WORCESTER POLYTECHNIC INSTITUTE
April 13, 2017

To: The WPI Faculty

From: Mark Richman
Secretary of the Faculty

The eighth Faculty meeting of the 2016-17 academic year will be held on **THURSDAY**, **April 13, 2017** at 3:15 pm in **Olin Hall 107**, with refreshments at 3:00 pm**.**

1. Call to Order — M. Richman
   - Approval of the Agenda
   - Approval of Consent Agenda (including and Minutes from 3-16-17)
2. Opening Announcements — M. Richman
3. President's Remarks — L. Leshin
4. Provost's Remarks — B. Bursten
5. Reading of Memorial Resolution
   - Prof. Elliot L. Buell (Mathematical Sciences) — M. Humi
6. Committee Reports
   - Committee on Advising and Student Life (CASL) — N. Rahbar
     - Recognition of Insight Faculty Advisors
7. Committee Business
   - Committee on Academic Policy (CAP) — M. Humi
     Committee on Governance (COG) — T. Dominko
     - Motion to Revise the Membership of the Undergraduate Outcomes Assessment Committee (UOAC)
   - Committee on Governance (COG) — T. Dominko
     Faculty Review Committee (FRC) — A. Hoffman
     - Motion to Expand the Role of the Faculty Review Committee (FRC) to Include an Appeal Process for Negative Promotion Decisions
   - Committee on Appointments and Promotions (COAP) — P. Hansen
     - Motion to Modify the Nomination Procedures for Faculty Promotion
     - Motion to Modify the Maximum Duration for Reappointments of Professors of Practice
8. New Business
9. Closing Announcements
10. Adjournment

TABLE OF CONTENTS
Faculty Meeting Materials, April 13, 2017

WORCESTER POLYTECHNIC INSTITUTE
Faculty Meeting Minutes
March 16, 2017

Summary:

1. Call to Order
2. Opening Announcements
3. Provost's Remarks
4. Committee Business: CAP/COG, CGSR, COAP
5. Committee Report: COG
6. Adjournment

Detail:

1. Call to Order

The seventh Faculty meeting of the 2016-2017 academic year was called to order at 3:20pm in OH 107 by **Prof. Richman** (ME). The meeting agenda (with President Leshin's Remarks removed because of her absence) and the consent agenda (including the minutes from February 14, 2017) were approved as otherwise distributed.

2. Opening Announcements

Prof. Hansen (HUA) announced that the Committee on Appointments and Promotions would hold a meeting on March 23rd for candidates, nominators, and advocates who might be involved in next year's promotion cases.

Prof. Scarlata (CBC) urged people to participate in the March for Science, which is a non-partisan effort to raise public awareness of about the positive impact of science and the need for continued government funding for scientific research. The main march will take place in Washington DC, with a satellite march in Worcester on April 22 at 11am in Institute Park.

Prof. Richman (ME) thanked all faculty members (106, in all) who participated in this year's Faculty Evaluation of Administrators. The Administrators evaluated this year were Provost Bursten, Dean Ginzberg, Vice President Tichenor, and Vice President Flavin. The Faculty receive the numerical results, the individuals evaluated received the numerical results and all comments relevant to their own positions, the President and Chair of the Board of Trustees received the numerical results and comments for all positions evaluated, and the Secretary of the Faculty and Chair of COG make themselves available to each evaluated administrator and to the President and the Chair of the Board to discuss the results that they each receive. Prof. Richman thanked the members of COG for revising the surveys this year to make them even more worthwhile than in the past.

Prof. Richman announced that the ballots for the Faculty Governance Standing Committees would be distributed soon. At the conclusion of these elections, Faculty representatives to five of the Trustees' committees will be nominated by COG and then appointed by the Trustees at their May meeting. Any faculty member willing to serve in this capacity should contact any member of COG.

3. Provost's Remarks

Provost Bursten introduced the new University Librarian, Anna Gold, who joined WPI on March 1st. Provost Bursten also congratulated all those faculty members who were most recently tenured and/or promoted. **Provost Bursten** announced that to date five faculty searches have been concluded, including one for the new Head of the SS&PS, and he indicated that four of those new faculty members are women. Provost Bursten congratulated Prof. Srinivasan (BBT) for receiving a $1.6 million NIH RO1 Grant.

The Provost expressed his concerns about recent proposed federal budget cuts to the arts and sciences, in general, and to the NIH and NEA, in particular. He also indicated that WPI is part of a consortium of Massachusetts universities that is submitting an amicus brief against President Trump's (suspended) travel ban. He urged all those with concerns about faculty hiring or conference travel due to the travel ban to come forward and share them with him.

4. Committee Business

CAP/COG

Prof. Humi (MA), for the Committee on Academic Policy and the Committee on Governance, described a motion (for discussion only at this meeting) to revise the membership of the Undergraduate Outcomes Assessment

Committee (UOAC). In addition to updating some out-of-date language describing the UOAC, the motion does the following: it adds IGSD to one identified group of academic departments from which a UOAC member may be elected; it allows CAP to appoint a member to UOAC who is not necessarily a member of CAP; and most importantly, it adds the Director of Institutional Research as an *ex officio* member of UOAC. This motion will be brought back to the Faculty for a vote in either April or May.

CGSR

Prof. Troy (BME), for the Committee on Graduate Studies and Research (CGSR), moved to change Graduate Certificate and Advanced Graduate Certificate program policies. (See **Addendum #1** attached to these minutes.) Prof. Troy explained that currently students accepted into a master's or doctoral program cannot retroactively apply to a certificate program. The motion would allow any student accepted into a master's or doctoral program to apply to a certificate program with approval of the graduate committee of the student's degree granting program or department. The admitted student may be awarded only one certificate for which course credits are used to satisfy requirements for both the graduate degree (MS or PhD) and a Graduate Certificate or Advanced graduate certificate, and no more than one-third of course credit applied to a Graduate Certificate or Advanced Graduate Certificate or graduate degree can be earned by transfer credit.

Prof. Dominko (BBT) wanted to know why a department might not want a student to apply to a certificate program. **Prof. Troy** did not provide an example, but thought that it was important to allow department the right to refuse should they have good reason to do so.

In response to a question from **Prof. Weekes** (MA), **Prof. Troy** explained that the motion would prevent a student from "triple-counting" credit that was already used toward a graduate degree and a certificate.

The motion **passed.**

6. Committee Report

COG

Prof. Richman (ME), for the Committee on Governance (COG), presented a report on the TTT/NTT Teaching Distribution at WPI: Fall 2004 to Spring 2016. (See **Addendum #2** attached to these minutes.) Prof. Richman reviewed the four main elements of the Appendix D of the WPI Faculty Constitution. First, the tenured and tenure track (TTT) Faculty are committed to delivering a significant majority of the academic credit offered to WPI students. Second, WPI meets this commitment by ensuring that the TTT Faculty grows at a rate commensurate with the growth of the University. Third, non-tenure track (NTT) faculty members enhance new and existing programs, and complement and expand scholarly expertise on campus. And fourth, COG will present a report to the Faculty each year concerning the distribution of teaching done by TTT and NTT faculty members.

Prof. Richman explained that from fall 2004 to spring 2016 the total number of credits delivered at WPI increased by 57 percent while the TTT faculty headcount increased by 14 percent (from 217 to 248), the fraction of credits delivered by the TTTs decreased from 65 percent to 49 percent, and the number of credits delivered per TTT faculty member increased by 3.6 percent (from 332 to 344). In the same time period, the number of full time equivalent (FTE) NTTs increased by 118 percent (from 75 to 163), the fraction of credits delivered by the NTTs increased from 35 percent to 51 percent, and the number of credits delivered per (FTE) NTT faculty member increased by 6.5 percent (from 510 to 543). Prof. Richman also showed how (in 2014-2015 and in 2015-16) the fraction of credits delivered by TTTs varied from division to division and from department to department, and how the load per TTT faculty member varied by rank. He showed that of the off-site corporate credits delivered during the academic year, only 27 percent were delivered by TTT faculty members in 2014-15 and only 19 percent were delivered by TTTs in 2015-16. And he showed that of the on-line credits attributed to CPE during the academic year, 36 percent were delivered by TTT faculty members in 2014-15 and 39 percent were delivered by TTTs in 2015-16.

Prof. Richman also provided a preliminary glance at the current academic year, indicating that since the previous year the number of FTE undergraduate students had increased by 0.4 percent (from 4213 to 4195) and the number of FTE graduate students has decreased by 5.0 percent (from 1366 to 1297), while the number of TTT's has remained the same (at 248) and the number of FTE NTT's has increased by 9.1 percent (from 163 to 178). These numbers suggest that the fraction of credits delivered by TTTs might be have dipped even further below 50 percent this year.

Prof. Richman concluded by estimating that 40 to 50 additional TTT faculty members were needed for WPI to meet both its teaching commitment as stated in the Faculty Handbook and its research goals as articulated in the Strategic Plan.

Prof. Boudreau (HUA) shared her concern that by shifting our balance toward NTT faculty members who are capable and active scholars but who are hired primarily for their teaching, we are losing the capacity to put scholar/teachers together with our students. Prof. Boudreau's second concern was for the increasing load on TTT faculty members for MQP and graduate student advising, for faculty governance, and for overseeing the curriculum as the number of TTT faculty members decreases relative to the size of our student body. As an example, she explained that as a Department Head, she was no longer certain that she could afford to send TTT faculty members to project centers or have them teach in the GPS program.

Prof. Sarkis (BUS) asked if the number of TTTs on sabbatical in any year could be accounted for in presenting the data. **Prof. Richman** indicated that an appropriate adjustment could be made, but the effect was easy to anticipate and the extra level of precision would probably not add much insight.

Prof. Rulfs (BBT) asked if we would have space for 40 to 50 new TTT faculty members, and if we had outgrown our capacity to continue to grow the TTT faculty. **Prof. Richman** suggested that the first step in solving the problem was to estimate how large the TTT faculty would need to be to meet our teaching commitment and research goals. And if we believe that need is real, then we will have an obligation to find the resources (both in budget and space) to make such growth possible. This could well mean changing our budget priorities, and, at least in the short term, finding economical ways to share space and equipment.

Prof. Gatsonis (ME) inquired about whether the shift to greater reliance on NTTs has an impact on the quality of our evaluations or on our academic reputation. He also was not sure what the difference would be between an TTT faculty member and an NTT faculty member whose responsibility included scholarship. **Prof. Richman** was also not sure of the overall effect of the shift toward more NTT's, but he was concerned because the shift is occurring without an overall plan and without a clear idea of how it will change the culture of the University.

Prof. Ryder (BBT) asked if there were a clear distinction between TTT delivery of upper division courses and TTT delivery of lower division courses. **Prof. Richman** explained that the data had not been collected in way that would answer the question.

Prof. Vick (HUA) was sure that the culture at WPI had changed, and that the WPI Plan had been eroded. She hoped that WPI could devise a new plan that would include our NTT faculty members as equals and would educate our students for the future. **Prof. Richman** suggested that we focus on the commitment we made in 2011 and ask, first of all, if we stand by it today.

Prof. Brattin (HUA) asked if the TTT commitment to deliver a significant majority of the credits weren't a moral commitment we had made so that an underpaid disposable class does not replace the TTT faculty at a lower cost. It was clear to him, in any case, that 49 percent is not a substantial majority! **Prof. Richman** observed that for quite some time the TTTs have fallen was well short of their credit-delivery commitment. The motivation of the TTT faculty for making the commitment is difficult to assess, but unless it is changed the data presented should be measured against that commitment.

Prof. Spanagel (HUA) observed that what was missing from the discussion so far was the fact that TTT faculty members carry, design and develop the curriculum, while NTT faculty members are hired, not to do that, but rather to fill slots on a case-by-case basis. If we get to the point at which TTT faculty members are delivering only a minimal fraction of the academic program, then they become disconnected in their role as developers and carriers of the curriculum.

Prof. Loiacono (BUS) pointed out that, although we may have outstanding NTT faculty members that make WPI an exception, the AAUP does have broader data indicating that increasing the number of NTT faculty members while reducing the number of TTT faculty members has a generally negative institutional effect.

Prof. Roberts (CHE) thought that the experience and responsibilities of NTT faculty members at WPI probably varies widely depending on the Department. In Chemical Engineering, for example, NTT faculty members design elements of the curriculum and collaborate with research-active faculty members to incorporate current research into their courses. With these kinds of activities in mind, Prof. Roberts was in favor of making long-term

commitments to NTT faculty members, which in turn would attract highly qualified faculty with much less turnover.

Prof. Richman asked for a motion to extend the meeting for ten minutes. The motion was made, seconded, and **passed**.

Prof. Vaz (IGSD) made the point that WPI is very different now than it was in 2004. He was pleased that WPI now does a better job compensating non-tenure track faculty members, and that we have developed paths by which they may be promoted. Given that the NTT faculty are delivering so many credits, have taken on programmatic responsibilities, and are playing critical roles in our signature programs, he thought that it was time to give continuing non-tenure track faculty members voting privileges and committee responsibilities. In his view, this would unify TTT and full time NTT faculty members in a common educational mission. **Prof. Richman** pointed out that the commitment made by the TTT faculty to deliver a significant majority of credits offered was made in 2011, at which point WPI had already undergone significant change from 2004.

Prof. Gaudette (BME) thought that moving some NTT faculty onto tenure-track lines was one opportunity to increase the numbers of TTT faculty members. His biggest concern was that while the Provost, the Deans, and the Department Heads would agree that we need to hire more TTT faculty members, WPI continues to fill new positions created outside of academic faculty lines. Prof. Gaudette felt strongly that the growth of the TTT faculty should be WPI's highest budgetary priority, but was not convinced that it was. **Prof. Richman** responded from his experience observing the budget planning process, and explained that the hiring of TTT faculty is only one of many priorities that, in effect, compete against one another. In his view, the case for hiring more growing the TTT faculty at a more rapid rate could be made more strongly, and the slow rate of growth over the past several years is clear evidence to that effect. **Provost Bursten** recognized that there has been criticism of how we determine our spending priorities, but pointed to the hiring of a new University Counsel as an example of money well spent. He also pointed out that the process by which we replace Banner will be extremely costly, but that much of the benefit of the new system will go to supporting WPI's academic function. He was hard pressed to cite a recent WPI expenditure that did not contribute our academic success, and saw that the choice that President Leshin has to make is between increasing the single number of TTT faculty and increasing our capacity as a high-productivity academic institution.

Prof. Hansen (HUA) thought it would be interesting to know the percentage of credits delivered by the combination of both TTT faculty and full time NTT faculty members.

Dean Wobbe (UG) read a statement from **Prof. Boudreau** (HUA) who pointed out that we are receiving international recognition for our project based curriculum. Institutions are trying to support and extend integrative STEM/Humanities learning. Prof. Boudreau expressed frustration over her inability as a Department Head to recruit, support, and retain strong new faculty members. The morale of the faculty at WPI, according to Prof. Boudreau, is as low as she has seen it. She hoped that the data presented at today's COG presentation would lead to better investments in more tenure-track teacher/scholars.

Prof. Vick (HUA), citing the WPI Plan as a radical idea that allowed the University to blossom at the time, was in search of the next great idea that would do the same for us today. She was tempted to suggest, for example, that all continuing non-tenure track faculty members be immediately tenured.

6. Adjournment

The meeting adjourned at 4:55pm.

Respectfully submitted,

Mark Richman
Secretary of the Faculty

Addendum on file with these minutes:

1. **Addendum #1 – CGSR Presentation on Graduate Certificate Policy – March 16 2017**
2. **Addendum #2 – COG Report on TTT-NTT Distribution at WPI 2004-2016 – March 16 2017**

Date: April 13, 2017
To: WPI Faculty
From: Committee on Governance (Prof. Dominko, Chair)
Committee on Academic Policy (Prof. Humi, Chair)
Re: Motion to revise the language describing the membership of the Undergraduate Outcomes Assessment Committee (UOAC)

Motion: The Committee on Governance (COG) and the Committee on Academic Policy (CAP) recommend, and I move that the current language describing UOAC membership (in Part One, Bylaw One, Section X of the Faculty Handbook) be revised, as described below.

Description of the Proposed Modifications to Part One, Bylaw One, Section X: (with added text in **bold** and deleted text ~~struck through~~):

X. The Undergraduate Outcomes Assessment Committee (UOAC) consists of the following members: four Faculty Members elected for staggered, three-year terms, a member appointed annually by the Committee on Academic Policy (CAP) from among ~~its elected~~ **the** Faculty ~~Members~~, one undergraduate student appointed by the Student Government Association, a representative of the Provost's Office, ~~and *ex-officio*~~ the Director of the ~~Center for Educational Development, Technology, and Assessment~~ **Morgan Teaching and Learning Center (*ex-officio*), and the Director of Institutional Research (*ex-officio*).** One of the four elected Faculty Members shall be elected from the Faculty at-large. The other three shall be elected by the entire Faculty but shall be chosen from among the following departmental groupings: One chosen from the Engineering programs; one chosen from the Natural Sciences, Math or Computer Science; and one chosen from ~~Management,~~ **The Foisie School of Business,** Social Science and Policy Studies, ~~or~~ Humanities and Arts**, or IGSD**.

The UOAC shall function as a permanent subcommittee of CAP. It shall report to CAP and forward recommendations for Faculty action to CAP for its consideration and possible recommendation to the Faculty.

The UOAC is responsible for:

a. proposing policy with regard to WPI's undergraduate learning outcomes;
b. identifying and facilitating procedures for assessing those outcomes;
c. coordinating outcomes assessment activities on campus;
d. communicating assessment results; and
e. formulating academic policy recommendations based on its assessment activities.

The Committee is not responsible for the assessment of departmental majors or programs, but for the identification and assessment of learning outcomes that arise from the undergraduate curriculum broadly defined, including assessment of the first year program.

Rationale:

The motion updates the Faculty Handbook with regard to new titles and offices and adds the Director of Institutional Research to the membership of UOAC. In spring 2016, WPI hired its first Director of Institutional Research. Her responsibilities include supporting the Committee and the Dean of Undergraduate Studies in the assessment of undergraduate learning and the documentation of learning for both NEASC and ABET accreditation. It is expected that the Director of Institutional Research will work closely with UOAC to improve our learning

outcomes, design methods for assessment of those outcomes, analyze data, and communicate performance on learning outcomes to the faculty.

The Undergraduate Outcomes Assessment Committee believes strongly that the Director of Institutional Research (IR) should be an *ex-officio* member of UOAC. The Director of IR will be more than a source of data for UOAC; this person's knowledge and ability to design assessment strategies and help carry out committee decisions are essential to the effective functioning of the committee. When the Assessment Plan for Institutional Learning Outcomes was approved by the Faculty in April 2005, it called for the Provost's Office to designate an "Assessment Coordinator" who would have responsibility for data collection and coordination. An Assessment Coordinator was never appointed, and the absence of this expertise has been a challenge for UOAC for more than a decade.

When the new position of Director of Institutional Research was under discussion at WPI, UOAC was a strong advocate since IR offices play a central role in assessment of learning outcomes at most institutions. Naming the Director as an *ex-officio* member of the committee will formalize her commitment of time to assessment work deemed important by the Faculty as part of her professional responsibilities. In this way, the Faculty and the quality of our undergraduate curriculum will benefit from greater assurance of this support in the future.

A specific example that illustrates the importance of the Director of IR to a well-functioning outcomes assessment system follows. In recent years many WPI constituencies have discussed the value of developing a periodic survey of recent alumni, and UOAC would like to lead that effort for purposes of outcomes assessment. While the current membership of the committee has some expertise in assessment design and implementation, the consistent participation of an assessment professional like the Director of Institutional Research would be invaluable in that process. As a member of the committee, it will be natural and appropriate for the Director to coordinate an alumni survey in collaboration with the other members of the committee.

Finally, we understand that it is desirable for faculty governance committees to have a majority of faculty members among their membership. The addition of the Director of IR to the committee would still leave the committee with a 6:3 ratio of faculty members to others on the committee. Also, UOAC is a standing sub-committee of CAP, which must approve all UOAC supported motions. The ratio of faculty members to others on CAP is 6:3,and three of the non-faculty members on UOAC and CAP are students.

In addition, the proposal would delete the requirement that the UOAC member appointed by CAP actually be an elected member of CAP. Making this change would give CAP the latitude to appoint a CAP member or other faculty member with the interest, expertise and time to serve on UOAC. UOAC has found that the liaison duties are infrequent and the Dean of Undergraduate Studies, who serves on both CAP and UOAC, also acts as a liaison between the committees.

Date: April 13, 2017
To: WPI Faculty
From: Committee on Governance (Prof. Dominko, Chair)
Faculty Review Committee (Prof. Hoffman, Chair)
Re: Motion to expand the role of the Faculty Review Committee (FRC) to include an appeal process for negative promotion decisions

Motion: The Committee on Governance (COG) and the Faculty Review Committee (FRC) recommend, and I move that the current language describing Duties and Responsibilities of Faculty Review Committee (in Part One, Bylaw One, Section IX of the Faculty Handbook) and the Operational Guidelines for the Faculty Review Committee (in Part One, Appendix B of the Faculty Handbook) be modified as described below.

Description of the Proposed Modifications to Part One, Bylaw One, Section IX: (with added text in **bold** and deleted text ~~struck through~~):

IX. The Faculty Review Committee
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The FRC reviews three types of cases: **1)** faculty grievances; **2)** allegations of faculty misconduct; and **3)** grade appeals.

1) For faculty grievances, a subcommittee of FRC consisting of three elected and two appointed members of FRC has the power to review and to require reconsideration of:

A. The Provost's ~~actions on non-renewal of~~ **decision not to renew a** probationary, tenure-track appointment~~s~~;
B. ~~The Provost's n~~**N**egative decisions on tenure; and
C. ~~The Joint Tenure Committee's negative recommendations on tenure~~ **Negative decisions on promotions of tenured, tenure track, and continuing non-tenure track faculty members;**

where the action, decision, or recommendation is alleged by an aggrieved faculty member to result from:

i. a violation of academic freedom; or
ii. improper procedure; or
iii. discrimination ~~on any of the grounds listed in Appendix B~~ **based on race, sex, age, color, national origin, religion, genetic identity, disability, gender identity or expression, marital or parental status, sexual orientation, transgender status, veteran status, or any other protected status**.

When a matter regarding a faculty grievance comes before the FRC, a subcommittee of three elected and two appointed members of the FRC are selected by the Chair of FRC to review the grievance. Committee members who have had a significant prior involvement with the matter in question, or who have a personal relationship with any of the parties directly involved in the matter, shall recuse themselves from participating in the proceedings. Recusals may be requested by FRC members, the grievant, or other parties in the action, such as the Provost or the Chair of CTAF **or COAP**. Additional recusals necessary to create the subcommittee with three elected and two appointed members will be arranged by the Chair of FRC such that recusals are distributed evenly over the FRC membership. The exercise of the functions of the FRC requires the presence and participation of all five members of the

subcommittee as constituted for a particular grievance. Operational guidelines for FRC review are described in **Part One,** Appendix B~~, 1-28~~).

2) For allegations of misconduct **by tenured, tenure-track, and continuing non-tenure track faculty members**, the fact finding committee is selected as described in the appropriate conduct policy (Sexual Misconduct Complaint Procedures: Faculty; Policy on Research Conduct; or Policy on Faculty Conduct). Selection of the fact finding committee is conducted so as to ensure members are unbiased and have the appropriate expertise and diversity as necessary for a particular case.

3) The Faculty Review Committee also **has a role** ~~participates~~ in the grade appeal process by forming three- member ad hoc committees to review grade appeals which are presided over by the Chair of the FRC.

When any matters regarding faculty grievances, allegations of faculty misconduct, or grade appeals are pending before the FRC at the time when the term of office of its members would expire, the subcommittee (or investigating committee) shall continue as then constituted for the sole purpose of disposing of such pending matters in its jurisdiction, notwithstanding the creation of a new FRC in the regular manner at the same time.

The exercise of the functions of the FRC, as well as its internal organization and procedures (including, if appropriate, the selection of a Committee Chair and the appointment of subcommittees) shall be governed, insofar as the matter is not prescribed by this policy or by the Faculty Constitution and Bylaws, by rules adopted by the Faculty Review Committee itself.

Description of the Proposed Modifications to Part One, Appendix B: (with added text in **bold** and deleted text ~~struck through~~):

APPENDIX B: OPERATIONAL GUIDELINES FOR THE FACULTY REVIEW COMMITTEE

FACULTY GRIEVANCES:

~~A Faculty Member may bring before the Faculty Review Committee (FRC) in the form of a grievance, an allegation that:~~

~~1. the Provost's actions in not renewing his/her probationary tenure-track appointment, or~~

~~2. the Provost's adverse decision on his/her tenure candidacy, or~~

~~3. the Joint Tenure Committee's negative recommendation on his/her tenure candidacy,~~

~~resulted from:~~

~~1. a violation of academic freedom, or~~

~~2. improper procedure, or~~

~~3. discrimination on ground of race, color, national origin, ancestry, sex, religion, creed, religious belief, age, marital status, sexual orientation, veteran status or handicap.~~

For faculty grievances, a subcommittee of FRC consisting of three elected and two appointed members of FRC has the power to review and to require reconsideration of:

A. The Provost's decision not to renew a probationary, tenure-track appointment;

B. Negative decisions on tenure; and

C. Negative decisions on promotions of tenured, tenure track, and non-tenure track faculty members.

where the action, decision, or recommendation is alleged by an aggrieved faculty member to result from:

i. **a violation of academic freedom; or**
ii. **improper procedure; or**
iii. **discrimination based on race, sex, age, color, national origin, religion, genetic identity, disability, gender identity or expression, marital or parental status, sexual orientation, transgender status, veteran status, or any other protected status.**

When a grievance on any one or more of these grounds is submitted, the grievant shall present all factual or other data that he or she deems pertinent to the case, as well as all the relevant documentation available to him or her. The FRC shall have access to all the relevant documentation under the control of the University in the same manner and to the same extent as had the administrators and committees or other faculty bodies that participated in the decisions or recommendations to which the grievance refers, and with the same obligation of confidentiality that these administrators, committees or bodies were under with regard to any particular document. The body of documents and files available to the FRC must be identical, without addition, deletion, or embellishment, to that available to those participants.

When a grievance is submitted, the FRC shall first decide whether the allegations and the evidence submitted by the grievant merit detailed consideration of the matter, and shall inform the grievant and the appropriate administrator(s) promptly of this decision.

If the FRC decides that detailed consideration of a grievance is in order, it shall expeditiously investigate the matter in the manner that it deems appropriate. If the Committee finds that there are grounds for formal interviews, it shall conduct such interviews under source confidentiality safeguards identical to those practiced by the Faculty Committee on Tenure and Academic Freedom (CTAF) **or the Committee on Appointments and Promotions (COAP)**. Only WPI personnel may participate in such interviews.

The FRC, in carrying out its investigation, may appoint *ad hoc* committees of investigation, reporting to it, and consisting of Faculty Members with tenure who may, but need not, be members of the FRC. The FRC shall be free to discuss the grievance with the Provost and the President.

If the grievance arises from non-renewal of a tenure-track appointment prior to tenure review and alleges infringement of academic freedom either prior to the decision or in the process surrounding the decision, the FRC shall first request a finding on that issue from CTAF. The FRC may not issue its report until receiving that finding.

If the grievance arises from denial of tenure **or promotion** and alleges infringement of academic freedom either prior to the decision or recommendation or in the process surrounding the decision or recommendation, the FRC will not consult CTAF **or COAP**, but may employ its powers of investigation and authority to conduct interviews in order to assess the merits of the academic freedom issue and the extent to which that issue bears on its ultimate report and recommendations.

In determining whether a decision or recommendation that is the subject of a grievance was affected by improper procedure, the FRC may examine whether the decision or recommendation by an administrator, committee, or other faculty body was the result of adequate consideration in terms of the relevant standards of the WPI. In no case shall the FRC substitute its judgment for that of the maker(s) of the original decision or recommendation.

If the FRC concludes, after detailed consideration of a grievance, that the allegations in it have been established in full or in part and that the aggrieved matters have affected the decision at issue, then the Committee has the power to require of the maker(s) of the decision or recommendation that is the subject of the grievance that he or she or they reconsider this decision or recommendation to the extent that it is affected by the established allegations. The conclusion of the Committee, its recommendations, the basis for those recommendations, and, if appropriate, requests for reconsideration shall be recorded in a report, and this report shall be provided to the grievant, the maker(s) of the questioned decision or recommendation, and the President. The outcome of a reconsideration required by the FRC shall be promptly reported to the Committee.

In the event that**, for** a tenure candidate~~'s~~ **the** Joint Tenure Committee**, or, for a promotion candidate, the Joint Promotion Committee,** conducts a reconsideration of a case, it shall use only the body of documents available during the first hearing of the case, without addition, deletion, or embellishment, except for the FRC report on the case and any other information the Joint Tenure **or Promotion** Committee wishes to obtain using its normal procedures, provided such additional information pertains directly to issues raised in the FRC report.

If the reconsideration(s) required by the Committee lead to the same negative decision as that which generated the grievance, the grievant may make a final appeal to the President, who may reverse or uphold the decision.

DATES FOR FILING OF A GRIEVANCE

For grievances arising from non-renewal of a probationary appointment, the grievance must be filed within ten business days after the applicable latest non-renewal notification date as stipulated in the Faculty Handbook, in the section entitled "Appointments and Reappointments of Tenure Track Faculty".

For grievances arising from a negative tenure **or promotion** decision, the grievance must be filed within ten business days after that meeting of the Board of Trustees (usually February) at which the Provost and President present their tenure **and promotion** decisions for Board approval. The FRC is charged with reviewing a grievance in a prompt and timely manner, with the intent that it will issue its report prior to the close of the academic year in which the filing was made. Should a grievance be pending at the close of the academic year, its resolution will continue to be the responsibility of the original receiving committee, notwithstanding the election of a new committee; see Bylaw One, Section IX.

The filing of a grievance or the granting of a reconsideration as an outcome of that filing in no way extends the period of employment beyond that which would apply if no grievance were filed, nor do filing and reconsideration in any way entitle the grievant to automatic tenure through AAUP rules.

Rationale:

This motion is made in direct response to an important recommendation made by the Task Force on Academic Promotion (in its report of October 2015), in which the Task Force proposed "…that a mechanism be instituted to appeal a negative decision for promotion based on procedural grounds, but not based on the merits of a case."

The motion extends the process by which negative tenure decisions may currently be appealed to include an appeal process for negative promotion decisions, as well. The extension to negative promotion decisions is parallel to the existing procedure for negative tenure decisions in that it applies only to decisions that are alleged to have resulted from a violation of academic freedom, improper procedure, or discrimination. However, unlike tenure cases considered by the Committee on Tenure and Academic Freedom (CTAF), promotion cases considered by the Committee on Appointments and Promotions (COAP) include those for continuing non-tenure track faculty members as well as for tenured and tenure track faculty members. For this reason, the proposed appeal process for negative promotion decisions applies to continuing non-tenure track faculty members as well as to tenured and tenure track faculty members.

The motion also updates the language defining the grounds for discrimination. This language is consistent with WPI's current Human Resources policy on discrimination at:

(https://www.wpi.edu/about/policies/equal-opportunity-anti-discrimination-harassment)

and explicitly protects against discrimination "based on race, sex, age, color, national origin, religion, genetic identity, disability, gender identity or expression, marital or parental status, sexual orientation, transgender status, veteran status, or any other protected status."

Finally, the motion contains modifications to Part One, Appendix B (Operational Guidelines for the Faculty Review Committee) of the Faculty Handbook that amount to straightforward editorial changes that ensure that the language in Appendix B is in parallel to corresponding language in Part One, Bylaw One Section IX describing the function of the FRC.

Date: April 13, 2017
To: WPI Faculty
From: Committee on Appointments and Promotions (Prof. Hansen, Chair)
Re: Motion to modify the nomination procedures for faculty promotion

Motion: The Committee on Appointments and Promotions recommends and I move that the existing "D.2 Nomination Procedures for Faculty Promotion" (Handbook, Part Two, Section 1.D, page 2-11 to 2-12) be replaced with the following:

D.2. Procedures for Promotion Nomination and Review

D.2.1. Eligibility and Time in Rank

A candidate for promotion to **Associate Professor** normally will have completed five years as an Assistant Professor before a promotion review in the sixth year. Probationary faculty with initial appointment as Assistant Professor normally receive a combined review for tenure and promotion to Associate Professor from a Joint Tenure Committee, as described in Part Two, Section 1.A. Only in exceptional circumstances should an Assistant Professor be nominated for promotion to Associate Professor earlier than the scheduled tenure review.

To be considered for promotion to professor, an associate professor must have demonstrated considerable professional growth. A candidate for promotion to **Professor** normally will have completed at least five years as Associate Professor and at least three years as an Associate Professor at WPI before the year of the promotion review. Only in exceptional circumstances should an Associate Professor be nominated for promotion to Professor at an earlier date.

D.2.2. Nomination and the Formation of a Joint Promotion Committee

A candidate must be nominated for promotion. The **Nominator** is normally the Department Head or a tenured full professor at WPI. Before nomination, the Nominator should discuss with the candidate the strengths and weaknesses of their case based on the promotion criteria and eligibility including time in rank. Departmental promotion procedures should assure equitable treatment of all eligible candidates and should be selective so that only well-qualified candidates are nominated.

The Nominator's initial *statement of nomination* of a candidate for promotion must be received by the Committee on Appointments and Promotions from the Department Head by April 15 or from nominators other than the Department Head by May 1. The nominator must submit a more detailed **letter of nomination**, with a description and analysis of the candidate's teaching, scholarship/creativity, service and impact, during the summer prior to the academic year of the promotion review.

After the initial statement of nomination, the **Candidate** is invited to submit the materials for the promotion dossier (described in section D.1.3), as well as a list of internal and external peers known as Professional Associates (described in section D.2.3) and the name of an Advocate. The **Advocate** is normally a full-time faculty member who agrees to serve with the Nominator as a non-voting member of a Joint Promotion Committee. The candidate should seek advice from the Nominator, Advocate and other mentors well in advance of the nomination deadline in order to develop a strong promotion dossier and to submit an appropriate list of Professional Associates. The candidate submits the name of the Advocate and the list of Professional Associates by May 1. The candidate's promotion dossier is due in June prior to the academic year of the promotion review.

The **Joint Promotion Committee** consists of six voting members from the Committee on Appointments and Promotions (COAP) and two non-voting members, the Nominator and Advocate. The selection and recusal of COAP members for a Joint Committee are described in Bylaw One, Section VI.

D.2.3. Selection of Internal and External Peer Reviewers

The Joint Promotion Committee develops a list of peer reviewers to evaluate the candidate's promotion dossier. These peers are 1) six Professional Associates who are selected by candidate; and 2) five to six External Reviewers who are selected by the Joint Committee.

Professional Associates are contacted by the candidate at the time of the initial nomination and must agree, at that time, to supply a letter of appraisal when later asked by the Joint Promotion Committee. The six professional associates should include a mixture of internal peers at WPI and external peers in the candidate's areas of expertise. All professional associates must be qualified to evaluate the candidate's promotion dossier, and they must have agreed to write a letter of appraisal when asked by the candidate before they will be contacted by the Joint Committee.

External Reviewers are selected by the Joint Promotion Committee after the candidate has identified the professional associates. External reviewers must be competent to judge the candidate's promotion dossier and not have conflicts of interests or close personal ties to the candidate (such as co-author, co-PI, co-advisor, etc.). The candidate may not suggest names for the list of external reviewers, though they should tell the Nominator if there is anyone who should not be asked, with an explanation. The Nominator and Advocate each identify potential external reviewers and the Joint Committee then develops a priority list of reviewers. On behalf of the Joint Committee, the Nominator invites individuals from this priority list to serve as external reviewers until at least five to six external peers agree to write letters of appraisal.

The Joint Committee sends electronic copies of the candidate's promotion dossier as well as the criteria for promotion to the Professional Associates and the External Reviewers early in the summer. All of these peer reviewers are asked to submit a confidential letter of appraisal to the Committee before the beginning of the academic year of the promotion review (typically by August 15).

D.2.4. Student and Alumni Evaluations and Other Materials

During the summer before the academic year of the promotion review, the Joint Promotion Committee solicits **student and alumni evaluations** and collects other materials in the summer or the fall, as necessary, to arrive at a fair and equitable evaluation of the candidate.

D.2.5. Review by the Joint Promotion Committee, Dean, and Provost

The Joint Promotion Committee reviews a nomination for promotion in order to make a recommendation to the appropriate Dean and the Provost.

In Term A and Term B of the academic year of the promotion review, the Joint Promotion Committee meets to consider the merits of the nomination for promotion. The Joint Committee reviews the complete promotion dossier (described in section D.1.3) including the letters of appraisal from Professional Associates and External Reviewers. The welfare of the candidate must be protected by all members of the Joint Committee by observing strict rules of confidentiality during all phases of the promotion review. When all the members of the Joint Promotion Committee agree that there has been sufficient discussion, a vote is taken by the six voting members of the Joint Committee for or against promotion (no abstentions) by means of a secret ballot, with the majority ruling. By the end of Term B, the Joint Committee forwards to the Dean and the Provost a letter conveying the result of its vote as a unitary recommendation for or against promotion and summarizing the salient reasons for its recommendation.

The Provost reviews each case and consults with the Dean and the President. Subsequently, the Provost may ask to meet with the Joint Committee to discuss any of its recommendations, and must meet with the Joint Committee in the case of potential disagreement. Lastly, the Provost sends to the Board of Trustees the names of candidates for whom promotion is recommended. The Provost will inform the candidate of the Board's decision.

In the event of a negative decision on promotion, a joint letter to the candidate discussing the strengths and weaknesses of the case for promotion will be written by the Joint Promotion Committee, the Dean, and the Provost. The purpose of this letter is to provide constructive advice to the candidate so that they may address any deficiencies and resubmit the case for promotion consideration in the future. The candidate should meet with the Provost, Dean, or the Nominator to discuss this letter and to receive further feedback on their case for promotion.

If a candidate for promotion wishes to appeal a negative decision, faculty grievance procedures are available to the extent provided by a Faculty Review Committee (Bylaw One, IX).

[End of Motion]

Rationale:

This motion is one of several modifications to the promotion process at WPI. Previously, the Faculty approved a motion to modify the criteria for promotion in February 2017 as well as a motion to change the bylaws to modify the description of COAP in the Faculty Handbook in January 2017.

This motion improves the clarity in promotion procedures:

- Clarifies the minimum expectations for eligibility and **time in rank**
- Creates procedures for a **Joint Promotion Committee**
- Defines the process to **select Professional Associates and External Reviewers**
- Stipulates that the Joint Promotion Committee provides **formal feedback** to unsuccessful candidates and designates the Provost, Dean, or Nominator to meet with the candidates

Much of the motion simply restates or codifies current practices. The existing description of **time in rank**, for example, states that "To be considered for promotion to Professor, an Associate Professor must have demonstrated considerable professional growth and development of qualities of leadership. This usually requires at least five years as an Associate Professor." The motion approved in February 2017 changed the criteria to replace leadership with external impact (as described in detail in section D.2). The current language regarding time in rank permits nomination for promotion in the fourth year, but also notes that it is difficult to document a sufficient case of achievement prior to that date. The proposed language maintains this flexibility but provides improved clarity. The minimum time in rank from assistant to associate and from associate to full professor are similar: typically the candidate will have *completed* at least five years before the year of the promotion review.

Many of the procedures for a **Joint Promotion Committee** are similar to the procedures of a Joint Tenure Committee. The motion to change the description of COAP, approved by the Faculty in January 2017, designates the Nominator and Advocate as non-voting members of the joint committee. That motion also increased the number of members of COAP and defined procedures for recusal modeled on similar procedures for tenure reviews.

Promotion and tenure reviews have long used **Professional Associates** (named by the candidate) and **External Reviewers** (named by the Joint Committee) to describe peer reviewers, but the responsibility for identifying external reviewers for promotion has fallen exclusively to the nominator. By contrast, Joint Tenure Committees supervise the choice of external reviewers by department tenure committees and this motion adapts that practice to Joint Promotion Committees. The nominator, advocate and department promotion committee should mentor the candidate well before nomination so that the list of professional associates includes an appropriate mix of colleagues at WPI and other institutions. Candidates must include internal peers from WPI who can evaluate their teaching, scholarship, service and impact among their professional associates. Only after the candidate submits their list of professional associates can a Joint Committee identify external reviewers.

The **Joint Promotion Committee vote** is recorded as a unitary recommendation for or against promotion. To receive a positive recommendation by majority rule in a committee of six voting members requires, by definition, four affirmative votes. Three negative votes results in a unitary recommendation against promotion. A unitary recommendation means that the vote is recorded as unitary, in one direction or the other, but the vote tally is not recorded. A unitary recommendation for promotion does not mean that the letter conveying this result mentions only strengths for a positive recommendation or only weaknesses for a negative one. On the contrary, to dwell exclusively on the candidate's weaknesses in such a letter for a negative recommendation would undermine confidence in the committee's judgment. Likewise, a tendentious letter to accompany a positive recommendation is far less convincing than a reasoned and measured statement of the salient reasons for the committee's recommendation in light of the promotion criteria.

The Joint Committee sends its recommendation to the Dean and Provost, and the **Provost consults with the Dean and the President** before recommending candidates to the Board of Trustees. At present, the Dean receives the committee's recommendation from the Provost, and the Dean makes a recommendation to the Provost regarding each tenure or promotion case at this stage. This motion also specifies that the Provost must meet with the Joint Promotion Committee in the case of potential disagreement. Such a meeting has been customary but was required in the Handbook only during tenure reviews.

In the event of a negative decision on promotion, the **candidate will receive written feedback** from the Joint Committee, the Dean, and Provost. The absence of substantive feedback has been a source of frustration to unsuccessful candidates in the past. The purpose of this joint letter is to provide feedback to the candidate in order to revise and resubmit.

The **Provost, Dean and Nominator are designated as the individuals to meet with the candidate** after an unsuccessful promotion review. The Provost makes the final recommendation to the Board and thus has a strong responsibility for providing the candidate with overall advice. The Nominator and Dean are typically much closer to the candidate's academic division, department, or area of expertise, and therefore they are well-placed to assist the candidate in identifying practical strategies for professional development that will strengthen the case for promotion in the future.

Implementation:

These nomination procedures for promotion will take effect for promotion cases to be reviewed during the 2017-18 academic year. For promotion cases to be reviewed during the 2017-18 academic year *only*, the deadline for all initial nominations and for candidates to name an Advocate and Professional Associates will be May 1, 2017. If a candidate should need more time, they are warmly encouraged to contact the committee regarding their circumstances. Department Heads or other nominators are strongly encouraged to submit the initial statement of nomination before this date. A brief email to the Faculty Governance Coordinator is sufficient to serve as the initial nomination, but it is a necessary step to form the Joint Promotion Committee that selects External Reviewers. The work to identify and secure the consent of peers to serve as external reviewers needs to begin as early as possible in May.

Date: April 13, 2017
To: WPI Faculty
From: Committee on Appointments and Promotions (Prof. Hansen, Chair)
Re: Motion to modify the maximum duration for reappointments of Professors of Practice

Motion: The Committee on Appointments and Promotions recommends and I move that the maximum duration for reappointment of Professors of Practice be changed from three years to five years as follows (Faculty Handbook, Part Two, Section 7.E, page 2-74):

7. CATEGORIES OF FACULTY MEMBERS AT WPI *

E. Appointment, Evaluation, and Promotion Procedures for Continuing Non-Tenure Track Faculty:

- For Professors of Practice:

  Term(s) of Appointment: Initial appointments of Professors of Practice will be for a maximum of five years. All appointments, regardless of their duration, will be reviewed on an annual basis. Multi-year appointments may be shortened due to changes in WPI's strategic needs.

  Professors of Practice are full-time non-tenure track faculty members who, by virtue of their non-academic industry-related experiences, are hired to bring a unique, current area of expertise to teaching. This experience and expertise must be distinct from that which would be brought by a conventional tenured or tenure-track faculty member and should be aligned with a specific institutional need or required area of expertise.

  After five years at WPI, if the Professor of Practice has maintained significant relevant currency within the field, has demonstrated high quality performance at WPI, and there remains a strong continued institutional need that still cannot be filled by hiring a tenured or tenure-track faculty member, then a Professor of Practice may receive an additional appointment (reviewed annually) for a maximum of ~~three~~ five years. Multi-year appointments may be shortened due to changes in WPI's strategic needs. Subsequent (maximum) ~~three~~five-year appointments can be made under the same circumstances as the first ~~three~~five-year appointment. Such appointments may be shortened due to changes in WPI's strategic needs.

  Initial Appointment: The evaluation for the initial appointment of a Professor of Practice will be made by a search committee consisting of a Department Head and/or Program Director and at least two tenured faculty members. This group could be the same as the Department's standing tenure committee. The initial appointment**s** of Professors of Practice will require both review by COAP and approval of the appropriate Dean and the Provost. The candidate for Professor of Practice should, by virtue of his or her non-academic industry-related experiences, bring a unique current area of expertise to teaching. This experience and expertise must be distinct from that which would be brought by a conventional tenured or tenure-track faculty member and should be aligned with a specific institutional need or required area of expertise. The review by COAP should be based on the extent to which these criteria are met, and on the quality of the candidate's experience to date.

  Evaluations: After the first year at WPI, the Professor of Practice will have established a record of teaching at WPI. Annual evaluations will include assessment of high quality teaching (based on course evaluations, project evaluations, and other relevant feedback) and documented evidence that the Professor of Practice has maintained significant relevant currency in the field. These evaluations will be made by the Department Head and/or Program Director, the appropriate Dean, and the Provost, and will also take into consideration any other activities described in the official letter of appointment from the Provost. These annual evaluations will include a written evaluation to be kept on file.

~~*Appointments beyond five years:*~~ After five years, the Department Head and/or Program Director (with input from members of the department and/or program and the appropriate Dean) may recommend that a Professor of Practice receive subsequent (maximum) ~~three~~five-year appointment to be reviewed annually subjected to the annual evaluations described above. These ~~three~~five-year appointments are to be reviewed by COAP and passed on to the Provost for action. The Professor of Practice to be reappointed should, by virtue of his or her non-academic industry-related experiences, continue to bring a unique current area of expertise to teaching. This experience and expertise must be distinct from that which would be brought by a conventional tenured or tenure-track faculty member and should be aligned with a specific institutional need or required area of expertise. The review by COAP should be based on the extent to which these reappointment criteria are met, on the quality of teaching performance (and of any other activities described in previous appointment letters) at WPI, and on documented evidence that the Professor of Practice has maintained significant relevant currency in the field (see Section 7F). These appointments are contingent on a continued institutional need for the Professor's of Practice specific area of expertise. Any multi-year appointments may be shortened due to changes in WPI's strategic needs.

Rationale:

The initial appointment of a Professor of Practice may be renewed annually for up to five years. During this initial five-year period, the annual review for a Professor of Practice is conducted through the normal channels in departments or programs under the direction of the appropriate Dean. After the initial five-year period, a reappointment review by COAP is required. If the Professor of Practice is reappointed after the fifth-year review, then further reappointment reviews by COAP are currently scheduled to take place every three years. This three-year cycle of reappointment reviews by COAP is excessive in its frequency, punitive in its effects, and not in the best interests of WPI.

This motion replaces "three years" with "five years" as the length of time between the reappointment reviews conducted by COAP. These changes standardize the maximum period for reappointments for Professors of Practice at five years. This motion does not change the expectation that a Professor of Practice—along with all other full-time faculty—have annual performance reviews by departments or programs.

A five-year period between a reappointment reviews by COAP is consistent with best practices in evaluating the maintenance of professional currency. For example, AACSB International uses a rolling five-year window to assess whether instructional practitioners sustain currency and relevance through continued professional engagement activities, interactions and experiences. A five-year period is an appropriate length of time between these broader reappointment reviews for a Professor of Practice.

Appendix: Consent Agenda Motions

Date: April 13, 2017
To: WPI Faculty
From: Committee on Academic Operations (Prof. Iannacchione, Chair)
Subject: Motion to remove ACC 4200 Managing Performance: Internal and Inter-Organizational Perspectives

Motion: On behalf of the Robert A. Foisie School of Business, the Committee on Academic Operations recommends, and I move that ACC 4200 *Managing Performance: Internal and Inter-Organizational Perspectives* be removed from the undergraduate catalog.

Description of Proposed Changes:

Course description to be removed:
ACC 4200 *Managing Performance: Internal and Inter-Organizational Perspectives* (Cat. II) Managing supply chains is recognized as a critical factor for success among many firms, and may be a source of competitive advantage. This course will adopt a management accounting perspective to help managers plan, analyze, and manage the performance of their firm and their supply chain. Three types of topics will be presented: theoretical perspectives, such as transaction cost economics, agency, and goal setting theories; performance measurement, such as financial and non-financial performance measures of the firm and its suppliers; and performance management and challenges, such as strategic cost management, incentives, and total cost of ownership. Recommended background: BUS 2060.

Proposed Changes to Undergraduate Catalog:
ACC 4200 is currently a major elective for the Business/Management major as well as for the Management Engineering major with an Operations Management concentration. It is also one of the options for the new Data Science minor. The Foisie Business School, specifically Prof. Bengisu Tulu, will take responsibility for coordinating with the proper person (Kristin McAdams at this time) to see that all appropriate updates listed below are made.

- UG Catalog 2017-18, Page 53. Remove ACC 4200 from Business Analytics Concentration recommended courses list
- UG Catalog 2017-18, Page 54. Remove ACC 4200 from General Business Concentration Accounting & Finance list.
- UG Catalog 2017-18, Page 56. Remove ACC 4200 from Operations Management Concentration list.
- UG Catalog 2017-18, Page 92. Remove ACC 4200 from Business Courses section under list of approved courses for the data science minor
- UG Catalog 2017-18, Page 137. Remove ACC 4200 course description.

Rationale: ACC 4200 has experienced declines in enrollment. The course was cancelled in 2011 due to low enrollment and only four students registered for this course in 2013. ACC 4200 is a Cat. II course, last offered in B term of 2013

Impact on distribution requirements: These are provided at the end of this document since both motions in this document have a combined effect on the same distribution requirements.

Implementation date: AY 2017-2018

Date: April 13, 2017
To: WPI Faculty
From: Committee on Academic Operations (Prof. Iannacchione, Chair)
Re: Motion to add INTL 3050 Global Re-Entry Seminar

Motion: On behalf of the Humanities and Arts Department and the International and Global Studies Program, the Committee on Academic Operation recommends and I move that INTL 3050, as described below, be added.

Proposed Course Description:

INTL 3050: Global Re-Entry Seminar Cat. I (1/6 unit)
Global projects are often life-changing and many students want to make sense of their experience and deepen global learning after returning to campus. This course provides opportunities for self-reflection about global experiences, for connecting with peers to share stories, and for translating these experiences into skills and future professional opportunities, which may include internships, scholarships, post-graduate study or employment. Students completing this seminar will have reflected on their global experiences, articulated and identified transferable skills garnered while away, and integrated these reflections into future academic plans, personal aspirations, or career goals.
Recommended background: This course is intended for students who have participated in WPI's global programs, including global IQPs, MQPs, Humanities projects, or exchange programs, either in the US or abroad.

Anticipated Instructors:
Peter Hansen, Bland Addison, John Galante, and others

Rationale:
WPI has one of the world's premier global project programs but provides only limited opportunities for students to reflect on their global experience after returning to campus. Many returning students, brimming with cultural experiences they hoped to share with classmates, sometimes find readjusting to life at WPI as challenging as their adjustment to a new culture at a project center. This course supplements existing resources for returning students in order to serve a larger number of students and to provide a more structured framework and academic credit. Thus, this course meets a significant need in WPI's global curriculum and supports the objectives of WPI's Strategic Plan.

Re-entry programs for students returning from study away programs are usually either re-entry courses, one-time events, re-entry conferences, or peer-mentor programs. The Interdisciplinary and Global Studies Division (IGSD) has offered some of these opportunities to a small number of students. One-time re-entry events sponsored by the IGSD for students who were away the previous semester have been sparsely attended. The IGSD also sends a few students each year to regional re-entry conferences and the 3-4 participants have learned a lot that they bring back to the campus. The Global Ambassadors program adapts the peer-mentor model (with uncertain level of involvement by students), and provides the IGSD with an email alias reaching 50-100 students who have been away to project centers and might be resources for global events on campus. Global Ambassadors provides social support for some project center veterans but is not structured around formal student reflection or learning.

A re-entry seminar has been offered twice as an Undergraduate Independent Study (ISU) by Bland Addison, once with 15 students in 2015-16 (in term C16) and once with ~15 students in 2016-17 (in Term D17). The ISU was 1/6 unit, meeting once a week in the evenings for up to two-hours. The feedback from students was very positive, though not collected on student course reports, since it was an ISU. The ISU seminar emphasized personal reflections, especially on cross-cultural understanding and appreciation during the project experience, with additional reflections on civic engagement and social action, and on future plans that might include global activities. As a course, the proposed seminar will include similar opportunities for self-reflection on personal growth and the cultural dimensions of the project experience, but also attempt to focus student attention more intentionally on identifying and applying the personal and professional skills developed through the global project program.

INTL 3050 will be offered by faculty in the International and Global Studies program, in coordination with the extensive professional expertise available through the IGSD and the Career Development Center. These resources will enhance the ability of students to identify skills garnered during study away and to apply them in future opportunities. This broad-based coordination of campus expertise reflects the holistic nature of global learning.

The seminar is intended for any student who has returned from WPI's study-away programs, including Project Centers located inside or outside the United States. Study-away is not limited to international locations (study abroad), and this seminar is intentionally designed to include any student who has had an academic experience off-campus.

INTL 3050 will be offered for 1/6 unit, and meet once a week for 1 hour and 50 minutes. The enrollment is projected to be up to 35 students, but could be adjusted upwards as necessary. As a Category I course, the seminar would be offered at least once annually. With strong enrollment, the seminar eventually could be offered once in the fall and once in the spring, to provide re-entry opportunities for students who were away the previous semester or year.

Implementation Date: Implementation date is the 2017-2018 Academic year.

Resource Needs: This course has no special needs beyond existing classrooms, laboratories, library resources, or information technology. If WPI adopts an e-portfolio platform, this course would be ideally suited to take advantage of this capability, though this course is not contingent on e-portfolios. The course could be offered with Canvas or another instructional website.

Impact on Distribution Requirements and Other Courses: The IGSD supports this program. This course will be advantageous for students planning a minor in International and Global Studies.

Date: April 13, 2017
To: WPI Faculty
From: Committee on Academic Operations (Prof. Iannacchione, Chair)
Re: Motion to add HU 2900 *Humanities and Arts Project Preparation*

Motion: On behalf of the Department of Humanities and Arts, the Committee on Academic Operation recommends and I move that HU2900 Humanities and Arts Project Preparation as described below, be added.

Proposed Course/Catalog Description:
HU2900, *Humanities and Arts Project Center Preparation* Cat. I (1/6 unit)
This course is required of students accepted to off-campus Humanities and Arts centers and programs. The course introduces students to methods for site-specific research, project-design, and analysis related to humanities and arts study. It also develops HUA disciplinary skills appropriate both to the projects students have selected and to the culture of the project center where they will be working. Students learn to develop project objectives, milestones, and deliverables in their topic areas related to their forthcoming onsite work and expectations. Students make presentations, write an organized project proposal, and develop a deliverable design for reporting their project findings. This course is a pre-requisite for off-campus Humanities and Arts project center study only. This credit will not count toward the Humanities and Arts requirement. Recommended background: none.

Anticipated Instructor: V.J. Manzo, but this course could also be taught by Bland Addison, Svetlana Nikitina or other project center advisors

Rationale:
The purpose of this course is to provide a preparatory course for off-campus Humanities and Arts project centers through which students are introduced to the site-specific areas of study. The instructor will use the course to describe the types of research projects, deliverables, and expectations associated with humanities and arts study at off-campus project centers. Students who apply to complete HUA courses off-campus are required to register for a preparatory course prior to departure. This convention is similar to the requirement for students to register for ID2050 before participating in the off-campus IQP. At present and historically, this type of preparatory work for off-campus HUA project centers is and has been completed through individual student *ISPs*, and, as such, the creation of this course will standardized the registration process and procedures for all students pursuing off-campus participation at Humanities and Arts project centers. The creation of this course will allow HUA faculty to run individualized sections varying with instruction on culture, language, history, and so forth as appropriate to each specific HUA project center, which will be offered in the term prior to off-campus departure.

Students will not be permitted to choose a variable amount of credit for the course.

Implementation Date: Implementation date for this action is the 2017-2018 Academic year.

Resource Needs: No new resources are needed. The proposed course is already being taught as an ISP by several Humanities and Arts faculty including V.J. Manzo for the London HUA project center, Bland Addison for the Morocco HUA project center, Svetlana Nikitina for the Russia HUA project center among others. Courses may be held within the existing Humanities and Arts classroom space, and can be scheduled by the HUA office staff.

Impact on Distribution Requirements and Other Courses: The new course will have no impact on current distribution requirements.

Date: April 13, 2017
To: WPI Faculty
From: Committee on Academic Operations (Prof. Iannacchione, Chair)
Re: Motion to add *IMGD 2400: Writing Characters for Interactive Media & Games*

Motion: On behalf of the Interactive Media & Game Development Program, the Committee on Academic Operation recommends and I move that *IMGD 2400 Writing Characters for Interactive Media & Games*, as described below, be added.

Proposed Course Description:

IMGD 2400. Writing Characters for Interactive Media & Games **(**Cat II)
This writing-intensive course covers concepts and skills necessary to create compelling characters in games. Topics include the three dimensions of character, growth and development of player- and non-player characters, dialogue, character relationships, and techniques for evoking emotion.

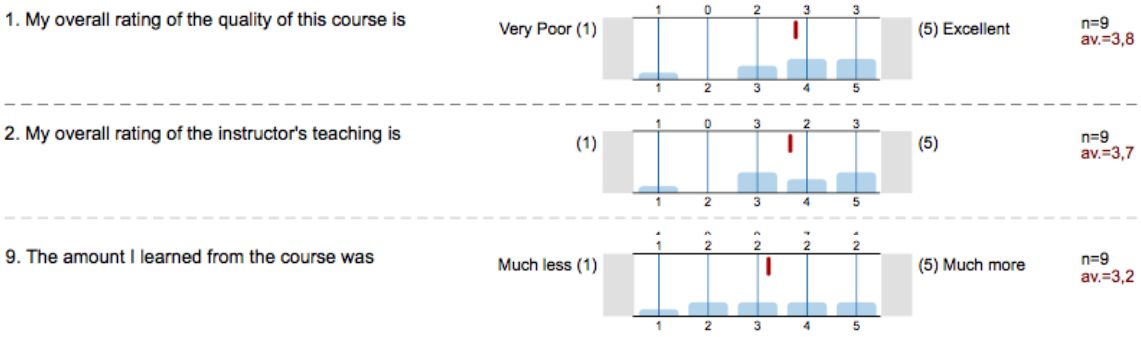
Recommended background: Previous investigation in the basic elements of interactive storytelling, such as that provided by IMGD 1002.

Anticipated Instructor(s): Prof. Lee Sheldon and other qualified instructors

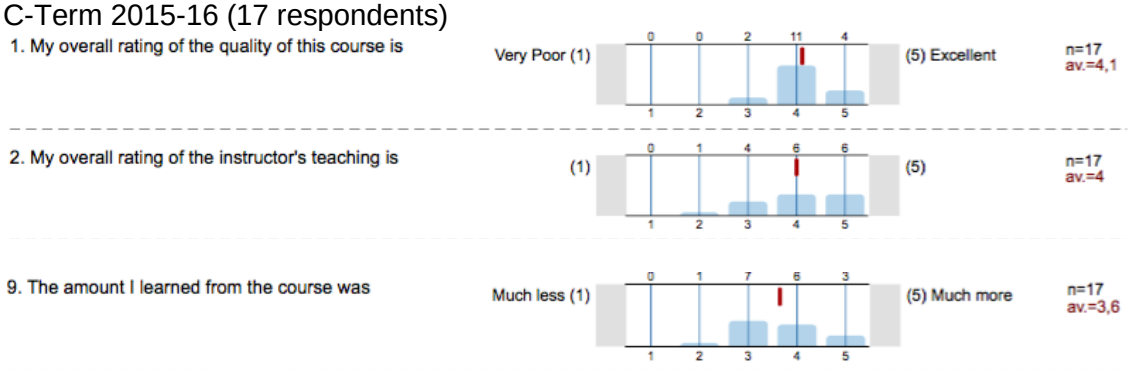
Rationale:
Like the various other disciplines necessary to game development being taught in academia, game writing is critically fundamental. These other disciplines (programming, art, audio, etc.) are already central to the IMGD curriculum. This course will elevate the craft of writing interactive characters to the same level of expertise necessary for students to succeed that the other disciplines currently enjoy.

Student course evaluations for IMGD 240X:

A-Term, 2016-17 (9 respondents)



C-Term 2015-16 (17 respondents)



The course met expectations in objectives and outcomes in both terms it has been offered. While homework time in AY15-16 was somewhat low, it doubled to 6-10 hours in AY16-17. In AY17-18 it is planned to increase writing assignments in both number (with additional iterations) and complexity (with increased interactivity) to bring the homework load firmly in line with Institute standards.

The AY15-16 C-term course was originally planned for 18 students. Late registrants raised the full enrollment to 25. It was necessary to turn away two students.

14 students were enrolled in the AY16-17 A-term course that was designed to complement the experimental B-term course, *Writing for Games II: Narrative,* in which A-term proposals for social issues games were, in collaboration with a Swedish game design class, expanded into concept documents (WPI) and analog prototypes (University of Skövde).

The C-term class' enrollment was high due to its being offered for the first time. The second time it was offered was only two terms later in A-term to accommodate students who were not able to enroll the first time. Plus, no freshmen took the class in their A-term due to the fact that the introductory level class, IMGD 1002, Storytelling in Interactive Media and Design is one of two required early courses. Given the enrollment in the first iteration of the class, it is expected enrollments will stabilize at closer to the higher number in the C-term course.

The evaluation scores declined due to the experiment conducted with the University of Skövde that required certain restrictions on the students, and resulted in some changes necessary as the class progressed to meet those restrictions. The first course reflected how the instructor had taught versions of the course in the past and can be considered the control in the experiment. With the addition of more homework assignments as noted above, future classes will follow the initial C-term class structure, not the second class in the following A-term.

Due to the intensive writing requirements, and the high amount of instructor and peer review in the course, its capacity has been set at 25 students.

Implementation Date: Implementation date for this action is the 2017-2018 academic year.

Resource Needs:

- Information on the instructor: IMGD Professor of Practice Lee Sheldon is a professional game writer/designer who has written the standard text on writing for games. This course is part of his normal teaching load.
- Classroom needs no additional technology or facilities beyond standard A/V equipment.
- Laboratory: N/A
- Library resources: N/A
- Information Technology: No software needs are necessary beyond Microsoft Office or software freely available online.

Impact on Distribution Requirements and Other Courses: IMGD is planning curricular revisions that will add an optional Writing Concentration to the recently approved IMGD (BA) major. This course will be an integral element of the amended curriculum. IMGD believes making this a Cat II course would allow us the flexibility to offer it every year, or every other year, depending upon how the Writing Concentration is finally developed.

This course will count towards the distribution requirement of 5/3 units of IMGD in either the current IMGD (BS) major or the new IMGD Technology (BS) major, or the 8/3 units of IMGD required in the new IMGD (BA) major. No additional faculty is required. There is no anticipated impact on other departments or programs.

Students cannot receive credits for both IMGD 240X and IMGD 2400.

Date April 13, 2017
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Troy, Chair)
Re: Motion to add ME5383/CE514 Continuum Mechanics

Motion:
On behalf of the Mechanical Engineering Department and the Civil and Environmental Engineering Department, the Committee on Graduate Studies and Research recommends, and I move that ME5383/CE 514 Continuum Mechanics, as described below, be added.

Proposed Course Description:

ME5383/CE514 Continuum Mechanics (2 credits)
This course covers the fundamentals of continuum mechanics at an introductory graduate level. Topics covered include: 1) Introduction: essential mathematics - scalars, vectors, tensors, and indicial notation; 2) Basics: three-dimensional states of stress, finite and infinitesimal measures strain, and principal axes; 3) Conservations laws: mass, linear momentum, angular momentum and energy; 4) Constitutive equations: ideal materials, Newtonian fluids, isotropy and anisotropy, elasticity and thermoelasticity, plasticity, and viscoelasticity; 5) Applications to classical problems and emerging topics in solid and fluid mechanics.

Recommended background: undergraduate knowledge of strength of materials, fluid mechanics, and linear algebra.

Anticipated Instructors
Prof. Rahbar, Prof. Richman, Prof. Liu (and others from ME).

Rationale:
This course provides the necessary unified view of both solid and fluid mechanics, and complements AE5380/ME5380 Fundamentals of Elasticity, AE5381/ME5381 Applied Elasticity, CE/ME5301 Applied Finite Element Analysis in Engineering, and CE524 Finite Element Method and Applications. Such a unified view is currently lacking in our (AE, ME, and CEE) graduate courses. Presented in this manner, the course is suitable for both first and second year graduate students.

Enrollment Data: Based on data from past AE5380/ME5380 and AE/ME5381 offerings, this course is expected to enroll about 40 students.

Resource Needs: Instructors have already been identified. There will be no need for additional resources as this course will replace either CE524 (Finite Element Method and Applications) or CE590 (Fracture Mechanics) that are currently offered by Prof. Rahbar in alternate years.

Impact on Distribution Requirements: The course forms a strong basis for mechanics and adds flexibility to graduate and advanced undergraduate students by increasing the number of available courses in mechanics, materials, and structures, and enriching our offerings.

Assessment: The course will be reviewed by the CEE and ME Graduate Committees as part of our regular course assessment process.

Implementation Date: Implementation date for this action is the 2017-2018 academic year.

Date: April 13, 2017
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Troy, Chair)
Re: Motion to remove cross-listing of four ME/MTE and one ME/MFE courses

Motion: On behalf of the Mechanical Engineering Department, the Committee on Graduate Studies & Research recommends and I move that the following 5 courses, currently cross-listed with the prefix "ME/MTE" or "ME/MFE" in the Graduate Catalog (pp. 148 – 151 of the 2016-17 Graduate Catalog) be removed from the "Mechanical Engineering" section in the Graduate Catalog (pp. 138 – 151 of the 2016-17 Graduate Catalog).

~~**ME 5326**~~ **/ MTE 526**	**Advanced Thermodynamics**
~~**ME 5332**~~ **/ MTE 532**	**X-Ray Diffraction and Crystallography**
~~**ME 5340**~~ **/ MTE 540**	**Analytical Methods in Materials Engineering**
~~**ME 5350**~~ **/ MTE 550**	**Phase Transformations in Materials**
~~**ME 542**~~ **/ MFE 510**	**Control and Monitoring of Manufacturing Processes**

Rationale:
The contents of the courses identified above primarily lie in the disciplines of Materials Science and Engineering (MTE) and/or Manufacturing Engineering (MFE), and do not lie within the core study areas of Mechanical Engineering (ME). The removal of cross-listing will help students to easily identify courses that are distinctly within the ME, MTE, and MFE disciplines. Furthermore, the removal of cross-listing will also help ease scheduling and administrative difficulties associated with courses with multiple sections.

This motion does not eliminate all graduate ME/MTE and ME/MFE cross-listed courses. The joint designation will continue to exist for the following 10 courses where the content is interdisciplinary between ME and MTE, or ME and MFE, as applicable.

ME 5311 / MTE 511	Structure and Properties of Engineering Materials
ME 5312 / MTE 512	Properties and Performance of Engineering Materials
ME 5356 / MTE 556	Smart Materials
ME 5358 / MTE 558	Plastics
ME 5361 / MTE 561	Mechanical Behavior and Fracture of Materials
ME 5370 / MTE 5841 / MFE 5841	Surface Metrology
ME 5420 / MFE 5420 / MTE 5420	Fundamentals of Axiomatic Design of Manufacturing Processes
ME 543 / MFE 520 / MTE 520	Axiomatic Design of Manufacturing Processes
ME 5431 / MFE 531	Computer Aided Manufacturing
ME 5441 / MFE 541	Design for Manufacturability

Implementation Date: The implementation date for this action is the 2017-18 Academic Year.

Date: April 13, 2017
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Troy, Chair)
Re: Motion to add CHE 565 Advanced Process Engineering

Motion: On behalf of the Chemical Engineering Department, the Committee on Graduate Studies and Research recommends, and I move that CHE 565 Advanced Process Engineering, as described below, be added.

Proposed Course Description:

CHE 565, Advanced Process Engineering (3 credits)

Advanced topics in process synthesis, optimization and process control are examined. Optimization topics include objective functions, multivariable optimization, constrained optimization, mixed integer linear programming and applications of optimization to process industries. Control topics include model predictive control, adaptive control, batch process control, and plant-wide control.

Recommended background: Undergraduate degree in Chemical Engineering.

Anticipated Instructor: A departmental committee (Professors Kimiotek, Dixon, Kazantzis, and Zurawsky) has been formed to craft the details of the course (week by week syllabus, etc). Two of the members of the committee (Kazantzis and Zurawsky) have been identified who can teach the course initially.

Rationale:
This course is essential to our proposed MS concentration in advanced process engineering and will provide foundation skills in process optimization and process control that are in demand in a variety of chemical-based industries. This course will be offered every year in the spring semester.

Implementation Date: 2017-18 academic year – first offering in spring 2018.

Resource Needs: None. We have adequate staff to offer this course each year.

Impact on Distribution Requirements and Other Courses: This course will be a required part of our MS CHE concentration in Advanced Process Engineering. It does not alter distribution requirements for other MS options.

Date: April 13, 2017
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Troy, Chair)
Re: Motion to add CHE 590 Graduate Qualifying Project in Chemical Engineering

Motion: On behalf of the Chemical Engineering Department, the Committee on Graduate Studies and Research recommends, and I move that CHE 590 Graduate Qualifying Project in Chemical Engineering, as described below, be added.

Proposed Course Description:

CHE 590 Graduate Qualifying Project in Chemical Engineering (3 or 6 credits)

These courses provide a capstone experience in applying chemical engineering skills to real-world problems. The Graduate Qualifying Project (GQP) is carried out with an industrial partner or sponsoring agency and with the approval and oversight of a faculty member in chemical engineering. A written report and a presentation to members of the department and industrial partners are required. (Pre-requisites: Completion of core requirements, at least one concentration course and consent of the program director.)

Recommended background: Undergraduate degree in Chemical Engineering, completion of the core requirements and at least one concentration course.

Anticipated Instructor: GQP's will be coordinated by Prof. W. Zurawsky, but various faculty members, depending on interests and expertise, will supervise projects. Any full-time faculty member in Chemical Engineering can supervise these projects. We anticipate GQP's to consist of teams of 3 students so that one or two faculty could supervise a dozen students.

Rationale:
The GQP provides a capstone experience that will be beneficial to students in our MS program and who are working in industry or who intend to pursue industrial employment. The GQP is an essential part of our proposed MS Professional Engineering option. We will begin offering these courses in Fall 2018 and they will be offered each semester (Fall and Spring).

Implementation Date: 2017-18 academic year, but first offering will be Fall 2018 since students admitted to the program will not be ready until the 2018-19 academic year.

Resource Needs: None

Impact on Distribution Requirements and Other Courses: For MS students in Chemical Engineering the GQP will replace the current option of taking up to six hours of Independent Study or two conventional courses for those students who do not elect to take Independent Study.

Date: April 13, 2017
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Troy, Chair)
Re: Motion to modify the Non-Thesis M.S. Degree Requirements in Chemical Engineering

Motion: On behalf of the Chemical Engineering Department, the Committee on Graduate Studies and Research recommends, and I move that the "Degree Requirements" section in the 2016-2017 Graduate Catalog (pp. 59) for the non-thesis M.S. degree in Chemical Engineering be modified as described below.

(Please note that the primary change is the addition of a new non-thesis MS degree option that includes a Graduate Qualifying Project as part of the requirements and a concentration; however, there is a clarification added to the existing non-thesis option.)

Current Description in Graduate Catalog:

Non-Thesis Option

A total of 30 credit hours is required, including a minimum of 24 credit hours in graduate level courses. At least 21 course credit hours must be in chemical engineering and 9 of these must be chosen from the core curriculum. A maximum of 6 credit hours of independent study under the faculty advisor may be part of the program.

Proposed Description (to Replace Current Description) in Graduate Catalog:

Non-Thesis Option

A total of 30 credit hours is required, including a minimum of 24 credit hours in graduate level courses. At least 21 course credit hours must be in chemical engineering and 9 of these must be chosen from the core curriculum. A maximum of 6 credit hours of independent study under the faculty advisor may be part of the program. *Any advanced undergraduate level courses must be approved by the departmental Graduate Committee.*

Professional Engineering Option with Concentration

A total of 30 credit hours is required. At least 24 course credit hours must be in chemical engineering including 6 credit hours of Graduate Qualifying Project (GQP), 9 credit hours chosen from the chemical engineering core curriculum, 9 credits of concentration courses, and 6 credits of chemical engineering electives. Students select a concentration in either Bioengineering or Advanced Process Engineering. Bioengineering prepares students for the biotech, pharma and medical device industries, while Advanced Process Engineering focuses on advanced topics in design, control and optimization that are applicable to a wide range of chemical processing. The credit distributions for the different concentrations are shown in Table 1.

The GQP provides a capstone experience in applying chemical engineering skills to real-world problems. GQP's are carried out in cooperation with an industrial partner and with the approval and oversight of a faculty member in Chemical Engineering.

Students must take one required three-credit concentration course plus 6 credits chosen from a list of approved concentration courses. Students in the Bioengineering concentration must take CHE 521: Biochemical Engineering, while students in the Advanced Process Engineering concentration must take CHE 565: Advanced Process Engineering. There is flexibility in other concentration course choices so that students can further tailor their studies to their interests and needs. Courses for each of the concentrations are listed in Table 2. Students can choose additional courses to fulfill their concentration requirement as new courses become available, as long as they receive approval, in advance, from the Professional Engineering Program Director.

Table 1. Professional Engineering Option Credit Distribution

Bioengineering Concentration	Credits	Advanced Process Engineering Concentration	Credits
3 Core Courses in CHE	9	3 Core Courses in CHE	9
2 Chemical Engineering Electives[1]	6	2 Chemical Engineering Electives[1]	6
Concentration:		Concentration:	
CHE 521: Biochemical Engineering	3	CHE 565: Advanced Process Engineering	3
2 Concentration Courses	6	2 Concentration Courses	6
CHE 590: GQP	6	CHE 590: GQP	6
Total	**30**	**Total**	**30**

[1]Students may choose to take one of these courses in the topic of innovation to gain additional experience in business and for preparation for the GQP, including ETR 500. Entrepreneurship and Innovation. Students should get approval from the Faculty Director for course substitution.

Table 2: Possible Concentration Courses

Bioengineering	
BCB 501. Bioinformatics	BME 523. Biomedical Instrumentation
BCB 502. Biovisualization	BME/ME 550. Tissue Engineering
BCB 503. Biological and Biomedical Database Mining	CH 538. Medicinal Chemistry
	CH 540. Regulation of Gene Expression
BCB 504. Statistical Methods in Genetics and Bioinformatics	MTE 555/ME 4860. Food Engineering
	BB 565. Virology
BB 505. Fermentation Biology	BB 575. Advanced Genetics and Cellular Biology
BB 509. Scale Up of Bioprocessing	BME 552 / ME 552. Tissue Mechanics
BB 560. Methods of Protein Purification and Downstream Processing	CE 562. Biosystems in Environmental Engineering
BB 562. Cell Cycle Regulation	

Advanced Process Engineering	
CHE 504. Mathematical Analysis in Chemical Engineering[2]	MTE 555/ME 4860. Food Engineering
	MTE 558. Plastics
CHE 506. Kinetics and Catalysis[2]	MTE 5844. Corrosion and Corrosion Control
CHE 507. Chemical Reactor Design[2]	ME 516. Heat Transfer
CHE 573. Separation Processes[2]	ME/AE 5220. Control of Linear Dynamical Systems
CHE 531. Fuel Cell Technology	ME/AE 5221. Control of Nonlinear Dynamical Systems
DS 501. Introduction to Data Science	
FP 521. Fire Dynamics I	SD 550. System Dynamics Foundation: Managing Complexity
FP 553. Fire Protection Systems	
FP 554. Advanced Fire Suppression	SD 553. Model Analysis and Evaluation Techniques
FP 555. Detection, Alarm and Smoke Control	SYS 501. Concepts of Systems Engineering
FP 573. Industrial Fire Protection	SYS 502. Business Practices
FP 575. Explosion Protection	SYS 510. Systems Architecture and Design
MFE 510/ME 542. Control and Monitoring of Manufacturing Processes	SYS 512. Requirements Engineering
	SYS 520. System Optimization
MFE 520/MTE 520/ME 543. Design and Analysis of Manufacturing Processes	SYS 521. Model-Based Systems Engineering
	SYS 540. Introduction to Systems Thinking
MFE/MTE/ME 5420. Fundamentals of Axiomatic Design of Manufacturing Processes	

[2]Can be used to satisfy concentration requirements if not taken as part of the core.

Rationale:

Many undergraduate students (including our own) want to work in specific industries, but do not have the training or credentials that enable them to work directly in such fields upon graduation. This proposed MS degree will provide students with targeted skills and training. Students typically gain minimal exposure to bioengineering in the chemical engineering undergraduate curriculum so this emphasis will enable students to compete for jobs in the biotech, pharma and medical devices industries, of which there is a local concentration in Massachusetts. The advanced process engineering concentration will focus on developing skills for process engineers (e.g., controls, optimization, and design) and will enable students to be competitive in a variety of chemical-based industries. Students will take several courses in their chosen concentration, and work with a company in the field to complete the GQP enabling them to get direct experience in their chosen career path. We will work closely with the Career Development Center (CDC) to help these students transition from the MS program to a successful industrial career.

This program is consistent with the "More in Four" component of the strategic plan – the focus of which is providing greater cost-effective opportunities to our students through co-ops, internships, and professional masters degrees (not necessarily in four years). Several of our students are currently getting these degrees in related fields at WPI, such as Fire Prevention Engineering (design) and/or Materials Engineering (materials processing/scale-up) in part because we do not offer such a program within the Chemical Engineering Department.

As the program is specifically intended to address industry needs, we anticipate that external funding from companies may be feasible and that a number of companies would be willing and interested in enrolling students in the program if courses were offered at convenient times (e.g., once per week, either early in the day or late in the day to provide minimal disruption) or available online. In turn, cultivating stronger ties to local industry through the proposed MS program will open new opportunities for beneficial corporate support of our existing BS and PhD programs – for example, by providing MQP support, fellowship support for PhD students, and other partnering opportunities in funded research projects.

Resources and Anticipated Instructors: This revision to our MS program requires only 1 new course in addition to the GQP course(s).

Capstone projects (the GQP) will be administered by individual faculty members (similar to MQPs or ISPs). Chemical Engineering faculty members have contacts at different companies, many of which work with us on MQP's, and we will initially reach out to such companies to establish these GQPs (see list below). We will also work with WPI alumni to establish relations with their current employers. Prof. Walter Zurawsky will serve as the Program Director of this new MS program and will assist in coordinating and assessing the GQPs. The proposed program as presented here can be launched with our current resources.

Potential companies for GQPs based on current WPI ChE faculty contacts			
Agrivida	Alkermes	Bristol-Myers Squibb	Cabot Corp.
Coolchips	Dow/DuPont	Flagship Ventures	Foster Miller
General Electric	Leidos	MassCEC	Nano-C
Sabic	Saint Gobain	Saudi Aramco	Sunovion
Eppendorf	Pfizer	Abvie	Rogers Corp

The new course, CHE 565 (Advanced Process Engineering), which is part of the Advanced Process Engineering concentration, will be taught by current faculty within the department.

Implementation Date: Implementation date for this action is the Fall semester of the 2017-2018 academic year. Current students will complete the requirements that were in place when they matriculated or they may elect to satisfy one of the new concentration requirements.

Date: April 13, 2017
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Troy, Chair)
Re: Motion to add OIE Supply Chain Consulting Project and OIE 599 Supply Chain Research

Motion: On behalf of the Foisie School of Business, Committee on Graduate Studies and Research recommends and I move that OIE Supply Chain Consulting Project and OIE 599 Supply Chain Research, as described below, be added.

Proposed Course descriptions:

OIE 597 (3 credits): Supply Chain Consulting Project
This course integrates Supply Chain Management theory and practice, and incorporates a number of skills and tools acquired in the Supply Chain Management curriculum. The objective of this course is twofold: (1) to enrich students' experiential learning and equip the students with additional skillsets and capabilities to tackle real-world problems; and (2) to enhance their teamwork, interpersonal and consulting skills. The media is a consulting project, to be sponsored by an external organization, and is completed in teams. In addition to a written report, the project will be formally presented to members of the School, outside sponsors and other interested parties. Prerequisites: OIE 500, OIE 544, OIE 553, MIS 576, MKT 561, and OBC 533 or equivalent content, or instructor consent.

OIE 599 (3 credits): Supply Chain Research
This research study is at the master's level. The course provides a research experience for students interested in studying a pressing supply chain management problem or challenge. Students must satisfactorily complete a written paper and are encouraged to publically present the results.

Rationale:
The two courses will be needed for the new graduate program in Supply Chain Management. OIE 597 (3 credits) will be a required course for the graduate degree and offers a project-based experience, and OIE 599 (3 credits) will be an elective. Suggested course descriptions are given below:

Resource Needs: Since OIE 597 – Supply Chain Consulting Project blends theory with practice; it will be taught by a team of two faculty members: one from industry or with significant practical experience (an adjunct professor), and the other from the OIE faculty group in the Foisie School of Business. For OIE 599 – Supply Chain Research, each study can be advised by either one OIE faculty member or co-advised by an OIE faculty member with any other full-time faculty member in the Foisie Business School.

Implementation Time: AY 2018-2019

Date: April 13, 2017
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Troy, Chair)
Re: Motion to establish an M.S. degree Program (including a B.S./M.S. option) in Supply Chain Management

Motion: On behalf of the Foisie School of Business, Committee on Graduate Studies and Research recommends and I move that an M.S. degree in Supply Chain Management (including a B.S./M.S. option) be established, as described below.

Description of the Proposed M.S. Degree Program in Supply Chain Management:

Program Goals and Degree Objectives:
Students will study proven theories, industry best practices, and new technologies in SCM. Upon graduation, students will be prepared to:

- design and manage an effective supply chain, and apply project management techniques
- improve the operational efficiencies of a supply chain and be able to interpret the implications of supply chain initiatives in terms of key financial performance metrics
- be able to apply supply chain analytics and conduct demand forecasting, aggregate planning, and sales and operations planning for a supply chain
- recognize and evaluate supply chain vulnerabilities and formulate approaches to mitigate supply chain risk
- assess fundamental dimensions of supply chain strategy, innovation, transformation, and organizational leadership
- evaluate and manage the sustainability of a supply chain
- work in teams, lead/manage projects, and communicate effectively in both oral presentation and writing

***Admission Requirements*:**
Applicants must follow the requirements set forth for all WPI graduate applicants: http://www.wpi.edu/admissions/graduate/appl-requirements.html. Specifically, a bachelor's degree in any discipline is required, along with either a GRE or GMAT examination score. The admission decision is made based on the overall profile of an applicant. While there is no specific undergraduate major required, we believe students that will most likely succeed in the program have had academic training and/or work experience in a STEM field, operations research/management, IT, economics, among others. Applicants for the Graduate Certificate Program will follow the same application procedure and requirements.

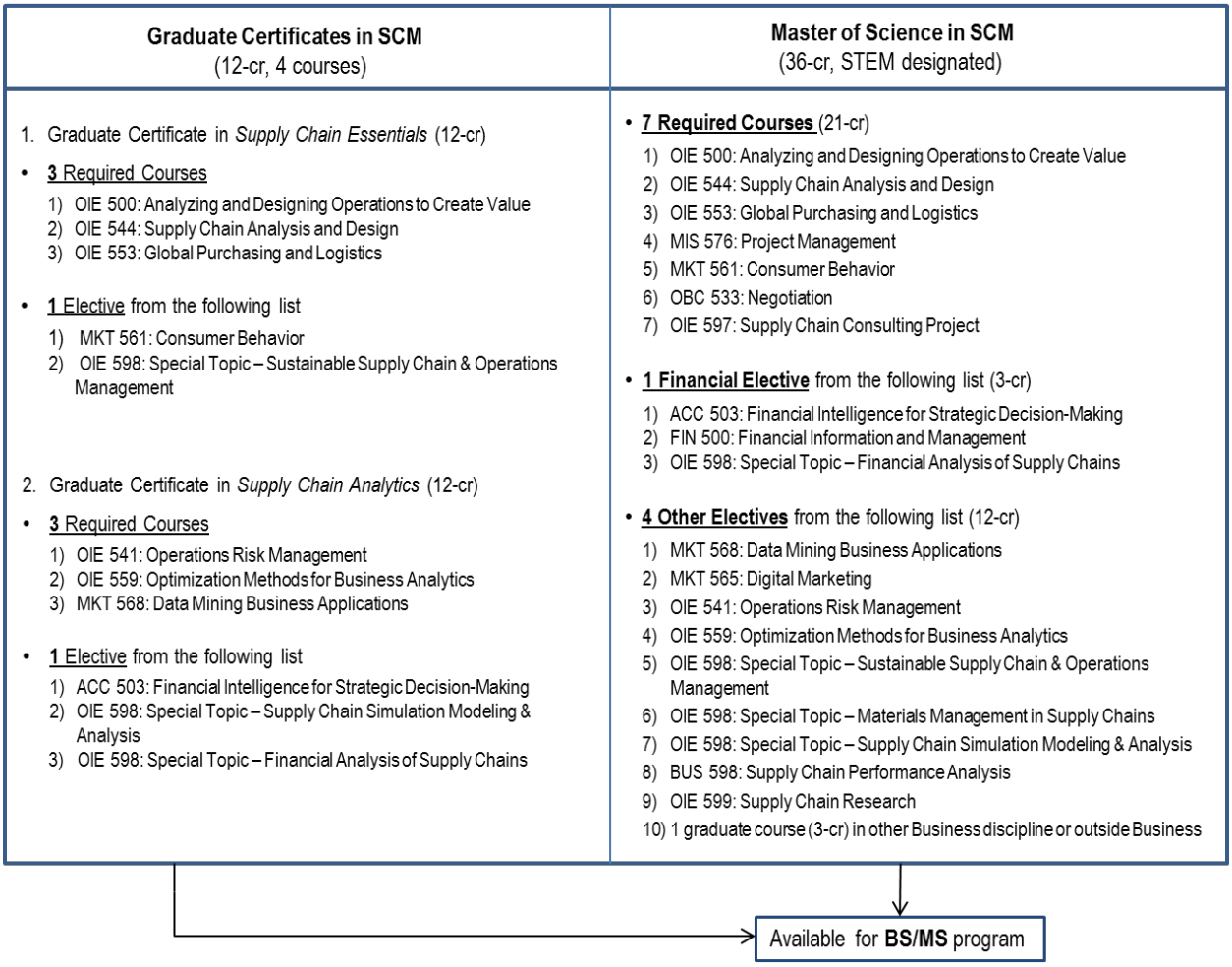
Requirements for the M.S. in Supply Chain Management:
The Master of Science in Supply Chain Management (MSSCM) is designed to provide a comprehensive yet flexible curriculum to students who are pursuing a Master's degree. The degree program is featured by action-based learning through a 3-credit hands-on supply chain consulting project (aka, Graduate Qualifying Project), which enables students to make immediate impact on the industry.

Students accepted into the program will be assigned an academic advisor. In consultation with the academic advisor, a student must prepare a Plan of Study outlining the selections that the student will make to satisfy the graduate degree requirements from among the options offered. This Plan of Study must then be approved by the SCM Program Director.

The overview of the curricula of the proposed graduate offerings in SCM is shown in the

diagram below. Detailed explanations of the curriculum for each offering are given in the subsequent sections.

Proposed Graduate Offerings in Supply Chain Management (SCM)



This degree program is grounded in proven theories, best business practices, and emerging innovations, and enables students to examine and design supply chain processes, evaluate process performance, manage information technology enabled logistics, and craft supply chain strategies. The total number of credits for this M.S. degree is 36, out of which a 3-credit supply chain consulting project (OIE 597) is also required to enrich students' experiential learning and to equip the students with additional skillsets and capabilities to tackle real-world problems and to enhance their teamwork and interpersonal skills. This degree will apply for STEM designation once it is approved, and the graduates from this program will be prepared to design and lead the future's most effective global supply chains. The curriculum of this 36-credit degree consists of the following three components:

Required Courses (7 courses; 21 credits)

(1) OIE 500: Analyzing and Designing Operations to Create Value
(2) OIE 544: Supply Chain Analysis and Design
(3) OIE 553: Global Purchasing and Logistics
(4) MIS 576: Project Management

(5) MKT 561: Consumer Behavior
(6) OBC 533: Negotiation
(7) OIE 597: Supply Chain Consulting Project (Graduate Qualifying Project)

Financial Elective (1 course; 3 credits) from the list below:
(1) ACC 503: Financial Intelligence for Strategic Decision-Making
(2) FIN 500: Financial Information and Management
(3) OIE 598: Special Topic – Financial Analysis of Supply Chains

Note that supply chain finance is an increasingly important component of SCM, and hence, students in this program are expected to acquire or strengthen their financial literacy and competency. This free elective is required for those who have NOT taken finance or accounting as an undergraduate or elsewhere or who cannot demonstrate sufficient financial experience.

Other Electives (4 courses; 12 credits) from the list below:
(1) MKT 568: Data Mining Business Applications
(2) MKT 565: Digital Marketing
(3) OIE 541: Operations Risk Management
(4) OIE 559: Optimization Methods for Business Analytics
(5) OIE 598: Special Topic – Sustainable Supply Chain & Operations Management
(6) OIE 598: Special Topic – Materials Management in Supply Chains
(7) OIE 598: Special Topic – Supply Chain Simulation Modeling and Analysis
(8) BUS 598: Special Topic – Supply Chain Performance Analysis
(9) OIE 599: Supply Chain Research
(10) 1 course in other Business discipline or outside Business

Note that (1) if a student meets the financial literacy requirement described in 4.2 and does not want to take more course in that area, a total of five electives (15 credits) from the above list must be taken; and (2) OIE 599 – Supply Chain Research is optional and is made available for those students that are interested in advanced research in the subject and/or plan to pursue a doctorate in the future. If a student chooses to pursue this option, he/she must conduct the project individually. This research project is expected to provide a research experience in studying a pressing supply chain management problem or challenge. The student and his/her project advisor can work together to identify a topic, and the final project topic and scope must be approved and overseen by a faculty member in the Foisie Business School. Students must satisfactorily complete a written paper and are encouraged to publically present the results.

Seeking Both Graduate Degrees in Supply Chain Management (SCM) and Operations Analytics and Management (OAM):
Students are allowed to pursue both M.S. in OAM and M.S. in SCM either sequentially or concurrently as long as **3/4** of the curricula are different (or up to 9 credits can be double counted), and must be accepted into both degree programs.

Requirements for the B.S./M.S. Degree:
Undergraduate students can pursue a BS/MS degree combining any undergraduate major with the Master of Science in SCM. Students enrolled in such a program must satisfy all the program requirements of their B.S. degree as well as all the requirements of the MSSCM program. The conversion rate between graduate credits and undergraduate units is stated in the Graduate Catalog (Page 22 of AY 2016-17).

In consultation with the academic advisor, students must prepare a Plan of Study outlining the

selections they will make to satisfy the B.S./M.S. degree requirements, including the courses that will double count. This Plan of Study must then be approved by the SCM Program Committee. Students must consult their advisors and the Graduate Catalog for making course selections.

***Program Delivery*:**
Students can pursue their certificate/degree option in SCM either on a part-time or full-time basis. The delivery format of each course in the SCM curriculum includes on-campus, online, or blended, and the delivery mode will be evaluated periodically to accommodate the evolving market needs.

Program Management:

SCM Program Committee: The Committee consists of the following four members:

- Professor Amy Zeng (Program Director)
- Professor Joseph Sarkis (Program Co-director)
- Professor Sara Saberi

Program Assessment and Accreditation: To ensure the long-term success of the program a regular and continuous assessment will be conducted of applicants, students, faculty and employers. This will include an end-of-year program review by the SCM Program Committee. The assessment will include, but not limited to: curriculum review, job placement, student feedback and employers' feedback. Additionally, since this new program is granted through the Foisie School of Business that is accredited by AACSB, regular assessments to meet the Assurance of Learning requirements after the first cohort comes on board will be conducted.

Advisory Board and Industrial Ties: An advisory board composed of leaders in the field will be created to provide invaluable input and ensure the marketability of the program over time. The SCM Program Committee will also work closely with WPI Corporate and Professional Education to augment our presence in this growing field including assessing industry needs, projects/internships, and potential employment opportunities for our students. Some of the companies where relationships already exist are UTC, MACOM, UPS, FedEx, Hitchiner, and others.

Rationale:
The Foisie Business School grounded in a technology-focused university has world-class expertise and educational resources in these areas, and thus is suitably poised to offer a graduate-level education to prepare interested parties for their career choices and leaderships in the field of supply chain management (SCM). The addition of this new degree program will not only provide needed response to market needs, but also solidify the Foisie School's enrollment, reputation, and impacts.

This new degree program is created in response to rapidly-growing market needs and focused student needs. Organizations in virtually every industry rely on intricate supply chains that globally manage goods and services demands. Synchronizing the flow of products, information, and funds is becoming increasingly complex with products that move across continents daily and deadlines that directly affect a company's profitability. This fast-paced industry requires professionals with strong and balanced quantitative, analytical, communication and project management skills. The Foisie Business School grounded in a technology-focused university has world-class expertise and educational resources in these areas, and thus is suitably poised to offer a graduate-level education to prepare students for their career choices and leaderships in the field of supply chain management (SCM).

Market Analysis: According to a survey by *SCM World*, 43% of supply chain executives believe it is more difficult to hire supply chain talent in 2014, compared with 37% in 2013 and 22% in 2011[1]. The nature of managing the entire lifecycle of a product, including how it is acquired, distributed, transported, allocated and delivered, means that there are many career options in SCM and the opportunities will continue to grow—50 percent of current supply chain professionals are expected to retire within the next decade. As organizations learn the competitive power of a well-run supply chain, they have discovered that they need a new kind of professional. The 21st century practitioner needs to grasp all the links in the chain. The Foisie School at WPI has been offering educational excellence through interdisciplinary and project-based learning for multiple decades. This new SCM program at WPI will differentiate itself from others by delivering an intensive analytical curriculum and embracing various experiential learning opportunities to develop students' interdisciplinary skills for linking major business processes, ranging from strategic planning, design, operations, logistics, and to the improvement of all activities involved in the procurement, manufacture, and delivery of goods and services.

Organizations in virtually every industry, including nonprofit and government sectors, use supply chains in their daily operations and as a way to gain competitiveness. This graduate degree program prepares students for a variety of upper-level SCM positions such as:

- director of supply chain operations
- senior supply chain management analyst
- performance improvement senior manager
- director of purchasing
- commodity manager
- supply chain technical analyst, or logistics management analyst

Competitive Programs: The number of graduate-level programs in SCM available in Massachusetts is sparse, and only the following three universities are found to offer some levels of training in SCM (certificate, coursework, and degree):

- Northeastern: http://www.northeastern.edu/graduate/programs/supply-chain-management/#certificate
- Northern Essex Community College: http://www.necc.mass.edu/academics/courses-programs/non-credit/bus-skills/supply-management/
- MIT 10-month M.S. Degree in SCM: http://scm.mit.edu/program/core_courses

An examination of the universities in New England that offer educational opportunities in SCM also shows that the availability is limited. Please refer to the complete list in the Appendix.

Resource Needs: A total of four experimental courses are used as electives for the SCM curriculum (Course descriptions are seen in Appendix 2); in particular, OIE 598: Special Topic – Sustainable Supply Chain & Operations Management has been offered once and will be offered again in AY2017-2018. Three other experimental courses, namely OIE 598: Special Topic – Materials Management in Supply Chains, OIE 598: Special Topic – Supply Chain Simulation Modeling & Analysis, and BUS 598: Special Topic – Supply Chain Performance Analysis, are currently offered at undergraduate level (OIE 3410, OIE 3460, and ACC 4200, respectively). It is anticipated that the instructors of these courses will be able to design and teach the graduate version when this new degree program is officially launched in AY 2018-2019. The 4th

[1] http://www.industryweek.com/supply-chain/battle-supply-chain-talent-starts-middle-school

experimental course, OIE 598: Special Topic – Financial Analysis of Supply Chains, was offered in the fall of 2016 through CPE.

Based on market analysis, we expect to attract 30 to 40 students per year to the program during the first couple of years of launch. During this initial development stage, Professors Amy Zeng, Joseph Sarkis and Sara Saberi will utilize some parts of their service time to support the program. The Foisie Business School will closely monitor the future service requirements of the program and adjust faculty commitment as needed. If the enrollment target is met at the end of the third year, new tenure-track faculty lines will be sought for the SCM and OIE faculty group.

Implementation Timeline:

- 2017 Spring: Program approval by WPI faculty
- AY 2017-18: Promoting the new degrees and accepting students into the program
- 2018 Fall: First cohort starting the program

Appendix 1: Supply Chain Management Education Opportunities in New England

No	State	University	Graduate Programs in Supply Chain
1	Connecticut	Central Connecticut State University	Graduate Certificate Supply Chain & Logistics
2	Connecticut	Quinnipiac University	MBA
3	Connecticut	University of Connecticut	Supply Chain Management course within EMBA
4	Massachusetts	Massachusetts Institute of Technology	Logistics and Supply Chains
5	Massachusetts	Northeastern University	Graduate Certificate In Supply Chain Management
6	Massachusetts	UMASS Lowell	Graduate Certificate Supply Chain and Operations Management
7	Massachusetts	Bentley University	Supply Chain and Service Operations Management
8	Massachusetts	Northern Essex Community College	Supply Chain Management
9	Massachusetts	UMASS Boston	Supply Chain Service Management
10	Massachusetts	Worcester Polytechnic Institute	Operation Analytics and Management
11	New Hampshire	Southern New Hampshire University	MBA
12	New Hampshire	Southern New Hampshire University	IMBA
13	New Hampshire	Southern New Hampshire University	Master
14	New Hampshire	Southern New Hampshire University	Graduate Certificate
15	Rhode Island	The University of Rhode Island	Master's and Ph.D.
16	Rhode Island	Johnson & Wales University	Certificate
17	Maine	Maine Maritime Academy	MS in Global Logistics & Maritime Management

Appendix 2: Possible Descriptions of the New Experimental Courses in SCM

OIE 598: Special Topic – Materials Management in Supply Chains

This course examines planning and controlling the material flow into, through and out of an organization. It explains fundamental relationships among the activities that occur in the supply chain from suppliers to customers. In particular, the course addresses the types of manufacturing systems, demand management and forecasting, master production scheduling, materials requirements planning, capacity management, inventory management, distribution resource planning, JIT and lean principles, and other current topics that are pertinent to managing the material flow of supply chains.

OIE 598: Special Topic – Supply Chain Simulation Modeling & Analysis

The course introduces students to the concepts of computer simulation, with an emphasis on the design of a simulation experiment and statistical interpretation of its results. It will explore simulation of queuing models, inventory and industrial dynamics, and gaming situations that are typical phenomena in supply chains. A commercial simulation language such as Arena will be used to execute simulation models and solve problems from the manufacturing and service supply chains.

OIE 598: Special Topic – Financial Analysis of Supply Chains

This course examines the impact that initial product design choices and their methods of manufacture have on the long-term cost of production. The course teaches how to identify cost drivers and understand inflation and changes in material costs that affect long-term production economics. Students will be able to describe the impact of late design changes on product costing; analyze how design and process alternatives affect cost based on product life volume versus unit cost; and perform break-even calculations that include tooling and investment in capital equipment and technology. A comprehensive course project will be used to give students an opportunity to learn how to document material selection criteria, process selection criteria, volume and methods tradeoffs analysis, the make or buy decision, the capital equipment investment decision, supply chain dynamics, vendor selection, and engineering economics.

BUS 598: Special Topic – Supply Chain Performance Analysis

Managing supply chains is recognized as a critical factor for success among many firms, and is a source of competitive advantage. This course will adopt a management accounting perspective to help managers plan, analyze, and manage the performance of their firm and their supply chain. Three types of topics will be presented: theoretical perspectives, such as transaction cost economics, agency, and goal setting theories; performance measurement, such as financial and non-financial performance measures of the firm and its suppliers; and performance management and challenges, such as strategic cost management, incentives, and total cost of ownership.

Date: April 13, 2017
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Troy, Chair)
Re: Motion to establish Graduate Certificate Programs in Supply Chain Essentials and Supply Chain Analytics

Motion: On behalf of the Foisie School of Business, Committee on Graduate Studies and Research recommends and I move that Graduate Certificate Programs in Supply Chain Essentials and in Supply Chain Analytics be established, as described below.

Description of the Proposed Certificate Programs:

Requirements for Graduate Certificates in SCM:

Two graduate certificate programs in SCM are available and each requires **four** courses (12 credits) as explained below:

Graduate Certificate in Supply Chain Essentials
This certificate provides a set of essential knowledge, principles, and basic tool sets for managing supply chains, and it is most suitable for people that want to synthesize their experiences and knowledge to have an elevated and focused expertise in supply chain management. The courses are also helpful for preparing anyone that plans to take APICS Certified Supply Chain Professional (CSCP) and APICS Certified Production and Inventory Management (CPIM).

Three Required Courses (9 credits)
(1) OIE 500: Analyzing and Designing Operations to Create Value
(2) OIE 544: Supply Chain Analysis and Design
(3) OIE 553: Global Purchasing and Logistics

One Elective (3 credits)
(1) MKT 561: Consumer Behavior
(2) OIE 598: Special Topic – Sustainable Supply Chain & Operations Management

Graduate Certificate in Supply Chain Analytics
This certificate provides a set of useful analytical tools for supply chain analysis and decision-making, which are necessary background and preparation for a position as supply chain analyst.

Three Required Courses (9 credits)
(1) OIE 541: Operations Risk Management
(2) OIE 559: Optimization Methods for Business Analytics
(3) MKT 568: Data Mining Business Applications

One Elective (3 credits)
(1) ACC 503: Financial Intelligence for Strategic Decision-Making
(2) OIE 598: Special Topic – Supply Chain Simulation Modeling and Analysis
(3) OIE 598: Special Topic – Financial Analysis of Supply Chain

Program Delivery:
Students can pursue their certificate/degree option in SCM either on a part-time or full-time basis. The delivery format of each course in the SCM curriculum includes on-campus, online, or blended, and the delivery mode will be evaluated periodically to accommodate the evolving market needs.

Rationale:

The Foisie Business School grounded in a technology-focused university has world-class expertise and educational resources in these areas, and thus is suitably poised to offer a graduate-level education to prepare interested parties for their career choices and leaderships in the field of supply chain management (SCM). The addition of this new degree program will not only provide needed response to market needs, but also solidify the Foisie School's enrollment, reputation, and impacts.

This new degree program is created in response to rapidly-growing market needs and focused student needs. Organizations in virtually every industry rely on intricate supply chains that globally manage goods and services demands. Synchronizing the flow of products, information, and funds is becoming increasingly complex with products that move across continents daily and deadlines that directly affect a company's profitability. This fast-paced industry requires professionals with strong and balanced quantitative, analytical, communication and project management skills. The Foisie Business School grounded in a technology-focused university has world-class expertise and educational resources in these areas, and thus is suitably poised to offer a graduate-level education to prepare students for their career choices and leaderships in the field of supply chain management (SCM).

Resource Needs: A total of four experimental courses are used as electives for the SCM curriculum (Course descriptions are seen in Appendix 2); in particular, OIE 598: Special Topic – Sustainable Supply Chain & Operations Management has been offered once and will be offered again in AY2017-2018. Three other experimental courses, namely OIE 598: Special Topic – Materials Management in Supply Chains, OIE 598: Special Topic – Supply Chain Simulation Modeling & Analysis, and BUS 598: Special Topic – Supply Chain Performance Analysis, are currently offered at undergraduate level (OIE 3410, OIE 3460, and ACC 4200, respectively). It is anticipated that the instructors of these courses will be able to design and teach the graduate version when this new degree program is officially launched in AY 2018-2019. The 4th experimental course, OIE 598: Special Topic – Financial Analysis of Supply Chains, was offered in the fall of 2016 through CPE.

Implementation Timeline:

- 2017 Spring: Programs approval by WPI faculty
- AY 2017-18: Promoting the new certificates and accepting students into the program
- 2018 Fall: First studets starting the program

Date: February 13, 2017
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. K. Troy, Chair)
Re: Motion to add AE 5090 Graduate Aerospace Engineering Colloquium

Motion: On behalf of the Aerospace Engineering Program, the Committee on Graduate Studies and Research recommends and I move that the following new seven-week zero-credit graduate course AE 5090 Graduate Aerospace Engineering Colloquium be established, as described below.

Proposed Course Description:

AE 5090. Graduate Aerospace Engineering Colloquium (0 credits)
This pass/fail graduation requirement is intended for graduate students. The Colloquium is offered by an aerospace engineering faculty member once a week, during A, B, C, and D term. Full-time graduate students are required to register every term, attend seminars on technical or broader professional topics, and make presentations on ongoing or previously completed research related to their thesis, dissertation, independent research or industrial experiences.
Recommended Background: graduate students in aerospace engineering.

Anticipated Instructors: A faculty member from the AE Program will be the instructor of record for this Colloquium during A, B, C and D terms.

Rationale:
The AE5090 Graduate Aerospace Engineering Colloquium will replace the existing AE 5091 Graduate Seminar. The AE 5090 Graduate Aerospace Engineering Colloquium becomes a weekly event and adds the requirement for a presentation by the graduate students. The coverage is also expanded to include seminars on broader professional topics. The requirements for passing are also clarified with this new course description.

Resources: An instructor from the AE Program already supervises the existing AE 5091 Seminar as part of the instructor's teaching load. No additional resources are required as this will be part of the nominal load of the instructor of record.

Implementation Timeline: Implementation date for this action is the 2017-2018 Academic year.

Date: February 13, 2017
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. K. Troy, Chair)
Re: Motion to drop AE 5091 Graduate Seminar

Motion: On behalf of the Aerospace Engineering Program, the Committee on Graduate Studies and Research recommends and I move that AE 5091 Graduate Seminar be dropped.

Description of Course to be dropped (pp. 34 of the AY 2016-17 Graduate Catalog):

AE 5901. Graduate Seminar (0 credits)
Seminars on current issues related to various areas of aerospace engineering are presented by authorities in their fields. All full-time aerospace engineering students are required to register and attend.

Rationale: The addition of the term-based colloquium course AE 5090. Aerospace Engineering Graduate Colloquium makes AE5091 redundant.

Resources and Anticipated Instructors: None.

Implementation Timeline: Implementation date for this action is the 2017-2018 Academic year.

Date: February 13, 2017
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. K. Troy, Chair)
Re: Motion to modify requirements for the M.S. and Ph.D. degrees in Aerospace Engineering

Motion: On behalf of the Aerospace Engineering Program, the Committee on Graduate Studies and Research recommends and I move that the requirements for the M.S. and Ph.D. degrees in Aerospace Engineering be modified as described below..

Description of Proposed Degree Requirement Modifications: (Additions in *italics*, deletions in ~~strikethrough~~.)

M.S. Degree (pp. 28 of the AY 2016-17 Graduate Catalog):

In the thesis option, the distribution of credits is as follows:

- 6 graduate credits, with 2 credits in each of the three AE Core Areas of Study
- 12 graduate credits of thesis research (AE 5099)
- 8 graduate credits of free electives in or outside AE
- 4 graduate credits in applied mathematics (ME 5000, ME 5001, or any other course with the approval of the AE Graduate Committee)

In the non-thesis option, the distribution of credits is as follows:

- 18 graduate credits in AE courses, with a minimum of 2 credits in each of the three AE Core Areas of Study (includes a maximum of 8 credits of directed research – AE 5098)
- 8 graduate credits of free electives in or outside AE
- 4 graduate credits in applied mathematics (ME 5000, ME 5001, or any other course with the approval of the AE Graduate Committee)

In either option, all full-time students are required to register for the zero-credit ~~graduate seminar (AE 5091)~~ *Graduate Aerospace Engineering Colloquium (AE 5090)* ~~every term and must attend a minimum of one seminar per term in order to receive a Pass~~.

Ph.D. Degree (pp. 29 of the AY 2016-17 Graduate Catalog):

In either case, the result of the dissertation research must be a completed doctoral dissertation. Only after admission to Candidacy may a student receive credit toward Dissertation Research under AE 6099. Prior to admission to Candidacy, a student may receive up to 18 credits of pre-dissertation research under AE 6098. All full-time students are required to register for the zero-credit ~~Graduate Seminar (AE 5091)~~ *Graduate Aerospace Engineering Colloquium (AE 5090)* ~~every term and must attend a minimum of one seminar per term in order to receive a Pass~~.

Rationale:
The changes reflect the replacement of the AE 5091 by the new AE 5090 course.

Resources and Anticipated Instructors: None.

Implementation: Implementation date for this action is the 2017-2018 Academic year.