

WORCESTER POLYTECHNIC INSTITUTE

February 2, 2023

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

The fifth Faculty meeting of the 2022-2023 academic year will be held on **Thursday, February 2, 2023 at 3:15pm in OH 107 and by Zoom at: <https://wpi.zoom.us/j/92919270530>** . Refreshments will be available in OH 107 at 3:00pm.

1. Call to Order M. Richman
 - Approval of the agenda
 - Approval of the consent agenda including minutes of the Dec. 19, 2022 meeting
2. Opening Announcements
3. Committee Reports:
 - Committee on Governance (COG) - for information and open discussion
 - **Second Annual Report on WPI Faculty Populations and Clarification of Faculty Categories** L. Albano
 - **Overview of Reorganization of and Revisions to the Faculty Handbook** M. Richman
4. Committee Business:
 - Committee on Financial and Administrative Policy (FAP) D. Spanagel
 - Moton to Endorse a Faculty Resolution: S. Strauss
 - Divesting, Investing, and Transforming for Carbon Neutrality:**
 - Accountability in Energy Systems, Climate Action, and Sustainability at WPI**
5. New Business
6. President's Report W. Soboyejo
7. Provost's Report A. Heinricher
8. Closing Announcements
9. Adjournment

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WORCESTER POLYTECHNIC INSTITUTE
Faculty Meeting Minutes
December 19, 2022

Summary:

1. Call to Order; Approval of the Agenda, the Minutes of Nov.10, and the Consent Agenda
2. Opening Announcements
3. Memorial Resolution in honor of Prof. Tom Gannon (ECE)
4. Committee Business: CAO, CGSR, CITP
5. Special Reports
6. New Business
7. President's Report
8. Provost's Report
9. Closing Announcements
10. Adjournment

Detail:

1. Call to Order

The fourth Faculty Meeting of the 2022-2023 academic year was called to order at 10:00am in Olin Hall 107 by **Prof. Richman** (AE). Prof. Richman reminded all those in attendance that the meeting was being recorded for the purpose of taking accurate minutes, only. The meeting agenda, the minutes of the November 10th meeting, and the consent agenda (with 19 CAO motions) were approved as distributed. Prof. Richman thanked all the faculty members involved in the work that it takes to bring the consent agenda motions to the faculty.

2. Opening Announcements

Prof. Richman also thanked all those who volunteered to bring in home baked goods for this meeting. He explained, however, that after soliciting volunteers, he was made aware of the following "WPI Potluck Policy" (<https://wpistg.prod.acquia-sites.com/sites/default/files/docs/Events/Potluck%20Policy.pdf>):

Potluck Events: A Potluck style event is any event where personally-made food from different people and places are brought to a common buffet area; served; and consumed by all.

These types of events are prohibited in any WPI room, space, or grounds.

Nevertheless, he expressed his gratitude to the following people who would have provided their homemade snacks: Prof. Boudreau (HUA), Prof. Demetry (MME), Provost Heinricher, Ms. Rock (Fac. Gov.), Prof. Servatius (MA), Prof. Skorinko (SSPS), Prof. Smith (IMGD), Prof. Stroe (PH), and Prof. Troy (BME).

3. Memorial Resolution

Prof. Brown (ECE) read a memorial resolution in honor of Prof. Tom Gannon (ECE):

We, the Faculty of Worcester Polytechnic Institute, note with profound sorrow and a great sense of loss the passing of our friend and colleague Tom Gannon, Full Teaching Professor in Electrical and Computer Engineering and in Systems Engineering, who died on November 6, 2022.

Tom held a Ph.D. in Electrical Engineering and Computer Science from Stevens Institute of Technology, as well as an M.S. from Purdue University and a B.S. from the Illinois Institute of Technology, both in Electrical Engineering. A world-renowned expert in Systems Engineering and Systems Thinking, he had over 50 years of experience in enterprise systems engineering, real-time control systems and information management systems.

Tom came to WPI as an Adjunct Teaching Professor in 1983 while serving as the Director of Information Systems Engineering and Chief Engineer for the Technology and Innovation Directorate of the Command and Control Center at the MITRE Corporation, where he was responsible for the Directorate's technology strategy, investment plans, and science and technology program. He had previously served as Director of the Corporate Technology Transfer Office at MITRE and held senior engineering management positions at Digital Equipment Corporation (DEC) and Bell Laboratories. While at DEC, he also served as Chairman of the Technology Policy Committee of CSPP - responsible for the development of public policy positions on technical issues affecting the global competitiveness of the U.S. computer industry.

Tom also served on the Technical Advisory Boards and Board of Directors of the Microelectronics and Computer Consortium, the Microelectronics Center of North Carolina, Semiconductor Manufacturing Technology, and the Semiconductor Research Corporation. He was a member of the National Academy of Science Committee on International Trends in Computer Science and Technology.

In collaboration with Jamie Monat, Tom coauthored the book entitled *Using Systems Thinking to Solve Real-World Problems*, and a paper entitled, "What Is Systems Thinking? A Review of Selected Literature Plus Recommendations," which - having been viewed more than 50,000 times – was one of his greatest sources of pride. In addition to his published work, he delivered lectures, hosted discussion panels, and led symposia and podcasts in Systems Engineering and Systems Thinking.

As an instructor, Tom was known for the clarity of his explanations, his investment in his students' learning, the relevancy of his course material, and his mastery of asynchronous teaching. He saw the founding of the new Systems Engineering program at WPI, and joyfully contributed to the success of our students and alumni.

Tom's impact on the world was also personal. He touched those who interacted with him by taking the time to learn about them in the moment. Ever courteous, considerate, and principled, he always stood up for his beliefs, whether he was dealing with students or university presidents.

Therefore, let it be resolved that we, the Faculty of Worcester Polytechnic Institute, express our admiration of and eternal gratitude to Tom Gannon, whose love for teaching, respect for others, and unfailing good humor serve as models for us all. Let it also be resolved that this resolution be inscribed in the permanent records of this faculty as a memorial to our beloved colleague, and that a copy be delivered to his family.

The resolution **passed** and a moment of silence was observed.

4. Committee Business

Committee on Academic Operations (CAO):

Prof. Elgert (DIGS) reported that the undergraduate student candidates listed in the meeting materials have either completed all the requirements for the degree designated in the department or program indicated or are expected to complete their degree requirements before December 30, 2022. They therefore are or will be eligible to receive that degree, and on behalf of CAO she moved that - pending final verification by the registrar - they be approved for December 30, 2022 graduation. **Prof. Richman** added that he'd sent out updated graduation lists this earlier this morning.

Prof. Medich (PH) requested that Kyle Marquez be removed from the list.

The motion **passed** pending the one change requested.

Committee on Graduate Studies and Research (CGSR):

Prof. Medich (PH) reported that the graduate student candidates listed in the meeting materials have either completed all the requirements for the degree designated in the department or program indicated or are expected to complete their degree requirements before December 30, 2022. They therefore are or will be eligible to receive that degree, and on behalf of CGSR he moved that - pending final verification by the registrar - they be approved for December 30, 2022, graduation.

Prof. Wyglinski (ECE) requested that Yael Rogoszinski be removed from the list.

The motion **passed** pending the one change requested.

Prof. Richman thanked all those in the Registrar's Office for all the work they do in preparing the graduation lists.

Committee on Information Technology Policy (CITP):

Prof. Smith (CS), on behalf of the Committee on Information Technology Policy (CITP), presented (for discussion only) a revised draft of the Security Camera Policy, the full text of which was included in the meeting materials. Prof. Smith thanked Prof. Cowlagi (AE) for his work on the policy last year before she offered a brief history of the policy and its revisions. The Information Security Risk and Compliance Committee (ISRCC), now disbanded, was a subcommittee internal to Information Technology. Without oversight from CITP, the ISRCC enacted several information security, risk, and compliance policies, including the Security Camera Policy. That original Security Camera Policy, still in effect, was also included in the meeting materials. Prof. Smith reiterated that this

current policy was never reviewed or approved by CITP before it was enacted, though it was discussed at the December 2021 faculty meeting on privacy concerns. Between spring of 2021 and the beginning of this year, CITP reviewed this policy and identified some major concerns that are addressed in the current draft revision.

Prof. Smith described CITP's remaining major concerns in the original policy: 1) the definition of "public and private areas" and where cameras are allowed to be placed; 2) what kind of notification is given to the community about security cameras on campus; 3) ambiguity in the policy regarding real-time monitoring; 4) ambiguity about the nature of, access to, and retention of security camera data; and 5) the impact of surveillance on the wellbeing and privacy of the WPI community. The goals of this policy are to establish internal standards and procedures governing the use of security cameras and data collected from them; to clarify community understanding of security camera presence on campus; and to protect academic freedom and freedom of expression and minimize damage from surveillance to individuals' freedom, security, and privacy. Prof. Smith welcomed feedback, promising to bring it back to the committee to be resolved.

The policy defines security cameras as video cameras and supporting infrastructure that are used "specifically and solely for security purposes." It specifies that security cameras record only video, not audio, with two named exceptions for cameras that already exist on campus (the WPI Police interview room and the WPI Mailroom doorbell camera). This policy also identifies several cameras on campus that are explicitly *not* security cameras and therefore not subject to this policy. These include cameras for classroom lecture capture (which are governed by the policy on Learning Management Systems and Video Lecture Support), video conferencing, recording of athletic events for post-game review, recording of human/animal subjects for research, cameras installed solely to ensure safe laboratory practices, and portable cameras used during law enforcement operations.

The policy positively defines *where* cameras are allowed to be used. Cameras are allowed only in "public areas"; they are explicitly prohibited from any "academic areas" and "private areas." The full list of private areas to be added to this policy is also included in the materials. In general, "public areas" are referred to as places that are used by the public, which can include lobbies of buildings. "Private areas" are anywhere where an individual person has a reasonable expectation of privacy (inside a bathroom, a shower area, a dorm room; at the SDCC or any site where people access medical, physical, and mental therapy). The policy defines an "academic area" as areas such as classrooms, study rooms, labs, library, study and research areas, or conference rooms that are used specifically for academic purposes. Although such academic locations offer no expectation of privacy for personal activities, security cameras are not to be placed there in the interest of academic freedom and freedom of expression.

The policy specifically protects privacy in several ways. It expressly forbids real-time monitoring through security cameras except when needed by the WPI Police to comply with law enforcement orders. At such times, the police would notify the community that the cameras are conducting real-time monitoring. Another exception is for special events such as commencement, when many cameras flip to real-time monitoring. The draft policy now requires notification to the community when security cameras are activated. This policy does not allow placebo cameras; therefore, if you see a camera, it is recording. The policy guarantees that there will be no use of facial recognition technology by WPI at any time (although WPI has no control over the use of any footage given to external law enforcement). Additionally, the policy specifies that security cameras can be used only for purposes of campus safety and calls for disciplinary action for anyone caught video monitoring an individual without probable cause and it specifies that security camera recordings can be used only for campus safety; they cannot be used to monitor employee performance or workplace attendance. The policy includes an oversight and compliance section that separates responsibility between the Chief of Police (who maintains records related to camera and footage use) and IT (which maintains records related to camera and security configuration). Storage of camera footage is now subject to the Policy on Records Retention and Destruction, a policy enacted by ISRCC that was also not approved by CITP but is currently under revision and review. The Chief of Police and IT collaborate to review use of security cameras (with no particular time scale set).

Prof. Ryder (BBT) asked if audio could be useful for campus safety and whether the WPI Police have reviewed this policy. Prof. Smith stated that the police have reviewed it but the subject of audio considered important

enough to safety that it would override concerns about privacy has not been discussed. **Prof. Smith** offered to bring this question back to CITP.

Prof. Gericke (UGS) asked whether the policy allowed WPI to flip cameras to real-time monitoring in a threatening situation. **Prof. Smith** explained that this scenario is included in the exception for compliance with law enforcement orders, where there is no notification to the community. She said she would get clarification about whether this compliance included law enforcement orders originating with WPI Police.

Dean Jackson (FBS) described a break-in and theft in a lab of the Business School involving expensive technology. With no video surveillance, there have been no leads. She urged implementing a policy that is respectful and mindful of the rights of everyone, but she pointed out that she can't afford to lose thousands of dollars of equipment from such thefts.

Prof. Cowlagi (AE) was very satisfied with many of the changes that are being proposed - in particular, the distinction between private and academic areas. Along with the Learning Management System Policy passed last year, he is confident that this revised policy provides strong privacy controls. He pointed out an ambiguity in the "Security Camera Monitoring and Review" section 4.C.1., which specifies the two exceptions to the prohibition on real-time monitoring: special events and compliance with law enforcement. But section 4.C.2. indicates that WPI Police may review live feeds "as needed." Prof. Cowlagi suggested that this might constitute a third exception. He also pointed out that a link in Section 4 is not working. [That link was repaired at the time these minutes were written.] Finally, his major concern is that the oversight provided in the policy is not *independent* oversight because the entities that provide oversight (WPI Police, IT, and University Counsel) are themselves responsible for implementation of security cameras. He suggested that CITP could also play an important role in reviewing metadata provided by IT and Campus Police, and he would like to see independent oversight included in the policy to safeguard against abuse.

Prof. Sanbonmatsu (HUA) asked if this policy could also include a privacy advocate. He recalled a discussion within CITP some time ago to that effect. **Prof. Smith** noted that CITP's Annual Report two years ago recommended a privacy advocate at WPI. That idea did not arise in discussion about this policy, but several policies currently under review raise similar concerns about surveillance, privacy, and protected information. Prof. Smith will resume this discussion in CITP, suggesting that CITP could consider unifying compliance and oversight across policies instead of trying to do this for each one.

Dean McNeill (ECE) asked about classifying spaces, such as theaters, as academic spaces at certain times but as public spaces at others. **Prof. Smith** explained that when the space is used as a classroom it is an academic space, but it is a public space during public performances. Such determinations could perhaps be made at the time of a request for the video data. Dean MacNeill asked about the classification of lecture hall spaces used for student meetings, and he also asked if a faculty member could have a non-recording camera that allows them to see who is knocking at their door. Prof. Smith will add these issues to be resolved. She also noted that they will look at the operations of the cameras to see if it is technically possible to program them to run only during class times.

Prof. Boudreau (HUA) was confused about a reference to requests for data from cameras in classrooms when it was her understanding that cameras wouldn't be running in academic spaces. **Prof. Smith** just wasn't sure about whether it was technically to turn cameras on and off in a scheduled manner. Prof. Boudreau pointed out that if it were not possible to do so and the cameras were left on, then the policy would have to point out that the cameras are running even in academic spaces.

Prof. Eckelman (HUA) pointed out that the recording of a performance in progress is an infringement on their rights agreement when producing a published play, so the it will be necessary to find a way to for the policy and the rights agreement to be consistent.

Prof. Wyglinski (ECE) asked about the use of cameras in research on artificial reality and virtual reality. **Prof. Smith** explained that this case would fall under video recording of human subjects during research. So it would not be considered usage of a security camera, and it would be allowed but governed by another policy.

Prof. Heilman (CBC) asked about how the policy deals with security cameras that capture some combination of public, academic, and private spaces simultaneously. **Prof. Smith** thought that this might be a question of how a

camera is angled and requesting that it be repositioned, which is covered in very general terms under Section 5 of the policy. However, stronger specific language might be needed.

Prof. Wyglinski (ECE) wanted to verify that none of the security cameras on campus captured audio data. **Prof. Smith** pointed out that the only cameras capturing audio were the two in the WPI Campus Police interview room, and the Mailroom doorbell camera in the Campus Center. All other cameras record video only.

5. Special Reports

Graduate Worker Union: WPI-GWU and You:

Jake Scarponi (MME), **Peter VanNostrand** (DS), and **Abhinav Gandhi** (RBE), presenting on behalf of the newly certified Graduate Worker Union, thanked the faculty for their support of the union and the opportunity to speak here today. **Jake Scarponi** (MME) explained that they anticipate that improved conditions won through union contracts will represent a compromise between the graduate workers and administration and will be beneficial to the rest of the campus community as well. The union election had very broad support from graduate workers. (See **Addendum #2** on file with these minutes.)

Peter VanNostrand (DS) briefly summarized efforts to organize, which began in August of 2020 when COVID significantly drove up their costs (without concomitant financial support from WPI, as other universities were providing). With graduate students earning well below the living wage for Worcester, they began talking about how to advocate for that living wage. Consultations in November 2020 with the United Auto Workers helped them understand the law, review their health insurance policy, and learn their rights as graduate students. In March of 2021, some graduate students refused to pay a new \$195 COVID testing fee and began discussions with administration about the many burdens on graduate students. In response, the WPI administration waived this fee for graduate students. Last April, students began gathering signatures for Union Authorization Cards, reaching 65 percent of the graduate student population within three weeks. In September 2022 they filed with the National Labor Relations Board. A vote on unionization was held in November 2022. Of the 535 graduate students, 379 voted and the measure passed; the students are now represented by the United Auto Workers. In late November, the students elected their first bargaining committee.

Abhinav Gandhi (RBE) described the union's next steps. In preparation for discussions with the administration over contracts, union leaders will need to determine worker priorities. Contract negotiations will begin next week between union representatives, the bargaining committee, and the administration - followed eventually by a union vote on the proposed contract. Mr. Gandhi asked the faculty to encourage student workers they know to stay informed and participate in this process, and to urge administration to address their key concerns.

Prof. Troy (BME) asked for some of the main findings about student priorities. **Jake Scarponi** indicated that the results of the surveys are confidential, but overall, they are asking for affordable comprehensive healthcare, a living wage, and protections against harassment and discrimination.

Prof. Richman thanked the presenters and noted their contact information: wpi.gwu@gmail.com.

Special Report on Divesting, Investing, and Transforming for Carbon Neutrality: Accountability in Energy Systems, Climate Action, and Sustainability at WPI:

Prof. Strauss (DIGS) provided background on the current draft resolution, including the history of efforts to encourage WPI Trustees to divest from fossil fuels. (See **Addendum #3** on file with these minutes.)

Recently, the student group DivestWPI issued a WPI Student Government Divestment Resolution. The current proposal is an effort to support that resolution. A draft resolution for divestment was included in the May 2022 faculty meeting materials with feedback solicited throughout the summer. Since then, a WPI group working on this resolution has expanded its scope beyond divestment. Prof. Strauss asked for feedback on the current draft resolution and indicated her intention to bring a revision to the next faculty meeting for further discussion and a vote.

Prof. Strauss then shared the revised resolution, pointing out that it calls on WPI not only to divest from fossil fuels, but also to develop a Culture of Sustainability that includes environmentally and ethically responsible

investments, energy efficient processes, reduced consumption and waste, and education and research connected with responsible stewardship, all unified in a Center for Sustainability at WPI. The resolution calls for a plan and effective tracking of progress toward goals to achieve transparency, visibility, and accountability, to unify the many efforts toward sustainability already underway at WPI, and to pursue new ways of becoming a model sustainable campus.

Prof. Wobbe (DIGS) asked if the resolution includes a commitment to an education about sustainability. **Prof. Strauss** indicated that the culture of sustainability does include educational components implicitly. Prof. Wobbe urged that this assumption be made explicit; Prof. Strauss invited Prof. Wobbe to send her appropriate wording that could be added to the resolution.

Prof. Mathisen (CEAE) added that the Second Nature Carbon Commitment importantly requires development of climate action plan that includes education.

Prof. Cowlagi (AE) asked whether the considerable carbon footprint of student and faculty travel to project centers has been considered during this process. **Prof. Strauss** noted that student groups are thinking about how to offset carbon emissions, and that in order to meet the goals of this resolution, WPI would have to find ways to offset emissions from travel.

Prof. Sanbonmatsu (HUA) raised his concern about food policy and our exploitation of other animals, particularly in the context of climate change. The resolution's proposed investment in alternative fuel vehicles and LED lighting will have less environmental impact than moving to a plant-based agriculture system. He asked that the resolution include something about plant-based diets. **Prof. Strauss** noted that the new item 10 addresses food waste, though she acknowledged that it doesn't address consumption of animals and animal products.

Prof. Smith (IMGD) asked if wording could be added about the climate impact of our own research.

Prof. Jayachandran (AE) asked about the roadmap to electrification: before deciding to convert a heating or transportation system to electricity, for example, will analysis be done to determine whether the proposed energy source will be an improvement or make things worse? **Prof. Strauss** replied that systems dynamics are important. She suggested that the new Sustainability Center would connect faculty and student research to those decisions.

Prof. Alatalo (BME) asked if students would take part in engineering these solutions. **Prof. Strauss** repeated that the Center for Sustainability is designed to incorporate faculty and student research into our campus processes.

Prof. Yagoobi (MME) pointed out that, among the number of current activities on campus to minimize carbon footprint through energy reduction, his [NSF-funded CARD research center](#) is helping other energy-intensive industries to be more efficient. In order for industry to be carbon neutral by 2050, electric lines will have to be green.

Prof. Chery (IMGD) urged a focus on equity, or consideration of the impact of material and energy sources on the people who are doing this work. He also asked that WPI consider the values of all companies with whom we do business.

Prof. Strauss (DIGS) reminded faculty members to send her suggestions and especially recommended wording for revisions.

6. New Business

There was no new business.

7. President's Report

President Soboyejo, referring to Prof. Strauss' presentation, suggested that it reflected on how WPI is repositioning itself in a decades-long process that will be critical to the survival of the planet. President Soboyejo sees that on these issues there is a convergence of thought between the faculty and the administration concerning a 2035 goal of carbon neutrality, ESG investments, and divestment. In his view, it is possible to move toward these goals in ways that are both profitable and beneficial to our academic programs.

President Soboyejo was also pleased by the presentation on behalf of the WPI Graduate Worker Union. We should see our graduate students as professionals with families who require wage and health insurance that support sustainable lives. The administration is committed to the wellbeing of our students and embraces the process of interaction with the GWU that will ensure the wellbeing of all sides. For all of us on campus, this includes planning for sustainable salaries during periods of high inflation. We are doing the analysis now to balance inflation rates with salaries and other expenses over the next three to five years. President Soboyejo indicated that in the next few months there would be open discussions about ensuring a sustainable future for WPI. As part of such a future, WPI is establishing a Center for Sustainability that will provide a forum for discussions and opportunities for teaching, research, funding, and philanthropy.

President Soboyejo also indicated that WPI was undertaking a Global STEM initiative with input to be sought from the community early next year.

President Soboyejo thanked the community for the support he has received as interim President, he thanked the faculty for the flexibility it has provided to our students, and he wished everyone a happy holiday season.

8. Provost's Report

Provost Heinricher thanked everyone for all their work this year. He told the story of a student who told his parents that in his first semester at WPI he'd never worked so hard, he wasn't able to sleep, he was struggling, and it was the most fun he had ever had.

Provost Heinricher thanked Prof. Yagoobi for his ten-and-a-half years of service as the MME Department Head.

Provost Heinricher pointed out that we are very good at combining teaching and research, but that we need to continue conversations about why we do what we do and what we can do better, especially because we are in a time of leadership transition. He also suggested that while it is our responsibility educate the newest members of our community, he pointed out that we can always learn from them as well.

Provost Heinricher questioned his decision to recuse himself from a recent COG discussion, and he committed himself to having good conversations with faculty and administration in the coming year.

9. Closing Announcements

Prof. Richman announced that based on preliminary discussions and other feedback, the spring 2023 faculty meeting schedule may shift in order to hold at least one more meeting such as today's - when there are no teaching conflicts and fewer other obstacles to attending. He thanked everyone in advance for being flexible with the scheduling.

10. Adjournment

Meeting was adjourned at 11:57am by **Prof. Richman**.

Respectfully submitted,

Mark Richman
Secretary of the Faculty

Addenda on file with these minutes:

Addendum #1 - CITP Motion to Modify Security Camera Policy - Minutes Dec 19, 2022

Addendum #2 - WPI Grad Worker Union Presentation - Minutes Dec 19, 2022

Addendum #3 - Divestment and Sustainability Draft Resolution - Minutes Dec 19, 2022

Date: February 2, 2023

To: WPI Faculty

From: Committee on Financial and Administrative Policy (Prof. Spanagel, Chair)

Re: Motion to endorse a Resolution calling for Carbon Neutrality and Accountability in Climate Action and Sustainability at WPI

Motion: The Committee on Financial and Administrative Policy recommends, and I move that the following Resolution concerning “Divesting, Investing, and Transforming for Carbon Neutrality: Accountability in Energy Systems, Climate Action, and Sustainability at Worcester Polytechnic Institute” be endorsed by the WPI faculty.

Resolution:

See attached document for the full text of the Resolution.

RESOLUTION

Divesting, Investing, and Transforming for Carbon Neutrality: Accountability in Energy Systems, Climate Action, and Sustainability at Worcester Polytechnic Institute

*Endorsed by:
the Committee on Financial and Administrative Policy
and the Faculty of Worcester Polytechnic Institute*

February 2, 2023

Whereas anthropogenic climate change [requires our immediate action](#) to reverse our impacts on the planetary community, human and non; and the Intergovernmental Panel on Climate Change (IPCC) has [demonstrated](#) that we must reduce the burning of fossil fuels, which constitutes the majority of global greenhouse gas emissions, in order to reach net zero by 2050 and thus lessen the consequences of this fossil fuel dependency on the well-being and prosperity of current and future generations. Climate change intensifies the environmental and health challenges that we already face, including biodiversity loss, challenges to the [global food, water, and energy systems as well as drivers of mass migrations of human communities seeking refuge](#)—all substantial threats to the world’s economic and political stability;

Whereas many universities and institutions have [in recent years passed resolutions](#) in favor of divesting their endowments from fossil fuels investments because of their contributions to climate change and its consequent impacts on the well-being of students, staff, alumni, and faculty; we support and stand in solidarity with the [WPI Student Government’s divestment resolution of April, 2022](#), which includes a comprehensive explanation of the history and actions of universities and other institutions in relation to fossil fuel divestment;

Whereas Worcester Polytechnic Institute emphasizes student well-being as a major pillar of its most recent strategic plan, [Lead with Purpose](#), while describing climate change as a major challenge to the planet. [Student mental health is tremendously impacted by climate change](#), and climate action is a critical response, in addition to mental health resources. Student choices about which university to attend are likewise [made in the context of where climate change and their futures are both taken seriously](#). And, at this point, many of our peer institutions have already achieved [carbon neutrality](#). Worcester Polytechnic Institute can address all of these challenges by directly engaging in climate action to support a sustainable world;

Whereas Worcester Polytechnic Institute, a university known for its ability to “think globally, act locally,” recognizes the importance of considering the implications of its own local actions within a global context and climate crisis. A great deal of student and faculty [research](#), as well as [coursework](#) and [student projects](#) at Worcester Polytechnic Institute are dedicated to sustainability, and the university has initiated much relevant work through the Office of Sustainability; we must ensure that our theory and practice are aligned across the institution and that the needed financial and staffing support exists to implement our Sustainability Plan, along with sustainable renovation and new construction, and other new initiatives for energy and climate action;

Whereas Worcester Polytechnic Institute has already demonstrated a strong resolve to evaluate its financial practices by signing onto in September 2021 the [Principles for Responsible Investing \(PRI\)](#), a United Nations-supported framework and reporting tool for responsibly managing investments, by ceasing our direct investments in fossil fuel assets and agreeing to abide by PRI’s [six principles](#), which include environmental, social, and governance issues in investment analysis and decision making. We have also committed to reducing our carbon footprint in ways that can be tracked, by signing onto the [Second Nature Carbon Commitment](#) in April of 2022, as well as having participated in the Association for the Advancement of Sustainability in Higher Education’s [STARS tracking system](#). We now need to track and

coordinate all of these commitments, and to create actionable plans and timetables for moving to the next level of both the PRI and the Second Nature Climate Commitment;

Whereas divesting is both a commitment and a process, developing a divestment plan and timeline will take some time. With respect to the value of making that promise and creating a specific timeline to implement a cleaner investment strategy, the Principles for Responsible Investing [discuss that divestment](#) “communicate[s] to the wider market that the investor believes the targeted company’s long-term strategy is likely to remain misaligned with relevant sustainability performance thresholds.” Fossil fuel companies contribute significantly to the climate crisis and are contraindicated with an ecologically sustainable economy. While Worcester Polytechnic Institute has not been directly investing in fossil fuel companies, we must continue the process of reducing our investments in fossil fuel production and, as complex and diversified investments that indirectly support fossil fuel sunset, ensure that we are reinvesting in companies that support a sustainable energy transition and economy, recognizing that the investment and corporate landscape is in many cases shifting its focus as well, such that these decisions will require careful review as the decades unfold. We note that this does not require the elimination of fossil fuel use on campus, for research or other important purposes, but rather the thoughtful reduction in use of fossil fuels and their byproducts for purposes that do not have reasonable replacements.

Whereas the employees of Worcester Polytechnic Institute currently have minimal ability to select responsible fossil-free investments for their retirement, since the [TIAA-CREF ESG SocialChoice fund maintains significant fossil investments](#). The [Fidelity Parnassus fund](#), however, does not, so there is a single option. We, as educators, taxpayers, and citizens of the world, whose communities are already feeling the impacts of climate change, and whose future is in jeopardy, have both a responsibility and a right to demand that our university institution is no longer complicit in the harms of fossil fuel companies; and that the university creates opportunities for employees to personally divest their retirement funds from fossil fuels. We have seen the damages wrought by climate change and we hope to give employees the opportunity to take individual action to combat these impacts with our retirement funds;

Whereas the demands of climate action highlight our commitment to “walk the walk”—just as our strategic plan, [Lead with Purpose](#), dictates. According to WPI’s recent [NECHE Institutional Self-Study](#), “WPI’s lowest rated [learning] outcome by faculty and students is ethical development”; WPI’s role as an institute of higher education is to cultivate the minds and talents of the next generation of humanity. Specifically, Worcester Polytechnic Institute’s vision is to improve society through the advancement of science and technology. Worcester Polytechnic Institute must take our current Strategic Plan seriously and remember that we can only better society through the application of STEM for the greater good. In [Lead with Purpose](#), “[w]e recognize that cultural competence, ethical reasoning, and historical understanding must align with technical capabilities to develop empathetic, collaborative, and creative STEM professionals”; we state further, “[a]s global citizens, we respect our natural environment and acknowledge the responsibility we all have to develop and disseminate sustainable stewardship practices for our planet.” We cannot be (or train) successful engineers, scientists, researchers, or professionals if our innovations ultimately cause more harm than good. Nowhere is this more apparent than with climate change. Industrial revolutions significantly advanced our society, while creating the largest threat to our species we have ever seen;

Whereas, we have at Worcester Polytechnic Institute committed to the creation of a new Institute for Research in Sustainable Systems (IRiSS) that will directly advance multiple objectives under the current [campus Sustainability Plan](#), including increasing Worcester Polytechnic Institute’s investment in sustainability research; promotion of cross-disciplinary approaches and systems approaches; addressing the Sustainable Development Goals (SDGs); and working to solve significant global issues by engaging research, projects, and coursework. We now call on the administration, faculty, staff, students, and wider alumni and community networks to work together to “walk the walk” by advancing a WPI campus “Culture of Sustainability” that includes carbon neutrality goals and ethical actions, allowing us to be a model for others as we reach out to meet community needs beyond Worcester Polytechnic Institute.

Whereas given the institutional power we wield, the clear and pressing need to make the transition to cleaner, more sustainable energy systems, a circular economy, and a society more resilient to the unparalleled havoc that the climate crisis promises to deliver; **now, therefore, be it**

Resolved, that the Worcester Polytechnic Institute Faculty:

1. *Hereby acknowledges the severity of climate change, and further, the need for swift action to prevent the earth's average temperatures from warming more than 1.5 °C to ensure a habitable future;*
2. *Advocates that Worcester Polytechnic Institute, having already ceased new direct investment in fossil fuels, further commits to sunsetting existing fossil investments, via a public declaration made in FY2023;*
3. *Calls on the leadership of Worcester Polytechnic Institute to create a divestment plan in FY2024, with full divestment of endowment funds from the fossil fuel industry by FY2030 or as the existing investments that include support of fossil fuels sunset (accountability table to be provided for tracking this process);*
4. *Calls on the leadership of Worcester Polytechnic to ensure by the end of FY2023 that more responsible retirement investment options that attend to ESG goals (and specifically excluding fossil fuel investments) are made available to faculty and staff as part of their retirement benefits plans;*
5. *Calls on the Division of Finance & Operations to develop a plan by FY2024 for pursuing the highest possible ratings under the Principles for Responsible Investment, with annual communications on the fulfillment of the plan and current ratings to the Student Government Association and the Green Team;*
6. *Calls on the Division of Finance & Operations to develop a plan by FY2024 for meeting the requirements of the Second Nature Carbon Commitment, and then moving on to meeting the more extensive goals of the Second Nature Climate Commitment, with annual communications on the fulfillment of the plan and current ratings to the Student Government Association and the Green Team;*
7. *Strongly supports the replacement of our police, facilities, and grounds vehicles and machinery with hybrid, electric, or fuel cell vehicles or tools as their useful lives expire, and with attention to new technologies and options as they arise, with a goal of 2030;*
8. *Requests that the stated efforts to aggressively pursue energy efficient and transformative strategies for central utility improvements and renewable energy technologies, in new and existing buildings, including collaboration with WPI's faculty, staff, and students to reduce energy-related emissions with strategies (including, but not limited to, LED lighting upgrades, HVAC optimization, heating and cooling system improvements, addition of geothermal, and on- and off-campus solar, microgrids, and ongoing research on emerging fusion and other technologies), are publicly tracked so that the WPI community can see continuing progress on these actions.*
9. *Strongly supports and actively engages with WPI Administration, Staff, and Students to develop the Institute for Research in Sustainable Systems and to dedicate ongoing funds and human resources that will be required for such research and outreach, as well as to promote the attendant ethics required for a campus "Culture of Sustainability" that includes attention to principles of a circular economy as a priority element for our institutional mission, in support of stated values in the current WPI strategic plan.*
10. *Strongly supports a broader level of campus-wide attention to solid waste management through participation in the [SWEEP standard](#) or similar approach, along with attention to sustainable renovation and new construction (for example green roofs) on campus as a community-engaged action, with faculty, staff, and student expertise brought to bear.*
11. *Strongly supports the use of locally-produced foods for campus consumption, as well as the development of food forests and gardens on campus and in the greater Worcester area, to both minimize our carbon footprint and increase the ability of our local environments to store carbon. Combining a local food economy with such additional practices as "meatless Mondays," attention to food waste and single-use utensils/packaging, and more vegetarian alternatives can help the WPI community reduce greenhouse gas contributions.*
12. *Requests that by FY2024, WPI commits to a plan for achieving carbon neutrality status on campus by 2035 and commits to pursuing new strategies to reach this goal as they emerge in the coming decades.*

Appendix to the Resolution:

Definition of Fossil Fuel Divestment:

While there is no universally accepted definition for what it means to be divested from fossil fuels, in alignment with guidelines outlined by 350.org, we believe that a fossil fuel free portfolio includes but is not limited to:

- No investments (direct or indirect) in any of the [top 200 fossil fuel companies](#) by size of reserves.
- No investments (direct or indirect) in any company that explores for, extracts, processes, refines, or transmits coal, oil, and gas.
- No investments (direct or indirect) in any utilities whose primary business function is to burn fossil fuels to produce electricity.

For more information regarding carbon risk and fossil fuel divestment, explore [this comprehensive list of resources](#) compiled by the Intentional Endowments Network and [this guide to Fossil-Free Investing](#) by Trillium Asset Management.

For inquiries, reach out to gr-divestWPI@wpi.edu

This Resolution was primarily authored by Professor Sarah Strauss, with input from the Faculty at Worcester Polytechnic Institute, including elements drawn from DivestWPI and the Student Government Association at Worcester Polytechnic Institute.

This Resolution was developed in support of and with inspiration from the WPI Student Governance Resolution passed in April, 2022, which was itself inspired by [Ivy League Universities Resolution for Fossil Fuel Divestment](#) written by the [Student Sustainability Association at Penn](#) and the [University of Pennsylvania Undergraduate Assembly](#), and passed by the student body presidents of the universities that make up the Ivy League universities. Their Resolution was also inspired by [Big 10 Schools Divestment Resolution](#)

Appendix
Consent Agenda Motions

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to remove EN 2221: American Drama

Motion: On behalf of the Humanities & Arts Department, the Committee on Academic Operation recommends and I move that EN 2221: American Drama be removed.

Course Description to be Removed:

EN 2221: American Drama *Cat I (1/3 units)*

An investigation into the development of American drama from its beginnings to the present. The history of the emergence of the legitimate theatre in this country will be followed by reading important plays, including the works of O’Neill, Williams, Mamet, Norman, Henley, and others. Discussion of the growth of regional theatres and their importance to the continuation of theatre as a serious and non-profit art form will be included in the course. The student will investigate the importance of theatre practice in the evolution of the dramatic literature of the country.

Rationale:

HUA Theatre is redesigning its dramatic literature curriculum to better reflect the increasingly global and intersectional nature of theatre studies, and to allow for greater flexibility in future course offerings.

Impact on Distribution Requirements and Other Courses:

The deletion of this course sequence (EN 2221, EN 3222, & EN 3223) will have minimal or no impact on most students—including HUA Theatre majors & minors. The HUA Theatre discipline will continue offering approximately the same number of courses per year, including in dramatic literature & performance studies.

(Note: Although it has an EN prefix, this course is taught exclusively by Theatre faculty. The EN prefix is left over from before there was a TH designation. English has been notified of these changes.)

What term is this course typically offered and is it Cat. I or Cat. II?

Cat. I – Typically offered in B-Term.

If there is a course to replace this, which one?

The current dramatic literature course sequence (EN 2221, EN 3222, & EN 3223) will be replaced by TH 3200: Special Topics in Dramatic Literature and TH 3300: Special Topics in Performance Studies. (For more details about this restructuring, please review the proposal for these new courses.)

Note if there are any changes to resource requirements.

(no resource impact)

Implementation: 2023-24 Academic Year

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to remove EN 3222: Forms in World Drama

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that EN 3222: Forms in World Drama be removed.

Course Description to be Removed:

EN 3222: Forms in World Drama. *Cat. II (1/3 units)*

The study of the major forms of world drama beginning with the Greeks and ending with contemporary works for the stage. Study will focus upon building skills to effectively analyze form and structure through dramatic content, and to create approaches to staging the plays from an informed understanding of the elements of theatrical style. The course will include plays by preeminent playwrights from cultures around the world. Texts to be studied will vary at each offering. This course will be offered in 2021-22, and in alternating years thereafter.

Changes to catalog: (no catalog changes beyond removing this course wherever it is listed)

Rationale:

HUA Theatre is redesigning its dramatic literature curriculum to better reflect the increasingly global and intersectional nature of theatre studies, and to allow for greater flexibility in future course offerings.

Impact on Distribution Requirements and Other Courses: The deletion of this course sequence (EN 2221, EN 3222, & EN 3223) will have minimal or no impact on most students—including HUA Theatre majors & minors. The HUA Theatre discipline will continue offering approximately the same number of courses per year, including in dramatic literature and performance studies.

(Note: Although it has an EN prefix, this course is taught exclusively by Theatre faculty. The EN prefix is left over from before there was a TH designation. English has been notified of these changes.)

What term is this course typically offered and is it Cat. I or Cat. II?

Cat. II – Typically offered in D-Term.

If there is a course to replace this, which one?

The current dramatic literature course sequence (EN 2221, EN 3222, & EN 3223) will be replaced by TH3200: Special Topics in Dramatic Literature and TH3300: Special Topics in Performance Studies. (For more details about this restructuring, please review the proposal for these new courses.)

Note if there are any changes to resource requirements. (no resource impact)

Implementation: 2023-24 Academic Year

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to remove EN 3223: Forms in Modern Drama

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that EN 3223: Forms in Modern Drama be removed.

Course Description to be Removed:

EN 3223: Forms in Modern Drama. *Cat. II (1/3 unit)*

The study of the forms in modern drama through application of methods of theatre analysis for dramaturgical consideration and staging. Contemporary playwrights studied will include those from around the world whose work has been seen on international stages since the 1950s. Attention to theatre movements that reflect contemporary issues will be included, and producing groups that have operated with textual revision, minimal text, or no texts will be considered. Texts to be studied will vary at each offering. This course will be offered in 2022-23, and in alternating years thereafter.

Changes to catalog:

(no catalog changes beyond removing this course wherever it's listed)

Rationale:

HUA Theatre is redesigning its dramatic literature curriculum to better reflect the increasingly global and intersectional nature of theatre studies, and to allow for greater flexibility in future course offerings.

Impact on Distribution Requirements and Other Courses: The deletion of this course sequence (EN 2221, EN 3222, and EN 3223) will have minimal or no impact on most students—including HUA Theatre majors and minors. The HUA Theatre discipline will continue offering approximately the same number of courses per year, including in dramatic literature and performance studies.

(Note: Although it has an EN prefix, this course is taught exclusively by Theatre faculty. The EN prefix is left over from before there was a TH designation. English has been notified of these changes.)

What term is this course typically offered and is it Cat. I or Cat. II?

Cat. II – Typically offered in D-Term.

If there is a course to replace this, which one?

The current dramatic literature course sequence (EN 2221, EN 3222, and EN 3223) will be replaced by TH 3200: Special Topics in Dramatic Literature and TH 3300: Special Topics in Performance Studies. (For more details about this restructuring, please review the proposal for these new courses.)

Note if there are any changes to resource requirements. (no resource impact)

Implementation: 2023-24 Academic Year

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to remove TH 1225: Theatre Production Practicum

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that TH 1225: Theatre Production Practicum be removed.

Course Description to be Removed:

TH 1225: Theatre Production Practicum (1/6 units)

Credit would be given on the condition that the performance takes place in a WPI performance directed or advised by a part- or full-time WPI instructor. Note: A maximum of four 1/6 units, or a total of two 1/3 units, may be applied toward the five courses, or five one-third units, taken prior to the final Humanities and Arts practicum.

Note changes to catalog:

(no catalog changes beyond removing this course wherever it's listed)

Rationale:

After much examination and evolution, HUA Theatre is restructuring how it gives credit for theatrical production work. The new proposed system is simpler (two courses instead of ten), clearer (with more explicit course titles and descriptions), and more rigorous (delineating between club-sponsored and department-sponsored experiences).

Impact on Distribution Requirements and Other Courses: This course deletion will not alter the process by which theatrical production work is credited, and thus will have no impact on most students—including HUA Theatre minors. It will impact HUA Theatre majors by requiring them to engage in faculty-led classroom and production work (in addition to any student-led club productions they choose to participate in, which still count toward the HUA major). It will have a similar but smaller impact on students completing their HUA Requirement in Theatre, who will be required to engage in a faculty-led class or production for at least 1/3 of their “depth.”

What term is this course typically offered and is it Cat. I or Cat. II?

Cat. I - Offered in all terms during which theatrical productions are taking place.

If there is a course to replace this, which one?

The current course sequence (TH 1225, TH 2225, TH 2227, TH 2229, TH 3225, TH 3227, TH 3229, TH 4225, TH 4227, & TH 4229) will be replaced by TH 1800: Club Theatre Production and TH 2800: Departmental Theatre Production. (For more details about this restructuring, please review the proposals for these new courses.)

Note if there are any changes to resource requirements.

(no resource impact)

Implementation: 2023-24 Academic Year

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to remove TH 2225: Acting

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move, that TH 2225: Acting be removed.

Course Description to be Removed:

TH 2225: Acting. *Cat. I (1/6 units)*

Credit would be given on the condition that the performance takes place in a WPI performance directed or advised by a part- or full-time WPI instructor. Note: A maximum of four 1/6 units, or a total of two 1/3 units, may be applied toward the five courses, or five one-third units, taken prior to the final Humanities and Arts practicum. Units: 1/6

Note changes to catalog:

(no catalog changes beyond removing this course wherever it's listed)

Rationale:

After much examination and evolution, HUA Theatre is restructuring how it gives credit for theatrical production work. The new proposed system is simpler (two courses instead of ten), clearer (with more explicit course titles & descriptions), and more rigorous (delineating between club-sponsored & department- sponsored experiences).

Impact on Distribution Requirements and Other Courses: This course deletion will not alter the process by which theatrical production work is credited, and thus will have no impact on most students—including HUA Theatre minors. It will impact HUA Theatre majors by requiring them to engage in faculty-led classroom & production work (in addition to any student-led club productions they choose to participate in, which still count toward the HUA major). It will have a similar but smaller impact on students completing their HUA Requirement in Theatre, who will be required to engage in a faculty-led class or production for at least 1/3 of their “depth.”

What term is this course typically offered and is it Cat. I or Cat. II?

Cat. I - Offered in all terms during which theatrical productions are taking place.

If there is a course to replace this, which one?

The current course sequence (TH 1225, TH 2225, TH 2227, TH 2229, TH 3225, TH 3227, TH 3229, TH 4225, TH 4227, & TH 4229) will be replaced by TH 1800:Club Theatre Production and TH 2800: Departmental Theatre Production. (For more details about this restructuring, please review the proposals for these new courses.)

Note if there are any changes to resource requirements.

(no resource impact)

Implementation: 2023-24 Academic Year

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to remove TH 2227: Advanced Acting

Motion: On behalf of the Humanities & Arts Department, the Committee on Academic Operation recommends and I move, that TH 2227: Advanced Acting be removed from the undergraduate catalog.

Course Description to be Removed:

TH 2227: Advanced Acting. *Cat. I (1/6 units)*

Credit would be given on the condition that the performance takes place in a WPI performance directed or advised by a part- or full-time WPI instructor. Note: A maximum of four 1/6 units, or a total of two 1/3 units, may be applied toward the five courses, or five one-third units, taken prior to the final Humanities and Arts practicum. Units: 1/6

Note changes to catalog:

(no catalog changes beyond removing this course wherever it's listed)

Rationale:

After much examination and evolution, HUA Theatre is restructuring how it gives credit for theatrical production work. The new proposed system is simpler (two courses instead of ten), clearer (with more explicit course titles & descriptions), and more rigorous (delineating between club-sponsored & department- sponsored experiences).

Impact on Distribution Requirements and Other Courses: This course deletion will not alter the process by which theatrical production work is credited, and thus will have no impact on most students—including HUA Theatre minors. It will impact HUA Theatre majors by requiring them to engage in faculty-led classroom & production work (in addition to any student-led club productions they choose to participate in, which still count toward the HUA major). It will have a similar but smaller impact on students completing their HUA Requirement in Theatre, who will be required to engage in a faculty-led class or production for at least 1/3 of their “depth.”

What term is this course typically offered and is it Cat. I or Cat. II?

Cat. I - Offered in all terms during which theatrical productions are taking place.

If there is a course to replace this, which one?

The current course sequence (TH 1225, TH 2225, TH 2227, TH 2229, TH 3225, TH 3227, TH 3229, TH 4225, TH 4227, & TH 4229) will be replaced by TH 1800: Club Theatre Production and TH 2800: Departmental Theatre Production. (For more details about this restructuring, please review the proposals for these new courses.)

Note if there are any changes to resource requirements. (no resource impact)

Implementation: 2023-24 Academic Year

Date: February 2, 2023

To: WPI Faculty

From: Committee on Academic Operations (Prof. Srinivasan, Chair)

Re: Motion to remove TH 2229: Advanced Theatre Production Practicum

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that TH 2229: Advanced Theatre Production Practicum be removed.

Course Description to be Removed:

TH 2229: Advanced Theatre Production Practicum. *Cat. I (1/6 units)*

Credit would be given on the condition that the performance takes place in a WPI performance directed or advised by a part- or full-time WPI instructor. Note: A maximum of four 1/6 units, or a total of two 1/3 units, may be applied toward the five courses, or five one-third units, taken prior to the final Humanities and Arts practicum.

Note changes to catalog:

(no catalog changes beyond removing this course wherever it's listed)

Rationale:

After much examination and evolution, HUA Theatre is restructuring how it gives credit for theatrical production work. The new proposed system is simpler (two courses instead of ten), clearer (with more explicit course titles & descriptions), and more rigorous (delineating between club-sponsored & department- sponsored experiences).

Impact on Distribution Requirements and Other Courses: This course deletion will not alter the process by which theatrical production work is credited, and thus will have no impact on most students—including HUA Theatre minors. It will impact HUA Theatre majors by requiring them to engage in faculty-led classroom & production work (in addition to any student-led club productions they choose to participate in, which still count toward the HUA major). It will have a similar but smaller impact on students completing their HUA Requirement in Theatre, who will be required to engage in a faculty-led class or production for at least 1/3 of their “depth.”

What term is this course typically offered and is it Cat. I or Cat. II?

Cat. I - Offered in all terms during which theatrical productions are taking place.

If there is a course to replace this, which one?

The current course sequence (TH 1225, TH 2225, TH 2227, TH 2229, TH 3225, TH 3227, TH 3229, TH 4225, TH 4227, & TH 4229) will be replaced by TH 1800:Club Theatre Production and TH 2800: Departmental Theatre Production. (For more details about this restructuring, please review the proposals for these new courses.)

Note if there are any changes to resource requirements.

(no resource impact)

Implementation: 2023-24 Academic Year

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to remove TH 3225: Directing

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that TH 3225: Directing be removed.

Course Description to be Removed:

TH 3225: Directing. *Cat. I (1/6 units)*

Credit would be given on the condition that the performance takes place in a WPI performance directed or advised by a part- or full-time WPI instructor. Note: A maximum of four 1/6 units, or a total of two 1/3 units, may be applied toward the five courses, or five one-third units, taken prior to the final Humanities and Arts practicum.

Note changes to catalog:

(no catalog changes beyond removing this course wherever it's listed)

Rationale:

After much examination and evolution, HUA Theatre is restructuring how it gives credit for theatrical production work. The new proposed system is simpler (two courses instead of ten), clearer (with more explicit course titles and descriptions), and more rigorous (delineating between club-sponsored and department-sponsored experiences).

Impact on Distribution Requirements and Other Courses: This course deletion will not alter the process by which theatrical production work is credited, and thus will have no impact on most students—including HUA Theatre minors. It will impact HUA Theatre majors by requiring them to engage in faculty-led classroom & production work (in addition to any student-led club productions they choose to participate in, which still count toward the HUA major). It will have a similar but smaller impact on students completing their HUA Requirement in Theatre, who will be required to engage in a faculty-led class or production for at least 1/3 of their “depth.”

What term is this course typically offered and is it Cat. I or Cat. II?

Cat. I - Offered in all terms during which theatrical productions are taking place.

If there is a course to replace this, which one?

The current course sequence (TH 1225, TH 2225, TH 2227, TH 2229, TH 3225, TH 3227, TH 3229, TH 4225, TH 4227, & TH 4229) will be replaced by TH 1800:Club Theatre Production and TH 2800: Departmental Theatre Production. (For more details about this restructuring, please review the proposals for these new courses.)

Note if there are any changes to resource requirements.

(no resource impact)

Implementation: 2023-24 Academic Year

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to remove TH 3227: Advanced Directing

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that TH 3227: Advanced Directing be removed.

Course Description to be Removed:

TH 3227: Advanced Directing. *Cat I (1/6 units)*

Credit would be given on the condition that the performance takes place in a WPI performance directed or advised by a part- or full-time WPI instructor. Note: A maximum of four 1/6 units, or a total of two 1/3 units, may be applied toward the five courses, or five one-third units, taken prior to the final Humanities and Arts practicum.

Note changes to catalog:

(no catalog changes beyond removing this course wherever it's listed)

Rationale:

After much examination and evolution, HUA Theatre is restructuring how it gives credit for theatrical production work. The new proposed system is simpler (two courses instead of ten), clearer (with more explicit course titles and descriptions), and more rigorous (delineating between club-sponsored and department-sponsored experiences).

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What term is this course typically offered and is it Cat. I or Cat. II?

Cat. I - Offered in all terms during which theatrical productions are taking place.

If there is a course to replace this, which one?

The current course sequence (TH 1225, TH 2225, TH 2227, TH 2229, TH 3225, TH 3227, TH 3229, TH 4225, TH 4227, & TH 4229) will be replaced by TH 1800: Club Theatre Production and TH 2800: Departmental Theatre Production. (For more details about this restructuring, please review the proposals for these new courses.)

Note if there are any changes to resource requirements.

(no resource impact)

Implementation: 2023-24 Academic Year

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to remove TH 3229: Dramaturgy

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that TH 3229: Dramaturgy be removed.

Course Description to be Removed:

TH 3229: Dramaturgy. *Cat. I (1/6 units)*

Credit would be given on the condition that the performance takes place in a WPI performance directed or advised by a part- or full-time WPI instructor. Note: A maximum of four 1/6 units, or a total of two 1/3 units, may be applied toward the five courses, or five one-third units, taken prior to the final Humanities and Arts practicum. Units: 1/6

Note changes to catalog:

(no catalog changes beyond removing this course wherever it's listed)

Rationale:

After much examination and evolution, HUA Theatre is restructuring how it gives credit for theatrical production work. The new proposed system is simpler (two courses instead of ten), clearer (with more explicit course titles and descriptions), and more rigorous (delineating between club-sponsored and department-sponsored experiences).

Impact on Distribution Requirements and Other Courses: This course deletion will not alter the process by which theatrical production work is credited, and thus will have no impact on most students—including HUA Theatre minors. It will impact HUA Theatre majors by requiring them to engage in faculty-led classroom & production work (in addition to any student-led club productions they choose to participate in, which still count toward the HUA major). It will have a similar but smaller impact on students completing their HUA Requirement in Theatre, who will be required to engage in a faculty-led class or production for at least 1/3 of their “depth.”

What term is this course typically offered and is it Cat. I or Cat. II?

Cat. I - Offered in all terms during which theatrical productions are taking place.

If there is a course to replace this, which one?

The current course sequence (TH 1225, TH 2225, TH 2227, TH 2229, TH 3225, TH 3227, TH 3229, TH 4225, TH 4227, & TH 4229) will be replaced by TH 1800: Club Theatre Production and TH 2800: Departmental Theatre Production. (For more details about this restructuring, please review the proposals for these new courses.)

Note if there are any changes to resource requirements.

(no resource impact)

Implementation: 2023-24 Academic Year

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to remove TH 4225: Theatre Technology Design

Motion: On behalf of the Humanities & Arts Department, the Committee on Academic Operation recommends and I move, that TH 4225: Theatre Technology Design be removed from the undergraduate catalog.

Course Description to be Removed:

TH 4225: Theatre Technology Design. *Cat. I (1/6 units)*

Credit would be given on the condition that the performance takes place in a WPI performance directed or advised by a part- or full-time WPI instructor. Note: A maximum of four 1/6 units, or a total of two 1/3 units, may be applied toward the five courses, or five one-third units, taken prior to the final Humanities and Arts practicum.

Note changes to catalog:

(no catalog changes beyond removing this course wherever it's listed)

Rationale:

After much examination and evolution, HUA Theatre is restructuring how it gives credit for theatrical production work. The new proposed system is simpler (two courses instead of ten), clearer (with more explicit course titles & descriptions), and more rigorous (delineating between club-sponsored & department- sponsored experiences).

Impact on Distribution Requirements and Other Courses: This course deletion will not alter the process by which theatrical production work is credited, and thus will have no impact on most students—including HUA Theatre minors. It will impact HUA Theatre majors by requiring them to engage in faculty-led classroom & production work (in addition to any student-led club productions they choose to participate in, which still count toward the HUA major). It will have a similar but smaller impact on students completing their HUA Requirement in Theatre, who will be required to engage in a faculty-led class or production for at least 1/3 of their “depth.”

What term is this course typically offered and is it Cat. I or Cat. II?

Cat. I - Offered in all terms during which theatrical productions are taking place.

If there is a course to replace this, which one?

The current course sequence (TH 1225, TH 2225, TH 2227, TH 2229, TH 3225, TH 3227, TH 3229, TH 4225, TH 4227, & TH 4229) will be replaced by TH 1800: Club Theatre Production and TH 2800: Departmental Theatre Production. (For more details about this restructuring, please review the proposals for these new courses.)

Note if there are any changes to resource requirements.

(no resource impact)

Implementation Date: 2023-24 Academic Year

Date: February 2, 2023

To: WPI Faculty

From: Committee on Academic Operations (Prof. Srinivasan, Chair)

Re: Motion to remove TH 4227: Advanced Theatre Technology Design

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that TH 4227: Advanced Theatre Technology Design be removed.

Course Description to be Removed:

TH 4227: Advanced Theatre Technology Design

Credit would be given on the condition that the performance takes place in a WPI performance directed or advised by a part- or full-time WPI instructor. Note: A maximum of four 1/6 units, or a total of two 1/3 units, may be applied toward the five courses, or five one-third units, taken prior to the final Humanities and Arts practicum.

Units: 1/6

Note changes to catalog:

(no catalog changes beyond removing this course wherever it's listed)

Rationale:

After much examination and evolution, HUA Theatre is restructuring how it gives credit for theatrical production work. The new proposed system is simpler (two courses instead of ten), clearer (with more explicit course titles & descriptions), and more rigorous (delineating between club-sponsored and department-sponsored experiences).

Impact on Distribution Requirements and Other Courses: This course deletion will not alter the process by which theatrical production work is credited, and thus will have no impact on most students—including HUA Theatre minors. It will impact HUA Theatre majors by requiring them to engage in faculty-led classroom & production work (in addition to any student-led club productions they choose to participate in, which still count toward the HUA major). It will have a similar but smaller impact on students completing their HUA Requirement in Theatre, who will be required to engage in a faculty-led class or production for at least 1/3 of their “depth.”

What term is this course typically offered and is it Cat. I or Cat. II?

Cat. I - Offered in all terms during which theatrical productions are taking place.

If there is a course to replace this, which one?

The current course sequence (TH 1225, TH 2225, TH 2227, TH 2229, TH 3225, TH 3227, TH 3229, TH 4225, TH 4227, & TH 4229) will be replaced by TH 1800: Club Theatre Production and TH 2800: Departmental Theatre Production. (For more details about this restructuring, please review the proposals for these new courses.)

Note if there are any changes to resource requirements.

(no resource impact)

Implementation: 2023-24 Academic Year

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to remove TH 4229: Advanced Dramaturgy

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that TH 4229: Advanced Dramaturgy be removed.

Provide course description:

TH 4229: Advanced Dramaturgy. *Cat. I (1/6 units)*

Credit would be given on the condition that the performance takes place in a WPI performance directed or advised by a part- or full-time WPI instructor. Note: A maximum of four 1/6 units, or a total of two 1/3 units, may be applied toward the five courses, or five one-third units, taken prior to the final Humanities and Arts practicum.

Note changes to catalog:

(no catalog changes beyond removing this course wherever it's listed)

Rationale:

After much examination and evolution, HUA Theatre is restructuring how it gives credit for theatrical production work. The new proposed system is simpler (two courses instead of ten), clearer (with more explicit course titles and descriptions), and more rigorous (delineating between club-sponsored and department-sponsored experiences).

Impact on Distribution Requirements and Other Courses: This course deletion will not alter the process by which theatrical production work is credited, and thus will have no impact on most students—including HUA Theatre minors. It will impact HUA Theatre majors by requiring them to engage in faculty-led classroom & production work (in addition to any student-led club productions they choose to participate in, which still count toward the HUA major). It will have a similar but smaller impact on students completing their HUA Requirement in Theatre, who will be required to engage in a faculty-led class or production for at least 1/3 of their “depth.”

What term is this course typically offered and is it Cat. I or Cat. II?

Cat. I - Offered in all terms during which theatrical productions are taking place.

If there is a course to replace this, which one?

The current course sequence (TH 1225, TH 2225, TH 2227, TH 2229, TH 3225, TH 3227, TH 3229, TH 4225, TH 4227, & TH 4229) will be replaced by TH 1800: Club Theatre Production and TH 2800: Departmental Theatre Production. (For more details about this restructuring, please review the proposals for these new courses.)

Note if there are any changes to resource requirements.

(no resource impact)

Implementation: 2023-24 Academic Year

Date: February 2, 2023

To: WPI Faculty

From: Committee on Academic Operations (Prof. Srinivasan, Chair)

Re: Motion to change the course number, title, and description TH 1100: Introduction to Acting

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move, that the course number, title, and description of TH1100: Introduction to Acting be changed as described below.

Description of the Proposed Changes:

The **yellow** highlighted text in the current description is replaced by the **yellow** highlighted text in the proposed description:

Current title, description and course offering schedule:

TH 1100: Introduction to Acting. *Cat. I (1/3 units)*

This course is designed to give students fundamental tools and techniques for acting in the theatre. These include concentration, relaxation, imagination, observation, communication, sensory awareness, and basic script analysis. Drawing on the “Stanislavski Method,” and using character analysis and scene study, it will include exploration of objectives, tactics, obstacles, action, conflict, subtext, and characterization. It will do this through in-class exercises, as well as monologue and scene work from a variety of plays. Beyond acting skills, the student will learn valuable skills in public speaking and in conveying clear, complex ideas.

Recommended Background: Some theatre or acting experience is desirable but the course is suitable for anyone with interest in the subject.

Proposed title, description, and course offering:

TH 2100: Fundamentals of Acting *Cat. I (1/3 units)*

This course is designed to give students fundamental tools and techniques for acting in the theatre. These include concentration, relaxation, imagination, observation, communication, sensory awareness, and basic script analysis. Drawing on the “Stanislavski Method,” and using character analysis and scene study, it will include exploration of objectives, tactics, obstacles, action, conflict, subtext, and characterization. It will do this through in-class exercises, as well as monologue and scene work from a variety of plays. Beyond acting skills, the student will learn valuable skills in public speaking and in conveying clear, complex ideas.

Recommended Background: None

Students may not receive credit for TH 2100 and TH 1100.

Explanation of Motion:

This course’s content, instruction, and scheduling will all remain unchanged, making it unnecessary to replace it with a new course.

Rationale:

HUA Drama/Theatre is renumbering and renaming several classes to better reflect each course’s level of specificity, as well as its alignment within the sub- disciplines of theatre (acting, literature, design, technology, etc.).

Impacts on students: This renumbering will allow more of HUA Theatre's academic classes (including this one) to count toward the HUA Theatre major (which requires 6/3 units at the 2000-level or above) and toward the HUA Requirement (which requires 1/3 unit at the 2000-level or above).

Note: Despite the 2000-level number, this course must keep its current cap of 20 students per section.

Resource Needs: (no resource impact)

Implementation: 2023-24 Academic Year

Date: February 2, 2023

To: WPI Faculty

From: Committee on Academic Operations (Prof. Srinivasan, Chair)

Re: Motion to change the title and description of TH 1221: Introduction to Drama - Theatre on the Page and on the Stage

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that the course title and description of TH 1221: Introduction to Drama - Theatre on the Page and on the Stage be changed, as described below.

Description of the Proposed Changes:

Current title, description and course offering schedule:

TH 1221: Introduction to Drama - Theatre on the Page and on the Stage. *Cat I (1/3 units)*

This introductory course will give the student a basic understanding of theatrical productions, from the moment we read the script to the moment it is presented to an audience, and it will initiate conversations on Art, Theatre and the ways it imitates, catalogues and presents life. Every week touches upon a different area, including playwrighting, directing, acting, and designing and the course culminates in the compilation of an original monologue. This course also serves as an introduction to the WPI Theatre community, often with student involvement to the current theatre production on campus.

Students may not receive credit for EN 1221 and TH 1221

Proposed title, description, and course offering schedule:

TH 1221: Introduction to Theatre on Page and Stage. *Cat I (1/3 units)*

This introductory course gives students a basic understanding of theatrical productions and theatre vocabulary through an investigation of how a play moves from the page to the stage. By touching on the various sub-disciplines of theatre (including playwrighting, design, performance, and more), this course explores the role of theatre and art in the world.

Students may not receive credit for EN 1221 & TH 1221

Explanation of Motion:

This course's content, instruction, and scheduling will all remain unchanged, making it unnecessary to replace it with a new course.

Rationale:

These updates reflect the current teaching of this course, which no longer requires participation in theatrical productions.

Impacts on students: (no impact on students)

Resource Needs: (no resource impact)

Implementation: 2023-24 Academic Year

Date: February 2, 2023

To: WPI Faculty

From: Committee on Academic Operations (Prof. Srinivasan, Chair)

Re: Motion to change the course number and description of TH 2219: Playwriting

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that the course number and description of TH 2219: Playwriting be changed as described below.

Description of the Proposed Changes:

The **yellow** highlighted text in the current description is replaced by the **yellow** highlighted text in the proposed description:

Current title, description and course offering schedule:

TH 2219: Playwriting. Cat. II (1/3 units)

Playwright. Wright – a maker. She creates a world on the stage through action, dialogue, and character. In this course, students will learn to write for the theatre – to make plays – through study, discussion, and practice. Working from foundational ideas of the well-made play, it will draw upon various analytic theories of theater to examine the structure of plays. Through exercises and studio-type critique, students will create and develop their own plays.

Recommended Background: No recommended background. This course is suitable for anyone with an interest in being a playwright.

This course will be offered in 2021-22, and in alternating years thereafter.

Proposed title, description, and course offering:

TH 3240: Playwriting. Cat. II (1/3 units)

Playwright. Wright – a maker. She creates a world on the stage through action, dialogue, and character. In this course, students will learn to write for the theatre – to make plays – through study, discussion, and practice. Working from foundational ideas of the well-made play, it will draw upon various analytic theories of theater to examine the structure of plays. Through exercises and studio-type critique, students will create and develop their own plays.

Students may not receive credit for TH 3240 and TH 2219.

Recommended Background: (none)

Explanation of Motion:

This course's content, instruction, and scheduling will all remain unchanged, making it unnecessary to replace it with a new course.

Rationale:

HUA Drama/Theatre is renumbering several classes to better reflect each course's level of specificity, as well as its alignment within the sub-disciplines of theatre (acting, literature, design, technology, etc.).

Impacts on students: none

Resource Needs: (no resource impact)

Note: This course must keep its current cap of 12 students per section.

Implementation: 2023-24 Academic Year

Date: February 2, 2023

To: WPI Faculty

From: Committee on Academic Operations (Prof. Srinivasan, Chair)

Re: Motion to change the course number and description of TH 2222: Introduction to Technical Theatre

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move, that the course number and description of TH 2222: Introduction to Technical Theatre be changed as described below.

Description of the Proposed Changes:

Current title, description and course offering schedule:

TH 2222: Introduction to Technical Theatre. *Cat I (1/3 units)*

This course introduces students to a variety of technical theatre disciplines, including scenic, lights, sound, props, costumes and more. Each week, students will focus on different technical elements through a combination of lectures, demonstrations, and hands on workshops. Students will demonstrate their learning through various projects and involvement in the current term production.

Students may not receive credit for EN 2222 and TH 2222. Units: 1/3. Category: I

Proposed title, description, and course offering:

TH 2500: Fundamentals of Technical Theatre. *Cat I (1/3 units)*

This course introduces students to a variety of technical theatre disciplines, including scenery, lighting, sound, props, and costumes. Students will explore each technical element through a combination of lectures, demonstrations, and workshops, and will demonstrate their learning through group projects and other hands-on activities.

Students may not receive credit for TH 2500 and either EN 2222 or TH 2222.

Explanation of Motion:

This course's content, instruction, and scheduling will all remain unchanged, making it unnecessary to replace it with a new course.

Rationale:

HUA Drama/Theatre is renumbering and renaming several classes to better reflect each course's level of specificity, as well as its alignment within the sub-disciplines of theatre (acting, literature, design, technology, etc.).

Impacts on students: This renumbering will allow more of HUA Theatre's academic classes (including this one) to count toward the HUA Theatre major (which requires 6/3 units at the 2000-level or above) and toward the HUA Requirement (which requires 1/3 unit at the 2000-level or above). Other than the renumbering, this change will have no impact on students.

Note: Despite changing numbers, this course must keep its current cap of 20 students per section.

Resource Needs: (no resource impact)

Implementation Date: 2023-24 Academic Year

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to add TH 1800: Club Theatre Production

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that TH 1800: Club Theatre Production, as described below, be added.

Proposed Course Description:

TH 1800: Club Theatre Production. *Cat. I (0 or 1/6 units)*

This course captures student participation in club theatrical productions. Course requirements and syllabus are available from the instructor. Students may not enroll themselves in this course; anyone participating in a credit-eligible club production will be invited to request credit; those who do will be enrolled by the instructor. *This course may be repeated for credit on different productions. Only 2/3 units of credited production work (TH 1800 and TH 2800) may be counted toward the Humanities & Arts Requirement.*

Recommended background: (none)

Anticipated Instructor: Profs. Patrick Crowe, Laura Eckelman, Despoina Giapoudzi, & Kathryn Moncrief

Rationale:

After much examination and evolution, HUA Theatre is restructuring how it gives credit for theatrical production work. The new proposed system is simpler (two courses instead of ten), clearer (with more explicit course titles and descriptions), and more rigorous (delineating between club-sponsored & department- sponsored experiences).

This course, along with TH2800: Departmental Theatre Production, will replace the previous production course sequence (TH 1225, TH 2225, TH 2227, TH 2229, TH 3225, TH 3227, TH 3229, TH 4225, TH 4227, and TH 4229).

Implementation: 2023-24 Academic Year

Resource Needs:

- **Instructor:** May be taught by any faculty member in Theatre.
- **Classroom:** This course requires no classroom space.
- **Laboratory:** This course requires no laboratory space.
- **Library Resources:** This course requires no additional library resources.
- **Information Technology:** This course requires no additional IT resources.

Impact on Distribution Requirements and Other Courses: This course addition will not alter the process by which theatrical production work is credited, and thus will have no impact on most students—including HUA Theatre minors. The 1000-level course number will impact HUA Theatre majors by requiring them to engage in faculty-led classroom & production work (in

addition to any student-led club productions they choose to participate in, which still count toward the HUA major). It will have a similar but smaller impact on students completing their HUA Requirement in Theatre, who will be required to engage in a faculty-led class or production for at least 1/3 of their “depth.”

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to add TH 2400: Fundamentals of Theatrical Design

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move, that TH 2400: Fundamentals of Theatrical Design as described below, be added.

Proposed Course Description:

TH 2400: Fundamentals of Theatrical Design. *Cat. I (1/3 units)*

This course will explore the principles and practices of theatrical design, including script analysis, research, concept development, and collaboration. Students will learn to engage in theatrical storytelling through a variety of design disciplines (scenery, costumes, lighting, sound), and will develop a basic understanding of how these elements fit together. *Students may not receive credit for TH 2400 and TH 111X.*

Recommended background: (none)

Anticipated Instructor: Prof. Laura Eckelman

Rationale:

This course (which has already been offered in experimental form) serves a significant and growing interest in theatrical design & technology, as well as a persistent demand for courses in the Humanities and Arts.

Resource Needs:

- **Instructor:** Prof. Eckelman was hired to teach this course and others in the sub-discipline of theatrical design.
- **Classroom:** This class may be taught in any number of classroom spaces, including a traditional lecture hall or seminar room.
- **Laboratory:** Some course activities may make use of other existing HUA Theatre laboratory spaces, such as the Little Theatre and Design Studio.
- **Library Resources:** This course requires no additional library resources.
- **Information Technology:** This course requires no additional IT resources.

Note: Despite the 2000-level number, this course must keep its current cap of 20 students per section.

Impact on Distribution Requirements and Other Courses: This course will serve students studying theatre for their HUA Requirement (breadth or depth), for an HUA major/minor, or simply as a free elective.

Implementation: 2023-24 Academic Year

Appendix: Information about Experimental Course Offering:

Experimental Course Description:

TH 111x. Introduction to Theatrical Production Design

How does a play leap from the page to the stage? Certainly, a director's concept and interpretation are the driving forces in producing and mounting a live performance of a script. But she doesn't

do it alone. In this course, we will discuss the cornerstones of theatrical production design, from interpreting a script to creating onstage symbology. We explore the various disciplines involved in theatrical design, from scenery to costumes, lighting to sound, props to projections. We'll start by analyzing a script and discussing the intention of the playwright far beyond the written word. From there, we will determine what the physical needs of the production are in order to propel the story. We'll then dive deeper, tapping into the creative, aesthetic aspects of design, not just the function, but the form. By dissecting the nuance of a script and reading between the lines, we'll discover the poetry in good design and why it takes a live performance beyond the basics of the plot.

Recommended background: No recommended background. This course is suitable for anyone with an interest in design.

Assessment of Experimental Course (from C-term 2021 and C-term 2022):

1. So far, the response to this course has been extremely positive. Students report high levels of interest & engagement in the course, and design work on campus theatrical productions has improved markedly since its first offering.
2. Course Evaluation Comments from 21A:
 - “I enjoyed the overall topic of the class, and learning more about the theatre.”
 - “I like how the class allows us to explore our creativity and learn about the design process.”
 - “I liked learning about the behind the scenes of theatre and it was an overall very interesting course to learn. Not something I would have picked out of interest but I am glad I took it because it gave me a new perspective.”
 - “I would encourage others to take this course. It is a great collaborative experience, the instructor grades fairly, and the material is extremely interesting. Design relates to more than just theatre and certain elements I take away from this course can be applied in other areas of my life.”
 - “It's a useful course to help prepare first year students like me for the collaborative aspects of WPI, and for non-first year students it's a way to improve collaborative skills.”
3. Course Evaluation Data from 21A:
 - Question 1 (Overall Quality) = 4.8
 - Question 2 (Instructor's Teaching) = 4.9
 - Question 7 (Amount Learned) = 4.0
 - Question 19 (Total Hours) = 2.9, a.k.a. 6-10 hours/week
4. This course has evolved significantly over its experimental offerings, but in all iterations has met its goals of encouraging greater awareness, consideration, rigor, and nuance in theatrical design.
5. All experimental offerings enrolled full to (or beyond) capacity (20+ students).

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to add TH 2800: Departmental Theatre Production

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that TH 2800: Departmental Theatre Production as described below, be added.

Proposed Course Description:

TH 2800: Departmental Theatre Production. *Cat. I (0, 1/6, or 1/3 units)*

This course captures student participation in departmental theatrical productions. Depending on the size of their role, students may earn 1/3 unit, 1/6 unit, or no credit. Course requirements & syllabi are available from the instructor. Students may not enroll themselves in this course; anyone wishing to participate in a departmental production should contact the Theatre faculty during the previous semester. *This course may be repeated for credit on different productions. Only 2/3 units of credited production work (TH 1800 & TH 2800) may be counted toward the Humanities & Arts Requirement.*

Recommended background: (none)

Anticipated Instructor: Profs. Patrick Crowe, Laura Eckelman, Despoina Giapoudzi, and Kathryn Moncrief

Rationale:

After much examination and evolution, HUA Theatre is restructuring how it gives credit for theatrical production work. The new proposed system is simpler (two courses instead of ten), clearer (with more explicit course titles & descriptions), and more rigorous (delineating between club-sponsored & department- sponsored experiences).

This course, along with TH 1800: Club Theatre Production, will replace the previous production course sequence (TH 1225, TH 2225, TH 2227, TH 2229, TH 3225, TH 3227, TH 3229, TH 4225, TH 4227, & TH 4229).

Resource Needs:

- **Instructor:** May be taught by any faculty member in Theatre.
- **Classroom:** This course requires no classroom space.
- **Laboratory:** This course requires no laboratory space.
- **Library Resources:** This course requires no additional library resources.
- **Information Technology:** This course requires no additional IT resources.

Impact on Distribution Requirements and Other Courses: This course addition will not alter the process by which theatrical production work is credited, and thus will have no impact on most students—including HUA Theatre minors.

Implementation: 2023-24 Academic Year

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to add TH 3200: Special Topics in Dramatic Literature

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that TH 3200: Special Topics in Dramatic Literature as described below, be added.

Proposed Course Description:

TH 3200: Special Topics in Dramatic Literature. *Cat I (1/3 units)*

In this course, students will learn to examine plays as works of literature and blueprints for performance. Through reading, discussion, and analysis, students will explore how playwrights engage social issues, respond to cultural trends, and provide entertainment through the medium of drama. Each offering will focus on works of dramatic literature within a specific period, genre, theme, or culture, such as: Modernism, Restoration, Musicals, Melodrama, Science Plays, LGBTQ+ Stories, Latinx Writers, or South African Drama. *Students may repeat this course for credit with different topics.*

Recommended background: (none)

Anticipated Instructor: Profs. Despoina Giapoudzi and Kathryn Moncrief

Rationale:

HUA Theatre is redesigning its dramatic literature curriculum to better reflect the increasingly global and intersectional nature of theatre studies, and to allow for greater flexibility in future course offerings.

This course, along with TH 3300: Special Topics in Performance Studies, will replace the previous dramatic literature course sequence (EN 2221, EN 3222, and EN 3223).

Resource Needs:

- **Instructor:** As a replacement for previous dramatic literature courses, this course fits within Prof. Giapoudzi's existing teaching load.
- **Classroom:** This course may be taught in any number of classroom spaces, including a traditional lecture hall or seminar room.
- **Laboratory:** This course requires no laboratory space.
- **Library Resources:** This course requires no additional library resources.
- **Information Technology:** This course requires no additional IT resources.

Impact on Distribution Requirements and Other Courses: This course will serve students studying theatre for their HUA Requirement (breadth or depth), for an HUA major/minor, or simply as a free elective.

Implementation: 2023-24 Academic Year

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to add TH 3300: Special Topics in Performance Studies

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that TH 3300: Special Topics in Performance Studies as described below, be added.

Proposed Course Description:

TH 3300: Special Topics in Performance Studies. Cat III (1/3 units)

This course will use the multidisciplinary approach of performance studies to examine specific theatrical traditions, movements, or approaches. Through reading/viewing, discussion, and practical exercises, students will explore the interactions of various theatrical sub-disciplines (such as directing, design, playwriting, acting, etc.) as well as the relationship of performance to adjacent fields such as sociology, geography, history, and politics. Each offering will focus on a specific type of performance, such as: Documentary Theatre, Audience- Driven/Interactive Performance, Theatre for Social Change, Religious & Ritual Performance, Puppetry, or Physical Theatre. *Students may repeat this course for credit with different topics.*

Recommended background: (none)

Anticipated Instructor: Profs. Despoina Giapoudzi and Kathryn Moncrief

Rationale:

HUA Theatre is redesigning its dramatic literature curriculum to better reflect the increasingly global & intersectional nature of theatre studies, and to allow for greater flexibility in future course offerings.

This course, along with TH 3200: Special Topics in Dramatic Literature, will replace the previous dramatic literature course sequence (EN 2221, EN 3222, & EN 3223).

Resource Needs:

- **Instructor:** As a replacement for previous dramatic literature courses, this course fits within Prof. Giapoudzi's existing teaching load.
- **Classroom:** This course may be taught in any number of classroom spaces, including a traditional lecture hall or seminar room.
- **Laboratory:** This course requires no laboratory space.
- **Library Resources:** This course requires no additional library resources.
- **Information Technology:** This course requires no additional IT resources.

Impact on Distribution Requirements and Other Courses:

This course will serve students studying theatre for their HUA Requirement (breadth or depth), for an HUA major/minor, or simply as a free elective.

Implementation: 2023-24 Academic Year

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to add TH 3510: Scenic Fabrication

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move, that TH 3510: Scenic Fabrication as described below, be added.

Proposed Course Description:

TH 3510: Scenic Fabrication. *Cat. I (1/3 units)*

This course will immerse students in the scenic fabrication process for a department theatre production. As members of the show's crew, students will plan, build, paint, install, and eventually remove all scenic elements, in collaboration with the show's technical staff and design team. Additionally, students may learn about the design process and other related activities. Students will demonstrate their learning by participating in the build process and other assigned projects. *Students may not receive credit for TH 3510 and TH 320X.*

Recommended background: (none)

Anticipated Instructor: Prof. Patrick Crowe

Rationale:

This course (which has already been offered in experimental form) serves a significant and growing interest in theatrical design & technology, as well as a persistent demand for courses in the Humanities & Arts.

Resource Needs:

- **Instructor:** This course is part of Prof. Crowe's normal teaching load.
- **Classroom:** This course is taught in HUA Theatre's laboratory spaces, including the Little Theatre and Alden Hall Scene Shop.
- **Laboratory:** (see above)
- **Library Resources:** This course requires no additional library resources.
- **Information Technology:** This course requires no additional IT resources.

Note: For the sake of student safety, this course must keep its current cap of 15 students per section.

Impact on Distribution Requirements and Other Courses: This course will serve students studying theatre for their HUA Requirement (breadth or depth), for an HUA major/minor, or simply as a free elective.

Implementation: 2023-24 Academic Year

Appendix: Information about Experimental Course Offering:

Experimental Course Description:

EN 320X, Scenic Design and Fabrication. *Cat.I*

This course will explore the concepts of scenic design and fabrication methods. During the first half of the course, the class will design the scenic elements for the following term's production.

The second half will focus the set construction, scenic painting and set dressing, culminating in a completed and installed set for the following term's production.

Recommended Background: Basic knowledge of theatre productions and a familiarity with WPI Theatre. (Theatre Workshop EN 2222 or equivalent ISUs)

Assessment of Experimental Course:

1. Overall positive. Many students enjoyed the truly hands-on nature of the course. The instructor & other faculty members heard repeatedly that it felt like a welcome change from their other coursework.
2. Course Evaluation Comments:
 - I loved that for almost every class, we were doing hands on "on the job training" in a sense where most of the time spent is taking a design and making it into a reality rather than learning how to do it and not really putting that knowledge to use. I loved the shorter classes where we had to brainstorm the best way to make something for a show. Overall was a very fun and informative class that makes me want to take it again.
 - I really enjoyed how hands-on this course was. Even though we were given blueprints, the actual process of building was entirely our own. We were able to use trial and error and figure out for ourselves what would work and what wouldn't.
 - Pat always did his best to make everyone feel included in what we were doing and did his best to make sure everyone was comfortable in the space. He also never looked down upon someone because they may not have had the same experience in carpentry as others in the class. He always used every mistake or question as a learning opportunity for everyone. Going to this class was the highlight of my week on most days because it was a break from the stress and rigor of other classes and I was able to use other more creative parts of my brain.
3. Course Evaluation Data:
 - Question 1 (Overall Quality) = 4.4
 - Question 2 (Instructor's Teaching) = 4.6
 - Question 7 (Amount Learned) = 3.6
 - Question 19 (Total Hours) = 1.9, a.k.a. 1-6 hours/week
4. Over two experimental offerings, the instructor has received valuable feedback about why students enjoyed this class, as well as some areas for improvement (such as balancing fabrication with design). During this time, student interest in scenery has also grown significantly across the WPI theatre community. We believe this change has been driven largely by this course.
5. All experimental offerings enrolled full to (or beyond) capacity (15+ students).

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Prof. Srinivasan, Chair)
Re: Motion to add TH 3800: Minor Capstone

Motion: On behalf of the Humanities and Arts Department, the Committee on Academic Operation recommends and I move that TH 3800: Minor Capstone as described below, be added.

Proposed Course Description:

TH 3800: Minor Capstone. *Cat I (1/3 units)*

To complete the Theatre Minor, students must engage in a faculty-supervised, research-driven investigation of a specific topic within theatre. This experience is typically paired with a significant role on a departmental production. Course requirements & syllabi are available from the instructor. Students may not enroll themselves in this course; anyone wishing to complete a minor capstone should contact the Theatre faculty during the previous semester.

Recommended background: All other Theatre minor requirements must be completed before taking this course.

Anticipated Instructor: Profs. Patrick Crowe, Laura Eckelman, Despoina Giapoudzi, & Kathryn Moncrief

Rationale:

The addition of this course simply formalizes & makes transparent HUA Theatre's existing minor capstone process. Whereas previous minor capstone projects were registered as 3000-level Independent Study Units (ISUs), this new course allows HUA Theatre to disambiguate minor capstones from true independent studies & other credited production work (which will now be registered as TH 1800 and TH 2800). It also makes this requirement more transparent to potential Theatre minors.

Resource Needs:

- **Instructor:** May be taught by any faculty member in Theatre.
- **Classroom:** This course requires no classroom space.
- **Laboratory:** This course requires no laboratory space.
- **Library Resources:** This course requires no additional library resources.
- **Information Technology:** This course requires no additional IT resources.

Impact on Distribution Requirements and Other Courses: As a solely clerical change, this new course will have no meaningful impact on program requirements, student experience, or other course offerings.

Implementation Date: 2023-24 Academic Year

Date: February 2, 2023

To: WPI Faculty

From: Committee on Academic Operations (Prof. Srinivasan, Chair)

Re: Motion to change the distribution requirements for the Industrial Engineering (IE) major

Motion: On behalf of the Business School, the Committee on Academic Operations recommends and I move that the distribution requirements for Industrial Engineering (IE) be modified as described below.

Description of the Proposed Changes:

Existing Distribution Requirements*:

On p.129 of the undergraduate catalog, under:

Industrial Engineering Topics must include courses in the following three topic areas

.....

2. IE Electives (3/3 units): Any 3000- or 4000-level Operations Research courses in MA; MIS 3720, 4084, 4720, 4741; OIE 3405*, 3600*, 4410, 4430*, 4460.

*Only if not taken in IE Core.

Proposed Distribution Requirements*:

Change the yellow text above to the blue text below:

.....

2. IE Electives (3/3 units): Any 3000- or 4000-level Operations Research courses in MA; MIS 3720, 3787, 4084, 4720, 4741; OIE 3405*, 3600*, 4410, 4430*, 4460.

*Only if not taken in IE Core.

Rationale:

The change is to add MIS 3787 Business Applications of Machine Learning as an elective for IE students. This increases flexibility for IE majors.

Resource Needs: No new resources are required.

Impact on Distribution Requirements and Other Courses: Change in distribution requirements described in the motion.

Implementation: 2023-24 Academic year.

Contact: Sharon Johnson

Date: February 2, 2023

To: WPI Faculty

From: Committee on Academic Operations (Prof. Srinivasan, Chair)

Re: Motion to change the recommended background for RBE 1001: Introduction to Robotics

Motion: On behalf of the Department of Robotics Engineering, the Committee on Academic Operations recommends and I move that the recommended background for RBE 1001: Introduction to Robotics be changed, as described below.

Description of the Proposed Changes:

Current course description:

RBE 1001. Introduction to Robotics. Cat. I

Multidisciplinary introduction to robotics, involving concepts from the fields of electrical engineering, mechanical engineering and computer science. Topics covered include sensor performance and integration, electric and pneumatic actuators, power transmission, materials and static force analysis, controls and programmable embedded computer systems, system integration and robotic applications. Laboratory sessions consist of hands-on exercises and team projects where students design and build mobile robots. Undergraduate credit may not be earned for both this course and for ES 2201.

Recommended background: mechanics (PH 1110/ PH 1111).

Proposed course description:

[The description is unchanged, only the recommended background **in yellow** is changed, as below.]

RBE 1001. Introduction to Robotics. Cat. I

Multidisciplinary introduction to robotics, involving concepts from the fields of electrical engineering, mechanical engineering and computer science. Topics covered include sensor performance and integration, electric and pneumatic actuators, power transmission, materials and static force analysis, controls and programmable embedded computer systems, system integration and robotic applications. Laboratory sessions consist of hands-on exercises and team projects where students design and build mobile robots. Undergraduate credit may not be earned for both this course and for ES 2201.

Recommended background: CS 1004 or significant experience with programming in python. PH 1120 or PH 1121.

Rationale:

RBE 1001 is the introductory course in Robotics Engineering. Currently, the recommended background does not include any programming courses, and students without significant programming experience tend to struggle in the course. By recommending a background related to a common programming language in robotics, students will have a more even set of skills across the board, which is expected to improve course outcomes.

PH 1110/1111 are replaced with PH 1120/1121 to better prepare students for analyzing fundamental electrical (sensor) circuits.

Impact on Degree Requirements: There is little effect on degree requirements. Students may need to delay taking RBE 1001, but we find that students who enroll in RBE 1001 in A-term of their first year are the most “at risk” for not having programming skills. Most students will use CS 1004 to meet the CS Requirement in Robotics Engineering. Students who are considering double-majoring in CS may need to take an extra course (CS 1101/1102 are recommended for CS), but students who are considering a double-major often have the necessary programming background already.

Resources and Anticipated Instructors: RBE is in consultation with the CS Department, as the change will require a shifting of resources from CS 1101/1102 to CS 1004. Students who take CS 1004 are more likely to take CS 2119 (instead of CS 2102/2103), which may also require a re-allocation of resources.

Implementation: Implementation for this action is the 2023-2024 academic year.

Date: February 2, 2023

To: WPI Faculty

From: Committee on Academic Operations (Prof. Srinivasan, Chair))

Re: Motion to change the recommended background for RBE 2001: Unified Robotics I

Motion: On behalf of the Department of Robotics Engineering, the Committee on Academic Operations recommends and I move that the recommended background for RBE 2001: Unified Robotics I be changed, as described below.

Description of the Proposed Changes:

Current course description:

RBE 2001. Unified Robotics I

First of a four-course sequence introducing foundational theory and practice of robotics engineering and the application of concepts from the fields of computer science, electrical engineering and mechanical engineering to the design of robots. The focus of this course is the effective conversion of electrical power to mechanical power, and power transmission for purposes of locomotion, and of payload manipulation and delivery. Concepts of energy, power and kinematics will be applied. Concepts from statics such as force, moments and friction will be applied to determine power system requirements and structural requirements. Simple dynamics relating to inertia and the equations of motion of rigid bodies will be considered. Power control and modulation methods will be introduced through software control of existing embedded processors and power electronics. The necessary programming concepts and interaction with simulators and Integrated Development Environments will be introduced. Laboratory sessions consist of hands-on exercises and team projects where students design and build robots and related sub-systems.

Recommended background: RBE 1001, ES 2501, and either PH 1120 or PH 1121.

Proposed course description:

[The description is unchanged, only the recommended background **in yellow** is changed, as below.]

RBE 2001. Unified Robotics I

First of a four-course sequence introducing foundational theory and practice of robotics engineering and the application of concepts from the fields of computer science, electrical engineering and mechanical engineering to the design of robots. The focus of this course is the effective conversion of electrical power to mechanical power, and power transmission for purposes of locomotion, and of payload manipulation and delivery. Concepts of energy, power and kinematics will be applied. Concepts from statics such as force, moments and friction will be applied to determine power system requirements and structural requirements. Simple dynamics relating to inertia and the equations of motion of rigid bodies will be considered. Power control and modulation methods will be introduced through software control of existing embedded processors and power electronics. The necessary programming concepts and interaction with simulators and Integrated Development Environments will be introduced. Laboratory sessions consist of hands-on exercises and team projects where students design and build robots and related sub-systems.

Recommended background: RBE 1001, ES 2501, and any of CS 2119 or CS 2102 or CS 2103.

Rationale:

RBE 2001 is the first of the core courses in Robotics Engineering. Currently, the recommended background does not include any programming courses, and students without significant programming experience tend to struggle in the course. By recommending a CS course in object-oriented programming, students will have a more even set of skills across the board, which is expected to improve course outcomes.

“PH 1120 or PH 1121” are removed because RBE 1001 has them as recommended background.

Impact on Degree Requirements: Minor, since most students already take CS 2119/2102/2103 to meet the Object-oriented Programming Requirement in the RBE major. CS 2119/2102/2103 are also commonly taken to meet the requirements of the RBE Minor. We do not anticipate the addition of a course to the recommended background to delay enrollment in RBE 2001, as many students take RBE 2001 in C-term of their second year already, and it’s straightforward to take the recommended CS course in one of the six terms prior.

Resources and Anticipated Instructors: No additional resources are required, as the courses are already used by most students to meet degree requirements.

Implementation: Implementation date for this action is the 2023-2024 academic year.

Date: February 2, 2023
To: WPI Faculty
From: Committee on Academic Operations (Jagan Srinivasan, Chair)
Re: Motion to add RBE 4540: Vision-based Robotic Manipulation

Motion: On behalf of the Robotics Engineering Department, the Committee on Academic Operations recommends and I move that RBE 4540: Vision-based Robotic Manipulation, as described below, be added.

Proposed Course Description:

RBE 4540 Vision-based Robotic Manipulation (Cat. I).

This course focuses on the role of visual sensing in robotic manipulation. It covers fundamental manipulation concepts such as mathematical grasp formulations, grasp taxonomies, and grasp stability metrics. Various grasp planning strategies in the literature are studied. 2D and 3D vision-based control algorithms are covered. Point cloud processing techniques that allow object detection, segmentation, and feature extraction are studied and implemented. Students will integrate all of these aspects to design the whole vision-based robotic manipulation pipeline.

Students cannot receive credit for both 450X and 4540.

Recommended background: Knowledge of robot kinematics, wrench spaces, and rigid body transformations as presented in RBE 3001. Familiarity with robotic simulation software as presented in RBE 3002.

Rationale:

This course will provide complementary knowledge for undergraduate robotics engineering students in robotic grasping and manipulation, vision-based control, and point cloud processing.

The course was offered twice as an experimental course and received very positive feedback (course evals of 4.5/5). The course has been in high demand, with course enrollments of 30 students in each term it was taught, with full wait lists. Currently there are no courses in the RBE undergraduate curriculum that covers topics such as how to synthesize stable grasps that enable robots picking objects, how the visual information is utilized to control the full pose of the robot, how to formulate a manipulation problem mathematically and derive practical solutions considering the robotics hardware and software. As such, the resources to equip the RBE students to implement full manipulation pipeline that unifies image/point cloud processing, object-robot interactions, and high-level reasoning are limited. These knowledge and skills taught in this course are in high demand in several industries, including manufacturing, logistics (warehouse management), assistive/service technologies, and waste recycling, among many others. Robotic manipulation is also an active research domain, and the materials covered in this course will give the students a significant lead on recent developments. The course is designed to minimize overlaps and achieve continuity with the RBE 3001-3002 series. The course uses simulations as the main form of implementation, and the students will gain significant practical experience in various image processing and robot coding tools. If real robot setups become available for educational use, they can easily be integrated into the course content.

Intended audience: All RBE senior year students and advanced junior year students.

Expected enrollment: 30

Preferred term: A

Anticipated Instructor: Prof. Berk Calli

Other RBE faculty who could also teach the course: Jing Xiao, Nitin Sanket, Mahdi Agheli

Resource Needs:

- Berk Calli is planned to teach this course. Jing Xiao’s research is also directly related to this course.
- The course population will be limited to 30. No special requirements are needed for the classroom other than the 30-student capacity.
- The course will require 1 TA or grader support. If additional TAs are provided, the course capacity can go up to 60 students.
- Students will be able to use their own computers during the lab hours.
- This course does not have a primary textbook. It utilizes various research papers, and some chapters of the books that are available in our library.
- The course will require ROS-installed virtual machines, which are available through the RBE department.

Assessment: The course will be assessed via student feedback, and instructor feedback and reflections at the end of each offering. Students' ratings about the instructor and the overall course content as well as the total time spent by the students outside the formally scheduled classes will be considered as the primary indicators.

Contact: Prof. Berk Calli

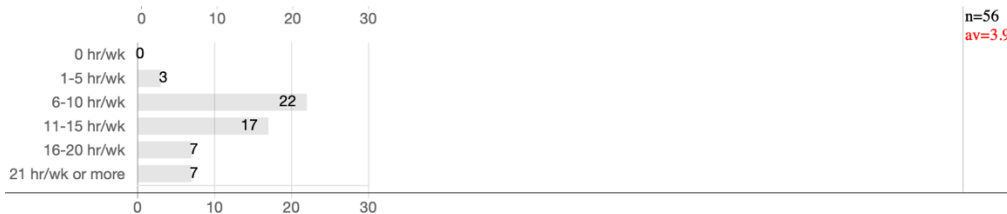
Appendix: Information about prior experimental offerings of the course:

Prior Enrollments:

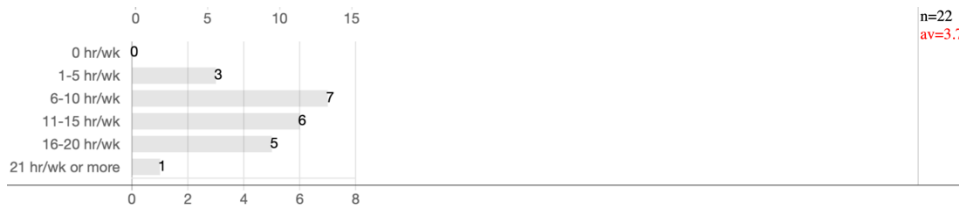
- In the academic year 2021-2022, the course was offered in the A term and was enrolled in full capacity with 30 students. The waiting list was also full with 5 students.
- In the academic year 2022-2023, the course was offered in the A term and was enrolled by 28 students (initially the course was enrolled with full capacity and a full waiting list. However, there were two last minute drops).

Prior Course Evaluations:

- In the academic year 2022-2023, the overall rating of the course was 4.5 (19 students completing the survey). The overall rating of the instructor's teaching was 4.3 and the educational value of the assigned work was 4.5. The amount students learned from the course relative to other courses was 4.4. The following is the number of hours students reported spending on the course:



- In the academic year 2021-2022, the overall rating of the course was 4.5 (22 students completing the survey). The overall rating of the instructor's teaching was 4.4 and the educational value of the assigned work was 4.7. The amount students learned from the course relative to other courses was 4.4. The following is the number of hours students reported spending on the course.



Date: February 2, 2023
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Medich, Chair)
Re: Motion to add AE 5096 Independent Study

Motion: On behalf of the Aerospace Engineering Department, the Committee on Graduate Studies and Research recommends and I move that the following new graduate course in Aerospace Engineering be established.

Proposed Course Description:

AE 5096. Independent Study

An independent study may be used as a substitute for an existing AE graduate course or as an opportunity to study an aerospace engineering topic not currently offered as a graduate course at WPI. The course can be offered to a student or a group of students. The deliverables are determined by the instructor.

Credits: variable

Prerequisites:

Determined by the instructor.

Rationale:

The AE 5096 Independent Study adds flexibility to the MS and PhD students.

Anticipated Instructors: Any faculty member from the AE Department can be the instructor of record for the AE 5096.

Resources: No additional resources are required.

Implementation: 2023-2024 Academic year.

Date: February 2, 2023
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Medich, Chair)
Re: Motion to modify MS program requirements in Aerospace Engineering

Motion: On behalf of the Aerospace Engineering Department, the Committee on Graduate Studies and Research recommends and I move that the MS program requirements in Aerospace Engineering be modified, as described below.

Description of the Proposed Changes:

The changes apply to both the BS/MS and MS program descriptions in the 2022-23 Graduate Catalog (pg. 42-44).

(Additions/revisions are underlined, deletions in ~~strikethrough~~.)

M.S. in Aerospace Engineering Degree with Thesis Option

The Master of Science degree with thesis option requires the completion of 30 graduate credit hours and is suitable for students interested in research with a focus in a specific area. ~~are encouraged to select the The M.S. AE degree with thesis~~ The thesis option ~~which~~ requires a minimum of 8 graduate credit hours in AE 5099 MS Thesis. Students must select a thesis advisor from the AED faculty prior to registration in AE 5099. The thesis advisor also serves as the academic advisor of the student. The thesis submission follows WPI's rules.

The distribution of credits for the M.S. in AE degree with the thesis option is as follows:

- 20 graduate credits in Aerospace Engineering with
 - A minimum of 2 graduate credits in each of the five AE Curricular Areas: Fluid Dynamics; Propulsion and Energy; Flight Dynamics and Controls; Materials and Structures; General Aerospace Engineering Topics (including Special Topics and Independent Study)
 - A minimum of 8 graduate credits in MS Thesis AE 5099
 - 0 graduate credits for four terms in Aerospace Engineering Seminar (AE 5032)
- 10 graduate credits in electives with
 - 8 graduate credits in free electives inside or outside AE (including Special Topics and Independent Study)
 - 2 graduate credits in applied mathematics (MA 501, MA 511, or any other course with the prior approval of the AE graduate committee)

TOTAL 30 Credits

M.S. in Aerospace Engineering Degree with Non-Thesis Option

The Master of Science degree with non-thesis option requires the completion of 30 graduate credit hours.

The distribution of credits for the M.S. in AE degree with non-thesis option is as follows:

~~The distribution of credits is as follows:~~

- 20 graduate credits in Aerospace Engineering with
 - A minimum of 2 graduate credits in each of the five AE Curricular Areas: Fluid Dynamics; Propulsion and Energy; Flight Dynamics and Controls; Materials and Structures; General Aerospace Engineering Topics (including Special Topics and Independent Study)

A maximum of 8 graduate credits in AE Research, of which up to 3 may be in Graduate Internship Experience (AE 5900) and the remaining in Directed Research (AE 5098)

0 graduate credits for four terms in Aerospace Engineering Seminar (AE 5032)

10 graduate credits in electives with

- 8 graduate credits in free electives inside or outside AE (including Special Topics and Independent Study)
- 2 graduate credits in applied mathematics (MA 501, MA 511 or any other course with the prior approval of AE graduate committee)

TOTAL 30 Credits

Rationale:

The changes reflect the introduction of the independent study courses AE 5096 and adds flexibility.

Resources and Anticipated Instructors: None.

Implementation: Implementation date for this action is the 2023-2024 Academic year.

Date: February 2, 2023
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Medich, Chair)
Re: Motion to modify the Ph.D. program requirements in Aerospace Engineering

Motion: On behalf of the Aerospace Engineering Department, the Committee on Graduate Studies and Research recommends and I move that the AE Ph.D. program requirements be modified, as described below.

Description of the Proposed Changes:

2022-23 Graduate Catalog pg. 45:
(Additions/revisions are underlined, deletions in ~~strikethrough~~.)

Ph.D. in Aerospace Engineering directly from B.S. (90 credits)

For students proceeding directly from B.S. degree to Ph.D. degree, the 90 credits should be distributed as follows:

~~30 graduate credits in courses~~

~~• 18 graduate credits in AE courses (incl. Special Topics, ISP and Graduate Internship Experience)~~

~~• 8 graduate credits in courses in or outside of AE~~

~~• 2 graduate credits in applied mathematics (MA 501, MA 511 or any other course with the approval of AE graduate committee)~~

~~• 2 graduate credits in computational methods (AE 5031, or any other course with the approval of the AE graduate committee)~~

~~30 graduate credits in Dissertation Research (AE 6099)~~

~~30 graduate credits in~~

~~• Additional coursework~~

~~• Additional Dissertation Research (AE 6099)~~

~~• Supplemental Research (AE 5098, AE 6098)~~

~~0 graduate credits for 1 term in AE 6999 Ph.D. Qualifying Examination~~

~~0 graduate credits for all terms during residency in AE 5032 Aerospace Engineering Colloquium~~

~~TOTAL 90 credits~~

- 30 graduate credits in courses distributed as follows:
 - A minimum of 2 graduate credits in each of the five AE Curricular Areas: Fluid Dynamics; Propulsion and Energy; Flight Dynamics and Controls; Materials and Structures; General Aerospace Engineering Topics (including Special Topics and Independent Study)
 - A maximum of 10 graduate credits in AE courses (including Special Topics, Independent Study and Graduate Internship Experience)
 - A maximum of 8 graduate credits in courses in or outside of AE (including Special Topics and Independent Study)
 - 2 graduate credits in applied mathematics (MA 501, MA 511 or any other course with the approval of AE graduate committee)
- 30 graduate credits in Dissertation Research (AE 6099)
- 30 graduate credits in
 - Courses in or outside of AE (including Special Topics and Independent Study)

- Dissertation Research (AE 6099)
- Supplemental Research (AE 5098, AE 6098)
- 0 graduate credits for 1 term in AE 6999 Ph.D. Qualifying Examination
- 0 graduate credits for all terms during residency in AE 5032 Aerospace Engineering Colloquium

TOTAL 90 credits

Ph.D. in Aerospace Engineering directly from M.S. (60 credits)

For students proceeding from Master's to Ph.D. degree, the 60 credits should be distributed as follows:

- ~~12 graduate credits in AE courses (incl. Special Topics, ISP and Graduate Internship Experience)~~
- ~~30 graduate credits in Dissertation Research (AE 6099)~~
- ~~18 graduate credits in~~
 - ~~courses in or outside of AE~~
 - ~~Dissertation Research (AE 6099)~~
 - ~~Supplemental Research (AE 5098, AE 6098)~~
- ~~0 graduate credits for 1 term during residency in AE 6999 Ph.D. Qualifying Examination~~
- ~~0 graduate credits for all terms during residency in AE 5032 Aerospace Engineering Seminar~~

~~TOTAL 60 credits~~

- 12 graduate credits in AE courses (including Special Topics, Independent Study and Graduate Internship Experience)
- 30 graduate credits in Dissertation Research (AE 6099)
- 18 graduate credits in
 - Courses in or outside of AE (including Special Topics and Independent Study)
 - Dissertation Research (AE 6099)
 - Supplemental Research (AE 5098, AE 6098)
- 0 graduate credits for 1 term during residency in AE 6999 Ph.D. Qualifying Examination
- 0 graduate credits for all terms during residency in AE 5032 Aerospace Engineering Seminar

TOTAL 60 credits

Rationale:

The changes reflect the introduction of the independent study courses AE 5096 and adds flexibility.

Resources and Anticipated Instructors: None.

Implementation: Implementation date for this action is the 2023-2024 Academic year.

Date: February 2, 2023
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Medich, Chair)
Re: Motion to remove CE 536: Construction Failures

Motion: On behalf of the Department of Civil, Environmental, and Architectural Engineering, the Committee on Graduate Studies and Research recommends and I move that CE 536: Construction Failures be removed.

Course Description to be Removed:

CE 536: Construction Failures: Analysis and Lessons

This course develops an understanding of the integration process of technical, human, capital, social and institutional aspects that drive the life cycle of a construction project. The study of failures provides an excellent vehicle to find ways for the improvement of planning, design and construction of facilities. Student groups are required to complete a term project on the investigation of a failure and present their findings and recommendations. This investigation includes not only the technical analysis of the failure but also requires a comprehensive analysis of the organizational, contractual and regulatory aspects of the process that lead to the failure. The course uses case studies to illustrate different types of failure in the planning, design, construction and operation of constructed facilities. Students taking this course are expected to have a sound academic or practical background in the disciplines mentioned above. Credits: 3

Rationale:

This course has not been taught in the past 10 years. The faculty member who used to teach this class is retired, and CEAE no longer has the resources to offer this course.

Resource Needs: There are no changes to resource requirements.

Impact on Distribution Requirements and Other Courses: This course removal will not have any significant impact on students as students have many other options for graduate courses. This course is not required for any graduate degrees.

Implementation: 2023-2024 Academic Year

Contact: Jeanine D. Dudle

Date: February 2, 2023
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Medich, Chair)
Re: Motion to remove CE 538. Pavement Analysis and Design for Highways and Airports

Motion: On behalf of the Department of Civil, Environmental, and Architectural Engineering, the Committee on Graduate Studies and Research recommends, and I move that CE 538. Pavement Analysis and Design for Highways and Airports be removed.

Course Description to be Removed:

CE 538. Pavement Analysis and Design for Highways and Airports

This course is designed for civil engineers and will provide a detailed survey of analysis and design concepts for flexible and rigid pavements for highways and airports. The materials will cover elastic and inelastic theories of stress pavement components and currently used design methods, i.e., Corps of Engineers, AASHTO, etc. The use of finite element methods for pavement stress and deformation analysis will be presented. A review of pavement rehabilitation methods and processes will be presented. (Prerequisites: differential equations, construction materials, soil mechanics, computer literacy.)

Rationale:

This course has not been taught since the Fall of 2019. From 2012 to 2017, it was offered every fall with an average population of 4 students per offering (range: 0 – 8). The faculty member who used to teach this class is no longer at WPI, and CEAE no longer has the resources to offer this course.

Resource Needs: There are no changes to resource requirements.

Impact on Distribution Requirements and Other Courses: This course removal will not have any significant impact on students as the department does not have a focus on pavements, and thus student demand is negligible. This course is not required for any graduate degrees.

Implementation Date: 2023-2024 Academic Year

Contact: Jeanine D. Dudle

Date: February 2, 2023
To: WPI Faculty
From: Committee on Committee on Graduate Studies and Research (Prof. Medich, Chair)
Re: Motion to remove CE 567: Hazardous Waste: Containment, Treatment and Prevention

Motion: On behalf of the Department of Civil, Environmental, and Architectural Engineering, the Committee on Graduate Studies recommends, and I move that CE 567. Hazardous Waste: Containment, Treatment and Prevention be removed.

Course Description to be Removed:

CE 567: Hazardous Waste: Containment, Treatment and Prevention

This course provides a survey of the areas associated with hazardous waste management. The course materials deal with identification of hazardous waste legislation, containment, storage, transport, treatment and other hazardous wastes management issues. Topics include hazardous movement and containment strategies, barrier design considerations, hazardous waste risk assessment, spill response and clean-up technologies, centralized treatment facilities, on-site treatment, in situ treatment, and industrial management and control measures. Design of selected containment and treatment systems, and a number of industrial case studies are also covered. This course is offered to students with varying backgrounds. Students interested in taking this course must identify a specific problem that deals with either regulation, containment of hazardous waste, treatment of hazardous waste or industrial source reduction of hazardous waste. This problem becomes the focal point for in-depth study. The arrangement of topics between the students and the instructor must be established by the third week. A knowledge of basic chemistry is assumed.

Rationale:

In the past 10 years, this course has only been offered twice (Fall 2013 and Fall 2017). This course was most recently taught by an adjunct faculty member; CEAE no longer has the resources to offer this course.

Resource Needs: There are no changes to resource requirements.

Impact on Distribution Requirements and Other Courses: This course removal will not have any significant impact on students as the department offers many other courses in environment engineering. This course is not required for any graduate degrees.

Implementation Date: 2023-2024 Academic Year

Contact: Jeanine D. Dudle

Date: February 2, 2023
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Medich, Chair)
Re: Motion to remove CE 592: Constructed Facilities Seminar

Motion: On behalf of the Department of Civil, Environmental, and Architectural Engineering, the Committee on Graduate Studies and Research recommends, and I move that CE 592: Constructed Facilities Seminar be removed from the graduate catalog.

Course Description to be Removed:

CE 592: Constructed Facilities Seminar
Participation of students, faculty and recognized experts outside of WPI in developing modern and advanced topics of interest in the constructed facilities area. Credits: 3

Rationale:

This course has not been offered in the past 10 years.

Resource Needs: There are no changes to resource requirements.

Impact on Distribution Requirements and Other Courses: This course removal will not have any significant impact on students as it is not utilized in any graduate programs at this time.

Implementation Date: 2023-2024 Academic Year

Contact: Jeanine D. Dudle

Date: February 2, 2023
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Medich, Chair)
Re: Motion to change the description and title of ECE 574 Modeling and Synthesis of Digital Systems Using Verilog and VHDL

Motion: On behalf of the *ECE Department*, the Committee on Graduate Studies and Research recommends and I move that following catalog changes for the course description of ECE 574 be approved.

Description of Proposed Changes:

Current course description:

ECE 574 MODELING AND SYNTHESIS OF DIGITAL SYSTEMS USING VERILOG AND VHDL
(3 credits)

This is an introductory course on Verilog and VHDL, two standard hardware description languages (HDLs), for students with no background or prior experience with HDLs. In this course we will examine some of the important features of Verilog and VHDL. The course will enable students to design, simulate, model and synthesize digital designs. The dataflow, structural, and behavioral modeling techniques will be discussed and related to how they are used to design combinational and sequential circuits. The use of test benches to exercise and verify the correctness of hardware models will also be described. Course Projects: Course projects will involve the modeling and synthesis and testing of systems using Xilinx tools. We will be targeting Xilinx FPGA and CPLDs. Students will need to purchase a FPGA or CPLD development board for project assignments. (Other VHDL tools may be used if these are available to the student at their place of employment.) Students will have the choice of completing assignments in either Verilog or VHDL. (Prerequisites: Logic Circuits and experience with programming in a high-level language (such as C or Pascal) and a computer architecture course such as ECE 505.)

Proposed course description (in red):

ECE 574 ADVANCED DIGITAL SYSTEMS DESIGN (3 credits)

This course introduces digital systems design using hardware description languages and their associated tooling to capture, integrate, verify, simulate, and synthesize digital hardware. The course will examine modern hardware design flows using high-level synthesis and register-transfer-level (RTL) synthesis. The course covers the role of hardware description languages in the verification, simulation, and integration process of hardware modules in large digital systems. The course projects offer an integrated experience in advanced digital systems design combining hardware description languages, hardware design methodologies, and hardware design practice on a programmable target such as a Field Programmable Gate Array, or on a chip-level target such as a standard-cell Application-Specific Integrated Circuit. (Prerequisites: Basic digital design, Experience with programming in a high-level language).

Rationale:

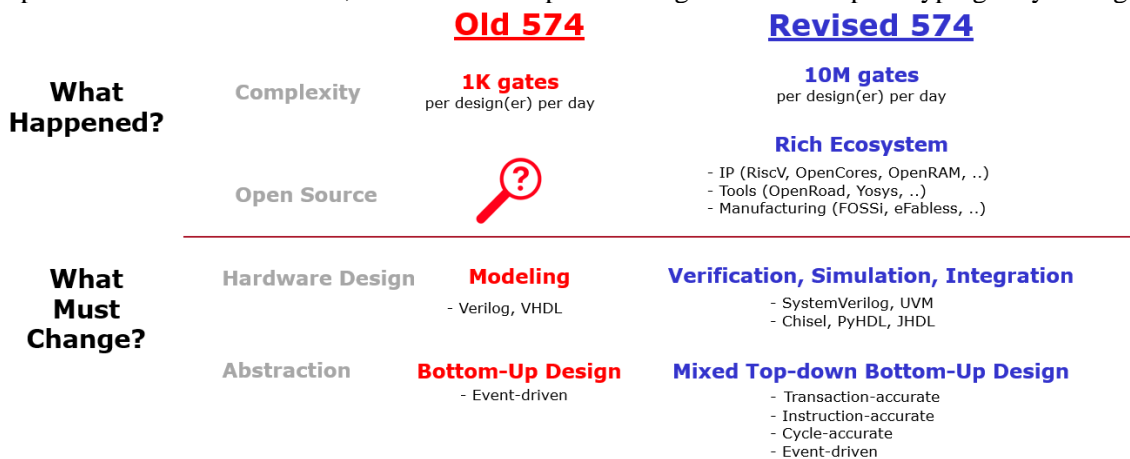
The reason for changing the course title and description is that the current version of the course description and the topics covered is not up to date with the practice of modern digital design in several aspects. Verilog and VHDL were developed over 30 years ago, reflecting digital design practice that was common at that time. Due to technological advances and market forces, hardware design productivity has since increased by orders of magnitude, and this has profoundly affected the digital design process. While Verilog and VHDL are still prevalent, they no longer offer a comprehensive experience in hardware design. Modern hardware design emphasizes verification, simulation, and integration, in addition to traditional function-level and circuit-level specialization in hardware. The hardware ecosystem, the hardware design languages, and hardware tooling have changed towards open-source environments and higher abstraction levels of design, using novel domain-specific languages. Some of the terms in the original course description, such

as CPLD and Pascal, are outdated by decades. Because of this, we propose a revision of the course that captures better the needs of a modern hardware design course.

Additional information:

40 years ago, the world of chip design was profoundly affected by the publication of the book ‘Introduction to VLSI systems’ by Carver Mead and Lynn Conway. The book was based upon a course they taught at Caltech, Berkeley and MIT. Up until then, integrated circuit design was an ad-hoc process, and it was commonly taught as ‘drawing layouts’ in which a chip is directly developed at the lowest level of abstraction (physical polygons), and in which the chip design is completed by technology experts. The Mead and Conway book was insightful in pointing out that chip design is more than drawing layouts; namely that there are higher level concepts such as controllers, data paths, circuit timing, synchronous computation, that strongly influence the quality of the resulting chip. Our present day thinking on VLSI Design is still strongly influenced by the concepts of Mead and Conway’s textbook.

Similarly, we see that the world of hardware design is undergoing rapid innovation as well. The original concept of ECE 574, based on Verilog/VHDL hardware design, stems from the mid 80’s, and represents a traditional vision on hardware design: rigid, bottom-up, technology specific, incapable of integration. But in 2022, hardware design has moved on. While Verilog and VHDL are still the primary means to get from a textual representation of hardware to a digital chip implementation, there are many aspects in hardware design that are no longer adequately captured with Verilog and VHDL based methodologies. As an aside, the course description mentions Pascal which was a popular programming language in the 80’s. The course description also mentions CPLDs, which were the pinnacle digital hardware prototyping 40 years ago.



There are two major innovative forces in hardware design. The first one is complexity. Digital hardware design faces drastically increased design complexity. Classic methodologies such as RTL level design can generate a few kilogates per designer per day, while modern chips require design productivities of millions of gates per designer per day. The use of high-level synthesis and the use of hardware design libraries is used to cover some of the needed productivity gaps. The second innovative force is open-source design. Hardware design used to be a from-scratch, bottom-up design activity in which every artifact was developed as an isolated entity. Nowadays, hardware design looks more like software design: there is a rich open-source ecosystem including open modules such as processors and memory modules, open tooling to support customized hardware design flows, and even open manufacturing to support low-cost hardware prototyping and broad access to hardware design.

To address the changing world of hardware design, we propose to revise ECE 574 in two areas: first, in hardware modeling, and second, in hardware abstraction. Regarding the first area, there are a great number of innovative hardware modeling techniques that have been proposed (and that are in industrial use) to address specific challenges related to hardware system testing, hardware system prototyping, and to

handling design complexity. While Verilog/VHDL will remain a centerpiece of the revised 574 course, it is essential to relate the traditional hardware modeling techniques to new efforts (SystemVerilog, UVM, Chisel, PyHDL, ...). Regarding the second area, even though Verilog/VHDL are said to support bottom-up and top-down design, digital design practice has stuck with bottom-up design. As an example, every textbook that one can find with 'Verilog' or 'VHDL' in the title typically starts with a chapter on combinational logic design, followed by sequential logic design, and ending with the 'most complex' case of a finite state machine with data path design. This is indicative of bottom-up design, and of the way things were done three decades ago. A sound hardware methodology must recognize the value and purpose of higher abstraction levels of modeling, and their use in a combined bottom-up, top-down process. Hardware modeling techniques must cover multiple levels of abstraction, and they must be compatible with non-hardware artifacts such as processors and system simulation environments

Impact on Degree Requirements: No Changes.

Resources and Anticipated Instructors: No changes.

Implementation Date: 2022-2023 Academic Year.

Date: February 2, 2023
To: WPI Faculty
From: Committee Graduate Studies and Research (Prof. Medich, Chair)
Re: Motion to terminate the graduate and certificate programs in System Dynamics

Motion: On behalf of the Department of Social Science and Policy Studies, the Committee on Graduate Studies and Research recommends and I move that the graduate and certificate programs in System Dynamics be terminated.

Description of Motion:

This motion would terminate the following certificate and degree programs the System Dynamics:

- Certificate Program in System Dynamics
- M.S. in System Dynamics
- M.S. in Systems Modeling
- Ph.D. in System Dynamics.

Descriptions of these programs will be removed from the WPI Graduate Catalog that now appear in the 2022-23 version on pages 216-220.

This motion would also remove the following graduate courses:

- SD 550: System Dynamics Foundation: Managing Complexity
- SD 551: Modeling and Experimental Analysis of Complex Problems
- SD 552: System Dynamics for Insight
- SD 553: Model Analysis and Evaluation Techniques
- SD 554: Real World System Dynamics
- SD 556: Strategic Modeling and Business Dynamics
- SD 557: Latent Structures, Unintended Consequences, and Policy
- SD 558: Introduction to Agent-Based Modeling
- SD 560: Strategy Dynamics
- SD 561: Energy and Environmental Dynamics
- SD 562: Project Dynamics
- SD 565: Macroeconomic Dynamics
- SD 590: Special Topics

Descriptions of these course will be removed from the WPI Graduate Catalog that now appear in the 2022-23 edition on pages 371-374.

Rationale:

The program has had no new students in three years and there are no current master students. The program has suspended accepting new students for several years.

Our goal is to integrate System Dynamics (SD) and Systems Thinking (ST) in our Science and Technology for Innovation in Global Development program and our new Complex Systems Analysis and Policy Lab. This move will enable students interested in SD/ST to have course options at the graduate level without committing to an entire degree program. These courses would also support the systems engineering program. By integrating these programs and courses we will better deploy our scarce resources while creating educational opportunities that appeal to current students across several programs.

Impacts on students: There are several PhD students, but they have progressed beyond their course work and are registered through the interdisciplinary Ph.D. option.

Resource Needs: No new resources are required.

Implementation Date: 2023-2024 Academic Year

Contact: Robert Krueger, SSPS

Date: February 2, 2023
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Medich, Chair)
Re: Motion to change the degree requirements of the Master's Program in Industrial Mathematics

Motion: On behalf of the Department of Mathematical Sciences, the Committee on Graduate Program recommends and I move that the degree requirements of the Professional Master of Science in Industrial Mathematics Program be changed as described below.

Description of the Proposed Changes:

(Deletions in ~~Red Strikethroughs~~ and Additions in Blue)

Professional Master of Science in Industrial Mathematics Program

This is a practice-oriented program that prepares students for successful careers in industry. The graduates are expected to be generalized problem-solvers, capable of moving from task to task within an organization. In industry, mathematicians need not only the standard mathematical and statistical modeling and computational tools, but also knowledge within other areas of science or engineering. This program aims at developing the analytical, modeling and computational skills needed by mathematicians who work in industrial environments. It also provides the breadth required by industrial multidisciplinary team environments through courses in ~~one area of~~ science or engineering, ~~e.g., physics, computer science, mechanical engineering, and electrical and computer engineering.~~

The connection between academic training and industrial experience is provided by an industrial professional master's project or internship that involves the solution of a concrete, real-world problem originating in industry. The department, through the industrial connections of the faculty affiliated with the Center for Industrial Mathematics and Statistics, may help students identify and select suitable industrial internships. Graduates of the program are expected to start or advance their professional careers in industry.

Degree Requirements

The master's program in Industrial Mathematics requires a minimum of 30 credit-hours of coursework. ~~Additional credit from coursework may be required by the department depending on the student's background. Students must complete four foundation courses: MA 503, MA 510, and two courses out of MA 508, MA 509, MA 529, and MA 530.~~

Students must complete four foundational courses, which include MA 500*, MA 510, and two other courses from either MA 501, MA 508, MA 530, and/or MA 540.

(* Students who have taken a rigorous real analysis course (at the level of WPI's undergraduate MA 3831 / MA 3832 sequence or above) should substitute this course by a more advanced analysis or measure theory course such as MA 503, MA 505 or MA 528.

Students must also ~~complete~~ develop a 12-credit-hour module composed of ~~two courses within the department and a sequence of two courses from one graduate program outside the Mathematical Sciences Department. The department offers a wide selection of modules to suit students' interest and expertise.~~ 6 credits of coursework in Mathematical Sciences and 6 credits of coursework from a graduate program outside of Mathematical Sciences.

Up to six credits of upper-level (i.e., 4000-level) undergraduate courses in mathematics or another department may be taken for graduate credit, subject to the approval of the program coordinator.

In addition, students are required to complete a 3-credit-hour elective from the Mathematical Sciences Department and a 3-credit-hour master's project or internship on a problem originating from industry. Candidates are required to successfully complete the Professional Master's Seminars MA 562A and MA

562B. The Plan of Study and the project or internship topic require prior approval by the departmental Graduate Committee, program coordinator.

Note: Students pursuing a B.S./M.S. degree should consult the specific requirements in section “B.S./M.S. in Mathematical Sciences”.

Examples of Modules for the M.S. Degree in Industrial Mathematics

~~The courses comprising the 12-credit module should form a coherent sequence that provides exposure to an area outside of mathematics and statistics, providing at the same time the mathematical tools required by that particular area. Examples of typical modules are:~~

- ~~• Dynamics and control module—MA 512, MA 540, ME 5220, 5221, 5222, 5223;~~
- ~~• Materials module—MA 512, MA 526, and ME 5311;~~
- ~~• Fluid dynamics module—MA 512, MA 526, ME 511 and ME 5101, 5102, 5103;~~
- ~~• Biomedical engineering module—MA 512, MA 526, BME/ME 550 and BME/ME 552;~~
- ~~• Machine learning module—MA 540, MA 541, CS 509 and CS 539;~~
- ~~• Cryptography module—MA 533, MA 514, CS 503 and ECE 578.~~

For examples of course modules that can be designed for the M.S. degree in Industrial Mathematics, please see the following website:

<https://www.wpi.edu/academics/study/industrial-mathematics-ms>

Rationale:

This motion updates the degree requirement of the Master’s Program in Industrial Mathematics to reflect the current practices and course offerings of the department, while permitting additional flexibility to support students in pursuing the degree. Specifically, the motion:

- Updates wording in the program description to encourage broader options for students to develop their own course modules in areas of interest to them (and to accommodate changes in offerings since the last catalog update)
- Adds language to allow students the potential to earn credit for internships
- Updates the foundation course requirements to permit students entering the program with different analysis backgrounds to take an appropriate analysis course and to replace out-of-date courses with current course offerings in a range of foundational topic areas for industrial mathematics
- Updates wording to describe module requirements in terms of credits (instead of courses) to allow for more flexibility in building appropriate modules of interest to the students
- Adds text explicitly describing options for counting 4000-level courses towards the MS degree (using language consistent with Applied Mathematics MS program)
- Adds text referring BS/MS students to the section describing specific coursework / double counting requirements for BS/MS degree
- Replaces out-of-date examples of modules with link to program website, where we will include more current examples

Implementation: 2023-2024 Academic Year

Impact on Degree Requirements: Students enrolled in the Industrial Mathematics MS program prior to the effective date of change above will be permitted to either follow the program requirements per their year of admittance or the updated program requirements.

Resources Needed: No new resources are needed.

Appendix: Current and Proposed Graduate Catalog Text:

Current Text:

Professional Master of Science in Industrial Mathematics Program

This is a practice-oriented program that prepares students for successful careers in industry. The graduates are expected to be generalized problem-solvers, capable of moving from task to task within an organization. In industry, mathematicians need not only the standard mathematical and statistical modeling and computational tools, but also knowledge within other areas of science or engineering. This program aims at developing the analytical, modeling and computational skills needed by mathematicians who work in industrial environments. It also provides the breadth required by industrial multidisciplinary team environments through courses in one area of science or engineering, e.g., physics, computer science, mechanical engineering, and electrical and computer engineering.

The connection between academic training and industrial experience is provided by an industrial professional master's project that involves the solution of a concrete, real-world problem originating in industry. The department, through the industrial connections of the faculty affiliated with the Center for Industrial Mathematics and Statistics, may help students identify and select suitable industrial internships. Graduates of the program are expected to start or advance their professional careers in industry.

Degree Requirements

The master's program in Industrial Mathematics requires a minimum of 30 credit-hours of coursework. Additional credit from coursework may be required by the department depending on the student's background. Students must complete four foundation courses: MA 503, MA 510, and two courses out of MA 508, MA 509, MA 529, and MA 530.

Students must also complete a 12-credit-hour module composed of two courses within the department and a sequence of two courses from one graduate program outside the Mathematical Sciences Department. The department offers a wide selection of modules to suit students' interest and expertise.

In addition, students are required to complete a 3-credit-hour elective from the Mathematical Sciences Department and a 3-credit-hour master's project on a problem originating from industry. Candidates are required to successfully complete the Professional Master's Seminars MA 562A and MA 562B. The Plan of Study and the project topic require prior approval by the departmental Graduate Committee.

Examples of Modules for the M.S. Degree in Industrial Mathematics

The courses comprising the 12-credit module should form a coherent sequence that provides exposure to an area outside of mathematics and statistics, providing at the same time the mathematical tools required by that particular area. Examples of typical modules are:

- Dynamics and control module—MA 512, MA 540, ME 5220, 5221, 5222, 5223;
- Materials module—MA 512, MA 526, and ME 5311;
- Fluid dynamics module—MA 512, MA 526, ME 511 and ME 5101, 5102, 5103;
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- Machine learning module—MA 540, MA 541, CS 509 and CS 539;
- Cryptography module—MA 533, MA 514, CS 503 and ECE 578.

Proposed Text:

Professional Master of Science in Industrial Mathematics Program

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Up to six credits of upper-level (i.e., 4000-level) undergraduate courses in mathematics or another department may be taken for graduate credit, subject to the approval of the program coordinator.

In addition, students are required to complete a 3-credit-hour elective from the Mathematical Sciences Department and a 3-credit-hour master's project or internship on a problem originating from industry. Candidates are required to successfully complete the Professional Master's Seminars MA 562A and MA 562B. The Plan of Study and the project or internship topic require prior approval by the departmental program coordinator.

Note: Students pursuing a B.S./M.S. degree should consult the specific requirements in section "B.S./M.S. in Mathematical Sciences".

Examples of Modules for the M.S. Degree in Industrial Mathematics

For examples of course modules that can be designed for the M.S. degree in Industrial Mathematics, please see the following website: <https://www.wpi.edu/academics/study/industrial-mathematics-ms>