how one should conduct themselves at a Faculty meeting. Prof. Richman gave a light-hearted presentation on when and when not to ask a question at a Faculty meeting, and “taking a minute, or two, or three, to save ourselves lots of time later”.

#### **3. President's Report**

**President Leshin** thanked COG for all the work on putting together the two items up for discussion at today's meeting. The President reminded everyone about the upcoming Faculty retreats, where she will be able to interact with Faculty and have in-depth discussions on many topics, including Strategic Plan details. She thanked the Deans for their help with organizing these retreats.

#### **4. Provost's Report**

**Provost Soboyejo** shared his vision for academics over the upcoming year (See **Addendum #1** attached to these minutes). He stated that he sees tremendous potential here at WPI, as a place that embodies all things that he values as an academic: project-based learning, STEM education, and global engagement. He spoke about WPI as an ideal place to be an academic and a scholar, where each professor/teacher is valued and should be rewarded equally.

The Provost then spoke about the importance of project-based learning and the impact it has on our students. He spoke about the value of the scholarship of teaching and learning, project-based learning, and theory and practice for our students. Combining theory and applications, the students obtain soft and hard skills to bring the two together.

The global and local engagement allows us to look at our environment as a source of inspiration for purpose-driven impact. Type of engagement may be different for each individual, but always reflects dedication to our local or global community. He explained that to build a community, we need to listen to and work with each other in order to articulate a vision that is bolder and bigger, moving WPI to the next level. The Provost's mission is to work in teams, in partnership with all different stakeholders of WPI, to engage in the use of theory and practice, to do purpose-driven education and research; and a vision to be a world-class institution that trains problem-solvers.

The Provost highlighted the uniqueness and distinctness of the education model of WPI, with the many project-based learning centers for undergraduate students, and shared a vision of the possibility of project-based learning centers for graduate students as well.

In regard to Global engagement, education and research, he believes that what makes WPI distinct is the ability to frame local and global challenges and design demand-driven group activities to address them. It is the ability to formulate real solutions that have impact that make us distinct. While we cannot do everything, it's what we value as a group, to focus on with our research, education and training for life, as well as with our partnerships, that gives us the context in which we can build from individual activities, to group activities, to impact.

He spoke about the five areas of the Strategic and has formed groups to address: Health and Biotech, Robotics Internet, Materials and Manufacturing, Cyber Security-Cyber Physical Systems, Data Science/Learning Science and Technology. The Provost stated his belief in the WPI departments and schools, and his ideas to support the faculty in those areas, to make them distinctive and strong, which is fundamental to the core of what WPI stands for.

He described "servant" leadership, a means to help the faculty achieve their goals. He spoke of cross-cutting areas, core values in sustainability and global engagement; entrepreneurship and innovation; project-based learning and STEM education. He spoke about purpose-driven research and education here at WPI, and how they make a difference in the world.

The Provost explained the development of a five-year space plan, with a newly acquired building on Sagamore St., shifting space in Gateway, and the hopes of a new building in the center of campus, as well as growing the full-time tenured and tenure-track faculty to 300.

The Provost stated that he has been very encouraged with his interactions with Faculty Governance and individual faculty members on these projects.

## **5. Reading of Memorial Resolution**

**Prof. Sisson (ME)** read a memorial resolution for President Edmund T. Cranch, who passed away on February 4, 2015. (See **Addendum #2** attached to these minutes.) The resolution passed and a moment of silence was observed in President Cranch's honor.

## **6. Committee Business**

**Prof. Roberts (CHE)**, for the Committee on Academic Operations (COG), and the Committee on Appointments and Promotions (COAP), moved to adopt guidelines for Mentoring and Professional Development of Professors at the Associate Level. Prof. Roberts reviewed several changes that had been made since the original motion was distributed two weeks previously. She gave a brief presentation of highlights of the mentoring and professional development program.

**Dean McNeill (Engineering)** asked for confirmation that the Morgan Teaching and Learning Center would be monitoring the assessment of this program. Prof. Roberts confirmed the Center's commitment.

**Prof. Demetriou (ME)** asked whether mentoring would be available immediately after a candidate was promoted to associate rank. Prof. Roberts stated that there was no specific recommendation and that any candidate should seek mentoring at his/her own discretion. She stated that faculty will be encouraged to take advantage of the mentoring program early, as a part of the new NSF ADVANCE grant activities. She also reiterated that the mentoring program was optional, and not mandatory.

**Prof. Demetry (ME)** supported the motion, and thanked COG and COAP for their efforts in working through competing ideas and values to complete the proposal. She stated that, while she plans on voting for the motion, the proposal does not represent a true structural change, and does not ensure that all associate professors have equitable, high quality mentoring for promotion to full professor. A true structural change would mandate accountability and clear commitment to shepherding associate professors through promotion; much like the process that is in place for shepherding assistant professors to tenure. Prof. Demetry asked that, by voting for this motion, the senior faculty commit to extending their mentoring to both assistant and associate faculty making us a more collegial community.

The motion **passed**.

## **7. Committee Reports**

**Prof. Spanagel (HUA)**, for the Committee on Governance (COG) gave an update on the Global School proposal (See **Addendum #3** attached to these minutes). He thanked the Provost-appointed faculty group who held listening sessions and collected input in order to produce a vision document. Prof. Spanagel stated that additional input should be considered by the administration as it generates a proposal for faculty consideration.

He summarized recent COG work on this subject, including discussions with Deans Wobbe and Rissmiller, and more recently with Provost Soboyejo.

Prof. Spanagel then reviewed COG's request for additional essential information and included the need for description of Administrative Structure (organizational chart; job description and

responsibilities of the Dean); Faculty Structure (current faculty membership, additional faculty affiliations, the need for tenured and tenure-track faculty lines, anticipated faculty growth); Budget (administrative, instructional and operational expenses, anticipated revenues, comparison to current expenditures and revenues of global programs, sources of funds for startup expenditures); and Current, planned or anticipated curriculum (undergraduate and graduate programs, current and expected enrollment). He highlighted additional critical questions that should be answered in the proposal, namely the **Need** for the school, the **Approach** to make it successful, the **Benefits** over the current structure, and **Competition** of already available global programming at other universities. He added that critical and careful reflection of alternatives to increase the impact of global initiatives would strengthen the proposal. Among others, he posed a question as to whether or not a School was the best structure for the global initiative, and whether any examples could be provided that will describe improvements to and efficiencies of current programs.

Prof. Spanagel encouraged everyone to email COG with any comments, questions, or ideas regarding the Global School.

**Provost Soboyejo** thanked COG and those faculty members who contributed their thoughts and ideas on this proposal. He acknowledged Deans Wobbe and Rissmiller, for their work on this project.

He proposed that the global school could be modeled after the Woodrow Wilson School of Public Policy (which brings together fields of Natural Sciences, Engineering, Humanities & Arts, Social Sciences) and after the Princeton Institute of Science and Materials – both relying on interdisciplinary and inter-departmental collaborations. His vision for the Global School (See **Addendum 4** attached to these minutes) included contribution of all current academic divisions at WPI to collectively increasing global. He outlined his expectation that new and interdisciplinary undergraduate and graduate programs encompassing global policy and economic development (both MS and PhD) could be developed under the umbrella of the new school.

The Provost described the current IGSD/GPS expenditures at \$6 million, generating revenue of \$8 to \$8.5 million. He projected that Global School would need about \$7 million in operating expenditures, but would be generating an additional \$12 million in revenues. Combined, to operate would be roughly \$7 million, generating about \$20 million; resulting in new revenue of \$14 to \$15 million (ROI 2/1).

He asked for input from faculty, staff and administration to build on this proposal and structure. He stated that the hope was to advertise for the Dean at the beginning of 2019, and have the Dean in place at the beginning of the next academic year and get moving on this right away, and look at internal recruitment processes.

**Prof. Sullivan (ME)** asked if there would be a vote on this at the next Faculty meeting (November 8, 2018). He was concerned that there were many questions and that we may not be ready to vote upon this.

Provost Soboyejo mentioned collaboration with the Committee on Governance and the assistance of Deans Wobbe and Rissmiller. He stated that preparation of the proposal is in progress and will

address all questions. He stated that the hopes would be to distribute a document prior to the November Faculty meeting and that a vote would take place at that meeting.

**Prof. deWinter (HUA)** spoke about the organizational chart, and asked about previous administration-designated HUBS, and whether or not this program facilitated them. Provost Soboyejo stated that HUBS are very important, and it could, quite possibly, be its own division in this program.

**Prof. Dominko** stated that time had run out for this meeting. Provost Soboyejo inquired about extending the meeting for 15 minutes, however Parliamentarian Hanlan and Prof. Dominko stated that since the time had expired, the meeting could not be extended.

### **8. Adjournment**

Meeting was adjourned at 4:50 pm by **Prof. Dominko**.

Respectfully submitted,

Tanja Dominko  
Secretary of the Faculty

### **Addenda on file with these minutes:**

1. Addendum #1 Provost Report – October 4, 2018
2. Addendum #2 Memorial Resolution, President Edmund T. Cranch – October 4, 2018
3. Addendum #3 COG Update on the “Global School” proposal – October 4, 2018
4. Addendum #4 Provost Update on the “Global School” proposal – October 4, 2018

**Date:** November 8, 2018

**To:** WPI Faculty

**From:** Committee on Academic Policy (Prof. Olinger, Chair)

**Re:** Motion to change grade replacement policy for repeated undergraduate courses

**Motion:** The Committee on Academic Policy recommends and I move that the WPI faculty change the following language in the WPI undergraduate catalog related to repeated undergraduate courses.

Additions to the catalog language are underlined. On page 196 of the undergraduate catalog, in the section titled “GRADES”, the following changes are made to the subsection “GRADING SYSTEM”:

### **Current Language**

#### **GRADING SYSTEM**

*Projects:* The following term grades are possible: A, B, C, SP (Satisfactory Progress), NAC (Not Acceptable) and NR (No record).

*Courses:* The following grades are possible: A, B, C, NR, and I (Incomplete). An instructor may also assign an “I” in an Independent Study course. AT (attended) is used to denote participation in seminars or college-sponsored programs.

Students such as Consortium (CO), nondegree-seeking students, and Graduate students will receive traditional A, B, C, D, F, Withdrawal and Pass/Fail grades.

### **Proposed Language Changes**

#### **GRADING SYSTEM**

*Projects:* The following term grades are possible: A, B, C, SP (Satisfactory Progress), NAC (Not Acceptable) and NR (No record).

*Courses:* The following grades are possible: A, B, C, NR, and I (Incomplete). An instructor may also assign an “I” in an Independent Study course. AT (attended) is used to denote participation in seminars or college-sponsored programs. If an undergraduate student repeats a course previously graded with an A, B or C, both grades will appear on the undergraduate student transcript with the lower grade marked with a ‘R’ indicating a repeated class. Only the higher grade will be used to calculate the student’s numerical equivalent.

Students such as Consortium (CO), nondegree-seeking students, and Graduate students will receive traditional A, B, C, D, F, Withdrawal and Pass/Fail grades.

### **Rationale:**



As stated in the WPI undergraduate catalog, one of the goals of the undergraduate program is to 'lead students to develop an excellent grasp of fundamental concepts in their principal areas of study'. Achieving excellence in a specific subject can be reflected by an A grade in the respective class, for example. If a student achieves mastery (at the A level), their transcript and degree audit should reflect their efforts by showing an A grade for the class that was retaken.

The current policy regarding repeated classes for undergraduate students allows only one completion of the course to be used towards the student's degree requirements, but counts both grades towards the calculation of the student's numerical equivalent. Marking the lower grade with a '/R' will indicate that a higher level of mastery was achieved in a specific course with a second grade for the same course found elsewhere on the student's degree audit. A note detailing the '/R' notation will be added to undergraduate student degree audits.

Although achieving mastery of a subject may take some students more than one time through a course, the student still put their time and efforts into mastering the subject and should therefore have a transcript that reflects this. Classes at WPI are challenging and rigorous; students should not be expected to master every course on their first try. If the student is willing to put in the time, effort and finances to repeat a course, the school should allow both grades to appear on the student's degree audit and transcript, with the lower grade marked with a '/R', and only count the higher grade towards calculating the student's numerical equivalent.

The proposed policy is currently used at the graduate level. Implementing it at the undergraduate level will provide consistency between graduate and undergraduate programs at WPI.

**Implementation:**

The proposed language change will be implemented in the 2019-2020 catalog in January 2019.

**Date:** ~~November 8, 2018~~

**To:** ~~WPI Faculty~~

**From:** ~~Committee on Governance (Prof. Spanagel, Chair)~~

**Re:** ~~Motion to change the name of the Department of Biology & Biotechnology~~

**Motion:** ~~The Committee on Governance recommends and I move that the name of the Department of Biology and Biotechnology be changed to the Department of Biological and Biomedical Sciences.~~

**Rationale:**

~~The reasons for this are several, but first and foremost, it better describes the current teaching and research foci of the department.~~

~~Previously we awarded two distinct undergraduate degrees, one in biology and the other in biotechnology. Over time, the two became indistinguishable, as the disciplinary tools and techniques originally uniquely identified with biotechnology (genetic engineering, cloning, recombinant DNA) were used in nearly all areas of biology, from cell and molecular to ecology and evolutionary biology and we moved to a single degree designation, matching the department name. As the biotechnology industry matured, much of the focus, and especially the regional focus of the industry (Amgen, AbbVie, Biogen, Genzyme, Astra Zeneca to name a few) is on the development of medical applications and the production of biologics that define biomedical science.~~

~~Our current curriculum includes fundamental courses in medically relevant areas such as molecular biology and genetics which will be critical areas for medical practitioners to understand as the era of personalized genomic medicine advances. We also teach courses such as anatomy, physiology, immunology, cancer biology, neurobiology and medical microbiology which again prepare our students well for future careers in areas related to medical research and practice. Our curriculum provides the prerequisite courses for admission to most health professions graduate programs in the areas of medicine, dentistry or veterinary medicine.~~

~~The research areas of many of our faculty are directly medically focused in areas such as cancer, tuberculosis and malaria. Others have medical implications in areas such as neurologic function, wound healing and tissue regeneration. All offer MQP opportunities to our students as the capstone experience in the discipline. Our recent move to tie faculty research to laboratory teaching in the design of authentic research labs further provides students with direct links to biomedical research happening in the department and area labs, both academic and industrial.~~

~~As indicated in the proposed department name, we will continue to provide educational opportunities in the breadth of biological science, including areas such as plant physiology, ecology and biodiversity for our own majors and others. Students interested in environmental studies and sustainability will continue to find courses to inform their studies and those who are our majors will find both course offerings and MQP opportunities.~~

~~The purpose of the name change is to more clearly and immediately represent the areas of study and expertise within the department, and thus to provide students, families and external~~

constituencies with a clearer sense of what the department, its members and its students are engaged in.

**Distribution requirements:**

We are not currently planning to change our course offerings or distribution requirements, thus there will be no immediate impact on any other departments.

**Implementation:**

Our intention is that students entering next academic year (2019/2020) would get a BBS degree, while those already enrolled could choose between the BBT degree they entered with or the new degree designation. This applies to undergraduate and graduate degrees currently carrying “Biology and Biotechnology” designation (namely BS, thesis-based MS and PhD). The name of the skills-based MS in “Biotechnology” would remain unchanged.

**Consent Agenda Motions**  
**November 8, 2018**

**Date:** November 8, 2018  
**To:** WPI Faculty  
**From:** Committee on Academic Operations (prof. Mattson, Chair)  
**Re:** Motion to change Distribution Requirements for the Civil Engineering Major

**Motion:** The Committee on Academic Operation recommends and I move, that Note 6 to the distribution requirements for the Civil Engineering Major be modified in the undergraduate catalog as described below.

**Existing Distribution Requirements:**

Notes:

6. Must include 1/3 unit of Capstone Design Experience.

**Proposed Distribution Requirements: (change noted in *underlined italics*)**

Notes:

6. Must include 1/3 unit of Capstone Design Experience, and 4/3 units from the following list of Civil Engineering courses: CE 2020, CE 3010, CE 3020, CE 3041, CE 3050, CE 3059, and CE 3062.

**Rationale:**

This revision to Note 6 of the distribution requirements is necessary to ensure that the requirements for the Civil Engineering Major satisfy an important criterion for technical breadth within the ABET Program Criteria for Civil Engineering Programs, namely “The curriculum must prepare graduates to analyze and solve problems in at least four technical areas appropriate to civil engineering.” Recognizing that the field of civil engineering involves many areas of technical specialization, the CEE Department has a long-standing practice of advising civil engineering majors to take courses in at least 4 areas of civil engineering. Civil engineering majors are not obligated to follow this advice, and the Program Review Committee cannot enforce it. Without a corresponding distribution requirement, it will be difficult for the CEE Department to certify to an ABET program evaluator that all of its graduates comply with the criterion for technical breadth. The proposed revision to Note 6 of the distribution requirements specifies that all civil engineering graduates must have technical breadth in at least four areas of civil engineering, while encouraging individual student choices in their programs of study.

The American Society of Civil Engineers (ASCE) is the lead society for defining the Civil Engineering Program Criteria, and ASCE has recognized 7 civil engineering technical areas:

- Construction engineering
- Environmental engineering
- Geotechnical engineering
- Hydraulics/hydrology/water resources engineering
- Structural engineering
- Surveying/measurements
- Transportation engineering

Each of the listed courses (CE 2020 Surveying, CE 3010 Structural Engineering, CE 3020 Project Management, CE 3041 Soil Mechanics, CE 3050 Transportation: Traffic Engineering, CE 3059 Environmental Engineering, and CE 3062 Hydraulics) represents one of the 7 technical areas.

**Resource Needs:**

There will be no new resources required because all of the listed CE courses are currently offered.

**Implementation Date:**

Implementation date for this action is the 2019-2020 Academic year.

**Date:** November 8, 2018  
**To:** WPI Faculty  
**From:** Committee on Academic Operations (prof. Mattson, Chair)  
**Re:** Motion to remove BB 3040 *Experimental Design and Data Analysis*

**Motion:** The Committee on Academic Operation recommends and I move that BB 3040 *Experimental Design and Data Analysis* be removed from the undergraduate catalog.

**Course description:**

BB 3040. EXPERIMENTAL DESIGN AND DATA ANALYSIS.

Cat. II

This applied course introduces students to the design of experiments and analysis of data. A combination of lecture, reading and discussion will be used to cover a variety of experimental situations occurring frequently in modern biology, including testing the fit of data to theoretical distributions, comparisons of groups, and regression analysis. Emphasis will be placed on the formulation of hypotheses, the design of experiments to test a formulated hypothesis, and the will be used to illustrate the importance of experimental control as well as some of the most common errors made in choosing and performing statistical tests. Students will learn to use computer packages to carry out both parametric and non-parametric tests on their own experimental data.

Recommended background: a solid background in a biological area at about the depth provided by any BB 3000 or 4000 level course. This course will be offered in 2019-20, and in alternating years thereafter. Students may not receive credit for both BB 4040 and BB 3040.

**Rationale:**

This Category II course has had very small enrollment numbers for some time now (5 and 14 students respectively for the last two offerings, spanning 4 years). Our department does not require students to take a statistics course, and no other department requires this course in particular. The Mathematical Sciences Department offers two entry level statistics courses, including MA 2610, *Applied Statistics for the Life Sciences*. Social Science and Policy Studies also teaches PSY 3500 *Experimental Design and Analysis*, which includes many of the same content BB 3040 encompassed. Finally, the Biology & Biotechnology Department will continue to teach BB 553, *Experimental Design and Statistics in the Life Sciences* which undergraduates could choose to take.

**Note changes to catalog:**

Page numbers refer to the 2018-19 undergraduate catalog.

- On page 39, note 1: remove BB 3040
- On page 125, remove course description

**Impact on Distribution Requirements and Other Courses:**

There are no other departments or courses which require or recommend this course specifically. Requirements for statistics content can be met in other ways (see Rationale)

**Implementation Date:**

Implementation date for this action is the 2019-20 Academic year.

**Date:** November 8, 2018  
**To:** WPI Faculty  
**From:** Committee on Academic Operations (Prof. Mattson, Chair)  
**Re:** Motion to add BB 4260 *Synthetic Biology*

**Motion:** The Committee on Academic Operation recommends and I move that the course BB 4260 *Synthetic Biology*, be added to the undergraduate catalog.

**Course/Catalog Description:**

BB 4260 SYNTHETIC BIOLOGY

*Cat. II*

Do we yet have the technology to engineer life? Can we control gene expression to create organisms that function in useful ways? Do we understand the tenets of genetic regulation as well as we think we do? These important questions and more are investigated by the emerging field of Synthetic Biology. In this course, students will explore this exciting new realm of biology through in-depth analysis and discussion of primary literature. Topics to be covered include the design and construction of synthetic gene circuits, synthesis of new genes and genomes, logic gate regulation of gene expression, and the latest applications of synthetic biology to advances in medicine, information processing, and the environment.

Recommended Background: Students should have a strong foundational knowledge of cell biology, molecular biology, and genetics, as would be obtained from BB2550, BB2920, and BB2950.

Anticipated Instructor: Natalie Farny

**Rationale:**

Recently, due in part to personnel changes within the department, we have dropped some courses at the 4000 level. Although we have also added a capstone course series, those courses will change year to year. In fact, Synthetic Biology has been taught as a capstone course. Now we are looking to make it a more permanent offering in our curriculum. Synthetic Biology loosely defined uses parts of natural biological systems as components of an engineered biological system. It is an area of increasing research and commercial focus in which a number of biotechnology companies are operating. Students in this course will benefit from an understanding of this emerging field of biology and its growing number of applications.

**Impact on Distribution Requirements and Other Courses:**

The distribution requirements for Biology & Biotechnology majors include a minimum of one course at the 4000 level. This will provide an additional option for our majors. No other department has a similar specific requirement, although this course may be attractive to students in other disciplines, especially biochemistry and although not specifically required can be used to fulfill a requirement for a minor in Biology.

**Additional Information:**

Synthetic Biology was taught by Professor Farny as a BB 4900 Capstone course in spring of 2018. Enrollments in these courses are capped at 15 and there were 13 students enrolled. Course evaluations were completed by 11 students with a Q2 rating of 4.91 and a Q9 rating of 4.64.



**Resource Needs:**

- This will become one of several courses taught by Natalie Farny, an Associate Teaching Professor in the department. It is also a topic which could be taught by a number of other department faculty should the need arise.
- Initial enrollment limit will be 35 students. No special classroom requirements, other than moveable furniture to facilitate discussion groups.
- No wet lab, no computer lab
- Potentially an R&I librarian for in class presentation and student consultations
- No special IT support

**Implementation Date:**

Implementation date for this action is the 2020-2021 Academic year.

**Date:** November 8, 2018  
**To:** WPI Faculty  
**From:** Committee on Academic Operations (Prof. Mattson, Chair)  
**Re:** Motion to add BB/BCB 1003 *Exploring Bioinformatics and Computational Biology*

**Motion:** The Committee on Academic Operations recommends and I move that the course: BB/BCB 1003 *Exploring Bioinformatics and Computational Biology* be added to the undergraduate catalog.

**Course/Catalog Description:**

BCB 1003. / BB 1003. Exploring Bioinformatics and Computational Biology

Cat. I

1/3 unit lecture/computer laboratory

Life scientists are generating huge amounts of data on many different scales, from DNA and protein sequence, to information on biological systems such as protein interaction networks, brain circuitry, and ecosystems. Analyzing these kinds of data requires quantitative knowledge and approaches using computer science and mathematics. In this project-based course, students will use case studies to learn about both important biological problems and the computational tools and algorithms used to study them. Students will study a sampling of topics in the field; recent topics included complex disease genetics, HIV evolution, antibiotic resistance, and animal migration behavior. In addition, students will hear from several guest speakers about their interdisciplinary research. Computational tools explored will include both freely-available tools to analyze sequences and build phylogenetic trees (e.g. BLAST, MUSCLE, MEGA) as well as guided programming using languages such as Python, R, and Netlogo. Students may not receive credit for both BCB / BB 100X and BCB / BB 1003.

BBT majors may count this course as fulfilling part of their quantitative science and engineering requirement, but not as part of their BB 1000 level course requirement. Recommended background: High school biology. Programming experience is not required.

**Intended audience:**

Students who will benefit from an introduction to the use of computational analyses of biologic data. The course was designed for freshman BCB majors, but the majority of students who have taken the class are engineering, computer science, and basic science majors

**Anticipated Instructor:** Elizabeth Ryder

Professor Ryder is a tenured member of the BBT Dept. faculty and the BCB Program faculty. Her teaching responsibilities have been negotiated between the department and program heads to allow her to teach this course.

**Rationale:**

Currently, the only permanent courses offered by the Bioinformatics and Computational Biology Program are at the 3000 and 4000 level. Students in the major thus typically have to wait until their junior year to get a closer view of the field, and of the interplay of the biology, math, and computer science concepts that they have mastered in their core courses. Similarly, non-major students who might find this area fascinating have no opportunity to explore it at an introductory level. The intent of this course is to give students a flavor of the kinds of problems bioinformaticians and computational biologists study, as well

as introducing them to programming techniques and algorithms. Course enrollment will be capped at 40 in order to allow a project-based / case study approach, and to allow the class to be scheduled in a computer lab where students can use software easily during class time.

This course has been taught as an experimental course with enrollment data shown.

- B term 2015: 30 students
- B term 2016: 38 students
- B term 2017: 36 students
- B term 2018: 31 students

**Resource Needs:**

No new resources are required.

**Implementation:**

Beginning in academic year 2019/2020.

**Date:** November 8, 2018  
**To:** WPI Faculty  
**From:** Committee on Graduate Studies and Research (Prof. Scarlata, co-Chair)  
**Re:** Motion to change course description for BCB 510 *BCB Seminar*

**Motion:** The Committee on Graduate Studies and Research recommends and I move that following catalog changes for the course description of BCB 510 Seminar be approved.

*Current description*

BCB 510 Seminar (1 credit)

This seminar provides an opportunity for students in the BCB program to present their research work, as well as hear research talks from guest speakers.

*Revised description*

BCB 510 Seminar (0 credits; P/F)

This seminar provides an opportunity for students in the BCB program to present their research work, as well as hear research talks from guest speakers.

**Rationale:**

Our original intent in making the seminar a credit-bearing course was to ensure that students took it seriously and attended, since lack of attendance would have an effect on their GPA. However, there are a number of problems with having the seminar bear credit. First, it is not really enough work to merit 1 credit, since the grade is based on attendance, and presentation of any research work once/year. Particularly since students take the seminar every semester, they are getting too much credit for this amount of work. Second, for our self-paying students, making them pay to attend the seminar seems punitive. Even for our supported students, since most get 9 credits of credit per semester of support, having to pay for this credit is problematic if they are taking 3 courses.

By changing the course to 0 credits and making it P/F, we believe we will achieve our original intent (since students will not want an F on their transcript, even with no credit attached), without the problems mentioned above.

**Impact on Degree Requirements:**

PhD candidates are required to take the seminar every semester. By changing this requirement, we will increase the number of credits they must take in other areas to graduate. We expect that most will take additional courses or research credits, which will be to their benefit. Master's students are not currently required to enroll in the seminar. This change will make it easy for the faculty to strongly encourage them to do so.

**Resource Needs:**

No additional resources are required.

**Implementation Date:**

Implementation date for this action is the 2018-2019 academic year, spring semester.