WORCESTER POLYTECHNIC INSTITUTE
November 10, 2022

To: The WPI Faculty
From: Mark Richman
           Secretary of the Faculty

The third Faculty meeting of the 2022-2023 academic year will be held on **Thursday**, **November 10, 2022 at 3:15pm in OH 107 and by Zoom at:** https://wpi.zoom.us/j/92802673390 . Refreshments will be available in OH 107 at 3pm.

1. Call to Order   M. Richman

   - Approval of the Agenda

2. Scheduling of Faculty Meetings   M. Richman

3. Consent Agenda   M. Richman

   - Minutes from Sept. 1, 2022 and Oct. 6, 2022;
   - Consent Agenda motions from CAO and CGSR

4. Opening Announcements

   - WPI Sexual Misconduct Policies: Brief Update   L. Albano
   - WPI AAUP Chapter: Update   J. Sanbonmatsu

5. Committee Business:

   Committee on Tenure and Academic Freedom (CTAF)   M. Claypool
   Committee on Governance (COG)   L. Albano
   - Motion to increase the number of members on CTAF and to update the
     Faculty Handbook description of CTAF

6. Special Reports:

   Equity in our Associate-to-Full promotion systems: How far have we come?   C. Demetry
                                                                    S. Roberts

   Graduate Worker Union: WPI-GWU and You   A. Gandhi
                                                                    A. McReynolds

7. New Business

8. Provost's Report   A. Heinricher

9. Closing Announcements

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WORCESTER POLYTECHNIC INSTITUTE
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2. Secretary of the Faculty's Report
3. Opening Announcements
4. Committee Business: CAO; CGSR
5. Introduction of New and Recently Appointed Faculty Members
6. President's Report
7. Provost's Report
8. Closing Announcements
9. Adjournment

Detail:

1. Call to Order

The first Faculty Meeting of the 2022-2023 academic year was called to order at 3:15pm in Olin Hall 107 by **Prof. Richman** (AE). Prof. Richman reminded all those in attendance that the meeting was being recorded. The meeting agenda, the minutes from the May 10 meeting, and the consent agenda motions were approved as distributed.

2. Secretary of the Faculty's Report

Prof. Richman welcomed all those in attendance to the first in-person faculty meeting since March 2020, after twenty-one on-line faculty meetings since that time. The main reason for the first meeting of the year is not only to approve the August 2022 graduation lists, but also to meet our new colleagues and to hear from them in their own voices. Prof. Richman thanked former Secretary of the Faculty Prof. Hanlan (HUA) for agreeing again to serve as the Parliamentarian this year.

Prof. Richman used himself as an example to provide a description of how the WPI faculty had evolved and devolved during COVID. Prof. Richman also reflected on the historic significance of Hughes House, which for many years had been used as the WPI Provost's residence. He reported that according to the Worcester Business Journal, the house had been sold by WPI to Holy Cross in May 2022 for $800K at roughly 40 percent of its $2M assessed value.

Prof. Richman introduced the Quorum to our new faculty members, and he explained that it was conceived of and designed primarily by the faculty in close collaboration with the administration, plant services, and Chartwells. The Quorum opened in September 2017 as a place to bring faculty and staff members together across departments, programs, and divisions to foster campus collegiality and as an important aid to maintaining employee mental health. Prof. Richman hopes that he and other faculty members will be invited into discussions that so far have not resulted in the reopening of the Quorum since it closed in March 2020 due to COVID. He emphasized that those discussions should focus on considerations of campus wellness even more than on financial profitability.

3. Opening Announcements

Prof. Strauss (DIGS) recalled the May faculty meeting when she asked the faculty to review a draft resolution that followed a similar resolution endorsed by WP students urging WPI's divestment from fossil fuels. A group of faculty members is developing a similar faculty resolution, which will be presented at an upcoming faculty meeting. Feedback and questions as that draft is in process should be directed to her.

Prof. Kmiotek (CHE) summarized the work of the Mental Health Task Force, which has developed over 100 recommendations based on surveys conducted last fall. The Committee on Advising and Student Life (CASL) will announce new resources for more effective advising, including a new exam testing proctoring center for make-up exams. The Morgan Center has compiled suggestions for ways we can incorporate more flexibility into our teaching while maintaining academic standards, and there are ways to employ lecture capture while also limiting their use to

specific students in a course. Prof. Kmiotek urged faculty to take advantage of all appropriate resources and thanked them for supporting our students.

Prof. Heineman (CS) gave an update from the Presidential Search Committee. The committee has screened the applications of well over 100 applicants, and it has conducted Zoom interviews with roughly 20 of them. From these candidates, a much smaller final group with diverse backgrounds as Presidents, Provosts, and Deans from highly rated universities have been identified by the search committee for final stage in-person interactions with the advisory groups.

4. Committee Business
Committee on Academic Operations (CAO):
Prof. Elgert (SSPS) reported on behalf of the Committee on Academic Operations (CAO) that the Office of the Registrar has verified that the undergraduate students listed in the meeting materials have, as of August 30, 2022, completed all of the requirements for the undergraduate degree designated in the department or program indicated and are therefore eligible to receive that degree. As Chair of the Committee on Academic Operations, she moved that these students be approved for August 30, 2022 graduation.

The motion passed.

Committee on Graduate Studies and Research (CGSR):
Prof. Medich (PH) reported on behalf of the Committee on Graduate Studies and Research (CGSR) that the Office of the Registrar has verified that the graduate students listed in the meeting materials have, as of August 30, 2022, completed all of the requirements for graduate degree designated in the department or program indicated and are therefore eligible to receive that degree. As Chair of the Committee on Graduate Studies and Research, he moved that these students be approved for August 30, 2022 graduation.

The motion passed.

Prof. Richman thanked Registrar Sarah Miles and her entire staff for the hard work required to compile the graduation lists accurately.

5. Introduction of New and Recently Appointed Faculty Members
Each new or recently appointed faculty member present at the meeting was introduced and gave a brief description of their teaching, research, or administrative interests, as appropriate.

Prof. Richman (AE) expressed Institutional pride in WPI's success in establishing a tenure track for teaching faculty in May 2021, and he highlighted the positive attention it had brought to WPI from Inside Higher Ed, The Chronicle of Higher Education, the American Association of Colleges and Universities, the Pullias Center for Higher Education at USC, and the American Association of University Professors. Prof. Richman then introduced the following faculty members recently named as part of a second cohort of Professors of Teaching, and each described their teaching and research interests: **Prof. Laila Abu-Lail** (ChE/CEAE); **Prof. Joseph Aguilar** (HUA); **Prof. Joseph Cullon** (HUA).**Prof. John Michael Davis** (DIGS); **Prof. Lindsay Davis** (HUA); **Prof. Katherine Foo** (DIGS); **Prof. Rudra Kafle** (PH); **Prof. Koksal Mus** (ECE); **Prof. Buddika Peiris** (MA); **Prof. Pradeep Radhakrishnan** (MME); **Prof. Louis Roberts** (BBT): **Prof. Joshua Rohde** (HUA); **Prof. Can Sabunco** (MME); and **Prof. Izabela Stroe** (PH).

President Soboyejo introduced **Interim Provost Art Heinricher** (MA) who thanked the faculty for their confidence in him. **Prov. Heinricher** introduced **Interim Dean Arne Gericke** (CBC) who is looking forward to working with the faculty in his new role.

Prov. Heinricher introduced **Prof. Craig Shue** (CS) as the new Department Head in Computer Science. **Prof. Shue** introduced the three new faculty members: **Prof. Matthew Ahrens**, Assistant Teaching Professor (CS); **Prof. Jennifer Mortensen**, Assistant Teaching Professor (CS); and **Prof. Fabrico Murai,** Assistant Professor (CS).

Prov. Heinricher introduced **Prof. Robert Hyers** (MME) as the new Department Head in Mechanical and Materials Engineering. **Prof. Sullivan** (Assoc. Dept. Head, MME) introduced two new faculty members: **Prof. Lee Moradi**, Professor of Practice (MME); and **Prof. Vladimir Vantsevich**, Professor (MME).

Prof. Skorinko (SSPS) introduced three new faculty members: **Prof. Richard Lopez**, Assistant Professor (SSPS); **Prof. Trent Masiki**, Assistant Professor (SSPS); and **Prof. Hermine Vedogbeton**, Assistant Research Professor (SSPS).

Prof. Rao (BBT) introduced **Prof. Christopher Collins**, Associate Teaching Professor (BBT).

Prof. Billiar (BME) introduced **Prof. Diana Alatalo**, Assistant Professor (BME).

Prof. Strong (BUS) introduced **Prof. Kwamie Dunbar**, Associate Professor (BUS); and **Prof. Daniel Treku**, Assistant Teaching Professor (BUS).

Prof. Roberts (CHE) introduced two new faculty members: **Prof. Christina Bailey-Hytholt**, Assistant Professor (CHE); and **Prof. Xiaowei Teng**, Professor CHE).

Prof. Tao (CEAE) introduced **Prof. Nancy Ma**, Assistant Professor (CEAE).

Prof. Ludwig (ECE) introduced **Prof. Bashima Islam**, Assistant Professor (ECE).

Prof. Moncrief (HUA) introduced two faculty members: **Prof. Laura Eckelman**, Associate Professor (HUA); and **Prof. Kara Parks Fontenot**, Assistant Teaching Professor (HUA).

Prof. Smith (IMGD) introduced **Prof. Melissa Kagen** Assistant Teaching Professor (IMGD).

Prof. Elgert (DIGS) introduced **Prof. Melissa Butler**, Instructor (DIGS).

Prof. Olson (MA) introduced two new faculty members and two new post-doctoral scholars: **Dr. Nicole Buczkowski**, Post-Doctoral Scholar, (MA); **Dr. Tharindu DeAlwis**, Post-Doctoral Scholar (MA); **Prof. Carly Thorp**, Professor of Practice (MA); and **Prof. Samuel Tripp**, Assistant Teaching Professor (MA).

Prof. Medich (PH) introduced the three new faculty members: **Prof. Thomas Noviello**, Instructor (PH); **Prof. William McCarthy**, Assistant Professor (PH); and **Prof. Leo Rodriguez**, Visiting Research Professor (PH).

Prof. Xiao (RBE) introduced two new faculty members: **Prof. Andre Rosendo**, Assistant Teaching Professor (RBE); and **Prof. Nitin Sanket**, Assistant Professor (RBE).

Dr. Chen (Exec Dir., STEM Ed Center) introduced **Prof. Jillian DiBonaventura**, Professor of Practice, (UGS).

Dean Gericke introduced **Prof. Joseph Mazzocchi** (Mil. Sci) as the new Department Head in Military Science.

6. President's Report

President Soboyejo shared his pleasure at seeing everyone in person. He explained that he joined WPI six years ago because he loves teaching, research, and projects, and the people who love these things. He pointed to the newly introduced faculty as evidence of WPI's devotion to research and teaching. President Soboyejo assured his new colleagues that WPI is a welcoming community where all views and matter. He promised that they could talk to the President, Provost, or Secretary of the Faculty and their opinions would be valued. Reflecting on his successes, President Soboyejo traced them to his professors and advisors who cared about him, and he urged all of us to consider their roles in making WPI a welcoming place for our students and helping them avoid excessive stress.

President Soboyejo described his top priority as rebuilding the community at every level. He urged everyone to take care of themselves by finding a healthy balance between work and life. He reflected on his original discussions last spring with Prof. Richman about the purpose and planning of community days that would be embraced by the entire campus, and he pointed out that such days would be continued throughout this academic year. Finally, Provost Soboyejo hoped to see everyone at the reception at the President's House following the faculty meeting.

7. Provost's Report

Provost Heinricher expressed his gratitude for the considerable work done this summer to prepare for the academic year, including research and advising for both undergraduate and graduate students. He thanked Prof. Cullon for leading summer work to redesign some of the introductory to humanities courses to address the challenges of coming to college for the first time. The Office of Academic Advising redesigned the scheduling process so that students designated the courses they wanted to take and then had their schedules determined by the office. Provost Heinricher thanked Prof. Kmiotek and others on the Mental Health and Well Being Task Force both last year and this year. And he thanked those present at the bridge crossing ceremony.

Provost Heinricher shared his belief that people come before process, while providing his assurance that he would follow process. He recalled the 2014 Gallup-Purdue study that identifies the six best predictors of success in college, which in reverse order of importance are as follows: social connections as undergraduates; a job or internship requiring that they apply classroom learning outside of the classroom; work on a research or other project that extended longer than a semester; a mentor who encouraged them to pursue their goals; a professor who cared about them as a person; and at least one professor who made them excited about learning. Nationally, only 3 percent of all respondents reported experiencing all six of these indicators. Prof. Heinricher welcomed the faculty to a new academic year.

8. Closing Announcements

Prof. Scarlata (CBC) announced a new forum to gather and have lunch with new and continuing colleagues. **Prof. Roberts** (CHE) asked the faculty to look for an email announcing the first of a series of monthly lunch events. Discussions will be informal and focus on topics that are important to the faculty; faculty are invited to suggest topics. The first event will be held on September 9.

Prof. Spanagel (HUA), in his role as the Vice President of WPI's AAUP chapter, announced that the Chapter's first meeting will be held on September 8 at 4pm in AK116. Any questions can be directed to Prof. Spanagel or WPI's AAUP President, Prof. Sanbonmatsu.

Prof. Richman thanked the faculty for their attendance and encouraged them to return regularly for subsequent meetings. He noted that faculty meetings extend well beyond policy matters: last year's faculty meetings, for example, included discussions about student mental health; faculty work-life balance; resource allocation; and admissions and enrollment data. Even within the context of policy matters, faculty meetings involve items that may be outside one's own field but benefit from campus-wide scrutiny, and oftentimes concern complex questions that are best resolved with broad support. For the benefit of the newest faculty members, Prof. Richman noted that faculty governance does not require a large amount of time, but instead derives its strength from broad community participation by a faculty abreast of the current issues most often addressed at our faculty meetings. As an example of the power of broad participation, he cited the inclusive process by which we established the teaching track to tenure, which, for teaching faculty at most institutions with weaker faculty governance, is unimaginable. More generally, he observed that once a matter is resolved by faculty vote, its legitimacy is never questioned.

9. Adjournment

The meeting was adjourned at 4:55pm by **Prof. Richman**.

Respectfully submitted,

Mark Richman
Secretary of the Faculty

WORCESTER POLYTECHNIC INSTITUTE
Faculty Meeting Minutes
October 6, 2022

Summary:
1. Call to Order
2. Opening Announcements
3. Committee Business: CTAF/COG
4. Committee Reports: CTAF; FAP
5. New Business
6. President's Report
7. Provost's Report
8. Closing Announcements
9. Adjournment

Detail:

1. Call to Order

The second faculty meeting of the 2022-2023 academic year was called to order at 3:30pm in Olin Hall 107 by **Prof. Richman** (AE). Prof. Richman reminded all those in attendance that the meeting was being recorded for the purpose of accurate minutes only. The meeting agenda was approved as modified. Approval of the minutes from the September 1st meeting will be moved to the November 10 meeting.

Prof. Richman (AE) pointed to the agenda of today's meeting as an example of the different levels of work done through faculty governance. The CTAF/COG motion is in response to our previous work in establishing a teaching path to tenure. The CTAF committee report on flexibility in timing final tenure reviews is the start of an attempt to modify our formal policies based on the realities of our professional and personal lives. And the FAP committee report is result of a longstanding effort to understand the trends and consequences of our executive compensation theories and practices.

2. Opening Announcements

Prof. Strauss (DIGS) reported that the formulation a faculty resolution on divestment from fossil fuels has expanded to address broader campus decarbonization efforts and to include timelines in addition to the initial single focus on divestment. She hopes that we will have a draft document to present at the November 10 faculty meeting for initial discussion. **Prof. Richman** thanked Prof. Strauss for her work in coordinating the various interests that have a stake in the University's sustainability efforts.

3. Committee Business

Committee on Tenure and Academic Freedom (CTAF) and the Committee on Governance (COG):

Prof. Claypool (IMGD; Chair, CTAF) explained that the motion, for discussion only, would expand CTAF from six to nine members, clarify the seniority system used to select the Chair and Secretary of the committee, update the charge of CTAF to explicitly include tenure reviews of Professors of Teaching, clarify that recommendations by Joint Committees for tenure of Assistant Professors and Assistant Professors of Teaching include recommendations for promotion to the associate rank whereas recommendations for tenure of associate or full professors do not include any promotion considerations, and reorganize and edit the CTAF charge and other language in the appendices of Part One of the current Faculty Handbook for consistency with a larger effort underway to reorganize the whole Faculty Handbook. (See **Addendum #1** on file with these minutes.)

Prof. Claypool further explained that by increasing the number of CTAF members from six to nine, the caseload per committee member each year will decrease from (5/6=) 83 percent of all cases reviewed to (5/9=) 55 percent of all cases. By 2026, when a peak of about 24 tenure cases is anticipated, this will decrease the number of cases per committee member from about 20 to about 13. This will keep the number of cases just manageable while not sacrificing the quality of the tenure reviews.

Prof. Neamtu (CS) asked if the motion would change the make-up of Joint Tenure Committees. **Prof. Claypool** explained that five CTAF members will still be chosen for each eight-member JTC, so the expanded CTAF membership would only provide a larger pool from which to choose the five CTAF members.

Prof. Gericke (CBC) suggested for consistency with a second sentence in the motion that recommendations to the "Administration" be described as recommendations to the "Provost."
Prof. Shue (CS) was in favor of the motion and asked if additional resources would be made available for the larger group of CTAF members to receive course releases for their CTAF service. **Prof. Claypool** agreed that there would be a larger expense. **Provost Heinricher** suggested that the logistics of finding replacements to fill course releases could possibly be offset by offering compensation to CTAF members for starting their reviews in August rather than in September.

Prof. Somasse (SSPS) asked if there were any significance to increasing from an even number to an odd number of CTAF members. **Prof. Claypool** explained that the increase would not affect voting majorities because the number of JTC members would not change.

Prof. Wyglinski (ECE) asked if CTAF members from departments with a large number of tenure cases in the same year would have to be recused from more cases than other CTAF members. **Prof. Claypool** noted that with the added CTAF members there will in all likelihood be enough people on the committee to work around departmental recusals without unevenly burdening any one committee member.

Prof. Boudreau (HUA) wanted to keep the language about calling on the most recent qualified past chair of CTAF on off-chance that too many CTAF members were recused in a particular case. **Prof. Claypool** appreciated the point, but pointed out that with nine CTAF members, five would have to be recused before such a need would arise, which is highly unlikely.

Prof. Hansen (HUA) asked if any consideration had been given to elaborating on the current requirement that CTAF members need only be tenured - without any mention of whether they were dual-mission or teaching faculty. **Prof. Claypool** agreed that the current language makes all tenured faculty eligible for CTAF regardless of their dual-mission or teaching roles. However, the next two CTAF elections will take place before any Professors of Teaching will be eligible for CTAF, so before proposing any further changes it is better to think more carefully about whether and how to designate further requirements on the CTAF membership and whether and how to constitute JTCs differently depending on the candidate's track.

4. Committee Reports
Committee on Tenure and Academic Freedom (CTAF):
Prof. Claypool (IMGD; Chair, CTAF) presented a very preliminary report that originated with CTAF last spring about ideas for providing additional flexibility in the timing of final tenure reviews. (See **Addendum #2** on file with these minutes.) The impetus for these ideas came from the disruptions in progress toward tenure created by COVID, to which we responded by providing a one-year (opt-out) tenure clock stoppage for all probationary faculty members and by including a COVID impact statement from each candidate in the materials considered during the tenure reviews.

Prof Claypool explained that the larger issue is whether the timing of the final tenure reviews could be made more flexible to accommodate the wider array of personal and professional circumstances that affect each faculty member in different ways. Such flexibility might help address the challenges of work-life balance, reduce stress, reduce inequities, and allow us to better recruit and retain talented faculty members.

In the current system, the year of the final tenure review is set at the time of initial probationary appointment; it can be delayed by stopping the tenure clock only for the arrival of a new child or for an unpaid or part-time leave of absence. There is reluctance and inequity in the usage of tenure clock stoppages by faculty members.

Prof. Claypool suggested that in a more flexible system, for example, every faculty member could choose the timing of their final tenure review within a window of four years, The tenure criteria would be the same within the window, and there would still be only one opportunity to be reviewed for tenure. This might eliminate the need for tenure-clock stoppages, or perhaps might replace them with an extenuating circumstances statement

more general than but analogous to the COVID impact statement. Just as for any change in our tenure review system, questions would have to be answered about how these changes might be implemented with respect to faculty members who are in their probationary periods when the changes are made.

Prof. Sabuncu (MME) suggested that more description might be needed about the differences between the criteria for early tenure and the normal tenure criteria. **Prof. Claypool** pointed out that the language about a higher set of criteria was in the current Faculty Handbook, and he thought it might be possible to clarify it.

Prof. Davis (HUA) asked if there are any other universities that use flexible timing of tenure reviews and if similar inequities are or would be observed in how and by whom longer probationary periods are chosen. **Prof. Demetry** (MME) was not sure if there were other universities using such models. **Prof. Claypool** thought the more flexible tenure system would be a step in the direction of addressing but not eliminating those inequities.

Prof. Boudreau (HUA) added that she was very much in favor of the general concept of increased flexibility, but she was concerned that a decision on the part of the candidate to put off the year of their final tenure review later within the window might complicate the significance and the perception of the outcome of the fourth-year tenure review by the DTC.

Prof. Smith (IMGD) appreciated the thoughtful approach that is being suggested here. She wondered if an alternative approach might be to make the tenure criteria rather than the tenure window more flexible to account for all our personal and professional differences in ways that are consistent with the fundamental meaning of tenure.

Prof. Neamtu (CS) pointed out that increasing the length of the probationary period may not decrease stress. She wanted to reward tenure for the work that the candidate has done and is doing rather than have the process make them feel as though they should do more because they can take more time to do it.

Prof. Shue (CS) was interested in exploring more humane tenure options than the usual single "up-or-out" final review. While acknowledging that we have to avoid a system that strings candidates along indefinitely, he suggested the possibility of providing more than one opportunity to be reviewed for tenure, as well as the possibility of retaining faculty who fell only slightly short of satisfying the tenure criteria.

Kris Sullivan (Assoc. VP, Academic Affairs) asked if any consideration had been given to the effect that longer probationary periods would have on start-up packages for new faculty members and the need that might arise to stretch or change the funding and/or personnel within those packages to extend for longer periods of time.

Prof. Coburn (BME) made the point that even with a flexible tenure review window, explicit language should be maintained to provide guidance for and typical examples of reasons (such as for a new child) why candidates might choose to extend their probationary periods.

Prof. Gericke was concerned that by providing extra time as a response to personal and professional difficulties, the university's response to helping candidates navigate those difficulties might be less robust than it would be with a firmer timeline for the final tenure review.

Prof. Rudolph (HUA) was in favor of the increased flexibility, but she agreed with Prof. Coburn that it was important to provide guidance for how and when and why the probationary period should be extended. **Prof. Claypool** clarified that the decision about when to set the tenure review within the window would be entirely up to the candidate, but that the tenure criteria would be the same in any case. In his view, the risk might be that if typically people don't need the extra time but take it anyway, then the bar for satisfying the tenure criteria might be raised over time.

Prof. Heilman (CBC) was also concerned about people using this extra time when they don't need it, increasing the average length of the probationary period, and in effect making the tenure process more demanding.

Prof. Zekavat (PH) thought that just as there are early tenure candidates, faculty members were inclined to earn tenure as soon as possible, and that without complications in their lives they were likely to abide by the normal tenure review timeline.

Prof. Eckelman (HUA) was in favor of the principle of extra flexibility, but was concerned about gender-based differences that would arise in the use of extra time. She also was concerned about the possibility of effectively

increasing the normal probationary period to seven or eight years and then needing to resolve that problem later.

Prof. Saeed (SSPS) disagreed with the spirit of the proposal. In his view, tenure is for promise of scholarship within a limited timeframe used consistently by most universities. He thought that flexibility should be provided to probationary faculty members on case-by-case basis, but he does not support the idea of retroactive pay to those who achieve tenure after an extended probationary period. Prof. Saeed also pointed out that the practice of providing reduced teaching loads to probationary faculty members would have to be reconsidered carefully if probationary appointments could be extended at the will of each faculty member.

Prof. Richman reminded all those in attendance that this was an introductory discussion on the topic, and he encouraged anyone with additional questions or comments or ideas to contact Prof. Claypool or the other members of CTAF.

Committee on Financial and Administrative Policy (FAP):
Prof. Spanagel (HUA; Chair, FAP) presented a report on executive compensation at WPI. (See Addendum #3 on file with these minutes.) He thanked current and former committee members, including last year's chair, Prof. Fehribach, noting that this work was begun last year but hasn't been presented until today. Prof. Spanagel began with what FAP considers generally held principles and goals: to attract and maintain talented people at WPI and to ameliorate tensions among categories of people at WPI. Prof. Spanagel suggested that the community should be asking how to bring equity and fairness to WPI's compensation practices. He also noted FAP's previous lack of access to data about executive compensation, but explained that today's presentation reflects careful review of the details and a better understanding of the data since it has been received.

Prof. Spanagel noted that the total compensation reported in tax documents includes such non-cash benefits as housing, tuition and retirement benefits. By contrast, the compensation data he presented on WPI's Presidents and Vice-Presidents include increases each year in base salary and reported bonuses and other incentive pay. Prof. Spanagel observed that the Trustee-approved salary increase pool (typically 2 to 3 percent per year throughout the 2010s) has not applied to administrators, whose salary increases (approved by the Board of Trustees) were much higher. Focusing on percent increases per year, Prof. Spanagel also noted that during the past decade, the number of people at WPI with annual salaries plus bonuses that exceeded $350,000 has increased significantly.

Prof. Spanagel closed by noting that FAP is not providing recommendations on how WPI should approach executive compensation; these are questions that should be discussed and resolved as a community. FAP does want to raise the following questions: How can WPI address inequities in the compensation of its lowest paid employees --and how can it hire an adequate number of faculty and staff to meet its educational mission-- while executive compensation grows so rapidly from year to year? If equity and fairness are a community value, is benchmarking against other institutions the proper means to get us there?
Prof. Fehribach (MA) added that this research has extended even earlier than 2010. In the early 1990's, the President made only $100,000 more than the highest paid faculty member. The wage gap will continue to increase if faculty members see increases of 3 to 4 percent, non-faculty see increases of 2 to 3 percent, and the most senior members of the administration see much higher increases. Noting that the former president continues to bring WPI attention, he said that there are advantages to having high-profile people associated with WPI.

Prof. Sturm (MA) suggested that, to put these numbers in context, the most recent pay increase of 2.5 percent set within an 8.5 percent inflation rate, means a 6 percent loss in earnings. While faculty members may be able to tolerate this sacrifice, staff members who earn less are more profoundly affected. Graduate students and staff members are the people who are really hurting. He does not have a problem with strong compensation for great work – as long as that compensation can lift everyone up. He urged the institution to benchmark executive compensation not to other institutions like RPI but rather to the lowest earners at WPI. He suggested, for example, that executive raises should not be higher than 50 percent of the raises of the lowest earners. This would address the needs of the people who are hurting the most at WPI.

Prof. LePage (CEAE) added that focusing on percentages is an equitable way of looking at the data. A 2 percent increase on $80,000 is not the same as a 2% increase on $160,000.

Prof. Iannacchione (PH) pointed out the WPI initiative asking us to find $500,000 of savings to make our education more affordable coincided with increases in executive compensation that exceeded that amount. If we want to make WPI affordable, we need to be find this $500,000 from the compensation of those making the most, not those making the least.

Prof. Spanagel added that when WPI Forward began in 2019, the increase in executive compensation exceeded $700,000. The former President pointed to the elimination of two administrative positions (quoted to us as a savings of $1.3 million), but that didn't change the culture of executive compensation at WPI. He suggested phasing out or severely reining in performance bonuses.

5. New Business
There was no new business.

6. President's Report
President Soboyejo shared his appreciation for the spirit of governance at WPI. He remembered quietly enjoying Maestro Richman's opening presentations at faculty meetings and one day being surprised by being the object of a "Where's Wole?" joke. He has enjoyed being part of this community and experiencing what it is to have fun with colleagues, to have open discourse and the way we engage each other –and also the way we challenge each other. He reflected on his collaborations with faculty governance over the past few years on the Global School and the teaching track to tenure and recalled how rigorously he and Prof. Richman, Prof. Dominko, and Prof. Boudreau would argue. Those who didn't know them would think, wow they're fighting with each other! But actually, President Soboyejo said, we were exchanging ideas in ways that helped us understand things better, and those things resulted in major progress for WPI and addressed our teaching faculty, our research faculty, and all members of our community. These are not easy issues to deal with, but we got through them stronger.

President Soboyejo was at Yale recently, and he and the faculty there discussed WPI's teaching track to tenure and its care for the long-term faculty. He explained that he wasn't the source of these innovations. Rather it was derived from the community here at WPI. At Yale and other institutions, they see WPI as a leader, and that reflects the quality of WPI's people and the importance of our efforts for those of us at WPI and for all of higher education.

President Soboyejo expressed his appreciation for the way the information in the last report was broken down and the care Prof. Spanagel took in getting the details right. He noted that there had been a significant ($50k) pay cut in 2019 and a serious effort to share the burden of the budget cuts. Even now as we confront issues such as inflation, WPI is planning to ensure our students don't suffer food and housing insecurity while reaching pay equity for faculty and staff. He noted this year's effort to give higher percentage raises to those who earn less.

President Soboyejo thanked everyone –faculty and staff-- for their efforts to rebuild our community. He shared his perception of the most recent community day that students and faculty are reconnecting in tangible ways. The President urged the faculty to think about three values: community makes us whole and makes WPI a place we want to be; respect happens as we learn from each other in disagreement and to take comments that we don't understand as opportunities to better appreciate other viewpoints; and inclusion allows us to gain new and broader perspectives. He told the story of his Nigerian university that rose on the strength of its international community, but after independence in 1960 rejected that diversity and sent the foreigners home. Like the U.S., which during those same years welcomed foreigners and benefited from that diversity, he hopes that WPI will build on that tradition of community and inclusion.

7. Provost's Report
Provost Heinricher thanked CTAF for the work that they have done. During his years serving as a faculty member on CTAF, he learned about what we do and what we value; they were the best years he has had at WPI. He supports the motion raised for discussion today. Provost Heinricher also thanked everyone for the almost normal

A-term. He recognized that we all carry some COVID fatigue. All students are building on foundations and carrying baggage that is different than past students have had. COVID has amplified extremes. Retention rates have been lower this year than we have seen in the past. We need to figure out ways to support these students. There is a crisis of mental health in higher education that is tied to a very unhealthy definition of success related to overemphasis on grades and resumes. Finally, he noted that in a fatigued community, it is easy to assign ill intent. We are a strong community and we need to come together for conversations rather than through email exchanges and petitions.

8. Closing Announcements
Prof. Richman thanked Prof. Claypool and Prof. Spanagel as well as all the other members of CTAF and FAP for the enormous amount of work that required to formulate the motions and introduce the ideas presented today.

9. Adjournment
Meeting was adjourned at 5:15pm by **Prof. Richman**.

Respectfully submitted,

Mark Richman
Secretary of the Faculty

Addenda on file with these minutes:
Addendum #1 - CTAF-COG Motion to Enlarge CTAF - Minutes Oct 6, 2022
Addendum #2 - CTAF Preliminary Idea on Tenure Window - Minutes Oct 6, 2022
Addendum #3 - FAP Executive Compensation Report - Minutes Oct 6, 2022

Date: November 10, 2022
To: The WPI Faculty
From: Committee on Tenure and Academic Freedom (Prof. Claypool, Chair)
Committee on Governance (Prof. Albano, Chair)
Re: Motion to increase the number of members on the Committee on Tenure and Academic Freedom (CTAF) and to update the Faculty Handbook description of CTAF

Motion: The Committee on Tenure and Academic Freedom and the Committee on Governance recommend and we move that the number of members on the Committee on Tenure and Academic Freedom (CTAF) be increased from six to nine, and that the description of CTAF in the Faculty Handbook (PART ONE, Bylaw One, Subsection V) and two other related parts of the Faculty Handbook (PART ONE, Appendix A, Section D; and PART ONE, Appendix A, Section B, Subsection 2) be modified accordingly and updated, as described below.

Description of the Proposed Modifications:

- The proposed modifications to **Part One, Bylaw One, Subsection V** of the Faculty Handbook (**shown in track-changes below**) would:
    - increase the number of CTAF members from six to nine (shaded in gray);
    - update the charge of CTAF to include tenure recommendations for Professors of Teaching (shaded in blue);
    - clarify the criteria for determining the Chair and the Secretary of the committee (shaded in yellow);
    - clarify the nature of the recommendations made to the Provost (shaded in green); and
    - reorganize and edit the current description of CTAF:

Modifications to **PART ONE, Bylaw One, Subsection V** (shown in track changes):

V. The Committee on Tenure and Academic Freedom (CTAF):

Roles and Responsibilities:
CTAF is given the authority and responsibility for overseeing tenure recommendations to the Provost. The committee is in charge of the process by which tenure recommendations to the Provost are reached for each tenure-track probationary faculty mMember of the tenure track Faculty. In the case of Assistant Professors who have also been nominated for promotion to the rank of Associate Professor, the each recommendation is either for or against tenure with promotion to Associate Professor or against tenure. In the case of Assistant Professors of Teaching, each recommendation is either for tenure with promotion to Associate Professor of Teaching or against tenure. In the cases of Associate Professors, Associate Professors of Teaching, and Professors, and Professors of Teaching, theeach recommendation is for or against tenure with no consideration given to or recommendation made concerning promotion.

CTAF is also concerned with questions relating to academic freedom, and the committee is charged with the responsibility of reviewing problems involving the academic freedom of both tenured and non-tenuredall faculty members, whether part-time or full-time.

Membership:
CTAF consists of six nine fFaculty mMembers having tenure. Department Heads, the Provost, and Deans are not eligible for membership on this Committee, and Tthere will not be more than one committee mMember from any one Department. The term of office for this Committee is four years. No member may serve successive terms. Department Heads, Deans, and the Provost are not eligible to serve on CTAF.

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(NOTE: The following paragraph is brought in from Appendix A: Section D.)

The Chair of CTAF shall be the member who~~se term of office expires in June of the current academic year.~~ has served the longest among the members in their current terms. In the case of ties in length of current service, CTAF will select the Chair from among those tied. The Chair shall rule on all matters of procedure and shall be responsible for interpreting all Faculty rules regarding tenure. The Chair's rulings are subject to review by the fFaculty only. The Secretary of CTAF shall be the member aside from the Chair who~~se term of office expires in June of either the current or thefollowing academic year~~. has served the longest among the members in their current terms. In the case of ties in length of current service, CTAF will select the Secretary from among those tied. ~~All four members of CTAF must be present to conduct official business.~~

Election Procedures:

Nominations and elections for CTAF are conducted by the Secretary of the Faculty. ~~Membership on this Committee is limited to no more than one elected Faculty Member from any one academic discipline.~~ The election procedure is as follows. The Secretary prepares a nominating ballot listing eligible Faculty Members by ~~discipline~~ department and distributes it to all voting m~~M~~embers of the fFaculty, with instructions to nominate up to one person from each ~~discipline~~department. The members of each academic ~~discipline~~ department who receives the largest number of nominations in their departments and are~~is~~ willing to serve if elected are~~is~~ then placed on an ~~electing~~ election ballot to be distributed ~~with voting instructions~~ to all voting m~~M~~embers of the fFaculty. In the normal pattern, the number to be elected annually will be ~~alternately~~ two, two, two, and ~~one~~ three in successive years. Vacancies to unexpired terms will be filled by the same nominating and election procedure as for full terms.

Tenure Cases:

For the purpose of considering each tenure case, a Joint Tenure Committee is formed, consisting of five members from CTAF and the three-member Department Tenure Committee. If the candidate and one of the CTAF members are from the same department, then that CTAF member is recused from the Joint Tenure Committee automatically. The Joint Committee shall also consider whether any of its members should be recused due to direct conflict of interest. In the event of no departmental overlap or conflict of interest, the selection of the five CTAF members to sit on the Joint Tenure Committee will be governed by CTAF procedures developed to lead to an overall pattern of recusals distributed over the CTAF membership so as to ensure appropriate participation for each CTAF member. ~~If recusal of two CTAF members is necessary, the most recent qualified past chair of CTAF will serve for that particular case.~~ The Joint Tenure Committee is chaired by the senior elected member of the five CTAF participants. Normally, each Department Tenure Committee consists of two elected department members with tenure plus the Department Head; in the cases of interdepartmental or interdisciplinary candidates the structure of the Department Tenure Committee shall be modified as explained in Appendix A, Section B2. In the event that recusal of one of the Department Tenure Committee members is necessary due to conflict of interest, the most recent qualified past Department Tenure Committee member will serve on the Joint Tenure Committee for that particular case.

Academic Freedom Cases:

~~CTAF is also charged with the responsibility of reviewing problems involving the academic freedom of both tenured and non-tenured faculty, whether part-time or full-time.~~ At the start of a particular academic freedom case, CTAF shall consider whether any of its members should be recused due to direct conflict of interest. If a Committee member is recused, the review will proceed with the remaining members. In the event that CTAF is unsuccessful in the resolution of such problems, the subsequent procedures as well as the procedures to be followed in the granting of tenure will be those ~~in the report of the *Ad Hoc* Committee on Tenure approved by the Trustees in June, 1968, and procedural amendments proposed in the Tenure Committee Report, 1968-69, and approved by the~~

- The proposed modifications described above to Part One, Bylaw One, Subsection V of the Faculty Handbook would modify and absorb the following two parts of **PART ONE, Appendix A, Section D**; and **PART ONE, Appendix A, Section B, Subsection 2** of the Faculty Handbook. Consequently, these two parts can be deleted from the Faculty Handbook.

  Text to be **deleted** from **PART ONE, Appendix A (Report of the ad hoc Tenure Committee), Section D (Procedural Amendments):**

  The Chair of CTAF shall be the member whose term of office expires in June of the current academic year. The Chair shall rule on all matters of procedure and shall be responsible for interpreting all Faculty rules regarding tenure. The Chair's rulings are subject to review by the Faculty only. The Secretary shall be the member whose term of office expires in June of the following academic year. All four members of CTAF must be present to conduct official business.
  ……

  Text to be **deleted** from **PART ONE, Appendix A (Report of the ad hoc Tenure Committee), Section B (Procedure for Granting Tenure); Subsection 2 (Joint Tenure):**
  ………

  CTAF shall be composed of six Faculty Members having tenure who shall be elected by the Faculty, by secret ballot, under the direction of the Secretary of Faculty. Department Heads and Deans are not eligible for membership on this Committee, and there shall not be more than one member from any one department. No member may serve successive terms.
  ……..

Rationale:

- *Rationale for reorganizing and editing the current description of CTAF* (shown in <u>red underline</u> and ~~red strikethrough~~):

  There is ongoing work-in-progress revising the Faculty Handbook. The guiding principle is to remove redundancies, unify sections and parts of sections that all relate to the same topic and subtopic, and increase readability and usability of the Handbook. The remainder of the changes are meant to align with this effort without changing the substance as it pertains to CTAF.

- *Rationale for expanding the number of members on CTAF from 6 to 9* (shaded in gray):

  The Committee on Tenure and Academic Freedom (CTAF) is in charge of the process by which tenure recommendations are reached for each probationary Member of the tenure-track faculty. As such, the primary workload for CTAF is in reviewing tenure cases for probationary faculty.

  Recently, the faculty created a new path to tenure (the "Professor of Teaching") and WPI has subsequently placed an additional 30 faculty on that tenure track, with an additional 15 appointments planned next academic year. This has led to a marked increase in the expected tenure case review load. The past, present and projected number of tenure cases are below.

Academic Year	Cases	CTAF-6	CTAF-9
2018-2019	6	5.0	-
2019-2020	7	5.8	-
2020-2021	6	5.0	-
2021-2022	7	5.8	-
2022-2023	*12*	*10.0*	-
2023-2024	14	11.7	7.8
2024-2025	19	16.9	11.6
2025-2026	23	19.2	12.8
2026-2027	24	20.0	13.3
2027-2028	12	10.0	6.6
2027-2028	11	9.2	6.1

The above data includes all faculty currently on the tenure track (offer letters signed) as well as the additional 15 Professors of Teaching faculty appointments that are planned (expected offer letters this academic year). CTAF-6 shows the average number of per-person cases if CTAF remains at size 6, and CTAF-9 shows the average number of per-person cases if CTAF expands to 9.

Without changes to the current CTAF membership and/or tenure review process, the massive workload that faces CTAF as early as next year may hurt the quality of the deliberations (too much work, not enough people to do it), greatly extend the time required to consider all cases (not providing decisions on tenure in a timely fashion), and/or deter faculty from voluntarily serving on CTAF.

An estimate for a reasonable workload (i.e., a service load that should not impinge upon teaching or research for those serving on the committee) for each CTAF faculty member is to review about one and a half tenure cases per week over a term, or about 10.5 cases total. Since there are 5 CTAF members on each case (that combine with the 3 Department Tenure Committee members to form the Joint Tenure Committee), CTAF at its current size can handle about 13 tenure cases per year. If CTAF expanded to 9, it could reasonably handle about 19 cases per year, close to the estimated peak case load. Increasing the size of CTAF beyond 9 is not recommended since large committees can be unwieldy, a sudden influx of new members can make continuity of process and culture a challenge, and there can be at most one member from each department which limits the CTAF candidate pool. Moreover, once the original influx of 45 Professors of Teaching has been fully incorporated (about after AY 28-29), it is anticipated that the tenure case load will decrease to about 19/year or fewer - meaning a CTAF of size 9 should be sufficient long-term.

As noted, the faculty handbook mandates there can be only 1 CTAF member from each department. WPI currently has 16 academic departments, so there are 10 departments that do not have members on CTAF. These 10 should be an adequate pool from which to elect the additional 3 CTAF members needed under this proposal.

- *Rationale for updates to the charge of CTAF to include tenure recommendations for Professors of Teaching* (shaded in blue):

  Since there are now probationary faculty that are Professors of Teaching, the CTAF charge needs to be expanded beyond the current wording that specifies recommendations for Assistant, Associate and Full Professors to also include recommendations for Assistant, Associate and Full Professors of Teaching.

- *Rationale for clarify the criteria for determining the Chair and the Secretary of CTAF* (shaded in yellow):

When choosing the CTAF Chair and Secretary, the current wording assumes there is a single CTAF member who's term expires each June (a throwback from when there were CTAF had only 4 faculty members). The revised wording clarifies how the CTAF Chair and Secretary should be selected given there may be multiple CTAF members who's terms expire in June.

- *Rationale for clarify the nature of the recommendations made to the Provost* (<mark>shaded in green</mark>):

    As currently worded, the tenure recommendation provided by the Joint Tenure Committee (JTC) to the Provost in each case is not clearly defined. The added language (in green) is to clarify exactly when the JTC is recommending for or against tenure and promotion (when the candidate is at the Assistant rank) versus when the JTC is recommending for or against just tenure (when the candidate is already at the Associate or Full rank).

Proposed Implementation: In addition to electing CTAF members to fill two regular vacancies (by following the regular *"Election Procedures"* included in the description of the committee proposed here) in spring 2022 for terms beginning in AY 23-24, the faculty will at the same time expand the membership of CTAF in AY 23-24 by also electing three *additional* CTAF members using the same election process.

In order to ensure that the number of regular vacancies follow a 2-2-2-3 pattern beginning in AY 24-25, the terms of the five members elected in spring 2022 for terms beginning in AY 23-24will be set as follows:

- **three** members will be elected for **four-year terms**;
- **one** member will be elected for a **two-year term**; and
- **one** will be elected for a **one-year** term.

The following table shows terms of CTAF membership in AY 22-23, and how members will be elected beyond this spring.

Years remaining on elected terms:

(**Bold red numbers** indicate **newly elected members** in any year.
Members *normally* to be elected in the same year are shaded together.)

Member	AY 2022-23	AY 2023-24	AY 2024-25	AY 2025-26	AY 2026-27
Current slot	1	**4**	3	2	1
Current slot	1	**4**	3	2	1
Current slot	2	1	**4**	3	2
Current slot	3	2	1	**4**	3
Current slot	4	3	2	1	**4**
Current slot	4	3	2	1	**4**
Added slot		**4**	3	2	1
Added slot		**1**	**4**	3	2
Added slot		**2**	1	**4**	3

Appendix
Consent Agenda Motions

Date: November 10, 2022
To: WPI Faculty
From: Committee on Academic Operations (Prof. Elgert and Prof. Srinivasan, co-Chairs)
Re: Motion to change the course title and description of CH 4420

Motion: On behalf of the Department of Chemistry and Biochemistry, the Committee on Academic Operation recommends and we move that the course title and course description of CH 4420 be changed, as described below.

Description of the proposed changes:
Current course title and description:

CH 4420: Application of Molecular Orbital Theory to Metal Complexes
Complexes of the transition metals are discussed. Covered are the electronic structures of transition metal atoms and ions, and the topological and electronic structures of their complexes. Symmetry concepts are developed early in the course and used throughout to simplify treatments of electronic structure. The molecular orbital approach to bonding is emphasized. The pivotal area of organotransition metal chemistry is introduced, with focus on complexes of carbon monoxide, metal-metal interactions in clusters, and catalysis by metal complexes.
Recommended Background: CH 1010 - CH 1040, CH 2640 - CH 2670, CH 3410, CH 3530, and CH 3550, and a fundamental understanding of atomic, molecular and solid state structures and properties. Thermodynamic stabilities of inorganic species. Acidity, solubility and precipitation of inorganic compounds (see CH3410).

Proposed course title and description:

CH 4420: Principles and Applications of Group Theory in Chemistry
The principles and applications of group theory as a tool in chemistry are presented with an emphasis on systems in inorganic chemistry. Topics covered include the development of symmetry group representations and character tables, applications of group theory in quantum-mechanical wavefunctions, molecular vibrations, ligand field theory, and molecular orbital theory. Particular emphasis will be placed on transition metal complexes, including classical coordination complexes, metal carbonyl complexes, and organotransition metal complexes.
Recommended Background: CH 1010 - CH 1040, CH 2640 - CH 2670, CH 3410, CH 3530, and CH 3550, and a fundamental understanding of atomic, molecular and solid state structures and properties. Thermodynamic stabilities of inorganic species. Acidity, solubility and precipitation of inorganic compounds (see CH3410).

Course Contact: Prof. Bursten (bbursten@wpi.edu)

Rationale:
Rationale for course title change:
Even if the content of the course did not change, the current name does not accurately reflect the breadth of the course. Molecular orbital theory is part of the current course, but there are many other aspects of structure and bonding in transition metal complexes that are also covered.

Rationale for course description change:
The current course has significant overlap with CH 3410, which most if not all of the students take prior to taking CH 4420. The proposed change will add greater depth to the course, especially in the application of the mathematical tools of group theory to chemical systems. By increasing the emphasis on more sophisticated applications of group theory, this course may be considered *transdisciplinary* between Chemistry and Mathematical Sciences.

Additional Resources Needed: None.

Impact on Distribution Requirements and Other Courses: There will be no change in the distribution requirements. No changes to other courses will be needed. Most notably, Chemistry 3410 will not need to change in response to this proposal.

Proposed Implementation Date: CH 4420 will be offered in AY 22-23 in C-term. It is proposed that the new course structure be offered at that time.

Date: November 10, 2022
To: WPI Faculty
From: Committee on Academic Operations (Prof. Elgert and Prof. Srinivasan, co-Chairs)
Re: Motion to remove 1000-level CS courses from the approved Computer Science course list for the Data Science Minor

Motion: On behalf of the Data Science Program, the Committee on Academic Operation recommends and we move that 1000-level CS courses be removed from the approved Computer Science course list for the Data Science Minor in the undergraduate catalog*, and that a corresponding sentence be removed and anothersentence be added to further clarify the Data Science Minor requirements, as described below*

Description of the Motion:
The approved Computer Science course list for Data Science minor in the undergraduate catalog contains CS 1004, CS 1101 and CS 1102, which have not been valid for fulfilling the Data Science Minor requirements since 2020 Fall. Therefore, this motion would remove the three 1000-level courses from the list and would remove one sentence related to the update. In addition, it would add one sentence under the Data Science Minor requirements to further clarify the Data Science Minor requirements. This motion does not change the Data Science Minor requirements. Instead, it makes the description and approved course list consistent.

The specific changes are:
- Page 152 (of the 2021-22 Undergraduate Catalog):
  Add the following sentence: "Note that one course satisfies only one of the above requirements." after the three bullets points/requirements. Please refer to the below illustration for the correct position (the red box is the place where the sentence should be added:

  > The **Minor in Data Science** will consist of 2 units, all of which must be selected from the list of approved Data Science major courses. These 2 units must be selected to include the following:
  >
  > - Three courses, one from each of the three areas (Business, Computer Science, Mathematical Sciences) at the 2000 level or above from the list of disciplinary courses approved for the Data Science major
  > - At least two courses out of the DS series DS 1010, DS 2010, and DS 3010.
  > - At least one course at the 3000 level or above selected from the list of disciplinary courses approved for the Data Science major.
  >
  > Note that one course satisfies only one of the above requirements.

- Page 152 (of the 2021-22 Undergraduate Catalog):
  Remove the following sentence: "* Credit may not be earned for both CS 1101 and CS 1102"

- Page 153 column 1 (of the 2021-22 Undergraduate Catalog): remove the following three courses:
  CS 1004 Introduction to Programming for Non-Majors
  CS 1101 Introduction to Program Design
  CS 1102 Accelerated Introduction to Program Design

Rationale:
1000-level CS courses have not been valid courses for Data Science Minor since Fall 2020. However, the undergraduate catalog still contains the courses under the approved computer science course list for data science minor. To make the description and the list consistent, in this motion, we request to remove the three courses in the list and make minor description update. Again, this motion does not change the current Data Science Minor requirements.

Impacts on Students: The only impact on students will be a clarification of the data science minor requirements.

Resource Needs: No additional resources are required.

Implementation Date: The implementation date is the 2023-2024 academic year.

Date: November 10, 2022
To: WPI Faculty
From: Committee on Academic Operations (Prof. Elgert and Prof. Srinivasan, co-Chairs)
Re: Motion to modify the Controls requirement of the RBE major

Motion: On behalf of the Department of Robotics Engineering, the Committee on Academic Operation recommends and we move that the Controls requirement of the RBE major be modified as described below:

Description of the Proposed Modification:

Current statement in the 2021-22 Undergraduate Catalog: Robotics Engineering Major Program Distribution Requirements for the Robotics Engineering Major – Note 7 (page 211)

7. Must include at least 1/3 unit in Statics and 1/3 unit in Controls.

Proposed revised statement in the Undergraduate Catalog: Robotics Engineering Major Program Distribution Requirements for the Robotics Engineering Major – Note 7)
(with **bold** text inserted)

7. Must include at least 1/3 unit in Statics and 1/3 unit in **Classical** Controls **(ES 3011, ECE 3012, AE 2310, or equivalent). RBE 502 cannot satisfy this requirement.**

Rationale:
1- We want to ensure that RBE undergraduates have developed at least a basic understanding of classical controls.

2- Many undergraduate students attempt to take RBE 502 to satisfy the controls requirements; however, there is no guarantee that students taking RBE 502 have a background in classical controls as RBE 502 focuses on modern and nonlinear controls.

Required Resources: None

Implementation: The change would be effective beginning AY 2023-24

Date: November 10, 2022
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Medich, Chair)
Re: Motion to add a B.S./M.S. Program in Biotechnology

Motion: On behalf of the Department of Biology and Biotechnology, the Committee on Graduate Studies and Research recommends and I move that a B.S./M.S. Program in Biotechnology be added as described below.

Description of the Proposed B.S./M.S. Program in Biotechnology

This B.S./M.S. Program in Biotechnology allows students to pursue a five-year Bachelor's/Master's program.

1. Program Description

Students enrolled in the B.S./M.S. program must satisfy all the program requirements for their B.S. degree, which could be in Biology and Biotechnology or another major, as well as for the M.S. in Biotechnology. As part of the application process, and in consultation with the student's major Academic Advisor and the Graduate Program Coordinator, the student prepares a proposed Plan of Study outlining the selections made to satisfy the B.S./M.S. degree requirements, including the courses that will be double-counted. This Plan of Study must then be approved by the Graduate Coordinator after acceptance to the program. All courses must be at the 500 or 4000 level and no more than 9 credits may be at the 4000 level (MQP credits cannot be used toward the M.S.). An approved list of courses is provided below. Additional courses will require approval of Graduate Coordinator.

Credit Requirements:
BB and Related courses* (from approved lists below) **24 CR,** inclusive of a minimum of **9 CR of Skills-based courses****
Electives (from BB and related, and Electives courses approved lists below) **6 CR**

* 4000-level undergraduate courses (listed below) can be applied towards the M.S. degree if the student achieves a grade of B or higher. No more than 9 graduate credit equivalents of 4000 level courses can count toward the 30-credit degree.

** a maximum of 6 credits of directed research (BB598) can count towards the skills-based course requirement

Other 4000-level or 500-level courses and independent studies not on this list but that could be used to satisfy Biotechnology M.S. requirements may be petitioned to count toward the degree. Such petitions need to be approved by the Biology and Biotechnology Graduate Coordinator.

2. Double-Counting Rules

B.S./M.S. students will be allowed to double-count courses towards both their undergraduate and graduate degrees provided that the double-counted credits total no more than 30% of the 30 graduate credits required for the M.S. degree in Biotechnology (i.e., up to 9 graduate credit equivalents of undergraduate course work or graduate course work can be double-counted toward both the BS and the M.S. in Biotechnology degree). The remaining 21 credits required for the M.S. in Biotechnology degree must be distinct from the credits required for the undergraduate degree. These courses can include graduate courses as well as undergraduate 4000-level courses that are acceptable for satisfying M.S. in Biotechnology requirements, but only 9 graduate credit equivalents of 4000 level courses will be allowed toward the total 30 credits. Credits cannot

be double counted across requirement categories (i.e., the same skills-based course in one category cannot count again in another category).

A student may not register for directed research credit (BB598) until after they have completed 1 full unit of MQP.

3. Credit Distributions

Credit Requirements	Must include	May include		
24 credits BB and BB related courses	12 500-level credits from approved list	Additional skills-based courses		Credits to double count with BS degree, not to exceed 9 total graduate credits
	3 additional credits from approved list		4000-level courses, not to exceed 9 total graduate credits	
	9 skills-based courses, not to exceed 6 credits BB598			
6 credits Elective courses	6 credits from approved lists of BB and BB related, and/or Electives courses			
30 total credits			<9 credits @ 4000 level	<9 credits double count with BS

4. Approved list of courses for M.S. degree in Biotechnology
**(indicates skills-based courses)

All graduate courses are 3 credits unless otherwise noted

BBT Graduate Courses
BB 501 Seminar (1 cr per semester; limited to 2 offerings)
BB 504 Molecular Biology of the Cell
BB 570 Special Topics (2 or 3 cr)
BB 551 Research Integrity in the Sciences (1 cr)
BB 552 Scientific Writing and Proposal Development (2 cr)
BB 553 Experimental Design and Statistics in the Life Sciences **
BB 554 Journal Club (1 cr; can be taken multiple times, as offerings change each semester)
BB 556 Mentored Teaching Experience (1 cr)
BB 505 Fermentation Biology **
BB 508 Animal Cell Culture **
BB 509 Scale Up of Bioprocessing **
BB 560 Methods of Protein Purification and Downstream Processing **
BB 565 Virology
BB 561 Model Systems: Experimental Approaches and Applications
BB 562 Cell Cycle Regulation
BB 581/ BCB 501 Bioinformatics **
BB 590 Capstone Experience in Biology and Biotechnology ** (can take multiple offerings, but not

count the same offering twice (graduate and undergraduate)
BB 598 Directed Research **(variable cr)

BBT Undergraduate Courses
BB 4801/BCB 4001 Bioinformatics **
BB/CH 4190 Regulation of Gene Expression
BB 4260 Synthetic Biology
BB/CH 4170 Experimental Genetic Engineering **
BB 4900 Capstone Experience in Biology and Biotechnology ** (can take multiple offerings, but not count the same offering twice (graduate and undergraduate)

Related Graduate Courses
Courses in this list can be used to fulfill the BB and related and skills-based credit requirement.
BCB 502/CS 582 Biovisualization
BCB 503/CS 583 Biological and Biomedical Database Mining
BCB 504 / MA 584 Statistical Methods in Genetics and Bioinformatics
CH 516 Chemical Spectroscopy **
CH 520 Cell Signaling
CH 536 Theory and Applications of NMR Spectroscopy **
CH 538. Medicinal Chemistry
CH 540 Regulation of Gene Expression
CH 541 Membrane Biophysics
CH 542 Drugs in the Brain
CH 545 Plant Natural Products
CH 546-Natural Product Isolation and Analysis
CH/CHE 554 Molecular Modeling **
CH 555 Advanced Topics
CH 561 Functional Genomics
CHE 521 Biochemical Engineering
CHE 573. Separation Processes
BME 531. Biomaterials in the Design of Medical Devices
BME 532. Medical Device Regulation
BME 550 Tissue Engineering **
BME 562 Laboratory Animal Surgery **
BME 583-Biomedical Microscopy and Quantitative Imaging **
BME 592-Healthcare Systems and Clinical Practice
NEU 502 Synaptic Plasticity
MA 511 Applied Statistics for Engineers & Scientists **

Related Undergraduate Courses
BCB 4002 / CS 4802 Biovisualization
BCB 4003/CS 4803. Biological and Biomedical Database Mining
BCB 4004/MA 4603 Statistical Methods in Genetics and Bioinformatics
CH 4110. Protein Structure and Function
CH 4120. Lipids and Biomembrane Functions
CH 4130. Nucleic Acids and Bioinformation
CH 4140. Metabolism and Disease
CH 4150. Enzymology and Protein Characterization Laboratory**
CH 4160 Membrane Biophysics
BME 4828 Biomaterial - Tissue Interactions
BME 4831 Drug Delivery
BME 4814 Biomaterials

Elective Graduate Courses
Electives may include any BB course or related course listed above, or any Elective Graduate course listed below. Selection of other courses to fulfill the elective requirement requires petition to the graduate coordinator.

BUS 546. Managing Technological Innovation
ETR 500. Entrepreneurship & Innovation
ETR 593. Technology Commercialization: Theory, Strategy & Practice
FIN 500. Financial Management
MIS 576. Project Management
OBC 505. Teaming and Organizing for Innovation
OBC 506. Leadership
OBC 537. Leading Change
OIE 501. Operations Management

Possible example using double counting during junior-senior-5th years.

Year	Fall (A+B terms)			Spring (C+D terms)			Cr
3	CH4110 2cr			Ch4120 2cr			4
4	BB554 JC 1cr		BCB4001 2cr	BB554 JC 1cr	BB590 2cr	BB4260 2cr	8
5	Grad 3cr	Grad 3cr	BB598 3cr	Grad 3cr	Grad 3cr	BB598 3cr	18
							30

Maximum of 9 graduate credit equivalents of courses at the 4000 level

5. Restricted Undergraduate and Graduate Course Pairs

Some undergraduate and graduate courses have significant overlap in their content. The following table lists these courses. A student can receive credit towards their M.S. degree for at most one of the two courses in any row of this table.

Courses in Biology and Biotechnology

Undergraduate Course	Graduate Course
BB4900. Capstone in Biology and Biotechnology	BB590. Capstone in Biology and Biotechnology

Note: a student can take more than one section of BB4900 (with different instructors/topics) but may not receive both undergraduate and graduate credit for re-taking the **SAME** section/topic of BB4900/BB590.

Courses in Chemistry and Biochemistry

Undergraduate Course	Graduate Course
CH4160. Membrane Biophysics	CH541. Membrane Biophysics

Courses in Bioinformatics and Computational Biology

Undergraduate Course	Graduate Course
BCB 4001/BB4801. Bioinformatics	BCB 501/BB 581 Bioinformatics
BCB 4002/CS 4802. Biovisualization	BCB 502/CS 582 Bio visualization
BCB 4003/CS 4803. Biological and Biomedical Database Mining	BCB 503/CS 583 Biological and Biomedical Database Mining
BCB 4004/MA 4603. Statistical Methods In Genetics and Bioinformatics	BCB 504/MA 584 Statistical Methods in Genetics and Bioinformatics

Rationale:

Demand for five-year B.S./M.S. programs is increasing as students seek to maximize the credentials that can be obtained from their expensive undergraduate educations and increase their competitiveness as they enter the workforce. Within the BBT department, several faculty have noted students enquiring about the availability of a combined B.S./M.S degree. The BBT department therefore proposes to offer this combined degree in order to meet student demand and keep our undergraduate program competitive with other institutions. For example, five-year B.S./M.S. life sciences programs are already offered at Boston University, Northeastern, Tufts, RPI, and Brandeis. Details of individual programs and comparison to proposed BBT BS/MS program can be found in the appendix.

Our B.S./M.S. program will combine our non-thesis M.S. in Biotechnology with an undergraduate major of the student's choosing. Completion of the requirements in five years will be straightforward for BBT undergraduates, and with careful planning will be accessible to students with other undergraduate majors. The M.S. in biotechnology provides a mix of theory and practical skills training, and has had a healthy enrollment (23 students completed their MS in 2021) since it was launched in 2017. The courses developed for that degree have capacity for additional students and will therefore be utilized for the combined B.S./M.S. degree.

The B.S./M.S. Program in Biotechnology described here follows all of the WPI B.S./M.S. rules. It has been informed by the B.S./M.S. program descriptions in the WPI Graduate Catalog as well as by life sciences B.S./M.S. program at other universities. We are confident that we have achieved an appropriate balance of rigor and accessibility, and that this program will be of interest to current students as well as serve as an effective recruitment tool for future classes.

We also note that making the combined B.S./M.S. available for fall 2022 is particularly desirable in light of the pandemic, given that many current students are apprehensive about entering the workforce immediately and would prefer to complete an M.S. degree first.

Impact on Degree Requirements: None.

Resources Needed: *Continued CPE engagement.* Currently, CPE covers the costs of adjunct faculty that deliver many of the credits in our M.S. Biotechnology program. These programs serve several of our industry partners in addition to other M.S. students. The success of this B.S./M.S. program requires the continued support of CPE in providing teaching support for these courses.

Implementation Date: Implementation date for this action is B term 2022

WPI Faculty Contacts:
Graduate Coordinators: (AY21/22) Luis Vidali and (AY22/23) Amity Manning
BBT Department Head: Reeta Rao

Appendix: Summary comparison with proposed BS/MS in Biology and Biotechnology at WPI:

Our proposed degree will require 10 courses (3 credits each, 30 total credits), 3 courses (30%) can double count towards both the BA and MS degree, 9 credits must be skills-based courses

> Boston University requires 8 courses (4 credits each, 32 total credits), 2 courses (25%) can double count towards both the BA and MS degree

> Northeastern University requires 30 credit hours of coursework, 16 of which (53%) can double count towards both the BS and MS degree

> Tufts University requires 10 courses, 2 of which (20%) can double count towards both the BS and MS degree

> RPI requires 30 credits, 15 (50%) of which can double count towards both the BS and MS degree. 15 of the 30 credits can be at the undergraduate level and 9 of the 30 credits must be project based

> Brandies University requires 10 courses, 6 (60%) of which can double count towards both the BS and MS degree. 2 of the 10 courses are project based.

Date: November 10, 2022
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Medich, Chair)
Re: Motion to add a B.S./M.S. Program in Learning Sciences & Technologies

Motion: On behalf of the Learning Sciences & Technologies Program, the Committee on Graduate Studies and Research recommends and I move that the a B.S./M.S. Program in Learning Sciences & Technologies be added as described below.

Description of the Proposed B.S./M.S. Program in Learning Sciences & Technologies
This B.S./M.S. Program in Learning Sciences & Technologies allows students to pursue a five-year Bachelor's/Master's program, in which the Bachelor's degree is awarded in any major offered at WPI and the Master's degree is awarded in Learning Sciences & Technologies.

1. Program Description
Students enrolled in the B.S./M.S. program must satisfy all the program requirements of their respective B.S. degree and all the program requirements of the M.S. degree in Learning Sciences & Technologies. WPI allows B.S./M.S. students to double-count courses towards both their undergraduate and graduate degrees whose credit hours total no more than 40 percent of the 33 graduate credit hours required for the M.S. degree in Learning Sciences & Technologies (i.e., up to 13 graduate credits or equivalently 2 undergraduate units), and that meet all other requirements for each degree. These courses can include graduate courses as well as certain undergraduate 4000-level courses, listed below, that are acceptable for satisfying Learning Sciences & Technologies M.S. requirements.

In consultation with the student's major Academic Advisor and the Learning Sciences & Technologies Program Director, the student prepares a Plan of Study outlining the selections made to satisfy the B.S./M.S. degree requirements, including the courses that will be double-counted. This Plan of Study must then be approved by the Learning Sciences & Technologies Faculty Steering Committee.

2. Admissions Requirements
Any WPI undergraduate student may apply to the B.S./M.S. program in Learning Sciences & Technologies. Students are expected to apply for admission to the B.S./M.S. program during their junior year so that they have sufficient time to plan their course selection with their major Academic Advisor and the Learning Sciences & Technologies Program Director.

3. Double-Counting Rules

4000-level courses and projects that can be double-counted
For the 4000-level courses listed below, two graduate credits will be earned towards the B.S./M.S. degree if the student achieves a grade of B or higher.

- **Computer Science courses:**
    - CS 4341. Introduction to Artificial Intelligence
    - CS 4342. Machine Learning
    - CS 4432. Database Systems II
    - CS 4445. Data Mining and Knowledge Discovery in Databases
    - CS 4518. Mobile and Ubiquitous Computing

- **Data Science courses:**
  - DS 4635/MA 4635. Data Analytics and Statistical Learning
  - DS 4433 Big Data Management and Analytics

- **Mathematics courses:**
  - MA 4631. Probability and Mathematical Statistics I
  - MA 4632. Probability and Mathematical Statistics II
  - MA 4635/DS 4635. Data Analytics and Statistical Learning

- **Psychological Science courses:**
  - PSY 4800. Special Topics in Psychological Science
  - PSY 4900. Advanced Research in Psychological Science

- **Business courses:**
  - MIS 4741 User Experience and Design (Business)
  - Other Business Courses could be double counters where the project work has a substantial overlap with Learning Science issues (like a final project that relates to student learning issues). Students who are interested in being able to double count a class are encouraged to petition the LS&T director explaining how their project work relates. Some such classes that might qualify
    - MIS 4720. Systems Analysis and Design
    - MIS 4084. Business Intelligence

- **Neuroscience Courses:**
  - Currently Neuroscience does not have a 4000 class listed but we imagine that over time such classes could be approved so we list Neuroscience as one of the departments whose classes could count toward this.

- **Major Qualifying Project (MQP):**
  - Up to 3 graduate credits (equal to 1/2 undergraduate unit) can be earned towards fulfillment of the Learning Sciences & Technologies thesis requirement by double counting a Major Qualifying Project, provided that:
    - the MQP involves substantial use of Learning Sciences & Technologies at an advanced level;
    - the thesis research is a continuation or extension of the MQP work;
    - the student satisfies the thesis requirement by completing at least 6 additional credits of PSY 599 Thesis Research, and the M.S. thesis advisor and the Learning Sciences & Technologies Faculty Steering Committee approve the double-counting.
  - MQP work may not be double-counted toward the non-thesis option.

Other 4000-level courses and independent studies not on this list but that could be used to satisfy Learning Sciences & Technologies M.S. requirements may be petitioned to double-count. Such petitions need to be approved by the Learning Sciences & Technologies Faculty Program Director.

Graduate courses that can be double-counted

A student in the B.S./M.S. Program in Learning Sciences & Technologies can double-count any of the graduate courses that are listed in the Learning Sciences & Technologies WPI Graduate Catalog. Special

topics courses or independent study classes need to be approved by the LST Program Director before they can be used for double counting.

Restricted Undergraduate and Graduate Course Pairs

Some undergraduate and graduate courses have significant overlap in their content. The following table lists these courses. A student can receive credit towards their M.S. degree for at most one of the two courses in any row of this table.

Courses in Computer Science	
Undergraduate Course	**Graduate Course**
CS 4341 Introduction to Artificial Intelligence	CS 534 Artificial Intelligence
CS 4342 Machine Learning	CS 539 Machine Learning
CS 4432 Database Systems II	CS 542 Database Management Systems
CS 4445 Data Mining and Knowledge Discovery in Databases	CS 548 Knowledge Discovery and Data Mining
CS 4518 Mobile and Ubiquitous Computing	CS 528 Mobile and Ubiquitous Computing
Courses in Mathematics	
Undergraduate Course	**Graduate Course**
MA 4631 Probability and Mathematical Statistics I	MA 540 Probability and Mathematical Statistics I
MA 4632 Probability and Mathematical Statistics II	MA 541 Probability and Mathematical Statistics II
DS 4635/MA 4635 Data Analytics and Statistical Learning	MA 543/DS 502 Statistical Methods for Data Science

<u>Rationale</u>:

The Learning Sciences & Technologies Program at WPI offers an M.S. degree. Given that this program is highly interdisciplinary, it attracts students from different majors and backgrounds: Computer Science, Data Science, Mathematics, Psychology, Neuroscience and Business to name a few. Hence, this B.S./M.S. Program in Learning Sciences & Technologies would provide a wide range of students with the option of

pursuing a Bachelor's/Master's program, in which the Bachelor's degree is awarded in any major offered at WPI and the Master's degree is awarded in Learning Sciences & Technologies.

WPI has a long tradition of offering the B.S./M.S. option to its students, either in the same department/program or in different departments/programs. There are numerous examples of B.S./M.S. students who have completed their B.S. degree in a department or program (e.g., Math) and their M.S. degree in a different department or program (e.g., Computer Science). Departments and programs that offer the B.S./M.S. option regulate the M.S. portion of the degree (e.g., what undergraduate courses can be double-counted toward the M.S. degree); note that these department/program-specific B.S./M.S. regulations are provided in the WPI Graduate Catalog (and not in the WPI Undergraduate Catalog). With a few exceptions (e.g., the B.S./M.S. options in Fire Protection Engineering and in Systems Engineering, which are only available to engineering undergraduate majors), departments/programs' B.S./M.S. options are available to any undergraduate major (see for example the B.S./M.S. option in Data Science on pp. 93-94 of the current Grad Catalog). In that spirit, the proposed B.S./M.S. in Learning Sciences & Technologies is open to any undergraduate major.

Note that there are several programs at WPI that offer the B.S./M.S. option to students even if they offer only graduate degrees and not a B.S. degree. Examples of these are the Fire Protection Engineering Program (see p. 113 of the current Grad Catalog), the Systems Engineering Program (see p. 201 of the current Grad Catalog), and until recently the Data Science Program (which started to offer a B.S. degree just this academic year).

The B.S./M.S. Program in Learning Sciences & Technologies described here follows all the WPI B.S./M.S. rules. This motion was modeled after the NeuroScience BS/MS, the most recent program to be approved by the committee. It has been informed by the B.S./M.S. program descriptions in the WPI Graduate Catalog; in particular those of interdisciplinary programs, including the B.S./M.S. in Data Science (see pp. 93-94 of the current Grad Catalog), in Bioinformatics and Computational Biology (see p. 35 of the current Grad Catalog) and in Robotics Engineering (which allows its B.S./M.S. students to double-count MQP credits towards the M.S. thesis option; see p. 181 of the current Grad Catalog). This B.S./M.S. program in Learning Sciences & Technologies has drawn aspects of and is consistent with B.S./M.S. programs offered by departments and programs involved in the interdisciplinary Learning Sciences & Technologies program, including Computer Science, Chemistry and Biochemistry and Biomedical Engineering.

Impact on Degree Requirements: None.

Resources Needed: We anticipate that only a small number of students per year will avail themselves of this program.

Implementation Date: Implementation date for this action is Summer(May) of 2023.

WPI Faculty Contacts:
BS/MS Program in Learning Sciences & Technologies:
Learning Sciences & Technologies Program Director:
Neil Heffernan, Computer Science

Learning Sciences & Technologies Faculty Steering Committee:
Joseph Beck, Computer Sciences
Erin Ottmar, Psychological & Cognitive Science in Social Science and Policy Studies
Adam Sales, Mathematics

Stacy Shaw, Psychological & Cognitive Science in Social Science and Policy Studies
Jacob Whitehill, Computer Science

Date: November 10, 2022
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Medich, Chair)
Re: Motion to decrease the minimum credits required for the Business School's Graduate Certificates

Motion: On behalf of the Business School, the Committee on Graduate Studies and Research recommends and I move that the minimum credits for all WPI Business School Graduate Certificate be decreased from 12 credits to 9 credits, as described below.

Description of the Motion: Proposed Modifications to Graduate Catalog:

Graduate Certificate and Advanced Certificate Programs:
In the description of *Graduate Certificate and Advanced Certificate Programs*, add the sentence "For the business school, GC students are required to complete three to five courses totaling 9 to 15 credit hours". This sentence should be added after, "GC students are required to complete four to six courses totaling 12 to 18 credit hours in their area of interest."

Admissions Requirements: No change.

Application Process: *Changes to the Graduate Catalog Description*
    Current: Application to the GC and AC requires submission of an official application form, official transcripts of all college-level work, and a $70 application fee (waived for WPI alumni) to the Office of Graduate Admissions. Individual departments may require additional information.

    Revised (in-progress): We are working with admissions toward a simpler application process, i.e., a short application form indicating intention to complete a particular graduate certificate, with no required reference letters or application fee. We will still need transcripts so that we have the information we need about potential students.

Faculty Contacts: Purvi Shah, Diane Strong

Rationale:
Summary:
WPI's Business School (WBS) has updated all its graduate programs over the last two years. WBS's MBA and MS programs are now structured around 3-course (9-credit) "stackables", i.e., a set of three courses with a common theme. An MS curriculum, for example, requires a core stackable plus two elective stackables and a capstone project. We have designed 18 such stackables that can be selected within one or more of WBS's degrees programs (our MBA and our STEM MS programs (BA, IT, IUX, OSCA)).

Currently, stackables are only available as part of a degree program (an MBA or STEM-based business MS degree). That is, students must apply and be accepted into a degree program before taking a stackable. (Non-matriculated students may enroll in two graduate courses before applying.)

We would like to offer these stackables as independent Graduate Certificates. Since stackables are a total of 9 credits, rather than the minimum 12 credits for graduate certificates as listed in the Graduate Catalog, this motion will change the minimum to 9 credits, thus allowing these "stackables" to be offered as Graduate Certificates.

Rationale:

One rationale for this request is the general trend toward shorter and less expensive degrees and toward various micro-credentialing. For WBS to compete in offering non-degree options to professionals, we should shorten our Graduate Certificate offerings. Shorter certificates will enable business professionals to more easily enhance their skills. While many Graduate Business Certificates at other schools remain at 12 credits, schools are starting to offer 9-credit Graduate Certificates. A quick search found three Business Schools (two in Mass.) that are offering 9-credit Graduate Business Certificates:

- **Bentley University** (a competitor of WBS) – 9 cr (3 courses) graduate certificates (cost is $3,300/class, i.e., $9,900 for the three-class certificate)
- **Fitchburg State University** – 9 cr (3 courses) Accounting Graduate Certificate
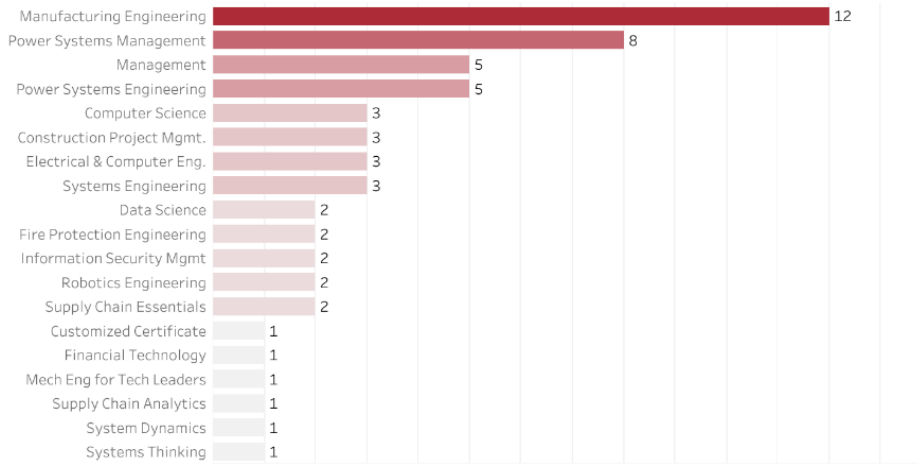- **Penn State World Campus** – 9 cr Certificates (cost $1,046 per credit)

Another rationale for WBS is that our revised curricula are organized into 3-course chucks. It would be ideal if these same chunks were also Graduate Certificates. As we keep the stackables for our degree programs current, we would also be keeping our certificates current. In addition, students can easily see how completing a Graduate Certificate is completing a portion of a graduate degree, making it easier and more likely for them to transfer from a Certificate to a degree program.

Another rationale is that a graduate certificate indicates that learners have engaged with graduate level academic work, which accurately characterizes our stackables. While we also plan to provide students with an e-badge for each stackable they complete, an e-badge or other micro-credential does not indicate graduate-level academic work to the same extent that a Graduate Certificate does.

Finally, WBS's 4-course Graduate certificates (of which we currently have 8) have few takers. See the graph on 2020 awarded certificates below. Thus, there is little downside to offering 9-credit certificates to try to increase Graduate certificate enrollments. On the upside, 9-credit certificates make it easier for working professionals, including WPI alumni, to enhance their business acumen, and may lead to additional enrollments in our graduate degree programs.

Certificate Degrees Awarded July 1, 2019 - June 30, 2020

Major	Count
Manufacturing Engineering	12
Power Systems Management	8
Management	5
Power Systems Engineering	5
Computer Science	3
Construction Project Mgmt.	3
Electrical & Computer Eng.	3
Systems Engineering	3
Data Science	2
Fire Protection Engineering	2
Information Security Mgmt	2
Robotics Engineering	2
Supply Chain Essentials	2
Customized Certificate	1
Financial Technology	1
Mech Eng for Tech Leaders	1
Supply Chain Analytics	1
System Dynamics	1
Systems Thinking	1

Dashboard Definitions

Graduation Year
2020

Degree Level
Certificate

Major Category
Primary Major

Gender
All

Diversity Status
All

Impact on Existing Programs at WPI: This proposal will not change existing Certificates. The Business School is likely to phase out its longer certificates in the future, except perhaps for a few offered only in companies.

Implementation:
Program Management: These shorter certificates will be managed in the same way as our longer certificates. We will also work with admissions toward a simpler application process (ideally with a short application form and no reference letters or application fee) that still provides the information we need about potential students.

Implementation Date: Implementation date for this action is the 2022-2023 academic year.

Resources Required: All courses in the stackables are already taught in our degree programs, so no new resources are required.