WORCESTER POLYTECHNIC INSTITUTE
May 10, 2016

To: The WPI Faculty

From: M. W. Richman
Secretary of the Faculty

The ninth Faculty meeting of the 2015-2016 academic year will be held on **Tuesday, May 10, 2016 at 11:00 am in Olin Hall 107,** with refreshments at 10:45 am**.**

1.	Call to Order	M. Richman
	• Consideration of the Minutes and the Consent Agenda	
2.	Opening Announcements	M. Richman
3.	Provost's Remarks	B. Bursten
4.	Committee Reports	
	• Committee on Advising and Student Life (CASL) - Insight Faculty Advisors: Recognition and General Information	S. Olson
	• Committee on Governance (COG) - Update on Progress to Date Concerning Promotions	G. Gaudette
5.	Committee Business	
	• Committee on Academic Operations (CAO) - May 2016 Undergraduate Student Graduation List	S. Sturm
	• Committee on Graduate Studies and Research (CGSR) - May 2016 Graduate Student Graduation List	M. Demetriou
	• Committee on Governance (COG) Committee on Graduate Studies and Research (CGSR) - Motion to revise the membership of CGSR	G. Gaudette M. Demetriou
6.	New Business	
7.	Old Business	
8.	Closing Announcements	
9.	Adjournment	

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WORCESTER POLYTECHNIC INSTITUTE
Faculty Meeting Minutes
April 14, 2016

Summary:
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2. Opening Announcements
3. Committee Business: COG/FAP; COG/CGSR
4. Committee Reports: COG
5. Adjournment

Detail:
1. Call to Order
The eighth meeting of the 2015-2016 academic year was called to order at 3:20pm in OH 107 by **Prof. Richman** (ME). The minutes from March 17, 2016 were approved with one modification. The consent agenda was approved as distributed.

2. Opening Announcements
Prof. Richman announced that the Faculty Honors Convocation would be held on April 22nd at 11am in the Campus Center Odeum, and encouraged all faculty members to attend. Prof. Richman announced that election ballots for the Faculty governance standing committees would be distributed in time to conclude the elections before the end of the academic year.

Dean Cyganski (ECE) announced that a celebration honoring the winners of the Gordon Prize (Dean Vaz, Dean Wobbe, Dean Heinricher, and Prof. Apelian) will be held on April 18 at 2:30pm in Alden Hall. The celebration will include a panel discussion moderated by Pres. Leshin, with panelists Dean Vaz, Dan Mote (Pres., National Academy of Engineering) Lynn Pasquerella (Pres., Mt. Holyoke College), and Mark Russell (WPI Trustee and Corporate VP of Engineering Technology and Mission Assurance at Raytheon).

Prof. Billiar (BME), as the co-Chair of the Dean of Engineering search committee, indicated that airport interviews had been scheduled and open sessions for the candidates invited to campus will be scheduled very soon. **Prof. Richman** stressed the importance of attending these open sessions, and encouraged those outside of the engineering departments to attend, as well. **Prof. Gericke** (CBC), as a member of the VPR search committee, indicated that four candidates will be interviewed on campus. He reiterated the importance of strong participation in the open sessions. **Prof. Gericke**, as co-Chair of the search for the VP of Talent Development and Chief Diversity Officer (CDO), explained that talent development focuses on the relational aspect of human resources and that that the combination of talent development and CDO into one position is relatively new to universities. He anticipated that open sessions for the final candidates would be held in early May with the intention to conclude the search by the end of May.

Dean Snoddy (Assoc. Dean of Students) reminded those in attendance that if they needed commencement regalia, then the bookstore would order it for them free of charge.

Provost Bursten announced that to date, 12 TTT positions had been filled for the upcoming academic year, with several additional offers pending.

3. Committee Business
Committee on Governance (COG)/Committee on Administrative and Financial Policy (FAP):
Prof. Dominko (BBT), for the Committee on Governance, and **Prof. El-Korchi** (CEE), for the Committee on Administrative and Financial Policy, moved that the current language of Bylaw One, Section VIII of the Faculty Handbook describing FAP's membership, charge, and name be revised as described in the meeting materials. Prof. El-Korchi explained that the proposed change in membership is to add one faculty member to FAP who will be appointed by COG for a one-year term renewable for up to three consecutive years and

will be chosen to diversify the skill sets of the committee members. The added member will ease the workload of the committee and will ensure that the committee is able to function well even in the absence of one of its members. The charge has been extended beyond "policy" to include informing the Faculty on all administrative and financial "matters" that affect WPI. Finally, FAP's name would be changed to the Committee on Financial and Administrative Policy. (See **Addendum #1** attached to these minutes.) The motion **passed** without further discussion.

Committee on Governance (COG)/Committee on Graduate Studies and Research (CGSR):
Prof. Dominko (BBT), for the Committee on Governance, and **Prof. Demetriou** (ME), for the Committee on Graduate Studies and Research, described a motion to revise the membership of CGSR. Prof. Demetriou explained that the motion would maintain nine members of CGSR and that six would remain as elected faculty members and one would remain as an appointed graduate student. However, the representative of the Provost's Office would be converted to the Vice Provost for Research (ex officio) and that the Director of Continuing Education would be replaced by the Dean of Graduate Studies (ex officio). The charge of the committee would remain unchanged. (See **Addendum #2** attached to these minutes.)

Prof. Gericke (CBC) did not understand why, given CPE's important role in delivering graduate credits, it made sense to eliminate the CPE representative as a voting member of CGSR. **Prof. Dominko** pointed out that, in the view of both CGSR and COG, the charge of CGSR (as described in the Faculty Handbook) now overlaps with the combined responsibilities of the Dean of Graduate Studies and the VPR. Prof. Dominko explained that with the expansion of the responsibilities of a full time DoGS for course and program development combined with the VPR's responsibilities for research activities, CGSR would be fully served by having members who are academics qualified to judge those matters. She emphasized that input from CPE representatives would be invited whenever discussions arose about programs associated with or facilitated by CPE. Prof. Gericke felt that the question of whether CGSR should include a representative from CPE was obscured by other changes in the proposed motion.

Provost Bursten expressed his opposition to the motion, and has already asked CGSR to be more inclusive. He explained that CPE serves corporate and professional clients, many of whom are not under the purview of our DoGS, who has a large role to play in bringing forward the Ph.D. Plan and working with very different students. His preference was to include the DoGS, the VPR, and a representative from CPE as voting members and to add another elected faculty member if needed to alleviate any concerns about having too many administrators on CGSR. **Prof. Demetriou** explained that the Director of Continuing Education was placed on CGSR when the Dean of Graduate Studies and Research was a single position. Since then, the positions have been split into two and now both are full time positions. With those added responsibilities, CGSR feels that all graduate programs should be under the purview of the Dean of Graduate Studies.

Prof. Fehribach (MA) asked if a representative of CPE could be a non-voting member of CGSR. **Prof. Demetriou** anticipated that the Director of CPE would be an invited non-voting guest, as currently are the Director of Graduate Admissions, the Registrar, and the Director of Academic Programs. **Prof. Dominko** reiterated that such an arrangement would leave academic matters to the Faculty, with input from key stakeholders solicited whenever appropriate.

Pröf. Overström (BBT) supported the inclusion of both the DoGS and the VPR as voting members, but was concerned about excluding the Director of CPE as a voting member of the committee given the magnitude of CPE's current credit delivery. He pointed out that all graduate programs originate in individual departments, so the Faculty has control of those programs.

Dean Cyganski cited Systems Engineering, Fire Protection Engineering, and Power Systems Engineering as important programs delivered through CPE, and pointed out that the function of CPE is also to find audiences for and help modify programs that are suitable for corporate audiences. He believed that a representative of CPE should be retained as a member of CGSR to ensure good communication. **Prof.**

Demetriou pointed out that good communication on these issues can be achieved without voting membership.

Prof. McNeill echoed the sentiment that communication doesn't need to equal a vote. He did not understand how, on the one hand, we say that CPE courses are no different than any other WPI graduate courses, but on the other hand, say that CPE needs special representation on CGSR. He also pointed out that our regular graduate students take online courses. So, in his view, there is not a distinct CPE interest that needs to be represented on CGSR, and two administrators provide sufficient representation on the committee.

Prof. Gatsonis (ME) agreed that CPE has a very distinct role in working with corporate audiences. However, he believed that the Faculty are concerned about the fact that in the past five or six years, CPE has overlapped into our academic activities. As he understands the accounting, CPE gets credit for all sections of courses delivered online, formally appoints faculty members to teach those sections, and conducts course evaluations that do not flow through the Dean's office. Prof. Gatsonis interpreted the motion as just one way that faculty members have to express these concerns. He urged the Provost and the Deans to address these concerns by bringing academic programs back to academic offices.

Prof. Saeed (SS&PS) asked if the business wing of the university should be telling us how to deliver course content.

VP Flavin (VP, ACD) thought that the questions raised today were legitimate but would be better addressed with inclusion rather than exclusion. He affirmed his confidence in the VPR and Dean of Graduate Studies to represent the interests of CPE, but he felt strongly that a voting CPE representative on the committee would bring an important and beneficial perspective to CGSR's deliberations.

Provost Bursten questioned the description of CPE as the business wing of WPI, and indicated that CPE reports to the Provost in his role as Chief Academic Officer. He thought it was outrageous that there was something to fear from mid-course evaluations, and expressed his view that the motion had become an all-out attack on CPE. He interpreted the remarks of Prof. Gatsonis and Prof. Saeed as having doubted the academic standards of CPE. **Prof. Dominko** pointed out that, according to WPI's organizational chart, the Director of CPE reports to the VP of Academic and Corporate Development (ACD), and the VP of ACD does not report to the Provost. According to this structure, CPE is not part of any academic division of the university.

Prof. Richman urged anyone with further questions or comments to contact Prof. Gaudette (COG Chair), Prof. Dominko (COG Secretary) or Prof. Demetriou (CGSR Chair).

4. Committee Reports

Committee on Governance (COG)

Prof. Richman (ME), for the Committee on Governance, presented a report on WPI's TTT/NTT credit-delivery balance from fall 2004 to spring 2015. **(See Addendum #3 attached to the file copy of these minutes.)**.

Prof. Richman reviewed the four main elements of the Appendix D of the WPI Faculty Constitution:

- The tenured and tenure track (TTT) Faculty are committed to delivering a significant majority of the academic credit offered to WPI students.
- WPI meets this commitment by ensuring that the TTT Faculty grows at a rate commensurate with the growth of the University.
- Non-tenure track (NTT) faculty members enhance new and existing programs, and complement and expand scholarly expertise on campus.
- COG will present a report to the Faculty each year concerning the distribution of teaching done by TTT and NTT faculty members.

Prof. Richman explained that from fall 2004 to spring 2015 the total number of credits delivered at WPI increased by 54 percent while the TTT faculty headcount increased by 12 percent (from 217 to 243), the fraction of credits delivered by the TTTs decreased from 65 percent to 51 percent, and the number of credits delivered per TTT faculty member increased by 8 percent (from 332 to 359). In the same time period, the number of full time equivalent (FTE) NTTs increased by 91 percent (from 75 to 143), the fraction of credits delivered by the NTTs increased from 35 percent to 49 percent, and the number of credits delivered per (FTE) NTT faculty member increased by 13 percent (from 510 to 576). Prof. Richman also showed how (in 2014-2015) the fraction of credits delivered by TTTs varied from division to division and from department to department, and how the load per TTT faculty member varied by rank. He also pointed out that of the credits delivered by CPE (excluding the online credits that were incorporated into the main body of the report), 27 percent were delivered by TTT faculty members.

Prof. Richman also provided a preliminary glance at the current academic year, indicating that since the previous year the number of FTE undergraduate students had increased by 1.5% (from 4150 to 4213) and the number of FTE graduate students has increased by 6.4 percent (from 1284 to 1366), while the number of TTT's has increased by 2.0 percent (from 243 to 248) and the number of FTE NTT's has increased by 13.9 percent (from 143 to 163). These numbers suggest that the fraction of credits delivered by TTTs might be below 50 percent this year.

Prof. Richman, in order to focus the discussion on future planning, concluded with two of his own "back-of-the-envelope" calculations suggesting that WPI would need approximately 40 new TTT faculty members for the TTT faculty to deliver 60 percent of the WPI's academic credits, and we would need approximately 42 new TTT faculty members to increase our research awards by 50 percent in three years.

In response to a question from **Prof. Heilman** (CBC), **Prof. Richman** explained that according to standard IPEDS accounting, each part time NTT faculty member is counted as one-third of a full-time equivalent. **Dean Heinricher** indicated that a more careful calculation done at WPI several years ago demonstrated that the crude one-third conversion factor was actually quite accurate.

Prof Humi (MA) was concerned that the hiring of adjunct NTTs was not carefully vetted by members of the Faculty and that eventually this could do damage to our academic reputation**. Prof. Richman** reported that, of the 143 full-time equivalent NTTs, 93 are full-time and 150 are part-time. The guidelines in the Faculty Handbook do include formalized hiring procedures for full-time NTTs that involve relevant faculty oversight, but those guidelines do not include any procedures for hiring part-time NTTs.

Dean Wobbe (UG) pointed out that in the last few years, while the number of TTTs has increased, the number of credits taught per TTT faculty member has decreased. Dean Wobbe also pointed out that a way to increase the total number of credits delivered by TTTs is to increase the number of credits taught per TTT, and that this could be done, for example, by shifting some TTTs to larger enrollment classes.

Prof. Gericke (CBC) pointed out that the departments with the lowest percentages of credits delivered by TTTs are those (CBC, PH, MA) with large first-year enrollments. In his view, the fraction of credits delivered by TTTs does not amount to a pedagogical statement. However, he was concerned about the ratio of TTT faculty to (FTE) NTT faculty, which is currently equal to 1.7. He pointed out that the average score (4.35) for CBC faculty on question #2 of the course evaluations for first-year courses is quite high, while those courses are taught by a particularly high number of NTTs. Prof. Gericke described a number of scenarios in the CBC department in which it made sense – given his limited resources - to have NTTs teach higher enrollment courses. In his view, departmental data does not do justice to the complexity of the problem. **Prof. Richman** emphasized that the data shown today is not meant to measure teaching quality. But the willingness of the TTT faculty to deliver a significant majority of our academic credits is a measure of the Faculty's commitment to our students and to our institution. Prof. Richman also urged Department Heads to think beyond simply "making do" with the current number of TTTs, and instead to use the data to see that we need more TTTs to reach our teaching and research commitments realistically.

Prof. Fehribach (MA) was concerned that the credits delivered by TTTs could be increased by simply making sure that TTTs were placed in large enrollment classes. **Prof. Richman** agreed that, in principle, it might be possible to shift teaching assignments to increase the credits delivered by TTTs but that might be at odds with the funded research commitment in the Strategic Plan.

Prof. Rahbar (CEE) asked if we knew about national averages of TTT- and NTT-credit delivery at other universities. **Prof. Richman** had not collected that information, and explained that a problem is in deciding which schools against whom to benchmark, and then extracting this credit-delivery data from those institutions. **Prof. Dominko** (BBT) made the point that after applying just a few key institutional characteristics, there are actually only a few institutions against which we can compare ourselves.

Prof. Weekes (MA) pointed out that COG was presenting the data as required in the Faculty Handbook. She also emphasized that regardless of how we might benchmark against other institutions, the TTT faculty has documented its commitment to deliver a significant majority of our credits

VP Flavin (ACD) pointed out that the CPE credits identified in the presentation did not include online credits. **Prof. Richman** clarified that this year, as always, COG included the online credits in the main body of the presentation. **VP Sullivan** (Asst. VP, Acad. Affairs) explained that the CPE credits identified in the COG report are those that are delivered off campus. VP Flavin thought that it was misleading to separate the on-line credits from the off-campus credits in measuring the credits delivered by CPE.

A motion to extend the meeting for ten minutes was seconded and **passed**.

Provost Bursten expressed his gratitude to the NTT faculty, whose efforts allow TTT faculty members to increase their productivity. He pointed out that the baseline year (2004-2005) of COG's report was a time of financial difficulty at WPI. He reminded those in attendance that the commitment of both TTT and NTT faculty members was to deliver quality instruction to our students and to reach our strategic goals. He described a time while he was Dean at a large public university when the TTT faculty there responded to double-digit budget cuts by increasing the number of credits they delivered by 19 percent. Provost Bursten expressed his view that the statement in the Faculty Handbook that the "…TTT Faculty are committed to delivering a significant majority of the academic credit offered to WPI students" is sometimes not interpreted correctly. He pointed out that the credits delivered per TTT has decreased since 2009-2010 and he did not believe that the decrease was due entirely to the hiring of 95 assistant professors whose teaching loads are typically lighter than those of associate and full professors. He asked the TTT Faculty to show its commitment to delivering a significant majority of the credits. Finally, he pointed out that last year the TTTs grew by five, and the hope was to grow by another five next year.

6. Adjournment
The meeting adjourned at 5:00pm.

Respectfully submitted,

Mark Richman
Secretary of the Faculty

Addenda on file with these minutes:
1. **COG-FAP Motion to modify FAP's Membership, Charge, and Name – April 14, 2016**
2. **COG-CGSR Revision of CGSR's Membership – April 14, 2016**
3. **COG-Report on WPI's TTT/NTT Credit-Delivery Balance – April 14, 2016**

Date: May 10, 2016
To: WPI Faculty
From: Committee on Academic Operations (Prof. Sturm, Chair)
RE: Undergraduate Student Graduation List
This is a PENDING list for May 14, 2016. Please notify the Office of the Registrar if there are any questions or concerns at extension 5211

Bachelor of Arts

Environ & Sustain Studies:
Alexander Carli-Dorsey
Chelsea Louise Costa
{ Double Major }
Luke Christian Pantuosco
Erich William Weltsek
{ Double Major }

Bachelor of Science

Actuarial Mathematics:
Ahmed Blanco Amado
- minor: Computer Science
Catherine Jean Bonner
Jeremiah Campanelli
- minor: Business
Caylee Mae Cartwright Chunga
- minor: Business
Cecily Ann Coia
- minor: Business
John Joseph Cotter, Jr.
- minor: Business
Linette Claire Davis
- minor: Business
- minor: Music
Branden Joseph Diniz
- minor: Business
Samuel Joseph Ellison
- minor: Business
Scott Phillip Lonergan
- minor: Business
Dayna Lee Madeiros
- minor: Business
Brittany Alexandra Mowe
Alexander Keiya Shoop
{ Double Major }
Bowei Wei

Aerospace Engineering:
Michelle Acevedo
Benjamin Matthew Andrews
Mica Anglin
Michael Robert Barney
Jonathan David Blythe
Krzysztof Adam Borowicz
- minor: Computer Science
Casey Tucker Brown
Christopher James Cahill
Abigail Marie Cervelloni
- minor: Robotics Engineering
Nicholas Christopher Christie
Thomas M. Cieslewski, Jr.
John William Colfer
- minor: Electrical & Computer Eng.
Ruxandra Duca
- minor: Electrical & Computer Eng.
- minor: Spanish
Emily Anne Dunham
- minor: Management Information Systems
Jackson Nicholas Andrew Gillenwaters
Alyssa Nicole Hollander
- minor: Electrical & Computer Eng.
Jared Michael Kepron
Justin Andrew Marsh
Luis Diego Paredes
- minor: Robotics Engineering
Emily Tina Perry
Stephanie Marie Rivard
Andrej Samardzic
- minor: Business
Miles Ryan Schuler
- minor: Materials
Dylan Michael Shields
Cody Slater
- minor: Physics
Ashley Antoinette Smith
- minor: Psychology
Daniel Dean Thiesse
Christian Alexis Zelaya

Architectural Engineering:
Corrado Addonisio, Jr.
Sonia Armida Banegas Nunez
Caroline Bartlett
Andrea Yvonne Bourke
{ Double Major }
Sopheaktra Chhim
Despoina Giapoudzi
{ Double Major }
Andrea Michelle Goldstein
Zachary David Harmony
Rachel Marie Kennedy
Shuhan Liu
Erin Elizabeth Murphy
Jillian Elizabeth Proulx
Cesar Eduardo Rodriguez

Matthew Stephen Sabetta
Allyson Beatrix Smith
- minor: History
Yun Jae Sohn
Ali Yalaz

Biochemistry:
Marya Celina Manalo Aherrera
Katherine Ann Amato
Hailey Marie Cambra
Brynn Hayden Sawyer Cardozo
- minor: Writing and Rhetoric
Rashid Gogen Chatani
Victor Chau
John Henry de Rivera
Kayla DeSanty
{ Double Major }
Jessica Marjorie Desmond
- minor: Biology
Fernando Galvez
Michael James Giroux
- minor: Bioinformatics & Computat Bio
Joshua Hall
Tamika Taylor Isaac
Erika Kollitz
{ Double Major }
Sravya Malempati
- minor: Spanish
Ingrid Marko
Mitra Marvasti-Sitterly
Julie Marie Mazza
{ Double Major }
Sarah Jean Monteith
Arianna Jill Roche Nitzel
- minor: Drama/Theatre
Bonham James Pierce
Rachel Ann Prescott
- minor: Law and Technology
Kevin Roopcharan
Saloni Sachar
Paige Elizabeth Salerno
Kayleigh Ann Sullivan
- minor: Writing and Rhetoric
Yi Sun
{ Double Major }

Bioinformatics & Computat Bio:
Xavier Jackson
- minor: Computer Science
Tete Zhang
{ Double Major }

Biology and Biotechnology:
Elior Anina
- minor: Psychology
Nicole Ann Baker
- minor: Spanish
Heather Marie Bartlett
Cara AiXin Berner
Victoria Shelby Botelho
Alessandra Maria Cerio
Francesca Louisa Cerio
Veronica Lynn Coyle
- minor: Spanish
Camneil Daly
Kayla DeSanty
{ Double Major }
Stephanie Rose Esmond
- minor: Psychology
Katherina Ainaz FathiBitaraf
Nathan Anthony Ferron
- minor: Philosophy and Religion
Sarah Kathleen Gardinier
Shannon Herlihy Guertin
Maureen Hester
Paulina Marie Karabelas
Sakshi Khurana
- minor: Entrepreneurship
Jessica Larsen
Nicholas Alexander Lemere
Kathryn Elizabeth Liziewski
Ashilly Mendes Lopes
Yasmeen Luna
Daniel MacVeigh-Fierro
Julie Marie Mazza
{ Double Major }
Paula Elizabeth Miller
Sunny Sang Huynh Nguyen
- minor: Bioinformatics & Computat Bio
Veroniki Nikolaki
- minor: Spanish
Christina Michelle Noyes
Florentia Nicole Ong
- minor: Economics
Lauren Marie Puishys
- minor: Environ & Sustain Studies
Megan Robidas
Jake Francis Rogers
- minor: Biochemistry
Victoria Ashley Scott
Nicolle Alexandra Shandrow
Tammy Kate Zamaitis
Tete Zhang
{ Double Major }

Biomedical Engineering:
Kevin Saile Ackerman
- minor: Chemistry
- minor: Music
Jamal James Akid
Stephanie Arce
Amanda Marie Ricardo Baltazar
- minor: Biology
- minor: Chemistry
Timothy John Biliouris
- minor: Business
Mary Kathryn Elizabeth Bindas
Derek Brinkman
- minor: Law and Technology
Tyler James Burns

Katie Candiloro
Edward Caputo
Kailey Joelle Castellano
Kathleen Elizabeth Correia
Anny Evelen Vilas Boas Cunha
Connor Redmond Darling
Grace Marion Davis
Jacquelyne Marie DiTroia
Duc Minh Do
Clare Ellen Doolin
Timothy Curtis Dow
Nadjia Hope Edwards
Stephanie Fariello
- minor: Biology
Sarah Rose Gabor
Dulguun Gantulga
Dennis Giaya
- minor: Electrical & Computer Eng.
Lindsay Guoying Gotts
- minor: Biology
Sean Russell Greene
{ Double Major }
- concentration in Biomechanical
Keith Paul Guay
{ Double Major }
Anne F. Harris
- minor: Computer Science
Danielle Healy
- minor: Entrepreneurship
Alexa Lee Hiznay
Ato Agyenkwah Howard
Jordan Darnell Jones
Serissa Joelle Jones
- minor: Biology
Julia Caulfield LaValley
{ Double Major }
Kevin Li
{ Double Major }
Vivian Liang
{ Double Major }
Zachary William Lipsky
- minor: Biology
Kevin W. Lou
Alison Lee Marotta
- minor: Materials
Breahna Irene Mattie
Caroline Mazzola

Raquel Mendoza Cabral
- minor: Mechanical Engineering
Mina-Mark Micheal Andres Monterroso
- minor: Business
Sean David Murphy
Mollie Ruth Myers
- minor: International Studies
Krisha Dona Nazareth
- minor: Electrical & Computer Eng.
Samantha Marie Neeno
- minor: Robotics Engineering
William Dao Ethan Noiles Gardner
Dalton Matthew Oakley
Selahaddin Sencer Ozkan
{ Double Major }
Elizabeth Pellegrini
- minor: Materials
Kate Emily Piotrowicz
{ Double Major }
Nathaniel Porter
Alexandra Susanne Price
- minor: Materials
Johanna Eleanor Santos
Nicholas Scrivanich
- minor: Computer Science
Gaetano Joseph Scuderi
- minor: Biology
Zachary Eugene Sellman
- minor: Chinese Studies
Nicolas Coelho Silva
Sarah Ann Sisson
Brian Sokoloff
Rebecca Ann Stolarczyk
- minor: Bioinformatics & Computat Bio
Deanna Deakin Stueber
Anisa Swei
Patricia Ann Swierk
Chi Nguyen Ta
- minor: Mechanical Engineering
Craig Steven Teed, Jr.
- minor: Chemistry
Julie Anne Tevenan
Richard Eric Thyden
Crystal Bhavdeep Trivedi
Sydney Elizabeth Tucker
Samantha Stephanie Varela
Paige Regan Waechter
Daniel Joseph Youkana
Nathalie Kate Zakrzewski

Chemical Engineering:
Ibrahim Abu Muti
Abdullah M. Almaymuni
Mohammed Saleh Alrayas
Mohammed Saeed Babkoor
- minor: Business
Rebecca Mae Barolli
Samuel Vincent Bergstrom
Elora Virginya Borkowski
- minor: Law and Technology
Melissa Ann Boule
- minor: Materials
Jaclyn Grace Bouvier
Andrea Nicole Boxell
- minor: Materials
Emily Grace Brecher
John Edward Caliri, Jr.
Matthew Vincen Carpenter
Rachel Elaine Cody

- minor: English
Jennifer Ann Coffey
Chelsea Nicole Conlon
Thomas William Cormier, Jr.
Matheus Augusto de Farias da Silva
{ Double Major }
- minor: German
- minor: Biochemistry
Nyoca Nyora Davis
- minor: Materials
- minor: Chinese Studies
Meghan Alexandra Dawe
- concentration in Environmental
- minor: Materials
Analise Teresa DeBaie
Daniela De la Fuente
Jiawen Michelle Dong
Andrew Curtiss Egger
- minor: Business
Mikayla Rose Filippone
Samuel Vaughn Flibbert
- minor: Materials
Corin Alvino Lerner Galati
{ Double Major }
Hannah Liberty Gallagher
Meghan Elizabeth Goodwin
KiJana Michael Davin Haney
Aaron Jacob Harshman
Rexford Whittier Hoadley
Cody John Holmes
Victor Waiman Hu
- minor: Biochemistry
Minxue Jia
{ Double Major }
- concentration in Biological
Courtney Michelle Jones
Seth Joshua Kamens
- concentration in Environmental
- minor: International Studies
Kevin Joseph Kerhulas
Iordanis Kesisoglou
David Ryan Knutson
George Ryker Kuegler
Oliver Peter Lizotte II
Adam Martin Macsata
Akshat Nagpal
- concentration in Biomedical
Andrew Thomas Ollerhead
Kristin Carol Olson
- minor: Writing and Rhetoric
Jessica Lynn Orr
- minor: English
Joseph Edward Ostrowski
Daniel John Ouellette, Jr.
Mark Overdevest
Michael J. Owens
Victoria Patterson
Joseph Nicholas Pizzuto
Hannah Bridget Reinertsen
- concentration in Environmental
Samantha Marie Ricci
Allison G. Rivard
- minor: Environ & Sustain Studies
- minor: International Studies
Hannah Elizabeth Robinson
Kathleen Mary Ross
Vincent Michael Sabo
Earl Michael Schiffhauer, Jr.
Kayleigh Ann Shaughnessy
Trevor Shaw
- minor: Entrepreneurship
Alex Wayne Silva
- concentration in Materials
Caitlin Marie Swalec
- concentration in Environmental
- minor: English
Kai Tang
Michael Joseph Terranova
Gianna Marie Terravecchia
Kevin Truc
- concentration in Materials
Halsey Vandenberg
- minor: Computer Science
Jonathan Vardner
Mariana Cravo Vertoni
Huyen Bich Vu
- minor: Materials
Brent Jeffery Young
- concentration in Materials
Jacob Robert Zagorski
Fengfan Zhu
{ Double Major }
- concentration in Materials
Kathryn Marie Ziegler
Alexander Joseph Zitoli
- minor: International Studies
Torin Zonfrelli
{ Double Major }

Chemistry:
Mario Enrique Alvarado
- concentration in Medicinal Chemistry
Vincent N. Azzolino
Hazel Anne Fargher
- minor: Mathematics
Kady Marisa Ferguson
- minor: Biology
Corin Alvino Lerner Galati
{ Double Major }

Hannah Hill
- concentration in Medicinal Chemistry
- minor: Music
Minxue Jia
{ Double Major }
Brian James O'Day
Jessica Lynne Taylor
Charles Robert Wentzell
Fengfan Zhu
{ Double Major }

Civil Engineering:
Robert Warren Antoine
- concentration in Environmental
Miryam Rae Becker
- minor: Sustainability Engineering
Alex Donald Bell
Tanner Reed Burke
Nicholas Lloyd Campbell
{ Double Major }
- minor: History
Adam Gregory Carrier
Christopher J. Cerruti
- concentration in Environmental
Ethan James Collins
Johnpatrick Connors
- minor: History
Nicholaus Allen Crossman
Vincent D'Ambrosio
Nicola Richard DiLibero III
Christopher Dobens
Haley Marie Dyer
Nicholas H. Engle
Christopher John Flanagan
Connor Patrick Flanagan
- minor: Economics
Kyle Bryan Foley
Carly Marie Giannini
Edward F. Giles III
Katherine Lynn Hedberg
- minor: Architectural Engineering
Coleman McLean Horsley
- minor: Materials
- minor: History
Kristen Deborah Hunt
- minor: Psychology
Malina Ferrari Ibelle
- concentration in Environmental
John Schulmeister Karlin
- minor: Business
Alexander Travis Klose
- minor: Architectural Engineering
Ronelle Ruby LeBlanc
Ryan Loucks
Julia Anne MacLeod
Jonathan Nicholas Mirabito
{ Double Major }
Amy May-Irene Misera
Haley Elizabeth Morgan
- concentration in Environmental
Rita Ping Newman
- concentration in Environmental
- minor: Business
Obiora Ofokansi
Matheus Pereira
Brigitte Chloe Perera
- minor: International Studies
Shannon Marie Rice
Benjamin Root
- concentration in Environmental
Lucas Michael Roy
Kelsey Lea Snyder
- concentration in Environmental
Jeremy Dylan Soderholm
Juan David Torres Betancur
- minor: Business
Jennifer Christine Wallace
Thomas Mills Washburn
Adrienne Lee Weishaar
- minor: International Studies

Computer Science:
Joseph Randall Acheson
Amanda Ann Adkins
{ Double Major }
Joshua Nicholas Allard
Brett Lowell Ammeson
- minor: Music

Sean Amos
- minor: Mathematics
Michael Andrews
Rafael de Castro Lessa Angelo
{ Double Major }
John Alfred Baia
- minor: Interactive Media & Game Dev
Ryan Daniel Baker
Philipp Henry Baumann III
Alec Robert Benson
Daniel John Benson
Barry D. Biletch
{ Double Major }
Alexander Carleton Bragdon
John Breen IV
Nicholas Francis Brown
- minor: Electrical & Computer Eng.
Nathaniel Michael Bryant
{ Double Major }
Andrew Busch
Justin Daniel Canas
- minor: Bioinformatics & Computat Bio
Thomas John Clark
Peter Craft
Patrick Desmarais
Punit Dharani

Anthony Daniel Dresser
{ Double Major }
Robert Esposito
{ Double Major }
Hongbo Fang
Eric Faust
{ Double Major }
Michael W. French
{ Double Major }
Anthony Richard Gallo
Tony Garside
Christopher Sean Gillis
{ Double Major }
Christian P. Gonzalez
Keenan Ryan Gray
{ Double Major }
Thomas Grimshaw
Andrew Waiming Han
Jillian Rose Hennessy
- minor: Spanish
Youwei Hu
{ Double Major }
Nathan Harold Hughes II
{ Double Major }
Lukas Laurence Hunker
{ Double Major }
Nicholas Andrew Kalamvokis
- minor: Electrical & Computer Eng.
Joshua Elijah Keller
{ Double Major }
Tri Kha Khuu
{ Double Major }
Khazhismel Kumykov
{ Double Major }
Sam La
Andrew La Manna
Peter Arthur Leondires
Tianyu Li
Xia Li
Yuchen Liu
- minor: Management Information Systems
Peerapat Luxsuwong
{ Double Major }
Patrick Lynch
Sean MacEachern
{ Double Major }
Samuel Forrest Mailand
- minor: Electrical & Computer Eng.
Kevin Paul Martin III
Robert Edward McKenna
{ Double Major }
Nicholas Paul McMahon
- minor: Spanish
Theodore Meyer
Julian R. Moore
Miguel Angel Mora
- minor: Management Information Systems
Nicholas Matthew Muesch
Daniel M. Murray
- minor: Robotics Engineering
Fangming Ning
- minor: Electrical & Computer Eng.
Batyrlan Nurbekov
{ Double Major }
Lindsay O'Donnell
- minor: Interactive Media & Game Dev
Thomas John Paolillo
Nilesh Chiman Patel
Laurentiu Pavel
{ Double Major }
Benjamin Peake
{ Double Major }
Oscar Perez III
{ Double Major }
Patrick Hartley Plenefisch
- minor: Electrical & Computer Eng.
Connor Geoffrey Porell
{ Double Major }
John William Rogers Pryor
{ Double Major }
Shadi Ryan Ramadan
Zachary Robert Richards
- minor: Business
Anthony A. Romeo
Andrew Joseph Roskuski
Anthony Joseph Ruffa
Ceren Savasan
{ Double Major }
Etienne-Alexandre Scraire
Thomas Alexander Sellie-Lund
Benjamin Sharron
{ Double Major }
Alexander Keiya Shoop
{ Double Major }
William Everett Spurgeon
{ Double Major }
Caleb Martin Stepanian
- minor: Electrical & Computer Eng.

Samantha Lauren Swartz
{ Double Major }
Dalton Scott Tapply
Alec Jeffrey Thompson
{ Double Major }
Mi Tian
Cem Mehmet Unsal
{ Double Major }
- minor: Mathematics
- minor: Electrical & Computer Eng.
Doruk Can Uzunoglu
Xiaosong Wen
- minor: Mathematics
Frederick Murphy Wight
Xiaoman Xu
Kevin Zhao
{ Double Major }
Hui Zheng

Economic Science:
Matheus Augusto de Farias da Silva
{ Double Major }
- minor: German
- minor: Biochemistry

Electrical & Computer Eng.:
Muhammad E. Abid
Alexander Robert Arnold
Caroline Mamdouh Atteya
- minor: Manufacturing Engineering
- minor: Spanish
Brian Baggaley
Stella Banou
- minor: Spanish
Scott Tyler Bento
Mark Bentson
Thomas Potter Buonomano
- minor: Environm & Sustainable Studies
Paul Joseph Calamari
Daniel James Campbell

Nicholas Foster Cebry
{ Double Major }
- minor: Computer Science
Jonas Ciemny
Princesa Mercedes Cloutier
- minor: Spanish
Angela-Marie Conklin
Jason Correia
Robert Charles Crimmins
{ Double Major }
Zachary Louis Culp
Colin P. Cunningham
Lea Holly Dighello
Brede Emil Doerner
Anthony Daniel Dresser
{ Double Major }
Alexander Ronald Dymek
William Kwame Senam Edor
Daniel Jeffrey Farrington
Karen Lois Fitch
Robert Howard Fleming
Sebastian Franco-Gomez
Charles John Frick
{ Double Major }
Felicia Marie Gabriel
Kathryn Anna Gillis
- minor: Computer Science
Jacob Alexander Grotton
Jon Paul Gualdarrama
Abby Elizabeth Wei Brackett Harrison
- minor: Computer Science
Brian William Harvey
Nicholas Hassan
{ Double Major }
Alex Manuel Maria Helderman
- minor: Computer Science

Meagan Hiatt
{ Double Major }
- minor: Chinese Studies
Daniel Charles Hill
Redon Ilirjan Hoxha
Lukas Laurence Hunker
{ Double Major }
Syed Shehroz Hussain
David Alan Kelly III
- minor: Computer Science
Joseph H.E. Keogh
Sara Kim
Eric Joseph Lacroix
Tian Luo
Kevin Ronald MacDougall
Caitlyn Nicole Marcoux
Jourdan Rae McKenna
Ryan Patrick McQuaid
Rigen Mehilli
Alejandro Jave Miranda
Justin John Morrow
- minor: Computer Science
Timothy Philip Neilan
{ Double Major }
Tyler Joseph Newman
Long Nguyen
- minor: Computer Science
William Thin Nguyen
Kaung Myat San San Oo
Dante Alighieri Pace
- minor: Computer Science
Laurentiu Pavel
{ Double Major }
Robert Michael Perry
Saraj Pirasmepulkul
{ Double Major }
Kaitlin Poss
Nicholas Bradley Potvin
Kelsey B. Powderly
George Karel Pytlik, Jr.
Risa Qirollari
George Peter Charles Randel
Adriana Mariel Reyes Rivera
- minor: Business
Blaine Christian Rieger
Santiago Rojas
- minor: Computer Science
Sebastian Rojas
Kevin M. Rondinone
Christopher E. Schramm
Brian Richard St Germain
Thomas Paul Sullivan
Yi Sun
Jacob Aaron Sussman
Alexander Mark Sylvia
Arsene Numbem Tchatchoua
Olawole Hakeem Tunde-Lukan
John Thomas Valley
- minor: Business
Joao Mauricio Casimiro Meira de Vasconce
{ Double Major }

Alex W. Velez
Emily Marie Wagner
- minor: Economics
Damani George Neil Walder
- minor: Computer Science
Teng Wang
Anthony James Martin Ward
Andrew James Weiler
- minor: Computer Science
James Stewart Whyte
{ Double Major }
- minor: Organizational Leadership
Ruxue Yang

Environmental Engineering:
Michael Bowen
Jessica Rita Caccioppoli
- minor: Environ & Sustain Studies
Deanna Clark
Ryan Christopher Clark
Brittany Lynn Colcord
- minor: German
Chelsea Louise Costa
{ Double Major }
Samantha Angell Foote
Douglas R. Geist II
Kevin Michael Gray
Thomas Aniello Hoctor
Grace Kathryn Howard
- minor: Business
Tatiana Dottori Huet De Bacellar
- minor: Chemistry
Alexandra Tooker MacLaren
David M. Manhardt
Kelsey Donnel Ouellette
- minor: Spanish
Casey Elizabeth Rota
Bryan Joseph Sadowski
Torin Zonfrelli
{ Double Major }

Humanities and Arts:
Despoina Giapoudzi
{ Double Major }
Sean Ryan McCarthy
{ Double Major }
Maeve Kathleen McCluskey
{ Double Major }
Erich William Weltsek
{ Double Major }

Industrial Engineering:
Sarah Abell
Mohamad Ahmad Alblaihess
- minor: Business
Julian Dano
Emily Elizabeth Doherty
- minor: Business
Nicolas Gomez Enriquez Riart
Reed Christopher Gontarek
Bryan Richard Jung
- minor: Mechanical Engineering
Samantha Mon-Ling Kwan
- minor: Management Information Systems
Elia T. Perez Luna Octavio
{ Double Major }
Zachary Michael Rahl
Emma Susan Raymond
{ Double Major }
- minor: Drama/Theatre
Amy Margaret Stevens
- minor: Spanish
- minor: Management Information Systems
Lailah Yasmina Thompson
- minor: English
Lingyi Xu
{ Double Major }
- minor: Entrepreneurship
- minor: International Studies
Yi Yang

Interactive Media & Game Dev:
Rafael de Castro Lessa Angelo
{ Double Major }
Jeffrey Michael Bardon, Jr.
Eric Robert Benson
- minor: Computer Science
William Emory Blackstone, Jr.
Nathaniel Michael Bryant
{ Double Major }
Fransesca Carletto-Leon
{ Double Major }
Jonathan Michael Decelle
Dillon Joseph DeSimone
Daniel Bronson Driggs
Bryce Alexander Dumas

Robert Esposito
{ Double Major }
Eric Faust
{ Double Major }
Michael W. French
{ Double Major }
William Oliver Frick
- minor: Computer Science
- minor: Music
Christopher Sean Gillis
{ Double Major }
Keenan Ryan Gray
{ Double Major }
John David Alexander Guerra
Sean Joseph Halloran
Jacob Tyler Hawes
Joseph Hill
Derek Alexander Johnson
Max Boileau Kinney

Stephen John Long
- minor: Computer Science
Kedong Ma
Sean MacEachern
{ Double Major }
Zackery Douglas Mason
Sean Ryan McCarthy
{ Double Major }
Maeve Kathleen McCluskey
{ Double Major }
Robert Edward McKenna
{ Double Major }
Benjamin Peake
{ Double Major }
Connor Geoffrey Porell
{ Double Major }
Peter Alexander Salem, Jr.
Ceren Savasan
{ Double Major }
Aaron M. Segal
Kevin Zhao
{ Double Major }

International Studies:
Samantha Ann Ervin
{ Double Major }
- minor: Environ & Sustain Studies
Elia T. Perez Luna Octavio
{ Double Major }
Yi Sun
{ Double Major }

Management Engineering:
David Philomeno Cardenas
- concentration in Civil Engineering
Brendan Christopher Connolly
- concentration in Mechanical Engineering
James Miguel Costello
- concentration in Operations Management
- minor: Entrepreneurship
Aaron Lionel Davis
- concentration in Operations Management
- minor: Entrepreneurship
Patrick Christopher Finn
- concentration in Civil Engineering
Elizabeth Rose Pagaduan Fitch
- concentration in Operations Management
Brianna Gabrielle Goncalves
- concentration in Operations Management
Zachary Michael Grasis
- concentration in Mechanical Engineering

Adam Jacob Hanna
- concentration in Mechanical Engineering
Morgan Hopeman
- concentration in Mechanical Engineering
- minor: Computer Science
Attila B. Kara
- concentration in Biomedical Engineering
Zachary Karalis
- concentration in Operations Management
Chandlor Lyles
- concentration in Mechanical Engineering
Dylan Wadsworth McCarthy
- concentration in ECE & Entrepreneurship
Lisa Michelle Mendez
- concentration in Operations Management
- minor: Entrepreneurship
Michael Joseph Moroney III
- concentration in Operations Management
Noelle D. Ouellette
- concentration in Operations Management
Elizabeth Ester Phan
- concentration in Electrical and Computer Eng
Carl Everette Pierce III
- concentration in Biomedical Engineering
Emma Susan Raymond
{ Double Major }
- minor: Drama/Theatre

Stephanie Rachael Symecko
- concentration in Operations Management
- minor: Industrial Engineering
Victor Manuel Vazquez
- concentration in Civil Engineering

Management Information Systems:
Daniel Cane
Abigail Marion DaBoll-Lavoie
- minor: Finance
- minor: Computer Science
Vincent James Doyle
Tyler James Greff
Philippe Warren Kelley
- minor: Computer Science
Jennifer Michaela Lally

- minor: Computer Science
- minor: Bioinformatics & Computat Bio
Yajie Li
Meghan Lutz
Kayla Marie McAvoy
- minor: Entrepreneurship
Nino Melikidze
- minor: Computer Science
- minor: International Studies
Nicholas Sloat
- minor: Computer Science
Haili Bella Welton
- minor: Entrepreneurship
Lingyi Xu
{ Double Major }
- minor: Entrepreneurship
- minor: International Studies
Chuankai Zhou

Management:
Alanah Haley Durr
Samantha Ann Ervin
{ Double Major }
- concentration in Social Entrepreneurship
- minor: Environ & Sustain Studies

Mathematical Sciences:
Laura Elizabeth Antul
- minor: Computer Science
Barry D. Biletch
{ Double Major }
Eric Vincent DeLisi
Leonard Jesse Fisher
- minor: Computer Science
Youwei Hu
{ Double Major }
Zitai Huang
Kathleen Rose Kay
Joshua Elijah Keller
{ Double Major }
Stephen Kelly
Jordan Ari Kovar
{ Double Major }
- minor: Computer Science
Khazhismel Kumykov
{ Double Major }
Richard Joseph O'Brien
- minor: Business
Oscar Perez III
{ Double Major }
Michael Perrone
- minor: Physics
Benjamin Sharron
{ Double Major }
Dennis Steven Silva, Jr.
- minor: Computer Science
Shuyang Sun
Johanna Tara Thomas
- minor: Computer Science

Jiaxun Xie
{ Double Major }
Hongji Yu
{ Double Major }
Borong Zhang

Mechanical Engineering:
Nathan Kendrick Clinton Alvord
- concentration in Mechanical Design
- minor: Robotics Engineering
Stephen Robert Arata
- concentration in Mechanical Design
- minor: Entrepreneurship
Sarah Melissa Bailey
- concentration in Mechanical Design
Ethan Barrieau
Evan Allington Baum
Jason Steven Beauregard
- concentration in Mechanical Design
Kelly Marie Beisswanger
George Carl Benda
- minor: Aerospace Engineering
Olivia Simone Bennett
- concentration in Biomechanical
Nicholas Earle Benson
- concentration in Robotics
Christina Joyce Bottom
Andrea Yvonne Bourke
{ Double Major }
Katrina Bradley
Grant M. Brining
Justin Brousseau
Maria Cristina Cantos Cabrera
- concentration in Robotics
Anthony Mario Capuano

Alexander Caracappa
{ Double Major }
Ryan Carello
Eleanore Mary Carson
- concentration in Robotics
Mark Samuel Chakuroff
- concentration in Mechanical Design
Andrea Yi War Chan
- minor: Electrical & Computer Eng.
Zachary Joseph Charland
Stacey Ruth Alves Chaves
- concentration in Aeronautics
Alexander Church

Matthew Thomas Clark
- minor: Materials
Aaron W. Cornelius
- concentration in Manufacturing
Eric Joseph Correia
- concentration in Biomechanical
Mariella Theresa Creaghan
- minor: Aerospace Engineering
Nathan G. Curtis
- minor: Materials
Tobin James Dancy
Nithin Das
Gabriel Demeneghi Ludke
Cameron Alan Dewallace
Peter Nicholas DiMaggio
- concentration in Mechanical Design
Lewis William DuBois
Matthew Ryan Dunster
- minor: Manufacturing Engineering
Jennifer Jean Eastaugh
- minor: Manufacturing Engineering
Jaime Elisabeth Espinola
- concentration in Biomechanical
- minor: Spanish
Paul Joseph Esteve
- concentration in Materials Science and Eng
Justin Michael Fahie
Jacquelyn Marie Fanning
- concentration in Manufacturing
William Emerson Farrar
- minor: Business
Jessica L. Faust
Thomas Joseph Fay
- concentration in Thermal-Fluid Engineering
Rida Fayyaz
Matthew R. Fegley
Daniel Felix
- concentration in Mechanical Design
Liam Patrick Fisher
Kingsley Flomo
Julianne Flynn
Kyle Paul Fortin
Joshua Chamberlain Friscia
{ Double Major }
Arthur John Fulgoni III
- concentration in Mechanical Design
- minor: Robotics Engineering
Benjamin Joseph Gaudet
Konstantinos Georgiadis
Nathan Ghion
- concentration in Thermal-Fluid Engineering
Connor Patrick Gillespie
Fernando Jose Gonzalez Navarro
Hannah Leigh Gouzias

Daniel Edward Carlotti Grande
- minor: Robotics Engineering
Benjamin Marx Greenbaum
- concentration in Mechanical Design
Mitchell Robert Greene
Sean Russell Greene
{ Double Major }
- concentration in Mechanical Design
James Henry Gruenbaum
- concentration in Mechanical Design
Keith Paul Guay
{ Double Major }
Danielle Nicole Haley
Brien Foster Hard
- minor: Aerospace Engineering
Rachel Adelaide Harrison
- concentration in Materials Science and Eng
- minor: Manufacturing Engineering
Zhidong He
Justin Andrew Hence
- concentration in Mechanical Design
Ryan Sedghi Horton
- minor: Manufacturing Engineering
Ahmed Safat Hossain
- minor: Electrical & Computer Eng.
Lauren Audrey Hunt
Flah Ilyas
- minor: Manufacturing Engineering
Samuel Donlon Jacobs
Jessie Greg Johnson
{ Double Major }
Eric Dean Jorgensen
- minor: Materials

Omesh Keshav Kamat
- minor: Computer Science
- minor: Aerospace Engineering
Francisco Kang
Andrew Noel Kennedy
- concentration in Mechanical Design
- minor: Interactive Media & Game Dev
Raeshawn Dominic Kennedy
Andrew John Kenyon
Carolyn Sawyer Keyes

Darien Nate Khea
Connor MacGregor King
William Matthew Kinkead
Camden Michael Knoff
Liam Brendan Koenen
Amanda Konieczny
Orland Lamce
- minor: Aerospace Engineering
Camden James Lariviere
Thomas R. Larkin
Heather Marie Lavoie
- minor: Materials
Kyle Stephen LeBorgne
- minor: Manufacturing Engineering
- minor: Business
Foster Robert Lee
- minor: Aerospace Engineering
Adam Christopher Lemoine
- minor: Manufacturing Engineering
Matthew Isaac Lesonsky
- concentration in Mechanical Design
Haoran Li
Kevin Li
{ Double Major }
Vivian Liang
{ Double Major }

Joseph Frederick Lidwin
- concentration in Mechanical Design
- minor: Manufacturing Engineering
Daniel Lipson
- concentration in Mechanical Design
Taylor Marie Llodra
Daniel Alexander Long
- minor: Aerospace Engineering
Connor Thayer MacMillan
- minor: Aerospace Engineering
Matthew Philip Mancini
Natalie Marie Marquardt
Adam Brian McNally
Kenneth W. McPherson
- concentration in Mechanical Design
Jason Nitin Mehta
- concentration in Mechanical Design
Abimael Mercado
Jacob B. Mercier
Connor James Morette
- minor: Materials
Glen Joseph Morgan
Christopher Henry Murray
Kurt Leslie Gray Naugler
- minor: Materials
Jinqiang Ning
- minor: Materials
James Patrick Nolan, Jr.
- concentration in Mechanical Design
Thomas Nuthmann
- minor: Aerospace Engineering
- minor: Robotics Engineering
Joshua Carl O'Connor
- minor: Aerospace Engineering
Scott David Olson
Andres Sebastian Ortiz Rosero
Selahaddin Sencer Ozkan
{ Double Major }
John Nicholas Papa
- concentration in Mechanical Design
Mikayla Marie Pasciuto
Cameron Duross Peterson
{ Double Major }
Nicholas A. Picard
Katherine R. Picchione
{ Double Major }
Adrian Frederick Pickering
Kate Emily Piotrowicz
{ Double Major }
Emily Stephanie Potter
- concentration in Biomechanical
- minor: History
Alexander Daniel Powers
- minor: Business
Anubhav Prasad
Christopher Bowen Preucil
- concentration in Mechanical Design
Luke Proctor
- concentration in Mechanical Design
Bernard Trevor Rabidou
Lauren Ann Richard
Corey Allan Richards
- concentration in Materials Science and Eng
- minor: Chemistry
- minor: Media Arts
Hector Antonio Rivas Cabrera
Michael Roche
Colin Francis Rose
Wilson Bly Rougier
- minor: Spanish
Steven Dean Ruotolo
{ Double Major }

Matthew Anthony Ryder
- concentration in Mechanical Design
- minor: Manufacturing Engineering
Joseph M. Samela III
- minor: Physics
Christopher Michael Sample
- minor: Manufacturing Engineering

Daniel Sanderson
- concentration in Mechanical Design
- minor: Aerospace Engineering
Eduardo Sandoval
- concentration in Aeronautics
Nathaniel Guild Sauer
Dimitrios Savva
John Andrew Scarborough
- minor: Aerospace Engineering
- minor: Computer Science
Nathan Schmidt
- concentration in Robotics
Elizabeth Marie Schofield
- concentration in Biomechanical
Zachary Sears
- concentration in Mechanical Design
Matthew Alexander Shanck
Riley Shoneck
- concentration in Mechanical Design
Alex Silk
- concentration in Mechanical Design
Sarah Rae Smith
Stefan McMillan Smith
- concentration in Thermal-Fluid Engineering
Aung Heain Soe
Nicholaus Spunar
Reed McIntosh Standley
- concentration in Mechanical Design
Thomas James Stanovich
- minor: German
Peter Christopher Starek
Dylan Craig Stimson
Cory Davies Stirling
Gregory Steven Stockman
- concentration in Mechanical Design
- minor: Music
Francois-Xavier Alain Stricker-Krongrad
Kathleen M. Sullivan
- concentration in Biomechanical
Keith Sullivan
Mark Alan Swanson, Jr.
Maereg Tesfaye Tafesse
Vincent Tavernelli
- concentration in Mechanical Design
Alino Te
- concentration in Materials Science and Eng
Christopher Tolisano
Panyawat Tukaew
Nathan Thomas Varney
- minor: Business
Joao Mauricio Casimiro Meira de Vasconce
{ Double Major }
Taylor Alexander Vass
Michael Patrick Vaudreuil
- minor: Psychology
Joseluis A. Velez
Alexander Stephen Venditti
James Michael Waldo
- concentration in Mechanical Design

Mitchell Roy Weeks
- minor: Aerospace Engineering
Everett Curtis Wenzlaff
- concentration in Mechanical Design
- minor: Electrical & Computer Eng.
James Paul West
James Stewart Whyte
{ Double Major }
- minor: Organizational Leadership
Luke Williams
- concentration in Mechanical Design
Iok Teng Wong
- minor: Aerospace Engineering
Robert R.S. Wood
Cody Gerard Woodard-Wallace
Jinghan Wu
- minor: International Studies
- minor: Writing and Rhetoric
Jiaxun Xie
{ Double Major }
Omar Sead Younis
- concentration in Mechanical Design
- minor: Aerospace Engineering
Eric Zandrow
Chenwei Zhang

Physics:
Nicole Elizabeth Beinstein
Edward Joseph Jarvis
Erika Kollitz
{ Double Major }
Emilia Monika Konert
Jordan Ari Kovar
{ Double Major }
- minor: Computer Science
Ryan Thomas Lang
Alejandro Emmanuel Leiro
William Connor McCarthy
Hayden Scott Small
Cem Mehmet Unsal
{ Double Major }
- minor: Mathematics

- minor: Electrical & Computer Eng.
Amanda Lee Varrichione
Hongji Yu
{ Double Major }

Professional Writing:
Fransesca Carletto-Leon
{ Double Major }
Jonathan Nicholas Mirabito
{ Double Major }

Psychological Science:
Julia Caulfield LaValley
{ Double Major }
Heather Rowan Ullery

Robotics Engineering:
Corey Jo Aday
- minor: Computer Science
- minor: Music
Amanda Ann Adkins
{ Double Major }
Ozan Akyildiz
William Spencer Barnard
- minor: Computer Science
Matthew James Beardsley
Alexander Caracappa
{ Double Major }
Nicholas Foster Cebry
{ Double Major }
- minor: Computer Science
Sarah Margaret Chamberlain
- minor: Manufacturing Engineering
Fuchen Chen
Robert Charles Crimmins
{ Double Major }
Andrew Dyson Davis
Nidhi Mallik Diwakar
Perry Carl Franklin
- minor: Mathematics
Gabrielle H. Franzini
- minor: Electrical & Computer Eng.
Charles John Frick
{ Double Major }
Joshua Chamberlain Friscia
{ Double Major }
Michelle Gagnon
Nathan Drew George
- minor: Computer Science
Nicholas Hassan
{ Double Major }
Meagan Hiatt
{ Double Major }
- minor: Chinese Studies
Nathan Harold Hughes II
{ Double Major }
Troy Hughes
- minor: Computer Science
William Daniel Hunt
Jessie Greg Johnson
{ Double Major }
Tri Kha Khuu
{ Double Major }
Peerapat Luxsuwong
{ Double Major }
Max Merlin
- minor: Computer Science
Timothy Philip Neilan
{ Double Major }
Batyrlan Nurbekov
{ Double Major }
Cameron Duross Peterson
{ Double Major }
Saraj Pirasmepulkul
{ Double Major }
John Price
John William Rogers Pryor
{ Double Major }
David Parker Rubenstein
- minor: Computer Science
Steven Dean Ruotolo
{ Double Major }
William Everett Spurgeon
{ Double Major }
Samantha Lauren Swartz
{ Double Major }
Selim Enis Tanriverdi
- minor: Computer Science
Weijia Tao
Alec Jeffrey Thompson
{ Double Major }
Gregory Tighe
Elizabeth Marie Tomko
Bryan Anthony Toribio
- minor: Electrical & Computer Eng.
Guillermo Jose Vincentelli Solanilla
Raymond Wang
Carson James Wolf
Nicholas Kai Woodward
Jacob Louis Zizmor
- minor: Computer Science

Society, Technology & Policy:
Nicholas Lloyd Campbell
{ Double Major }
- minor: History
Katherine R. Picchione
{ Double Major }

Date: May 10, 2016
To: WPI Faculty
From: Committee on graduate Studies and research (Profe Demetriou, Chair)
RE: Graduate Student Graduation List

This is a PENDING list for May 14, 2016. Please notify the Office of the Registrar if there are any questions or concerns at extension 5211.

Doctor of Philosophy

Biochemistry:
Sagar Laljibhai Antala
Katrice Elizabeth McLoughlin
Sarju Jagdish Patel

Biomedical Engineering:
Heather Ann Cirka
Yuan Yin

Chemical Engineering:
Pei Shan Yen

Chemistry:
Ryan Andrew Richards

Civil Engineering:
Maria del Lourdes Gomez Lara
Xiaokong Yu

Computer Science:
Lei Cao
Dovan Rai
Russell Charles Toris
Chiying Wang
Kaiyu Zhao

Electrical & Computer Eng.:
Lei Wang
Janakinadh Yanamadala

Manufacturing Engineering:
Khalid Mohammed Alzahrani

Materials Science and Eng.:
Shaymus William Hudson

Mathematical Sciences:
Nguyenho Ho
Erin Marie Kiley
Grigor Nika
William Charles Sanguinet
Jiani Yin

Mechanical Engineering:
Gang Li

Physics:
Mashael Ali S. Alghamdi
Ibar Isaac De La Cruz

Robotics Engineering:
Halit Bener Suay

Master of Business Admin.
Alexander Jay Bosworth
David Charles Bridge
Michael Smith Bristol
Chelsea Marie Brown
Jonathan Thayer Graham
Julienne Catherine Labrecque
Michael P. Laurent
Mary Elizabeth Leovich
Yan Li
Whitney M. McMackin
Tyrone Joseph Mellon, Jr.
Marjorie Sarah Miller

Manikandan Pandi
Lindsay Marie Piccioli
Charles Geoffrey Prescott
Stephen Anthony Rose
Joanne Bednarz Szewc
Christopher Mason White, Jr.
Eric Thomas Williams

Master of Engineering

Biomedical Engineering:
Brian Steven Alejandro Azarmeedokht
Ghazanfari Azizi
Kyra Rand Burnett
Alexander John Hallet
Joshua Robert Harvey
Karen Levi
Kayla Patricia Manzi

Electrical & Computer Eng.:
Barry Ahern
Caitlin Margaret Fowler
Matthew Ryan LaFlair
Chen Lin

Power Systems Engineering:
Richard Walter Allen
Thomas Michael Brown
Patricia Mary Bullis
Matthew Paul Cloud
S. Meena Cullen-Corson

Oumar Diop
Christopher Francis Malone
Zarin Jamshed Mirza
Adam O'Laughlin
Jason Wayne Philhower
Robert Joseph Sazanowicz
Maxwell C. Smith

Master of Mathematics for Educ
Elizabeth Lura Anderson
Kaitlyn Marie Foucher
Kaitlyn Marie Hannen
Katherine L. R. Horning Pearson
Paul Brian Kirrane
Francois Lubin

Master of Science

Aerospace Engineering:
James Iain Hitchen
Radu Constantin Morar
Joseph Prothero Sperry

Applied Mathematics:
Andrew O'Gilvie Holmes
Fan Yang
Junchi Zhang

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Bioinformatics & Computat Bio:
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Biology and Biotechnology:
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Chemical Engineering:
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Qiwen Chen
Tairui Chen
Jiyang Dong
Sarah Louise Griffith
Michelle Leigh Guevara
Daoheng Guo
Sovan Lillian Gusack
Xu Han
Chunfu Hou
Kun Huang
Craig David Janeczek
Jifeng Kou
Haocheng Li
Xuanyu Li

Zhouchi Li
Ziyong Liu
Qiuzhe Ma
Elaina Cresoula Mansur
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Towa Matsumura
Jiang Miao
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Jianan Ou
Bowen Pan
Kelsey B. Powderly
Muxi Qi
Fen Qin
Peiwen Qin
Zhong Ren
Neda Seyedmahmoud
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Guilherme Tebaldi Meira
Yu Tian
Naihui Wang
Tianyang Wang
Zi Wang
Eric Nicholson Willcox III
Soe San Win
Jing Yang
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Alexander Duhaney
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Yuan Miao
Mu Niu
Anastasiia Parkhomenko
Yiquan Qi
Alexander Sunde-Brown
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Kelley Melissa Brown
Ibraeim Abdulmonem Bukhamsin
Kyle James Christiansen
Tyler Edward Faszewski
Brianna Helen Gillespie
Sean Daniel Gillis
Nathan Richard Jaworski
Abbas Ahmed Julaih
Aarat Samir Kaushik
Scott Sheppard Knight
John Curtis Mallers, Jr.
Benjamin Douglas Morse
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Joyeta Chatterjee
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George Takchee Gong
Siyao Gu
Sravan K. Katepalli
Xiaoshuai Li
Akshay Balachandran Menon
Siddhesh Subhashchandra Narkar
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Sanil Gajanan Sawant
Neil A. Schneider
Jia Shen
Hui Shi
Romel Alcantara Tuscano
Qi Wang
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Xiong Zhang
Yifan Zhang
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Jesiel Lyncoln Lucena
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Roman Alejandro Gutierrez
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Kaimin Huang
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Margaret Genevieve Battisti
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Lauren Bisacky Collins
Kevin Michael Cremona
Danielle Theresa Davis
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Omesh Keshav Kamat
Prathamesh Ganesh Kulkarni
Jason Ballou Lackie
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Haoran Li
Zhengxiu Li
Bhavin Vinay Mehta
Brad Clayton Mello
Norbert Hector Mongeon III
Mikhail Yuryevich Morozov
Patrick Gerard Napier
Nicole Marie Nelson
Erica Leigh Parker
Monica Jourdan Preston
Mario Rolon
Thaddeus Joseph Savery
Miles Ryan Schuler
Kelsey Elizabeth Stergiou
Joshua Paul Stewart
Michael Patrick Sweeney

Jighjigh Tersoo-Ivase
Luis Alberto Vargas Charro
Jason Anthony Zelle

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Yunshen Cai
Shiyang Fan
Zhou Fang
Lingjun Ge
Shensheng Gu
Qiyang Huangfu
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Date: May 10, 2016
To: WPI Faculty
From: Committee on Governance (Prof. Gaudette, Chair)
Committee on Graduate Studies and Research (Prof. Demetriou, Chair)
Re: Motion to modify the membership of CGSR

Motion: The Committee on Governance (COG) and the Committee on Graduate Studies and Research (CGSR) recommend and I move that the description pertaining to membership composition of CGSR as written in the Faculty Handbook, Part One, Section Three, Bylaw One, Section IV be modified, as described below.

Proposed Description of CGSR Membership (additions are in **bold**, deletions are ~~crossed out~~):

The Committee on Graduate Studies and Research (CGSR) consists of six elected Faculty Members, one graduate student, ~~a representative of the Provost's Office, , and, *ex officio* , the Director of Continuing Education~~ **and two *ex officio* members: Vice Provost for Research and Dean of Graduate Studies**.

Proposed Description of CGSR Membership (clean version):

The Committee on Graduate Studies and Research (CGSR) consists of six elected Faculty Members, one graduate student, and two *ex officio* members: Vice Provost for Research and Dean of Graduate Studies.

Rationale:
The current description of CGSR membership within the Faculty Handbook is out-of-date. When the description was last updated, the Dean of Graduate Studies and Research was the *single* individual in the Provost Office responsible for overseeing *both* graduate studies and research at WPI. In that role, the Dean of Graduate Studies and Research typically served as the Provost's representative on CGSR. This single position in the Provost Office is now separated into two full-time positions: the Vice Provost for Research (VPR), and the Dean of Graduate Studies (DoGS). However, according to the Faculty Handbook, only one of the two could serve as a voting member of CGSR. In order to reflect this change in administrative responsibilities, the natural modification in CGSR's membership is to include both the VPR and the DoGS as voting members.

The current description of CGSR's responsibilities in the Faculty Handbook is as follows:

> *CGSR is concerned with all post-baccalaureate programs of the College, and reviews and recommends changes in WPI policies on goals, student recruitment, admissions, academic standards, teaching and research assistantships, scholarships, and fellowships. It also makes recommendations to the Faculty and Administration on new graduate programs and changes in programs and courses. The Committee acts on admission of graduate students to degree candidacy, dismissal for failure to meet academic standards, and student petitions on academic matters. It brings to the Faculty for action the names of students who it has determined are eligible for post-baccalaureate degrees. The*

Committee reviews and recommends changes in policy on the funding, promotion, and conduct of research at WPI.

These issues continue to be central to the interests of the Faculty at WPI and should fall well within the responsibilities of the Dean of Graduate Studies and the VPR. The proposed modification to the CGSR composition is consistent with this portfolio, while it includes multiple important viewpoints on decisions and maintains the current committee size and balance between elected faculty committee-members and non-elected committee-members. Naturally, CGSR will continue its practice of inviting key stakeholders, including representatives from Corporate and Professional Education, to meetings when issues requiring their specific areas of expertise are discussed.

Implementation:
Effective Academic year 2016-2017.

Appendix:

Consent Agenda Items

(Continued on next page)

Date: May 10, 2016
To: WPI Faculty
From: Committee on Academic Operations (Prof. Sturm, Chair)
Re: Motion to modify the requirements for a Minor in Music

Motion: On behalf of the Department of Humanities and Arts, the Committee on Academic Operations recommends and I move that the requirements for the completion a minor in music be changed to allow students to fulfill their requirements with capstones in areas of music that could include music history, theory, or technology as well as performance, as described below.

Description of the Proposed Change:
Current Description

The minor in Music is for students who choose to continue their studies in Music beyond the Humanities and Arts Requirement without majoring in Music. Students who, for personal or career purposes, wish to achieve official recognition of their achievements in Music, yet do not find the time to fulfill the requirements for the major, should consider the Music minor option. Interested students should speak with one of the music faculty in the Department of Humanities and Arts. Because performance is an integral component of music study, the proposed minor will contain performance emphasis and consist of two units of work distributed as follows:

1. 1/3 unit for participation in MU IS/P Ensembles.
2. 1/3 unit Performance IS/P as the capstone experience. A student, with faculty guidance, will present a recital, original composition, or other musical performance that demonstrates the student's skill and knowledge.
3. 1 1/3 units of music courses.
4. If a student completes his/her Humanities and Arts Requirement in music, 1 unit of that work may be applied to the minor except for the final IS/P.
5. A student who is pursuing a major in Humanities and Arts with music as the major field cannot also receive a minor in music.

Proposed Description:

The Minor in Music is for students who choose to continue their studies in Music beyond the Humanities and Arts Requirement without pursuing a Concentration in Music. Students who, for personal or career purposes, wish to achieve official recognition of their achievements in Music, yet do not find the time to fulfill the

requirements for the Concentration, should consider the Music Minor option. The Music Minor consists of two units of work distributed as follows:

1. 1 2/3 units of music courses .
2. 1/3 unit ISP as a final capstone experience. Students, with faculty guidance, will complete a project which could consist of a paper, composition, arrangement, performance, or other project designed in consultation with the faculty advisor.
3. Students may receive no more than 2/3 units from Music Ensembles (MU 2631, MU 2632, MU 2633, MU2634, MU 2635, MU 2636, MU 2637, MU 2638).
4. If a student completes the Humanities and Arts Requirement in music 1 unit of that work may be applied to the minor except the final Seminar or Practicum.
5. A student who is pursuing a Major in Humanities and Arts with Music as the Concentration cannot also receive a Minor in Music.

Rationale:

When the Minor in Music was instituted the focus of the program was performance. The program, however, has since expanded to include three Professors in Music Technology and one Professor in Music History with several new courses offered in those areas. The current description requires a student to "..*present a recital, original composition, or other musical performance that demonstrates the student's skill and knowledge*."

Many students would like the opportunity to continue to study music after completing the Humanities and Arts seminar or practicum by completing a minor in music that relates to other areas and not be limited to performance. The Music Division would like to change the language so that students with their capstone advisor's input, could design their own capstone projects and not be bound by the presentation of a performance.

Date: May 10, 2016
To: WPI Faculty
From: Committee on Academic Operations (Prof. Sturm, Chair)
Re: Motion to add DS 3001 Foundations of Data Science

Motion: On behalf of the Data Science program, the Committee on Academic Operations recommends, and I move that DS 3001 *Foundations of Data Science*, as described below, be added.

Proposed Course Description:
DS 3001 *Foundations of Data Science*
Cat. I
This course provides an introduction to the core ideas in Data Science. It covers a broad range of methodologies for working with and making informed decisions based on real-world data. Core topics introduced in this course include data collection, data management, statistical learning, data mining, data visualization, cloud computing, and business intelligence. Students will acquire experience with big data problems through hands-on projects using real-world data sets.

Recommended background for this course includes statistics knowledge equivalent to MA2611 and MA 2612, linear algebra equivalent to MA2071, and the ability to program equivalent to (CS 1004 or CS 1101 or CS 1102) and (CS 2102 or CS 2119).

This course does not fulfill Mathematics, Basic Science or Engineering Science/Design credits.

Note: Currently, there are no DS courses at the undergraduate level. However, DS is an approved course indicator, currently used at the graduate level.

Anticipated Instructors: Most faculty in the Data Science program would be able to teach this course, in particular, Prof. Fatemeh Emdad, Prof. Xiangnan Kong, Prof. Yanhua Li, Prof. Randy Paffenroth, Prof. Carolina Ruiz, and Prof. Elke Rundensteiner.

Rationale:
The ability to extract useful information from large volumes of data is becoming increasingly important in many disciplines from sciences to engineering. While individual courses in Mathematical Sciences, Computer Sciences and in the School of Business offer some of the discipline-specific techniques essential for Data Science, this DS3001 course, entitled *Foundations of Data Science,* now provides for the integration of the diverse set of core topics in Data Science in a comprehensive fashion. It offers opportunity for the students to learn and practice interdisciplinary Data Science skills using hands-on projects using real-world data sets.

Resource Needs: No additional resources are needed beyond what is already available. Four faculty members have been hired within the last two years specifically for the Data Science program. Any one of those four faculty member, as well as several existing faculty associated with the Data Science program, are anticipated to teach this course on a rotating basis.

Impact on Distribution Requirements: No impact on distribution requirements. This course is part of the new DS Minor being proposed. It is currently not cross-listed with other majors.

Implementation Date: Implementation date for this action is the 2016-17 academic year, with DS 3001 expected to be offered in D term.

Date: May 10, 2016
To: WPI Faculty
From: Committee on Academic Operations (Prof. Sturm, Chair)
Re: Motion to add a Data Science Minor

Motion: On behalf of the Data Science program, the Committee on Academic Operations recommends, and I move that a Minor in *Data Science*, as described below, be added.

The **Minor in Data Science** will consist of 2 units, all of which must be selected from the list of approved Data Science minor courses. These 2 units must be selected to include the following:

- Three courses, one from each of the three areas (Business, Computer Science, Mathematical Sciences) at the 2000 level or above from the list of approved Data Science minor courses
- Two courses at the 3000 level or above, as follows:
  - DS 3001 *Foundations of Data Science*
  - Any other 3000 level or above course from the list of approved Data Science minor courses
- One course at any level selected from the list of approved Data Science minor courses

The Minor in Data Science is open to all undergraduate majors at WPI. Students majoring in Business, Computer Science, or Mathematical Sciences should consult WPI rules on minors for double-counting courses.

List of Approved Courses for the Data Science Minor
Any graduate course approved for the Data Science graduate program can also be counted towards the Data Science minor. These courses are not repeated here.

Data Science courses:

- DS 3001 Foundations of Data Science

Business courses:

- BUS 2080 Data Analysis for Decision Making
- MIS 3720 Business Data Management
- MKT 3650 Consumer Behavior
- OIE 3420 Quality Planning: Design and Control
- OIE 3460 Simulation Modeling and Analysis
- ACC 4200 Managing Performance: Internal and Inter-organizational Perspectives
- OIE 4420 Practical Optimization: Methods and Applications

Computer Science courses:

- CS 1004 Introduction to Programming for Non-Majors
- CS 1101 Introduction to Program Design*
- CS 1102 Accelerated Introduction to Program Design*
- CS 2102 Object-Oriented Design Concepts
- CS 2119 Application Building with Object-Oriented Concepts
- CS 2223 Algorithms
- CS 2301 Systems Programming for Non-majors
- CS 2303 Systems Programming Concepts
- CS 3431 Database Systems I
- CS 4120 Analysis of Algorithms
- CS 4341 Introduction to Artificial Intelligence
- CS 4432 Database Systems II
- CS 4445 Data Mining and Knowledge Discovery in Databases
- CS 4802 Biovisualization
- CS 4803 Biological and Biomedical Database Mining

Mathematical Sciences courses:

- MA 2071 Linear Algebra
- MA 2611 Applied Statistics I
- MA 2612 Applied Statistics II
- MA 2621 Probability for Applications†
- MA 2631 Probability†
- MA 3231 Linear Programming
- MA 3627 Introduction to the Design and Analysis of Experiments
- MA 3631 Mathematical Statistics
- MA 4213 Loss Models – Risk Theory
- MA 4214 Loss Models – Survival Models
- MA 4235 Mathematical Optimization
- MA 4237 Probabilistic Methods in Operations Research
- MA 4631 Probability and Mathematical Statistics I
- MA 4632 Probability and Mathematical Statistics II

* Credit may not be earned for both CS 1101 and CS 1102
† Credit may not be earned for both MA 2621 and MA 2631

Rationale:
The ability to extract useful information from large volumes of data is becoming increasingly important in many disciplines. The Minor in Data Science is thus designed to provide WPI undergraduates in any major with the tools essential to understand and

work with data by applying models, algorithms and statistical techniques to data. The minor complements many of the existing undergraduate majors at WPI from sciences to engineering that increasingly must work with large digital data sets using computational and statistical techniques and tools by providing these students with the core competencies of Data Science.

Resource Needs: No additional resources required for the Minor in Data Science. Four faculty have been hired in the last two years specifically for the Data Science program. Thus there is sufficient expertise and time available collectively to administer this minor – in particular, as it lines up well with the WPI strategic plan concerning thrust areas.

Impact on distribution requirements: No impact on distribution requirements.

Implementation Date: Implementation date for this action is the 2016-17 academic year.

Date: May 10, 2016
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Demetriou, Chair)
Re: Motion to add ME 5225 (Fiber Optical Sensors)

Motion: On behalf of the Mechanical Engineering Department, the Committee on Graduate Studies and Research recommends and I move that ME 5225 (Fiber Optical Sensors) be added, as described below..

Proposed Course Description:

ME 5225 Fiber Optical Sensors (Cat. II, term-based course, 2 credits)
This course is designed to introduce students to the field of fiber optics, with an emphasis on design and working principles of fiber optical sensors for mechanical, biological, and chemical measurements. It covers basic knowledge and working principles of optical fibers and fiber optical components, as well as practical design guidelines and applications of fiber optical sensing systems. The first half of the course will introduce different aspects of fiber optics, including working principles of optical fibers, single-mode and multimode fibers, properties of optical fibers, passive fiber optical devices, light sources, and optical detectors. The second half of the course will focus on various fiber optical sensors and sensing systems, including working principles of fiber optical sensors, intensity-based and interferometer-based fiber optical sensors, fiber Bragg gratings, low-coherence fiber optical interferometers. Specifically, design and implementation of fiber optical sensors and sensing systems for strain and pressure measurements will be discussed in detail. Measurement characteristics and signal processing of fiber optical sensing systems for different applications will be introduced.
Recommended Background: ES2502, PH1140. ME 4506 is preferred but not required.

Rationale: Fiber optical sensors have been used in a broad range of applications to measure temperature, strain, pressure, sound, and chemicals. Fiber optical sensors have been used in almost every discipline in science and engineering, thanks to their small size, low cost, robustness to the environment, immunity to electromagnetic interference, and available technology and devices in industry. In fact, the market size of fiber optical sensors is expected to reach $1 billion in 2019. Fiber optical sensors have been routinely used for applications such as health monitoring of dams and bridges.

There is currently no existing course in the WPI curriculum specifically focusing on fiber optics, neither at undergraduate nor at graduate levels, although several faculty members do use optical fibers in their research in the departments of Mechanical Engineering, Biomedical Engineering, and Biology & Biotechnology. This proposed advanced course connects many topics in emerging areas of research, and therefore, it is appropriate for the graduate level. Students in ME/AE/MTE/CE/ECE/BME/BB will potentially be interested in such an offering as it intimately connects fiber optical sensors to mechanics and biological sciences. This course can help students to find positions in industry that require

knowledge related with fiber optics. The enrollment and course evaluation of this course in the past are shown below:

Term Offered	Course name	Student enrollment	# of evaluations	Answer to Q2 in student evaluation
2013-14 D	ME 593 Fiber Optics	8	7	5.0
2015-16 B	ME 593 Fiber Optics	12	12	4.8

Resources and Anticipated Instructors: Professor Yuxiang Liu will be the primary instructor for the course. This course has been built in the regular teaching load of Prof. Yuxiang Liu. This course will use existing equipment available in Prof. Yuxiang Liu's lab for lab sessions and projects. No particular library resources are needed for this category. Library database such as Web of Science is available through WPI website. No special software is necessary for this course.

Enrollment Data
Based on data from ME 593 Fiber Optics (2013-14D, 2015-16B) offerings, this course is expected to enroll 10-30 students.

Assessment
The course will meet two days per week, with a total meeting time of 200 minutes (equivalent to four 50-minute meetings). Homework, exams, project reports, and project presentations will be used to assess student performance.

Implementation Date: Implementation date for this action is the 2016-2017 academic year.

Date: May 10, 2016
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Demetriou, Chair)
Re: Motion to eliminate five ME graduate courses

Motion: On behalf of the Mechanical Engineering Department, the Committee on Graduate Studies and Research recommends and I move that the following ME graduate courses be eliminated.

Course to be eliminated, and page numbers from 2015-2016 Graduate Catalog:

*ME 5327/CE 527 - Impact Strength of Materials (3 credits) - pg. 149
†ME/MTE/BME 554 - Composites with Biomedical and Materials Applications (3 credits) - pg. 151
‡ME/BME 558 - Biofluids and Biotransport (3 credits) - pg. 151
ME 611 - Turbulence (3 credits) - pg. 146
ME 641 - Cam Design (3 credits) - pg. 150

*Removal of this course has been approved by both ME and CE
†Removal of this course has been approved by three departments: ME; MTE; and BME
‡Removal of this course has been approved by both ME and BME

Rationale:
The elimination of these five courses is a recognition that none of them have been offered in at least the last five years.

ME 5327, ME 611, and ME 641 are courses that were developed specifically for and taught by faculty members with specialties in those areas who are no longer members of the WPI Faculty.

ME 554 and ME 558 were intended primarily for graduate students in BME, and the ME department no longer has faculty members whose focus areas overlap with these course topics.

Resource Needs: No additional resources are needed.

Impact on Distribution Requirements:
Eliminating these courses will not affect any degree requirements because none of the courses were required for either the M.S. of Ph.D. degrees in mechanical engineering. Furthermore, because these courses have not been offered in at least five years, eliminating will have no real effect on the range of courses that graduate students have to choose from.

Implementation Date: Implementation date for this action is the 2016-2017 Academic year.

Date: May 10, 2016
To: WPI Faculty
From: Committee on Graduate Studies and Research (Prof. Demetriou, Chair)
Re: Motion to remove three BME graduate courses

Motion: On behalf of the Department of Biomedical Engineering, the Committee on Graduate Studies and Research recommends and I move that the following three (3) courses be removed from the WPI Graduate Catalog.

BME/ME/MTE 554. Composites with Biomedical and Materials Applications

BME/ME 558. Biofluids and Biotransport

BME 582. Principles of In Vivo Nuclear Magnetic Resonance Imaging

Rationale:

BME/ME/MTE 554 and BME/ME 558 have not been offered since Spring semesters 2011 and 2006, respectively. The BME department has no plans to offer the course in the future, and the Mechanical Engineering Graduate Committee confirmed that they have no plans to offer these two cross-listed course in the future.

BME 582 has not been offered since before 2010 and the BME department does not plan to offer it in the future.

Impact on Distribution Requirements:
The removal of these courses from the catalog will not impact the ability of Biomedical Engineering graduate students to fulfill their degree requirements.

Resource Needs: No additional resources are needed.

Implementation Date: Implementation date for this action is the 2016-2017 Academic year.