

UNIVERSITY OF MICHIGAN
College of Engineering
Curriculum Committee Meeting
Tuesday, March 11, 2025

Attending: Varun Agrawal, Sarah Barbrow, Yavuz Bozer, Xudong Fan, Chris Fidkowski, Anouck Girard, Amir Kamil, Xiaogan Liang, Frank Marsik, Radoslaw Michalowski, Nolgie Oquendo-Colon, Eric Rutherford, Romesh Saigal, Rachael Schmedlen, Stephanie Sheffield, Won Sik Yang

Support Staff: Mercedes Carmona, Betsy Dodge, Matthew Faunce

Call to Order: 1:35 PM

Adjourned: 3:05 PM

Agenda:

1. Approval of 2.11.2025 Meeting Minutes – Page 3 - **APPROVED**
2. New Financial Engineering Concentration for IOE BSE – Action Item - Page 7 – **APPROVED**
 - a. IOE is seeking approval for the establishment of a new concentration, Financial Engineering, for the Bachelor of Science degree. The new concentration is to provide students with specialized knowledge and skills in Financial Engineering combining elective foundational and related coursework to address industry demands and align with educational objectives. Requirements for a student to complete a minimum of 12 credits and maintain a GPA of at least 2.0. Required courses are IOE 452 and IOE 453 for 3 credits each and 6 Elective Credits consisting of IOE 410, IOE 460, IOE 465, and/or IOE 473. The proposed effective term for this concentration is Fall 2025 and/or Winter 2026 if all approvals are not granted in time.
 - b. CLaSP questions what is the engineering component within this concentration as financial is covered, but what is the mix between both engineering and financial?
 - i. IOE says that financial engineers are growing at a rapid rate. For example, banks typically hire individuals with MBAs, but there is a recent trend of banks turning to financial engineers due to their problem-solving skills. Engineering is tied in due to analysis and putting together of financial instruments, whether that is analyzing current instruments, designing new, or a combination of both.
 - c. CoE CC members voted unanimously to approve this proposal. The proposal will appear at the next CoE Faculty meeting for Winter 2025.
3. CoE and LSA Joint Curriculum Committee Meeting – Informational Item
 - a. In the past the CCC has had joint committee meetings with LSA, but there has not been a joint meeting in the last few years and the most recent in April 2022. For Winter 2024 CCC meetings, previous topics discussed by the CCC for a joint LSA meeting were the Incomplete Grade Policy, Course Withdrawals, and Reciprocity for Minor Approvals between CoE and LSA. These topics were only discussed in CCC meetings and never discussed in a joint LSA meeting.
 - i. EECS – CSE asks members if an Incomplete Grade Policy should still be pursued by the CCC. If so, a proposal can be created to review and submit to the CoE faculty.
 1. CLaSP asks if LSA Has a policy for I Grades.
 - a. EECS – CSE says LSA does not have a policy in place. LSA submits grade change requests to adjust I Grade courses as needed.
 2. Suggestion that the I Grade should be removed from the official transcript, but still listed on an unofficial transcript so that advisors can follow up as needed with the student as well as watch for any continued patterns. CoE wants students to be successful overall and not penalized for I Grades that may have a good reason for why the course was incomplete due to extenuating circumstances.
 3. EECS – CSE will draft a proposal for an Incomplete Grade Policy. Members are to think of what the positives and negatives for CoE students are and what should be included in this proposal.
 - ii. LSA has a policy for first year students in which W's do not appear for the student's first term.

1. CLaSP brings up that students are encouraged to develop early momentum by taking at least 15 credits, but do not understand the workload of 15 or more credits being taken. Some students are then afraid to withdraw and may think this is a failure to start out their academic career.
- b. Are there any other topics that should be discussed with LSA?
 - i. EECS – CSE says LSA has added a policy that a student cannot take any major courses within the student’s declared program as P/F. CoE does not have a similar policy. There was no reasoning from LSA behind this new policy. This can be discussed more within the CCC and review the new LSA policy to see if CoE should create a similar policy.
 1. CEE deems that CoE does not need to follow LSA with creating policies just to be similar. CoE should get more information for the changes/policies created, discuss with committee, and then decide if any further action is needed.
 - ii. UG Representative asks if there are any concerns of courses being dropped/discontinued due to funding challenges going forward and/or largely impacting research.
 1. EECS – CSE states this is not in the control of the CCC and relies more with university leadership.
 2. IOE mentions an issue that due to the lack of instructors for a course then the course could not be taught.
 - a. ENGR brings up an example that CHEM and PHYSICS this year did not have enough GSI Support and seats for courses. ENGR 100 and ENGR 101 had similar issues, which made the department have to adjust quickly by moving personnel around for the courses. Not sure if these issues have been fixed but will need to be figured out by the university and departments affected.
 3. EECS – CSE questions how this could be a problem for students needing to take a required course for their degree and the problems that would arise.
 - iii. Robotics brings up a topic to discuss are ROTC students that are enrolled in both LSA (military science) and CoE.
 - iv. EECS – CSE asks if the newly formed First Year Program Committee has any topics/concerns to bring to LSA.
 1. First Year Program Committee members say their focus is on mathematic courses, but more internal discussions are ongoing as well as reaching out to the Math Department, so not necessary to include LSA for discussion yet. Once determined, topics can be brought forth to LSA for further discussions.
- c. Overall, is a joint meeting with CoE and LSA worth pursuing?
 - i. Split decision between CCC members, but willing to pursue a joint meeting with LSA. A request will be sent to the LSA Chair and Committee to see if a joint meeting can be scheduled for this term.
 - ii. Question if the joint meeting is virtual like our CCC meetings.
 1. Past joint meetings have always been held in person. This does take a lot of communication and coordinating for all members of both committees to attend. Members need to pay attention and not all members get to speak like the CCC meetings and more focused on the meeting agenda topics.
- d. Other topics that were brought forth, but should be discussed within the CCC before bringing to LSA:
 - i. Letter grades, such as the difference between an E and F, as well as other grading topics.
 - ii. Recorded lectures are resulting in low class attendance. Students are still doing well in class due to watching the recorded lectures on their own time. Should there be a policy in place to ensure students are attending lectures? Should attendance be mandatory in the grading policy for a course and how could that be implemented? Are other departments experiencing this issue?
 1. EECS has been dealing with this issue for a decade. After COVID, students are used to receiving recorded lectures to watch and reference. May be helpful for students that have a personal need for recorded lectures.

CARF SUMMARIES

PAGE	SUBJECT	COURSE #	ACTION	SUMMARY	EFFECTIVE TERM	MIN. GRADE REQ. FOR ENF. PREPREQ	Is Course on LSA Course Guide?	APPROVED	NOTES & REVISIONS	TABLED
9	AEROSP	388	MOD	Change to Enforced Prerequisite.	WT 2026	B	YES	APPROVED		
12	ENGR	301	MOD	Change to Course Description.	WT 2026	NO	YES	APPROVED	Recommendation of including an additional sentence or two referencing the experience gained from study abroad.	
15	ENGR	345	DEL		WT 2026	NO	YES	APPROVED		
18	ENGR	403	DEL		WT 2026	NO	YES	APPROVED		
21	ENGR	465	DEL		WT 2026	NO	YES	APPROVED		
24	ENGR	542	DEL		WT 2026	NO	YES	APPROVED		
27	IOE	316	MOD	Change to Enforced Prerequisite.	WT 2026	C-	YES	APPROVED		
30	IOE	424	MOD	Changes to Enforced Prerequisite and Credit Exclusions.	WT 2026	C-	YES	APPROVED		
33	IOE	481	MOD	Changes to Enforced Prerequisite and Credit Exclusions.	WT 2026	C-	YES	APPROVED		
36	ROB	430	NEW		WT 2026	C	NO	APPROVED		

UNIVERSITY OF MICHIGAN
College of Engineering
Curriculum Committee Meeting
Tuesday, February 11, 2025

Attending: Sarah Barbrow, Yavuz Bozer, Xudong Fan, Chris Fidkowski, Anouck Girard, Christine Gordon, Saadet Albayrak Guralp, George Halow, Robert Hovden, Amir Kamil, Xiaogan Liang, Frank Marsik, Jason McCormick, Radoslaw Michalowski, Raj Rao Nadakuditi, Nolgje Oquendo-Colon, Yulin Pan, Jason Rhoades, Eric Rutherford, Rachael Schmedlen, Stephanie Sheffield, Volker Sick, Kristen Thornton, Won Sik Yang

Support Staff: Mercedes Carmona, Betsy Dodge, Matthew Faunce

Call to Order: 1:34PM

Adjourned: 2:55PM

Agenda:

1. Approval of 1.28.2025 Meeting Minutes – Page 4 – **APPROVED**
2. CEE – Civil Engineering BSE Program Modifications – Action Item - Page 6 – **APPROVED**
 - a. These program modifications reflect a shift toward a reduction in required program elective courses in favor of an increase in required technical elective courses. The changes align with and continue to exceed ABET requirements and meet the interests of students’ desire to access more upper-level courses as well as providing course flexibility. Program Elective requirements are now 5 courses (20 credit hours) as opposed to 6 courses (24 credit hours). Technical Elective requirements are now 3 courses (9 credit hours) as opposed to 2 courses (6 credit hours). These changes are to be effective for Fall 2025 and if approvals take longer, then the next effective term, Winter 2026.
 - b. EECS – CSE wonders what the motivation behind prohibiting a seventh program elective to count as a technical elective.
 - i. In exit interviews conducted within the department, results showed that students were interested in taking in depth, upper elective courses. The department found students have no interest to take seven technical electives.
 - c. ENGR asks if a student were to take a program elective above the five required courses, such as a 4-credit course, how do students receive credits, such as 3 credits towards technical electives and one to general electives? Also, what was the feedback to the external advisory board?
 - i. Yes, that would be the plan and exception for students so that students receive credit. The changes were brought up and discussed with the board, who were in favor of students getting the technical electives/courses where modifications were being made
 - d. CoE CC members voted unanimously to approve this proposal. The proposal will appear at the next CoE Faculty meeting for Winter 2025.
3. ECE Signal & Image Processing and Machine Learning (SIPML) New Graduate Certificate – Action Item - Page 14 – **APPROVED**
 - a. ECE has had a partnership with KLA to offer current employees the opportunity to take ECE courses as Non-Candidate for Degree (NCFD) students. This process has allowed current industry professionals to enhance their skills and knowledge as well as staying on top of the current trends within the evolving engineering fields. Creating a certificate for these courses taken will hopefully have students transition to the ECE MEng Program for more thorough training. KLA has provided fellowships and funding, which has been mutually beneficial between the local industry and UM Signal Processing faculty. The certificate would be overseen by the ECE department with a planned effective term for Fall 2025 or Winter 2026, if approvals take longer.
 - b. EECS – CSE asks if this program is in person.
 - i. Department states the certificate is in person and not online.
 - c. ENGR wonders how many students would take this certificate.

- i. Not a specific number, but not more than 10-15 students per year. Many of these students can asynchronously connect the dots and complete other courses to complete the certificate. Taking one course could build taking all courses to complete the certificate. The courses listed for this certificate are not a heavy workload for a student to take/complete.
- d. CoE CC members voted unanimously to approve this proposal. The proposal will appear at the next CoE Faculty meeting for Winter 2025.

CARF SUMMARIES

PAGE	SUBJECT	COURSE #	ACTION	SUMMARY	EFFECTIVE TERM	MIN. GRADE REQ. FOR ENF. PREPREQ	Is Course on LSA Course Guide?	APPROVED	NOTES & REVISIONS	TABLED
22	AEROSP	288	DEL		FT 2025	NO	YES	APPROVED		
25	AEROSP	388	MOD	Changes to Course and Abbreviate Titles, Course Description, Full Term Credit Hours, Y Graded, Advisory Prerequisite, Course Components, and Contact Hours.	FT 2025	B	YES	APPROVED		
28	AEROSP	488	MOD	Changes to Course Description, Full Term Credit Hours, Y Graded, and Contact Hours.	FT 2025	B	YES	APPROVED		
31	AEROSP	740	MOD	Changes to Course Description and Repeatability.	FT 2025	NO	YES	APPROVED		
34	CLIMATE	105	MOD	Changes to remove ENSCEN cross-listing.	FT 2025	NO	YES	APPROVED	Cross-listed with CHEM 105, ENSCEN 105, ENVIRON 105, STS 105.	
37	CLIMATE	280	DEL		FT 2025	NO	YES	APPROVED	Cross-listed with SPACE 280.	
40	CLIMATE	381	DEL		FT 2025	C	YES	APPROVED	Cross-listed with SPACE 381.	
43	CLIMATE	451	MOD	Changes to remove ENSCEN cross-listing.	FT 2025	NO	YES	APPROVED	Cross-listed with EARTH 457 and ENSCEN 451.	
46	CLIMATE	463	MOD	Changes to remove ENSCEN cross-listing.	FT 2025	NO	YES	APPROVED	Cross-listed with ENSCEN 463.	
49	CLIMATE	475	MOD	Changes to remove ENSCEN cross-listing.	FT 2025	NO	YES	APPROVED	Cross-listed with EARTH 475 and ENSCEN 475.	
52	CLIMATE	479	MOD	Changes to remove ENSCEN cross-listing and Course Credit Type.	FT 2025	NO	YES	APPROVED	Cross-listed with ENSCEN 479.	
55	CLIMATE	511	DEL		FT 2025	NO	YES	APPROVED		
58	CLIMATE	524	MOD	Changes to remove ENSCEN cross-listing and Course Credit Type.	FT 2025	NO	YES	APPROVED	Cross-listed with ENSCEN 524.	

PAGE	SUBJECT	COURSE #	ACTION	SUMMARY	EFFECTIVE TERM	MIN. GRADE REQ. FOR ENF. PREPREQ	Is Course on LSA Course Guide?	APPROVED	NOTES & REVISIONS	TABLED
61	CLIMATE	555	DEL		FT 2025	NO	YES	APPROVED	Cross-listed with SPACE 555.	
64	CLIMATE	578	DEL		FT 2025	NO	YES	APPROVED	Cross-listed with ENSCEN 578.	
67	ENGR	354	DEL		FT 2025	NO	YES	APPROVED		
70	ENTR	405	NEW		FT 2025	NO	NO	APPROVED		
89	ENTR	419	NEW		FT 2025	NO	NO	CONDITIONAL APPROVAL	Adjustment to last sentence of Course Description to remove “..this course..”	
108	ENTR	570	NEW		FT 2025	NO	NO	CONDITIONAL APPROVAL	Adjustment to last sentence of Course Description to remove “This course..” and/or edit entire sentence.	
132	IOE	424	MOD	Changes to Credit Exclusions.	FT 2025	C-	YES	APPROVED	Suggestion of updating Credit Exclusions to Enforced Prerequisites for WT 2026.	
135	IOE	481	MOD	Changes to Add/Drop Consent and Credit Exclusions.	FT 2025	C-	YES	APPROVED	Suggestion of updating Credit Exclusions to Enforced Prerequisites for WT 2026.	
138	IOE	534	MOD	Changes to Advisory Prerequisite.	FT 2025	NO	YES	APPROVED	Cross-listed with BIOMEDE 534 and MFG 534.	
141	SPACE	371	MOD	Changes to Course and Abbreviated Titles and Course Description.	FT 2025	C-	YES	APPROVED		
144	SPACE	495	MOD	Changes to remove ENSCEN cross-listing.	FT 2025	NO	YES	APPROVED	Cross-listed with ENSCEN 495.	

Julie Simmons Ivy • Vivian L. Carpenter Collegiate Professor and Department Chair

TO: Curriculum Committee of the College of Engineering

FROM: Julie Ivy, Chair, Department of Industrial and Operations Engineering

DATE: February 28, 2025

SUBJECT: Financial Engineering Concentration for the Bachelor of Science in Engineering, Industrial and Operations Engineering

This memo seeks the approval of the College of Engineering Curriculum Committee for the establishment of a new concentration in Financial Engineering within the BSE Bachelor of Science in Engineering (BSE) degree offered by the Department of Industrial and Operations Engineering (IOE). The establishment of this concentration has been reviewed and approved by the IOE faculty.

Financial engineers are employed by investment banks, hedge funds, asset managers, commercial banks, insurance agencies, and consultancies to the financial industry. They also work in corporate treasuries, regulatory agencies, and in international quasi-governmental organizations like The World Bank. There is a growing realization in this industry that hiring engineers with some financial background is very helpful for their operations.

Summary of the Proposal

The proposed concentration is designed to provide students with specialized knowledge and skills in Financial Engineering, combining elective foundational and related coursework to address industry demands and align with educational objectives. The proposed effective date for this concentration is Fall 2025 or Winter 2026.

Concentration Requirements:

Students must complete a minimum of 12 credits and maintain a GPA of at least 2.0 within the concentration coursework:

Required Core Courses (6 credits):

These foundational courses are mandatory for all students pursuing the Financial Engineering concentration:

IOE 452 – Corporate Finance (3 credits)

IOE 453 – Derivative Instruments (3 credits)

Elective Courses (minimum of 6 credits):

Students must select additional courses from the following electives, which enhance their expertise in optimization and statistics and data analytics:

IOE 410 – Advanced Optimization and Computational Methods (3 credits)

IOE 460 – Decision Analysis and Bounded Rationality (3 credits)

IOE 465 – Design of Experiments (3 credits)

IOE 473 – Advanced Data Analytics (3 credit)

Alignment with Program Objectives:

The courses within the concentration are regularly offered in the IOE program. Together they form a cohesive curriculum in Financial Engineering.

Core Courses: Provide tools and methodologies specific to Financial Engineering focusing on corporate finance and derivative instruments.

Electives: Offer complementary skills in optimization and statistics and data analytics, ensuring students develop a well-rounded technical foundation.

Advising and Support

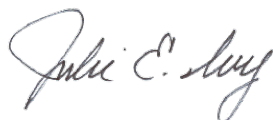
The department will designate a faculty member as a program advisor specifically for this concentration to guide students, monitor progress, and ensure compliance with degree requirements.

Conclusion

The proposed Financial Engineering concentration is designed to meet the stated criteria of the College Curriculum Committee. It leverages existing program strengths and aligns with the department's mission to offer high-impact educational opportunities. We are confident this concentration will enrich the BSE degree and prepare graduates for competitive roles in the field of Financial Engineering.

We respectfully request the committee's review and approval of this proposal.

Sincerely,



Julie Simmons Ivy, Ph.D.
Vivian L. Carpenter Collegiate Professor and Department Chair
IISE Fellow 2023
INFORMS Fellow 2022



Course Approval Request Form

Office of the Registrar, University of Michigan

1210 LSA Building
500 S. State Street
Ann Arbor, MI 48109-1382
Phone: 734.763.2113
Fax: 734.936.3148
ro.curriculum@umich.edu
ro.umich.edu

CHECK APPROPRIATE BOXES FOR ALL CHANGES

Action Requested

- New Course
- Modification of Existing Course
- Deletion of Existing Course

Date of Submission: 2025-02-04

Effective Term: Winter 2026

<input checked="" type="checkbox"/>	Course Offered	RO USE ONLY Date Received: Date Completed: Completed By:
	<input checked="" type="checkbox"/> Indefinitely <input type="checkbox"/> One term only	

CURRENT LISTING

REQUESTED LISTING

<input type="checkbox"/>	Dept (Home): Aerospace Engineering Subject: AEROSP Catalog: 388			Dept (Home): Aerospace Engineering Subject: AEROSP Catalog: 388		
<input type="checkbox"/>	<input type="checkbox"/> Course is Cross-Listed with Other Departments			<input type="checkbox"/> Course is Cross-Listed with Other Departments		
	Department	Subject	Catalog Number	Department	Subject	Catalog Number
<input type="checkbox"/>	Course Title (full title) Systems Engineering Processes and Digital Tools (MBSE)			Course Title (full title) Systems Engineering Processes and Digital Tools (MBSE)		
<input type="checkbox"/>	Abbreviated Title (20 char) SYS ENGR PRC TL MBSE			Abbreviated Title (20 char) SYS ENGR PRC TL MBSE		
<input type="checkbox"/>	Course Description (Please limit to 80 words and attach separate sheet if necessary) Model-Based Systems Engineering (MBSE) tools and methods will be taught on a known system, so students can learn fundamentals and apply them to their own student projects such as the development of complex products such as aircraft, spacecraft, automobiles, etc.. Other product development leadership tools and processes are also included.					
<input type="checkbox"/>	Full Term Credit Hours			Half Term Credit Hours		
	Undergraduate Min: 3.5	Graduate Min:		Undergraduate Min:	Graduate Min:	
<input type="checkbox"/>	Undergraduate Max: 3.5	Graduate Max:		Undergraduate Max:	Graduate Max:	
	Course Credit Type Undergraduate Student					
<input type="checkbox"/>	Repeatability			<input checked="" type="checkbox"/> Course is Y graded		
	<input checked="" type="checkbox"/> Course is Repeatable for Credit			<input type="checkbox"/> Can be taken more than once in the same term		
Maximum number of repeatable credits:			<input checked="" type="checkbox"/> Maximum Total Completions Allowed: 2			

Subject: Aerospace Engineering Catalog: 388

<input type="checkbox"/>	Grading Basis		
	<input checked="" type="checkbox"/> Graded (A – E)		
	<input type="checkbox"/> Credit/No Credit		
	<input type="checkbox"/> Satisfactory/Unsatisfactory	Add Consent	Drop Consent
	<input type="checkbox"/> Pass/Fail	<input type="checkbox"/> Department Consent	<input type="checkbox"/> Department Consent
	<input type="checkbox"/> Business Administration	<input checked="" type="checkbox"/> Instructor Consent	<input checked="" type="checkbox"/> Instructor Consent
Grading		<input type="checkbox"/> No Consent	<input type="checkbox"/> No Consent
	<input type="checkbox"/> Not for Credit		
	<input type="checkbox"/> Not for Degree Credit		
	<input type="checkbox"/> Degree Credit Only		

CURRENT LISTING**REQUESTED LISTING**

<input type="checkbox"/>	Advisory Prerequisite (254 char) AEROSP 215, AEROSP 225 or equivalent/similar AEROSP 200-level courses within major	Advisory Prerequisite (254 char) AEROSP 215, AEROSP 225 or equivalent/similar AEROSP 200-level courses within major																					
<input checked="" type="checkbox"/>	Enforced Prerequisite (254 char) AEROSP 288 (B or Better) Minimum grade requirement: B	Enforced Prerequisite (254 char) Minimum grade requirement:																					
<input type="checkbox"/>	Credit Exclusions	Credit Exclusions																					
<input type="checkbox"/>	<table border="0"> <tr> <td>Course Components</td> <td>Graded Component</td> <td>Terms Typically Offered</td> </tr> <tr> <td><input checked="" type="checkbox"/> Lecture</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/> Fall</td> </tr> <tr> <td><input type="checkbox"/> Seminar</td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/> Winter</td> </tr> <tr> <td><input checked="" type="checkbox"/> Recitation</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Spring</td> </tr> <tr> <td><input checked="" type="checkbox"/> Lab</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Summer</td> </tr> <tr> <td><input type="checkbox"/> Discussion</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Spring/Summer</td> </tr> <tr> <td><input type="checkbox"/> Independent Study</td> <td><input type="checkbox"/></td> <td></td> </tr> </table>	Course Components	Graded Component	Terms Typically Offered	<input checked="" type="checkbox"/> Lecture	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Fall	<input type="checkbox"/> Seminar	<input type="checkbox"/>	<input checked="" type="checkbox"/> Winter	<input checked="" type="checkbox"/> Recitation	<input type="checkbox"/>	<input type="checkbox"/> Spring	<input checked="" type="checkbox"/> Lab	<input type="checkbox"/>	<input type="checkbox"/> Summer	<input type="checkbox"/> Discussion	<input type="checkbox"/>	<input type="checkbox"/> Spring/Summer	<input type="checkbox"/> Independent Study	<input type="checkbox"/>		
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<input type="checkbox"/> Independent Study	<input type="checkbox"/>																						
Cognizant Faculty Member Name: George Halow Cinar		Cognizant Faculty Member Title:																					

SIGNATURES ARE REQUIRED FROM ALL DEPARTMENTS INVOLVED (Please Print AND Sign Name)

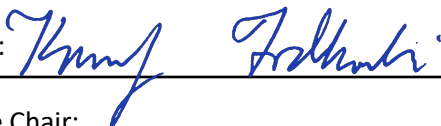
Contact Person:

Email:

Phone:

CoE Curriculum

Committee Representative:



Print: Krzysztof Fidkowski

Date: 01-23-25

CoE Curriculum Committee Chair:

Print:

Date:

Home Department Chair:



Print: Carlos Cesnik

Date: 1/27/2025

Cross-Listed Department Chair:

Print:

Date:

Cross-Listed Department Chair:

Print:

Date:

Cross-Listed Department Chair:

Print:

Date:

DEPARTMENTAL/COLLEGE USE ONLY

Current:**Requested:**Course Description

Model-Based Systems Engineering (MBSE) tools and methods will be taught on a known system, so students can learn fundamentals and apply them to their own student projects such as the development of complex products such as aircraft, spacecraft, automobiles, etc.. Other product development leadership tools and processes are also included.

Course Description

Model-Based Systems Engineering (MBSE) tools and methods will be taught on a known system, so students can learn fundamentals and apply them to their own student projects such as the development of complex products such as aircraft, spacecraft, automobiles, etc.. Other product development leadership tools and processes are also included.

Class Length

Full term

Class Length

Full term

Contact hours (lecture):

3

Contact hours (lecture):

3

Contact hours (recitation)

2

Contact hours (recitation)

2

Contact hours (lab)

4

Contact hours (lab)

4

Additional Info:Submitted by:

Home dept

Describe how this course fits with the degree requirements:

Meets sophomore design/build/test/fly requirement, as well as junior/senior capstone systems laboratory requirement

Special resources of facilities required for this course:

MBSE Leadership Lab (operational)

Supporting statement:

This course is being adjusted to remove enforced prereq as 288 is no longer an active course.



Course Approval Request Form

Office of the Registrar, University of Michigan

1210 LSA Building

500 S. State Street

Ann Arbor, MI 48109-1382

Phone: 734.763.2113

Fax: 734.936.3148

CHECK APPROPRIATE BOXES FOR ALL CHANGES

Action Requested

- New Course
 Modification of Existing Course
 Deletion of Existing Course

Date of Submission: 2025-02-20

Effective Term: Winter 2026

<input checked="" type="checkbox"/>	Course Offered <input checked="" type="checkbox"/> Indefinitely <input type="checkbox"/> One term only	RO USE ONLY Date Received: Date Completed: Completed By:
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CURRENT LISTING

REQUESTED LISTING

<input type="checkbox"/>	Dept (Home): Engineering Subject: ENGR Catalog: 301	Dept (Home): Engineering Subject: ENGR Catalog: 301												
<input type="checkbox"/>	<input type="checkbox"/> Course is Cross-Listed with Other Departments	<input type="checkbox"/> Course is Cross-Listed with Other Departments												
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<input type="checkbox"/>	Course Title (full title) Engineering Undergraduate Study Abroad	Course Title (full title) Engineering Undergraduate Study Abroad												
<input type="checkbox"/>	Abbreviated Title (20 char) Engr Ugrad Stdy Abrd	Abbreviated Title (20 char) Engr Ugrad Stdy Abrd												
<input checked="" type="checkbox"/>	Course Description (Please limit to 80 words and attach separate sheet if necessary) Students planning to study abroad for fall, winter, spring, summer, or spring/summer on College of Engineering approved Study Abroad programs should register under Engineering.													
<input type="checkbox"/>	Full Term Credit Hours Undergraduate Min: 1 Graduate Min: Undergraduate Max: 16 Graduate Max:	Half Term Credit Hours Undergraduate Min: 1 Graduate Min: Undergraduate Max: 16 Graduate Max:												
<input type="checkbox"/>	Course Credit Type Undergraduate Student													
<input type="checkbox"/>	Repeatability <input checked="" type="checkbox"/> Course is Repeatable for Credit Maximum number of repeatable credits: 999	<input type="checkbox"/> Course is Y graded <input checked="" type="checkbox"/> Can be taken more than once in the same term												

Subject: Engineering Catalog: 301

<input type="checkbox"/>	Grading Basis		
	<input type="checkbox"/> Graded (A – E)	<input checked="" type="checkbox"/> Multiple Grading Patterns	
	<input type="checkbox"/> Credit/No Credit		
	<input type="checkbox"/> Satisfactory/Unsatisfactory	Add Consent	Drop Consent
	<input type="checkbox"/> Pass/Fail	<input type="checkbox"/> Department Consent	<input type="checkbox"/> Department Consent
	<input type="checkbox"/> Business Administration	<input type="checkbox"/> Instructor Consent	<input type="checkbox"/> Instructor Consent
	Grading	<input checked="" type="checkbox"/> No Consent	<input checked="" type="checkbox"/> No Consent
	<input type="checkbox"/> Not for Credit		
	<input type="checkbox"/> Not for Degree Credit		
	<input type="checkbox"/> Degree Credit Only		

CURRENT LISTING**REQUESTED LISTING**

<input type="checkbox"/>	Advisory Prerequisite (254 char) Student must meet any other prerequisites designated by the host university.	Advisory Prerequisite (254 char) Student must meet any other prerequisites designated by the host university.
<input type="checkbox"/>	Enforced Prerequisite (254 char) Minimum grade requirement:	Enforced Prerequisite (254 char) Minimum grade requirement:
<input type="checkbox"/>	Credit Exclusions	Credit Exclusions

<input type="checkbox"/>	Course Components	Graded Component	Terms Typically Offered
	<input checked="" type="checkbox"/> Lecture	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Fall
	<input type="checkbox"/> Seminar	<input type="checkbox"/>	<input checked="" type="checkbox"/> Winter
	<input type="checkbox"/> Recitation	<input type="checkbox"/>	<input checked="" type="checkbox"/> Spring
	<input type="checkbox"/> Lab	<input type="checkbox"/>	<input checked="" type="checkbox"/> Summer
	<input type="checkbox"/> Discussion	<input type="checkbox"/>	<input checked="" type="checkbox"/> Spring/Summer
	<input type="checkbox"/> Independent Study	<input type="checkbox"/>	

Cognizant Faculty Member Name: Aline Cotel

Cognizant Faculty Member Title: IPE Faculty Advisor

SIGNATURES ARE REQUIRED FROM ALL DEPARTMENTS INVOLVED (Please Print AND Sign Name)

Contact Person: Ryan Latimer

Email: rlatimer@umich.edu

Phone: 734-647-9039

CoE Curriculum

Committee Representative:



Print: Rachael Schmedlen

Date: 2/24/25

CoE Curriculum Committee Chair:

Print:

Date:

Home Department Chair:



Print: Kevin Pipe

Date: 2/25/25

Cross-Listed Department Chair:

Print:

Date:

Cross-Listed Department Chair:

Print:

Date:

Cross-Listed Department Chair:

Print:

Date:

DEPARTMENTAL/COLLEGE USE ONLY

Current:**Requested:**Course Description

Students planning to study abroad for fall, winter, spring, summer, or spring/summer on College of Engineering approved Study Abroad programs should register under Engineering. Separate course sections will be listed for each different study abroad destination.

Course Description

Students planning to study abroad for fall, winter, spring, summer, or spring/summer on College of Engineering approved Study Abroad programs should register under Engineering.

Class Length

Full term

Class Length

Full term

Contact hours (lecture):

1-16

Contact hours (lecture):

1-16

Contact hours (recitation)Contact hours (recitation)Contact hours (lab)Contact hours (lab)**Additional Info:**Submitted by:

Home dept

Describe how this course fits with the degree requirements:

Free Elective

Special resources of facilities required for this course:Supporting statement:

Course no longer being divided into separate course sections



Course Approval Request Form

Office of the Registrar, University of Michigan

1210 LSA Building

500 S. State Street

Ann Arbor, MI 48109-1382

Phone: 734.763.2113

Fax: 734.936.3148

CHECK APPROPRIATE BOXES FOR ALL CHANGES

Action Requested

- New Course
 Modification of Existing Course
 Deletion of Existing Course

Date of Submission: 2025-02-07

Effective Term: Winter 2026

<input checked="" type="checkbox"/>	Course Offered <input checked="" type="checkbox"/> Indefinitely <input type="checkbox"/> One term only	RO USE ONLY Date Received: Date Completed: Completed By:
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CURRENT LISTING

REQUESTED LISTING

<input type="checkbox"/>	Dept (Home): Engineering Subject: ENGR Catalog: 345	Dept (Home): Subject: Catalog:												
<input type="checkbox"/>	<input type="checkbox"/> Course is Cross-Listed with Other Departments	<input type="checkbox"/> Course is Cross-Listed with Other Departments												
<input type="checkbox"/>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Department</th> <th style="width: 25%;">Subject</th> <th style="width: 50%;">Catalog Number</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Department	Subject	Catalog Number				<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Department</th> <th style="width: 25%;">Subject</th> <th style="width: 50%;">Catalog Number</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Department	Subject	Catalog Number			
Department	Subject	Catalog Number												
Department	Subject	Catalog Number												
<input type="checkbox"/>	Course Title (full title) Introduction to Design Processes	Course Title (full title)												
<input type="checkbox"/>	Abbreviated Title (20 char) Intro to Design Proc	Abbreviated Title (20 char)												
<input type="checkbox"/>	Course Description (Please limit to 80 words and attach separate sheet if necessary) Processes of design, focusing on front-end strategies, including opportunity discovery, problem definition, developing robust mechanisms to gather information from users and other stakeholders, data synthesis methods for translating user data into design requirements, creating innovative solutions during concept generation, and decision-making systems for evaluating possible solutions.													
<input type="checkbox"/>	Full Term Credit Hours Undergraduate Min: 2 Graduate Min: Undergraduate Max: 2 Graduate Max:	Half Term Credit Hours Undergraduate Min: Graduate Min: Undergraduate Max: Graduate Max:												
<input type="checkbox"/>	Course Credit Type Undergraduate Student													
<input type="checkbox"/>	Repeatability <input type="checkbox"/> Course is Repeatable for Credit <input type="checkbox"/> Course is Y graded Maximum number of repeatable credits: <input type="checkbox"/> Can be taken more than once in the same term													

Subject: Engineering Catalog: 345

<input type="checkbox"/>	Grading Basis		
	<input checked="" type="checkbox"/> Graded (A – E)		
	<input type="checkbox"/> Credit/No Credit		
	<input type="checkbox"/> Satisfactory/Unsatisfactory	Add Consent	Drop Consent
	<input type="checkbox"/> Pass/Fail	<input type="checkbox"/> Department Consent	<input type="checkbox"/> Department Consent
	<input type="checkbox"/> Business Administration	<input checked="" type="checkbox"/> Instructor Consent	<input type="checkbox"/> Instructor Consent
	Grading	<input type="checkbox"/> No Consent	<input checked="" type="checkbox"/> No Consent
<input type="checkbox"/> Not for Credit			
<input type="checkbox"/> Not for Degree Credit			
<input type="checkbox"/> Degree Credit Only			

CURRENT LISTING**REQUESTED LISTING**

<input type="checkbox"/>	Advisory Prerequisite (254 char)	Advisory Prerequisite (254 char)																					
<input type="checkbox"/>	Enforced Prerequisite (254 char)	Enforced Prerequisite (254 char)																					
<input type="checkbox"/>	Minimum grade requirement:	Minimum grade requirement:																					
<input type="checkbox"/>	Credit Exclusions	Credit Exclusions																					
<input type="checkbox"/>	<table border="0"> <tr> <td>Course Components</td> <td>Graded Component</td> <td>Terms Typically Offered</td> </tr> <tr> <td><input type="checkbox"/> Lecture</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Fall</td> </tr> <tr> <td><input checked="" type="checkbox"/> Seminar</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/> Winter</td> </tr> <tr> <td><input type="checkbox"/> Recitation</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Spring</td> </tr> <tr> <td><input type="checkbox"/> Lab</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Summer</td> </tr> <tr> <td><input type="checkbox"/> Discussion</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Spring/Summer</td> </tr> <tr> <td><input type="checkbox"/> Independent Study</td> <td><input type="checkbox"/></td> <td></td> </tr> </table>	Course Components	Graded Component	Terms Typically Offered	<input type="checkbox"/> Lecture	<input type="checkbox"/>	<input type="checkbox"/> Fall	<input checked="" type="checkbox"/> Seminar	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Winter	<input type="checkbox"/> Recitation	<input type="checkbox"/>	<input type="checkbox"/> Spring	<input type="checkbox"/> Lab	<input type="checkbox"/>	<input type="checkbox"/> Summer	<input type="checkbox"/> Discussion	<input type="checkbox"/>	<input type="checkbox"/> Spring/Summer	<input type="checkbox"/> Independent Study	<input type="checkbox"/>		
Course Components	Graded Component	Terms Typically Offered																					
<input type="checkbox"/> Lecture	<input type="checkbox"/>	<input type="checkbox"/> Fall																					
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<input type="checkbox"/> Discussion	<input type="checkbox"/>	<input type="checkbox"/> Spring/Summer																					
<input type="checkbox"/> Independent Study	<input type="checkbox"/>																						
Cognizant Faculty Member Name: Shanna Daly		Cognizant Faculty Member Title:																					

SIGNATURES ARE REQUIRED FROM ALL DEPARTMENTS INVOLVED (Please Print AND Sign Name)

Contact Person: Ryan Latimer Email: rlatimer@umich.edu Phone: 734-647-9039

CoE Curriculum

Committee Representative:



Print: Rachael Schmedlen

Date: 2/7/25

CoE Curriculum Committee Chair:

Print:

Date:

Home Department Chair:



Print: Kevin Pipe

Date: 2/10/25

Cross-Listed Department Chair:

Print:

Date:

Cross-Listed Department Chair:

Print:

Date:

Cross-Listed Department Chair:

Print:

Date:

DEPARTMENTAL/COLLEGE USE ONLY

Current:**Requested:**Course Description

Processes of design, focusing on front-end strategies, including opportunity discovery, problem definition, developing robust mechanisms to gather information from users and other stakeholders, data synthesis methods for translating user data into design requirements, creating innovative solutions during concept generation, and decision-making systems for evaluating possible solutions.

Course DescriptionClass Length

Full term

Class LengthContact hours (lecture):

2

Contact hours (lecture):Contact hours (recitation)Contact hours (recitation)Contact hours (lab)Contact hours (lab)**Additional Info:**Submitted by:

Home dept

Describe how this course fits with the degree requirements:Special resources of facilities required for this course:Supporting statement:

Instructor used this course only once in W15 before converting it to a permanent course in ME



Course Approval Request Form

Office of the Registrar, University of Michigan

1210 LSA Building

500 S. State Street

Ann Arbor, MI 48109-1382

Phone: 734.763.2113

Fax: 734.936.3148

CHECK APPROPRIATE BOXES FOR ALL CHANGES

Action Requested

- New Course
 Modification of Existing Course
 Deletion of Existing Course

Date of Submission: 2025-02-21

Effective Term: Winter 2026

<input checked="" type="checkbox"/>	Course Offered <input checked="" type="checkbox"/> Indefinitely <input type="checkbox"/> One term only	RO USE ONLY Date Received: Date Completed: Completed By:
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CURRENT LISTING

REQUESTED LISTING

<input type="checkbox"/>	Dept (Home): Engineering Subject: ENGR Catalog: 403	Dept (Home): Subject: Catalog:												
<input type="checkbox"/>	<input type="checkbox"/> Course is Cross-Listed with Other Departments	<input type="checkbox"/> Course is Cross-Listed with Other Departments												
<input type="checkbox"/>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Department</th> <th style="width: 25%;">Subject</th> <th style="width: 50%;">Catalog Number</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Department	Subject	Catalog Number				<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Department</th> <th style="width: 25%;">Subject</th> <th style="width: 50%;">Catalog Number</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Department	Subject	Catalog Number			
Department	Subject	Catalog Number												
Department	Subject	Catalog Number												
<input type="checkbox"/>	Course Title (full title) Scientific Visualization	Course Title (full title)												
<input type="checkbox"/>	Abbreviated Title (20 char) Sci Visualization	Abbreviated Title (20 char)												
<input type="checkbox"/>	Course Description (Please limit to 80 words and attach separate sheet if necessary) Introduces engineering and science students to scientific visualization principles of data display. Use of color to encode quantitative information. Display of 2- and 3-D scalar and vector data. Interactive computer techniques emphasized. Extensive hands-on practice.													
<input type="checkbox"/>	Full Term Credit Hours Undergraduate Min: 3 Graduate Min: 3 Undergraduate Max: 3 Graduate Max: 3	Half Term Credit Hours Undergraduate Min: Graduate Min: Undergraduate Max: Graduate Max:												
<input type="checkbox"/>	Course Credit Type Undergraduate Student, Rackham Graduate Student													
<input type="checkbox"/>	Repeatability <input type="checkbox"/> Course is Repeatable for Credit Maximum number of repeatable credits:	<input type="checkbox"/> Course is Y graded <input type="checkbox"/> Can be taken more than once in the same term												

Subject: Engineering Catalog: 403

<input type="checkbox"/>	Grading Basis		
	<input checked="" type="checkbox"/> Graded (A – E)		
	<input type="checkbox"/> Credit/No Credit		
	<input type="checkbox"/> Satisfactory/Unsatisfactory	Add Consent	Drop Consent
	<input type="checkbox"/> Pass/Fail	<input type="checkbox"/> Department Consent	<input type="checkbox"/> Department Consent
	<input type="checkbox"/> Business Administration	<input type="checkbox"/> Instructor Consent	<input type="checkbox"/> Instructor Consent
	Grading	<input checked="" type="checkbox"/> No Consent	<input checked="" type="checkbox"/> No Consent
<input type="checkbox"/> Not for Credit			
<input type="checkbox"/> Not for Degree Credit			
<input type="checkbox"/> Degree Credit Only			

CURRENT LISTING**REQUESTED LISTING**

<input type="checkbox"/>	Advisory Prerequisite (254 char) Upper division or graduate standing	Advisory Prerequisite (254 char)																					
<input type="checkbox"/>	Enforced Prerequisite (254 char) Minimum grade requirement:	Enforced Prerequisite (254 char) Minimum grade requirement:																					
<input type="checkbox"/>	Credit Exclusions	Credit Exclusions																					
<input type="checkbox"/>	<table border="0"> <tr> <td>Course Components</td> <td>Graded Component</td> <td>Terms Typically Offered</td> </tr> <tr> <td><input checked="" type="checkbox"/> Lecture</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/> Fall</td> </tr> <tr> <td><input type="checkbox"/> Seminar</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Winter</td> </tr> <tr> <td><input type="checkbox"/> Recitation</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Spring</td> </tr> <tr> <td><input type="checkbox"/> Lab</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Summer</td> </tr> <tr> <td><input type="checkbox"/> Discussion</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Spring/Summer</td> </tr> <tr> <td><input type="checkbox"/> Independent Study</td> <td><input type="checkbox"/></td> <td></td> </tr> </table>	Course Components	Graded Component	Terms Typically Offered	<input checked="" type="checkbox"/> Lecture	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Fall	<input type="checkbox"/> Seminar	<input type="checkbox"/>	<input type="checkbox"/> Winter	<input type="checkbox"/> Recitation	<input type="checkbox"/>	<input type="checkbox"/> Spring	<input type="checkbox"/> Lab	<input type="checkbox"/>	<input type="checkbox"/> Summer	<input type="checkbox"/> Discussion	<input type="checkbox"/>	<input type="checkbox"/> Spring/Summer	<input type="checkbox"/> Independent Study	<input type="checkbox"/>		
Course Components	Graded Component	Terms Typically Offered																					
<input checked="" type="checkbox"/> Lecture	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Fall																					
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<input type="checkbox"/> Recitation	<input type="checkbox"/>	<input type="checkbox"/> Spring																					
<input type="checkbox"/> Lab	<input type="checkbox"/>	<input type="checkbox"/> Summer																					
<input type="checkbox"/> Discussion	<input type="checkbox"/>	<input type="checkbox"/> Spring/Summer																					
<input type="checkbox"/> Independent Study	<input type="checkbox"/>																						
Cognizant Faculty Member Name: Unknown		Cognizant Faculty Member Title:																					

SIGNATURES ARE REQUIRED FROM ALL DEPARTMENTS INVOLVED (Please Print AND Sign Name)

Contact Person: Ryan Latimer

Email: rlatimer@umich.edu

Phone: 734-647-9039

CoE Curriculum

Committee Representative:



Print: Rachael Schmedlen

Date: 2/24/25

CoE Curriculum Committee Chair:

Print:

Date:

Home Department Chair:



Print: Kevin Pipe

Date: 2/25/25

Cross-Listed Department Chair:

Print:

Date:

Cross-Listed Department Chair:

Print:

Date:

Cross-Listed Department Chair:

Print:

Date:

DEPARTMENTAL/COLLEGE USE ONLY

Current:**Requested:**Course Description

Introduces engineering and science students to scientific visualization principles of data display. Use of color to encode quantitative information. Display of 2- and 3-D scalar and vector data. Interactive computer techniques emphasized. Extensive hands-on practice.

Course DescriptionClass Length

Full term

Class LengthContact hours (lecture):

3

Contact hours (lecture):Contact hours (recitation)Contact hours (recitation)Contact hours (lab)Contact hours (lab)**Additional Info:**Submitted by:

Home dept

Describe how this course fits with the degree requirements:Special resources of facilities required for this course:Supporting statement:

Course has not been offered since Winter 2009, no Atlas listing



Course Approval Request Form
Office of the Registrar, University of Michigan

1210 LSA Building
500 S. State Street
Ann Arbor, MI 48109-1382
Phone: 734.763.2113
Fax: 734.936.3148

CHECK APPROPRIATE BOXES FOR ALL CHANGES

Action Requested

- New Course
 - Modification of Existing Course
 - Deletion of Existing Course
- Date of Submission: 2025-02-19
Effective Term: Winter 2026

<input checked="" type="checkbox"/>	Course Offered <input checked="" type="checkbox"/> Indefinitely <input type="checkbox"/> One term only	RO USE ONLY Date Received: Date Completed: Completed By:
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CURRENT LISTING

REQUESTED LISTING

<input type="checkbox"/>	Dept (Home): Engineering Subject: ENGR Catalog: 465	Dept (Home): Subject: Catalog:
<input type="checkbox"/>	<input type="checkbox"/> Course is Cross-Listed with Other Departments	
	Department	Subject
<input type="checkbox"/>	Course Title (full title) Environmental Process Engineering	Course Title (full title)
<input type="checkbox"/>	Abbreviated Title (20 char) Env Process Engr	Abbreviated Title (20 char)
<input type="checkbox"/>	Course Description (Please limit to 80 words and attach separate sheet if necessary) An introduction to the analysis, characterization and principles of physical, chemical and biological processes, operations and reactor configurations commonly used for water quality control; preliminary design of specific water and wastewater treatment processes and operations; discussion of economic and legislative constraints and requirements.	
<input type="checkbox"/>	Full Term Credit Hours Undergraduate Min: 3 Graduate Min: Undergraduate Max: 3 Graduate Max:	
	Half Term Credit Hours Undergraduate Min: Graduate Min: Undergraduate Max: Graduate Max:	
<input type="checkbox"/>	Course Credit Type Undergraduate Student	
<input type="checkbox"/>	Repeatability <input type="checkbox"/> Course is Repeatable for Credit	
	Maximum number of repeatable credits:	<input type="checkbox"/> Course is Y graded <input type="checkbox"/> Can be taken more than once in the same term

Subject: Engineering Catalog: 465

<input type="checkbox"/>	Grading Basis	Add Consent	Drop Consent
	<input checked="" type="checkbox"/> Graded (A – E)	<input type="checkbox"/> Department Consent	<input type="checkbox"/> Department Consent
	<input type="checkbox"/> Credit/No Credit	<input type="checkbox"/> Instructor Consent	<input type="checkbox"/> Instructor Consent
	<input type="checkbox"/> Satisfactory/Unsatisfactory	<input checked="" type="checkbox"/> No Consent	<input checked="" type="checkbox"/> No Consent
	<input type="checkbox"/> Pass/Fail		
	<input type="checkbox"/> Business Administration		
	Grading		
<input type="checkbox"/> Not for Credit			
<input type="checkbox"/> Not for Degree Credit			
<input type="checkbox"/> Degree Credit Only			

CURRENT LISTING**REQUESTED LISTING**

<input type="checkbox"/>	Advisory Prerequisite (254 char) CEE 325 and CEE 365	Advisory Prerequisite (254 char)																					
<input type="checkbox"/>	Enforced Prerequisite (254 char) Minimum grade requirement:	Enforced Prerequisite (254 char) Minimum grade requirement:																					
<input type="checkbox"/>	Credit Exclusions	Credit Exclusions																					
<input type="checkbox"/>	<table border="0"> <tr> <td>Course Components</td> <td>Graded Component</td> <td>Terms Typically Offered</td> </tr> <tr> <td><input checked="" type="checkbox"/> Lecture</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/> Fall</td> </tr> <tr> <td><input type="checkbox"/> Seminar</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Winter</td> </tr> <tr> <td><input type="checkbox"/> Recitation</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Spring</td> </tr> <tr> <td><input type="checkbox"/> Lab</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Summer</td> </tr> <tr> <td><input type="checkbox"/> Discussion</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Spring/Summer</td> </tr> <tr> <td><input type="checkbox"/> Independent Study</td> <td><input type="checkbox"/></td> <td></td> </tr> </table>	Course Components	Graded Component	Terms Typically Offered	<input checked="" type="checkbox"/> Lecture	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Fall	<input type="checkbox"/> Seminar	<input type="checkbox"/>	<input type="checkbox"/> Winter	<input type="checkbox"/> Recitation	<input type="checkbox"/>	<input type="checkbox"/> Spring	<input type="checkbox"/> Lab	<input type="checkbox"/>	<input type="checkbox"/> Summer	<input type="checkbox"/> Discussion	<input type="checkbox"/>	<input type="checkbox"/> Spring/Summer	<input type="checkbox"/> Independent Study	<input type="checkbox"/>		
Course Components	Graded Component	Terms Typically Offered																					
<input checked="" type="checkbox"/> Lecture	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Fall																					
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<input type="checkbox"/> Discussion	<input type="checkbox"/>	<input type="checkbox"/> Spring/Summer																					
<input type="checkbox"/> Independent Study	<input type="checkbox"/>																						
Cognizant Faculty Member Name:		Cognizant Faculty Member Title:																					

SIGNATURES ARE REQUIRED FROM ALL DEPARTMENTS INVOLVED (Please Print AND Sign Name)

Contact Person: Ryan Latimer Email: rlatimer@umich.edu Phone: 734-647-9039

CoE Curriculum

Committee Representative:



Print: Rachael Schmedlen

Date: 2/24/25

CoE Curriculum Committee Chair:

Print:

Date:

Home Department Chair:



Print: Kevin Pipe

Date: 2/25/25

Cross-Listed Department Chair:

Print:

Date:

Cross-Listed Department Chair:

Print:

Date:

Cross-Listed Department Chair:

Print:

Date:

DEPARTMENTAL/COLLEGE USE ONLY

Current:

Requested:

Course Description

An introduction to the analysis, characterization and principles of physical, chemical and biological processes, operations and reactor configurations commonly used for water quality control; preliminary design of specific water and wastewater treatment processes and operations; discussion of economic and legislative constraints and requirements.

Course Description

Class Length

Full term

Class Length

Contact hours (lecture):

3

Contact hours (lecture):

Contact hours (recitation)

Contact hours (recitation)

Contact hours (lab)

Contact hours (lab)

Additional Info:

Submitted by:

Home dept

Describe how this course fits with the degree requirements:

Special resources of facilities required for this course:

Supporting statement:

Course never offered since being created in Fall 2011



Course Approval Request Form
Office of the Registrar, University of Michigan

1210 LSA Building
500 S. State Street
Ann Arbor, MI 48109-1382
Phone: 734.763.2113
Fax: 734.936.3148

CHECK APPROPRIATE BOXES FOR ALL CHANGES

Action Requested

- New Course
- Modification of Existing Course
- Deletion of Existing Course

Date of Submission: 2025-02-19
Effective Term: Winter 2026

<input checked="" type="checkbox"/>	Course Offered <input checked="" type="checkbox"/> Indefinitely <input type="checkbox"/> One term only	RO USE ONLY Date Received: Date Completed: Completed By:
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CURRENT LISTING

REQUESTED LISTING

<input type="checkbox"/>	Dept (Home): Engineering Subject: ENGR Catalog: 542	Dept (Home): Subject: Catalog:
<input type="checkbox"/>	<input type="checkbox"/> Course is Cross-Listed with Other Departments	
	Department	Subject
<input type="checkbox"/>	Catalog Number	Catalog Number
<input type="checkbox"/>	Course Title (full title) Stochastic Dynamics of Marine Systems	Course Title (full title)
<input type="checkbox"/>	Abbreviated Title (20 char) Sto Dyn Mar Sys	Abbreviated Title (20 char)
<input type="checkbox"/>	Course Description (Please limit to 80 words and attach separate sheet if necessary) Response of systems to stochastic excitation with marine applications. Linear dynamical systems, probability, stochastic processes, stationarity and ergodicity, spectral analysis, stochastic response, time series analysis, statistics of extremes. Applications from floating body dynamics, random sea representation and design of marine structures. Workshop on stochastic analysis, design of offshore wind turbines.	
<input type="checkbox"/>	Full Term Credit Hours Undergraduate Min: Graduate Min: 3 Undergraduate Max: Graduate Max: 3	
	Half Term Credit Hours Undergraduate Min: Graduate Min: Undergraduate Max: Graduate Max:	
<input type="checkbox"/>	Course Credit Type Rackham Graduate Student, Non-Rackham Graduate Student	
<input type="checkbox"/>	Repeatability <input type="checkbox"/> Course is Repeatable for Credit	
	Maximum number of repeatable credits:	<input type="checkbox"/> Course is Y graded <input type="checkbox"/> Can be taken more than once in the same term

Subject: Engineering Catalog: 542							
<input type="checkbox"/>	<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"> Grading Basis <input checked="" type="checkbox"/> Graded (A – E) <input type="checkbox"/> Credit/No Credit <input type="checkbox"/> Satisfactory/Unsatisfactory <input type="checkbox"/> Pass/Fail <input type="checkbox"/> Business Administration </td> <td style="width: 33%;"> Add Consent <input type="checkbox"/> Department Consent <input type="checkbox"/> Instructor Consent <input checked="" type="checkbox"/> No Consent </td> <td style="width: 33%;"> Drop Consent <input type="checkbox"/> Department Consent <input type="checkbox"/> Instructor Consent <input checked="" type="checkbox"/> No Consent </td> </tr> <tr> <td colspan="3"> Grading <input type="checkbox"/> Not for Credit <input type="checkbox"/> Not for Degree Credit <input type="checkbox"/> Degree Credit Only </td> </tr> </table>	Grading Basis <input checked="" type="checkbox"/> Graded (A – E) <input type="checkbox"/> Credit/No Credit <input type="checkbox"/> Satisfactory/Unsatisfactory <input type="checkbox"/> Pass/Fail <input type="checkbox"/> Business Administration	Add Consent <input type="checkbox"/> Department Consent <input type="checkbox"/> Instructor Consent <input checked="" type="checkbox"/> No Consent	Drop Consent <input type="checkbox"/> Department Consent <input type="checkbox"/> Instructor Consent <input checked="" type="checkbox"/> No Consent	Grading <input type="checkbox"/> Not for Credit <input type="checkbox"/> Not for Degree Credit <input type="checkbox"/> Degree Credit Only		
Grading Basis <input checked="" type="checkbox"/> Graded (A – E) <input type="checkbox"/> Credit/No Credit <input type="checkbox"/> Satisfactory/Unsatisfactory <input type="checkbox"/> Pass/Fail <input type="checkbox"/> Business Administration	Add Consent <input type="checkbox"/> Department Consent <input type="checkbox"/> Instructor Consent <input checked="" type="checkbox"/> No Consent	Drop Consent <input type="checkbox"/> Department Consent <input type="checkbox"/> Instructor Consent <input checked="" type="checkbox"/> No Consent					
Grading <input type="checkbox"/> Not for Credit <input type="checkbox"/> Not for Degree Credit <input type="checkbox"/> Degree Credit Only							

	CURRENT LISTING	REQUESTED LISTING			
<input type="checkbox"/>	Advisory Prerequisite (254 char) Graduate student or permission of instructor	Advisory Prerequisite (254 char)			
<input type="checkbox"/>	Enforced Prerequisite (254 char) Minimum grade requirement:	Enforced Prerequisite (254 char) Minimum grade requirement:			
<input type="checkbox"/>	Credit Exclusions	Credit Exclusions			
<input type="checkbox"/>	<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;"> Course Components <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Seminar <input type="checkbox"/> Recitation <input type="checkbox"/> Lab <input type="checkbox"/> Discussion <input type="checkbox"/> Independent Study </td> <td style="width: 33%;"> Graded Component <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> </td> <td style="width: 33%;"> Terms Typically Offered <input checked="" type="checkbox"/> Fall <input type="checkbox"/> Winter <input type="checkbox"/> Spring <input type="checkbox"/> Summer <input type="checkbox"/> Spring/Summer </td> </tr> </table>	Course Components <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Seminar <input type="checkbox"/> Recitation <input type="checkbox"/> Lab <input type="checkbox"/> Discussion <input type="checkbox"/> Independent Study	Graded Component <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Terms Typically Offered <input checked="" type="checkbox"/> Fall <input type="checkbox"/> Winter <input type="checkbox"/> Spring <input type="checkbox"/> Summer <input type="checkbox"/> Spring/Summer	
Course Components <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Seminar <input type="checkbox"/> Recitation <input type="checkbox"/> Lab <input type="checkbox"/> Discussion <input type="checkbox"/> Independent Study	Graded Component <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Terms Typically Offered <input checked="" type="checkbox"/> Fall <input type="checkbox"/> Winter <input type="checkbox"/> Spring <input type="checkbox"/> Summer <input type="checkbox"/> Spring/Summer			
Cognizant Faculty Member Name: Pan Yulin		Cognizant Faculty Member Title: Asst Professor			

SIGNATURES ARE REQUIRED FROM ALL DEPARTMENTS INVOLVED (Please Print AND Sign Name)

Contact Person: Ryan Latimer Email: rlatimer@umich.edu Phone: 734-647-9039

CoE Curriculum Committee Representative: *Rachael Schmedlen* Print: Rachael Schmedlen Date: 2/24/25

CoE Curriculum Committee Chair: Print: Date:

Home Department Chair: *Kevin Pipe* Print: Kevin Pipe Date: 2/25/25

Cross-Listed Department Chair: Print: Date:

Cross-Listed Department Chair: Print: Date:

Cross-Listed Department Chair:

Print:

Date:

DEPARTMENTAL/COLLEGE USE ONLY

Current:**Requested:**Course Description

Response of systems to stochastic excitation with marine applications. Linear dynamical systems, probability, stochastic processes, stationarity and ergodicity, spectral analysis, stochastic response, time series analysis, statistics of extremes. Applications from floating body dynamics, random sea representation and design of marine structures. Workshop on stochastic analysis, design of offshore wind turbines.

Class Length

Full term

Contact hours (lecture):

3

Contact hours (recitation)Contact hours (lab)Course DescriptionClass LengthContact hours (lecture):Contact hours (recitation)Contact hours (lab)**Additional Info:**Submitted by:

Home dept

Describe how this course fits with the degree requirements:Special resources of facilities required for this course:Supporting statement:

Course never used. Instructor agrees it can be deleted.



Course Approval Request Form
Office of the Registrar, University of Michigan

1210 LSA Building
500 S. State Street
Ann Arbor, MI 48109-1382
Phone: 734.763.2113
Fax: 734.936.3148
ro.curriculum@umich.edu
ro.umich.edu

CHECK APPROPRIATE BOXES FOR ALL CHANGES

Action Requested

- New Course
- Modification of Existing Course
- Deletion of Existing Course

Date of Submission: 2025-01-13
Effective Term: Winter 2026

<input checked="" type="checkbox"/>	Course Offered <input checked="" type="checkbox"/> Indefinitely <input type="checkbox"/> One term only	RO USE ONLY Date Received: Date Completed: Completed By:
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CURRENT LISTING

REQUESTED LISTING

<input type="checkbox"/>	Dept (Home): Industrial & Operations Engin Subject: IOE Catalog: 316	Dept (Home): Industrial & Operations Engin Subject: IOE Catalog: 316												
<input type="checkbox"/>	<input type="checkbox"/> Course is Cross-Listed with Other Departments	<input type="checkbox"/> Course is Cross-Listed with Other Departments												
<input type="checkbox"/>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Department</th> <th style="width: 25%;">Subject</th> <th style="width: 50%;">Catalog Number</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Department	Subject	Catalog Number				<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Department</th> <th style="width: 25%;">Subject</th> <th style="width: 50%;">Catalog Number</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Department	Subject	Catalog Number			
Department	Subject	Catalog Number												
Department	Subject	Catalog Number												
<input type="checkbox"/>	Course Title (full title) Introduction to Markov Processes	Course Title (full title) Introduction to Markov Processes												
<input type="checkbox"/>	Abbreviated Title (20 char) Intr Markov Proc	Abbreviated Title (20 char) Intr Markov Proc												
<input type="checkbox"/>	Course Description (Please limit to 80 words and attach separate sheet if necessary) Introduction to discrete Markov Chains and continuous Markov processes, including transient and limiting behavior. Introduction to Markov Decision Processes. The Poisson/Exponential process. Applications to reliability, maintenance, inventory, production, queues, and other engineering problems.													
<input type="checkbox"/>	Full Term Credit Hours Undergraduate Min: 3 Graduate Min: Undergraduate Max: 3 Graduate Max:	Half Term Credit Hours Undergraduate Min: Graduate Min: Undergraduate Max: Graduate Max:												
<input type="checkbox"/>	Course Credit Type Undergraduate Student													
<input type="checkbox"/>	Repeatability <input type="checkbox"/> Course is Repeatable for Credit <input type="checkbox"/> Course is Y graded Maximum number of repeatable credits: <input type="checkbox"/> Can be taken more than once in the same term													

Subject: Industrial & Operations Engin		Catalog: 316	
<input type="checkbox"/>	Grading Basis <input checked="" type="checkbox"/> Graded (A – E) <input type="checkbox"/> Credit/No Credit <input type="checkbox"/> Satisfactory/Unsatisfactory <input type="checkbox"/> Pass/Fail <input type="checkbox"/> Business Administration Grading <input type="checkbox"/> Not for Credit <input type="checkbox"/> Not for Degree Credit <input type="checkbox"/> Degree Credit Only	Add Consent <input type="checkbox"/> Department Consent <input type="checkbox"/> Instructor Consent <input checked="" type="checkbox"/> No Consent	Drop Consent <input type="checkbox"/> Department Consent <input type="checkbox"/> Instructor Consent <input checked="" type="checkbox"/> No Consent

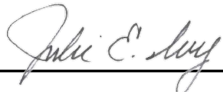
	CURRENT LISTING	REQUESTED LISTING																					
<input type="checkbox"/>	Advisory Prerequisite (254 char)	Advisory Prerequisite (254 char)																					
<input checked="" type="checkbox"/>	Enforced Prerequisite (254 char) [(IOE 265 or STATS 265); (C- or better, no OPF)] and [(MATH 214 or 216 or 256 or 286 or 316 or ROB 101); (C- or better, no OPF)] Minimum grade requirement: C-	Enforced Prerequisite (254 char) [(IOE 265); (C- or better, no OPF)] and [(MATH 214 or 216 or 256 or 286 or 316 or ROB 101); (C- or better, no OPF)] Minimum grade requirement: C-																					
<input type="checkbox"/>	Credit Exclusions	Credit Exclusions																					
<input checked="" type="checkbox"/>	<table style="width:100%; border:none;"> <tr> <td style="width:35%;">Course Components</td> <td style="width:35%;">Graded Component</td> <td style="width:30%;">Terms Typically Offered</td> </tr> <tr> <td><input checked="" type="checkbox"/> Lecture</td> <td><input checked="" type="checkbox"/></td> <td><input checked="" type="checkbox"/> Fall</td> </tr> <tr> <td><input type="checkbox"/> Seminar</td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/> Winter</td> </tr> <tr> <td><input type="checkbox"/> Recitation</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Spring</td> </tr> <tr> <td><input type="checkbox"/> Lab</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Summer</td> </tr> <tr> <td><input type="checkbox"/> Discussion</td> <td><input type="checkbox"/></td> <td><input type="checkbox"/> Spring/Summer</td> </tr> <tr> <td><input type="checkbox"/> Independent Study</td> <td><input type="checkbox"/></td> <td></td> </tr> </table>	Course Components	Graded Component	Terms Typically Offered	<input checked="" type="checkbox"/> Lecture	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Fall	<input type="checkbox"/> Seminar	<input type="checkbox"/>	<input checked="" type="checkbox"/> Winter	<input type="checkbox"/> Recitation	<input type="checkbox"/>	<input type="checkbox"/> Spring	<input type="checkbox"/> Lab	<input type="checkbox"/>	<input type="checkbox"/> Summer	<input type="checkbox"/> Discussion	<input type="checkbox"/>	<input type="checkbox"/> Spring/Summer	<input type="checkbox"/> Independent Study	<input type="checkbox"/>		
Course Components	Graded Component	Terms Typically Offered																					
<input checked="" type="checkbox"/> Lecture	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Fall																					
<input type="checkbox"/> Seminar	<input type="checkbox"/>	<input checked="" type="checkbox"/> Winter																					
<input type="checkbox"/> Recitation	<input type="checkbox"/>	<input type="checkbox"/> Spring																					
<input type="checkbox"/> Lab	<input type="checkbox"/>	<input type="checkbox"/> Summer																					
<input type="checkbox"/> Discussion	<input type="checkbox"/>	<input type="checkbox"/> Spring/Summer																					
<input type="checkbox"/> Independent Study	<input type="checkbox"/>																						
Cognizant Faculty Member Name: Mariel Lavieri		Cognizant Faculty Member Title: Professor & Associate Chair																					

SIGNATURES ARE REQUIRED FROM ALL DEPARTMENTS INVOLVED (Please Print AND Sign Name)

Contact Person: Leonora Lucaj Email: lucajl@umich.edu Phone: 734-764-3297

CoE Curriculum Committee Representative: Yavuz Bozer Print:  Date: Feb 17, 2025

CoE Curriculum Committee Chair: Print: Date:

Home Department Chair:  Print: Julie Ivy Date: Feb 17, 2025

Cross-Listed Department Chair: Print: Date:

Cross-Listed Department Chair: Print: Date:

Cross-Listed Department Chair: Print: Date:

DEPARTMENTAL/COLLEGE USE ONLY

Current:Course Description

Introduction to discrete Markov Chains and continuous Markov processes, including transient and limiting behavior. Introduction to Markov Decision Processes. The Poisson/Exponential process.

Applications to reliability, maintenance, inventory, production, queues, and other engineering problems.

Class Length

Full term

Contact hours (lecture):

2

Contact hours (recitation)Contact hours (lab)

2

Requested:Course Description

Introduction to discrete Markov Chains and continuous Markov processes, including transient and limiting behavior. Introduction to Markov Decision Processes. The Poisson/Exponential process.

Applications to reliability, maintenance, inventory, production, queues, and other engineering problems.

Class Length

Full term

Contact hours (lecture):

3

Contact hours (recitation)Contact hours (lab)**Additional Info:**Submitted by:

Home dept

Describe how this course fits with the degree requirements:

Degree Requirement

Special resources of facilities required for this course:Supporting statement:

Removing STATS 265 as a prerequisite since this course does not exist anymore. This course does not have a lab component, so we are correcting that as well. It is correct on the Maintain Schedule of Classes but not on the View Course Catalog section on Wolverine Access.



Course Approval Request Form
Office of the Registrar, University of Michigan

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500 S. State Street
Ann Arbor, MI 48109-1382
Phone: 734.763.2113
Fax: 734.936.3148
ro.curriculum@umich.edu
ro.umich.edu

CHECK APPROPRIATE BOXES FOR ALL CHANGES

Action Requested

- New Course
- Modification of Existing Course
- Deletion of Existing Course

Date of Submission: 2025-02-14
Effective Term: Winter 2026

<input checked="" type="checkbox"/>	Course Offered <input checked="" type="checkbox"/> Indefinitely <input type="checkbox"/> One term only	RO USE ONLY Date Received: Date Completed: Completed By:
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CURRENT LISTING

REQUESTED LISTING

<input type="checkbox"/>	Dept (Home): Industrial & Operations Engin Subject: IOE Catalog: 424	Dept (Home): Industrial & Operations Engin Subject: IOE Catalog: 424												
<input type="checkbox"/>	<input type="checkbox"/> Course is Cross-Listed with Other Departments	<input type="checkbox"/> Course is Cross-Listed with Other Departments												
<input type="checkbox"/>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Department</th> <th style="width: 25%;">Subject</th> <th style="width: 50%;">Catalog Number</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Department	Subject	Catalog Number				<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Department</th> <th style="width: 25%;">Subject</th> <th style="width: 50%;">Catalog Number</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Department	Subject	Catalog Number			
Department	Subject	Catalog Number												
Department	Subject	Catalog Number												
<input type="checkbox"/>	Course Title (full title) Practicum in Production and Service	Course Title (full title) Practicum in Production and Service												
<input type="checkbox"/>	Abbreviated Title (20 char) Practicum Prod &Srv	Abbreviated Title (20 char) Practicum Prod &Srv												
<input type="checkbox"/>	Course Description (Please limit to 80 words and attach separate sheet if necessary) Student teams with work on an externally sponsored IOE design project. The final report should demonstrate a mastery of the established technical communication skills. The report will be reviewed and edited to achieve this outcome. Projects are overseen/graded by faculty and may involve mentoring by representatives from external organizations.													
<input type="checkbox"/>	Full Term Credit Hours Undergraduate Min: 4 Graduate Min: Undergraduate Max: 4 Graduate Max:	Half Term Credit Hours Undergraduate Min: Graduate Min: Undergraduate Max: Graduate Max:												
<input type="checkbox"/>	Course Credit Type Undergraduate Student													
<input type="checkbox"/>	Repeatability <input type="checkbox"/> Course is Repeatable for Credit <input type="checkbox"/> Course is Y graded Maximum number of repeatable credits: <input type="checkbox"/> Can be taken more than once in the same term													

Subject: Industrial & Operations Engin		Catalog: 424	
<input type="checkbox"/>	Grading Basis <input checked="" type="checkbox"/> Graded (A – E) <input type="checkbox"/> Credit/No Credit <input type="checkbox"/> Satisfactory/Unsatisfactory <input type="checkbox"/> Pass/Fail <input type="checkbox"/> Business Administration Grading <input type="checkbox"/> Not for Credit <input type="checkbox"/> Not for Degree Credit <input type="checkbox"/> Degree Credit Only	Add Consent <input type="checkbox"/> Department Consent <input type="checkbox"/> Instructor Consent <input checked="" type="checkbox"/> No Consent	Drop Consent <input type="checkbox"/> Department Consent <input type="checkbox"/> Instructor Consent <input checked="" type="checkbox"/> No Consent

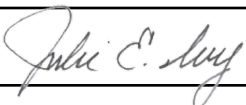
	CURRENT LISTING	REQUESTED LISTING
<input type="checkbox"/>	Advisory Prerequisite (254 char)	Advisory Prerequisite (254 char)
<input checked="" type="checkbox"/>	Enforced Prerequisite (254 char) IOE 310 and IOE 316 and IOE 333 and IOE 366 and IOE 373 and TCHNCLCM 380; C- or better and Senior Standing Minimum grade requirement: C-	Enforced Prerequisite (254 char) IOE 310 and IOE 316 and IOE 333 and IOE 366 and IOE 373 and TCHNCLCM 380; C- or better and senior standing, no credit for IOE 481 Minimum grade requirement: C-
<input checked="" type="checkbox"/>	Credit Exclusions Credit for only one: IOE 424 or IOE 481	Credit Exclusions
<input type="checkbox"/>	Course Components <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Seminar <input type="checkbox"/> Recitation <input type="checkbox"/> Lab <input type="checkbox"/> Discussion <input type="checkbox"/> Independent Study	Graded Component <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Terms Typically Offered <input checked="" type="checkbox"/> Fall <input checked="" type="checkbox"/> Winter <input type="checkbox"/> Spring <input type="checkbox"/> Summer <input type="checkbox"/> Spring/Summer	
Cognizant Faculty Member Name: Mark Van Oyen		Cognizant Faculty Member Title: Professor

SIGNATURES ARE REQUIRED FROM ALL DEPARTMENTS INVOLVED (Please Print AND Sign Name)

Contact Person: Leonora Lucaj Email: lucajl@umich.edu Phone: 734-764-3297

CoE Curriculum Committee Representative:  Print: Yavuz Bozer Date: 02/27/25

CoE Curriculum Committee Chair: _____ Print: _____ Date: _____

Home Department Chair:  Print: Julie Ivy Date: 02/21/25

Cross-Listed Department Chair: _____ Print: _____ Date: _____

Cross-Listed Department Chair: _____ Print: _____ Date: _____

Cross-Listed Department Chair: _____ Print: _____ Date: _____

DEPARTMENTAL/COLLEGE USE ONLY

Current:**Requested:**Course Description

Student teams with work on an externally sponsored IOE design project. The final report should demonstrate a mastery of the established technical communication skills. The report will be reviewed and edited to achieve this outcome. Projects are overseen/graded by faculty and may involve mentoring by representatives from external organizations.

Course Description

Student teams with work on an externally sponsored IOE design project. The final report should demonstrate a mastery of the established technical communication skills. The report will be reviewed and edited to achieve this outcome. Projects are overseen/graded by faculty and may involve mentoring by representatives from external organizations.

Class Length

Full term

Class Length

Full term

Contact hours (lecture):

4

Contact hours (lecture):

4

Contact hours (recitation)Contact hours (recitation)Contact hours (lab)Contact hours (lab)**Additional Info:**Submitted by:

Home dept

Describe how this course fits with the degree requirements:Special resources of facilities required for this course:Supporting statement:

Changing the enforced prereqs so students cannot register for both IOE 424 and 481. Some students do this to hold their seat and decide later which one to take.



Course Approval Request Form
Office of the Registrar, University of Michigan

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ro.curriculum@umich.edu
ro.umich.edu

CHECK APPROPRIATE BOXES FOR ALL CHANGES

Action Requested

- New Course
- Modification of Existing Course
- Deletion of Existing Course

Date of Submission: 2025-02-14
Effective Term: Winter 2026

<input checked="" type="checkbox"/>	Course Offered <input checked="" type="checkbox"/> Indefinitely <input type="checkbox"/> One term only	RO USE ONLY Date Received: Date Completed: Completed By:
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CURRENT LISTING

REQUESTED LISTING

<input type="checkbox"/>	Dept (Home): Industrial & Operations Engin Subject: IOE Catalog: 481	Dept (Home): Industrial & Operations Engin Subject: IOE Catalog: 481												
<input type="checkbox"/>	<input type="checkbox"/> Course is Cross-Listed with Other Departments	<input type="checkbox"/> Course is Cross-Listed with Other Departments												
<input type="checkbox"/>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Department</th> <th style="width: 25%;">Subject</th> <th style="width: 50%;">Catalog Number</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Department	Subject	Catalog Number				<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Department</th> <th style="width: 25%;">Subject</th> <th style="width: 50%;">Catalog Number</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Department	Subject	Catalog Number			
Department	Subject	Catalog Number												
Department	Subject	Catalog Number												
<input type="checkbox"/>	Course Title (full title) PRACTICUM IN HOSPITAL SYSTEMS	Course Title (full title) PRACTICUM IN HOSPITAL SYSTEMS												
<input type="checkbox"/>	Abbreviated Title (20 char) PRACTICUM HOSP SYS	Abbreviated Title (20 char) PRACTICUM HOSP SYS												
<input type="checkbox"/>	Course Description (Please limit to 80 words and attach separate sheet if necessary) Project teams meet needs of hospital clients. Technical communications for presentations and reports, design processes, inclusive team functioning, project methodologies, data collection, data analysis, lean, operations research, project management, and ethics and standards. Projects will be overseen/graded by faculty and may also involve mentoring by representatives from external organizations.													
<input type="checkbox"/>	Full Term Credit Hours Undergraduate Min: 4 Graduate Min: Undergraduate Max: 4 Graduate Max:	Half Term Credit Hours Undergraduate Min: Graduate Min: Undergraduate Max: Graduate Max:												
<input type="checkbox"/>	Course Credit Type Undergraduate Student													
<input type="checkbox"/>	Repeatability <input type="checkbox"/> Course is Repeatable for Credit <input type="checkbox"/> Course is Y graded Maximum number of repeatable credits: <input type="checkbox"/> Can be taken more than once in the same term													

Subject: Industrial & Operations Engin		Catalog: 481	
<input type="checkbox"/>	Grading Basis <input checked="" type="checkbox"/> Graded (A – E) <input type="checkbox"/> Credit/No Credit <input type="checkbox"/> Satisfactory/Unsatisfactory <input type="checkbox"/> Pass/Fail <input type="checkbox"/> Business Administration Grading <input type="checkbox"/> Not for Credit <input type="checkbox"/> Not for Degree Credit <input type="checkbox"/> Degree Credit Only	Add Consent <input type="checkbox"/> Department Consent <input type="checkbox"/> Instructor Consent <input checked="" type="checkbox"/> No Consent	Drop Consent <input type="checkbox"/> Department Consent <input type="checkbox"/> Instructor Consent <input checked="" type="checkbox"/> No Consent

	CURRENT LISTING	REQUESTED LISTING
<input type="checkbox"/>	Advisory Prerequisite (254 char)	Advisory Prerequisite (254 char)
<input checked="" type="checkbox"/>	Enforced Prerequisite (254 char) IOE 310 and IOE 316 and IOE 333 and IOE 366 and IOE 373 and TCHNCLCM 380; C- or better and Senior Minimum grade requirement: C-	Enforced Prerequisite (254 char) IOE 310 and IOE 316 and IOE 333 and IOE 366 and IOE 373 and TCHNCLCM 380; C- or better and Senior, no credit for IOE 424 Minimum grade requirement: C-
<input checked="" type="checkbox"/>	Credit Exclusions Credit for only one: IOE 424 or IOE 481	Credit Exclusions
<input type="checkbox"/>	Course Components <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Seminar <input type="checkbox"/> Recitation <input type="checkbox"/> Lab <input type="checkbox"/> Discussion <input type="checkbox"/> Independent Study	Graded Component <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
		Terms Typically Offered <input checked="" type="checkbox"/> Fall <input checked="" type="checkbox"/> Winter <input type="checkbox"/> Spring <input type="checkbox"/> Summer <input type="checkbox"/> Spring/Summer
Cognizant Faculty Member Name: Mark Van Oyen		Cognizant Faculty Member Title: Professor

SIGNATURES ARE REQUIRED FROM ALL DEPARTMENTS INVOLVED (Please Print AND Sign Name)

Contact Person: Leonora Lucaj Email: lucajl@umich.edu Phone: 734-764-3297

CoE Curriculum Committee Representative:  Print: Yavuz Bozer Date: 02/27/25

CoE Curriculum Committee Chair: _____ Print: _____ Date: _____

Home Department Chair:  Print: Julie Ivy Date: 02/21/25

Cross-Listed Department Chair: _____ Print: _____ Date: _____

Cross-Listed Department Chair: _____ Print: _____ Date: _____

Cross-Listed Department Chair: _____ Print: _____ Date: _____

DEPARTMENTAL/COLLEGE USE ONLY

Current:**Requested:**Course Description

Project teams meet needs of hospital clients. Technical communications for presentations and reports, design processes, inclusive team functioning, project methodologies, data collection, data analysis, lean, operations research, project management, and ethics and standards. Projects will be overseen/graded by faculty and may also involve mentoring by representatives from external organizations.

Class Length

Full term

Contact hours (lecture):

4

Contact hours (recitation)Contact hours (lab)Course Description

Project teams meet needs of hospital clients. Technical communications for presentations and reports, design processes, inclusive team functioning, project methodologies, data collection, data analysis, lean, operations research, project management, and ethics and standards. Projects will be overseen/graded by faculty and may also involve mentoring by representatives from external organizations.

Class Length

Full term

Contact hours (lecture):

4

Contact hours (recitation)Contact hours (lab)**Additional Info:**Submitted by:

Home dept

Describe how this course fits with the degree requirements:Special resources of facilities required for this course:Supporting statement:

Changing the enforced prereqs so students cannot register for both IOE 424 and 481. Some students do this to hold their seat and decide later which one to take.



Course Approval Request Form

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Phone: 734.763.2113

Fax: 734.936.3148

ro.curriculum@umich.edu

ro.umich.edu

CHECK APPROPRIATE BOXES FOR ALL CHANGES

Action Requested

- New Course
 Modification of Existing Course
 Deletion of Existing Course

Date of Submission: 2024-12-12

Effective Term: Winter 2026

<input checked="" type="checkbox"/>	Course Offered <input checked="" type="checkbox"/> Indefinitely <input type="checkbox"/> One term only	RO USE ONLY Date Received: Date Completed: Completed By:
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CURRENT LISTING

REQUESTED LISTING

<input checked="" type="checkbox"/>	Dept (Home): Subject: Catalog:	Dept (Home): Robotics Subject: ROB Catalog: 430												
<input type="checkbox"/>	<input type="checkbox"/> Course is Cross-Listed with Other Departments	<input type="checkbox"/> Course is Cross-Listed with Other Departments												
<input type="checkbox"/>	<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 25%;">Department</th> <th style="width: 25%;">Subject</th> <th style="width: 50%;">Catalog Number</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Department	Subject	Catalog Number				<table border="1" style="width: 100%;"> <thead> <tr> <th style="width: 25%;">Department</th> <th style="width: 25%;">Subject</th> <th style="width: 50%;">Catalog Number</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Department	Subject	Catalog Number			
Department	Subject	Catalog Number												
Department	Subject	Catalog Number												
<input checked="" type="checkbox"/>	Course Title (full title)	Course Title (full title) Deep Learning for Robot Perception and Manipulation												
<input checked="" type="checkbox"/>	Abbreviated Title (20 char)	Abbreviated Title (20 char) Deep Robot Percept												
<input checked="" type="checkbox"/>	Course Description (Please limit to 80 words and attach separate sheet if necessary) Neural-network-based deep learning for robot perception that enable robots to physically manipulate objects. Students implement, train, and debug their own state-of-the-art neural networks. Explore research topics in deep learning for robotics. Analysis, implementation, and reproduction of research publications in the area.													
<input checked="" type="checkbox"/>	Full Term Credit Hours Undergraduate Min: 4 Graduate Min: 4 Undergraduate Max: 4 Graduate Max: 4	Half Term Credit Hours Undergraduate Min: Graduate Min: Undergraduate Max: Graduate Max:												
<input checked="" type="checkbox"/>	Course Credit Type Undergraduate Student, Rackham Graduate Student, Non-Rackham Graduate Student													
<input type="checkbox"/>	Repeatability <input type="checkbox"/> Course is Repeatable for Credit <input type="checkbox"/> Course is Y graded Maximum number of repeatable credits: <input type="checkbox"/> Can be taken more than once in the same term													

	Subject:	Catalog:			
<input checked="" type="checkbox"/>	Grading Basis <input checked="" type="checkbox"/> Graded (A – E) <input type="checkbox"/> Credit/No Credit <input type="checkbox"/> Satisfactory/Unsatisfactory <input type="checkbox"/> Pass/Fail <input type="checkbox"/> Business Administration Grading <input type="checkbox"/> Not for Credit <input type="checkbox"/> Not for Degree Credit <input type="checkbox"/> Degree Credit Only				
	Add Consent <input type="checkbox"/> Department Consent <input type="checkbox"/> Instructor Consent <input checked="" type="checkbox"/> No Consent		Drop Consent <input type="checkbox"/> Department Consent <input type="checkbox"/> Instructor Consent <input checked="" type="checkbox"/> No Consent		

	CURRENT LISTING	REQUESTED LISTING
<input checked="" type="checkbox"/>	Advisory Prerequisite (254 char)	Advisory Prerequisite (254 char) ROB 330
<input checked="" type="checkbox"/>	Enforced Prerequisite (254 char) Minimum grade requirement:	Enforced Prerequisite (254 char) Linear Algebra (ROB 101 or MATH 214 or MATH 217); Differential Equations (MATH 216); Systems programming and algorithms (ROB 320 or EECS 281) Minimum grade requirement: C
<input type="checkbox"/>	Credit Exclusions	Credit Exclusions
<input checked="" type="checkbox"/>	Course Components <input checked="" type="checkbox"/> Lecture <input type="checkbox"/> Seminar <input type="checkbox"/> Recitation <input checked="" type="checkbox"/> Lab <input type="checkbox"/> Discussion <input type="checkbox"/> Independent Study	Graded Component <input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
	Terms Typically Offered <input type="checkbox"/> Fall <input checked="" type="checkbox"/> Winter <input type="checkbox"/> Spring <input type="checkbox"/> Summer <input type="checkbox"/> Spring/Summer	
Cognizant Faculty Member Name: Chad Jenkins		
Cognizant Faculty Member Title: Professor		

SIGNATURES ARE REQUIRED FROM ALL DEPARTMENTS INVOLVED (Please Print AND Sign Name)

Contact Person: Kayla Dombrowski Email: kakelle@umich.edu Phone: 734-936-7999

CoE Curriculum Committee Representative: *Anouck R Girard* Print: Anouck Girard Date: 12-23-2024

CoE Curriculum Committee Chair: Print: Date:

Home Department Chair: *[Signature]* Print: Dawn Tilbury Date: 12-18-24

Cross-Listed Department Chair: Print: Date:

Cross-Listed Department Chair: Print: Date:

Cross-Listed Department Chair: Print: Date:

DEPARTMENTAL/COLLEGE USE ONLY

Current:**Requested:**Course DescriptionCourse Description

Neural-network-based deep learning for robot perception that enable robots to physically manipulate objects. Students implement, train, and debug their own state-of-the-art neural networks. Explore research topics in deep learning for robotics. Analysis, implementation, and reproduction of research publications in the area.

Class LengthClass Length

Full term

Contact hours (lecture):Contact hours (lecture):

3

Contact hours (recitation)Contact hours (recitation)Contact hours (lab)Contact hours (lab)

2

Additional Info:Submitted by:

Home dept

Describe how this course fits with the degree requirements:

Upper level elective Robotics BSE

Special resources of facilities required for this course:

Compute credits and GPU resources for deep learning

Supporting statement:

This course (known as "DeepRob") has been successfully offered for two years (Winter 2023, Winter 2024) as a combined course with undergraduate and graduate sections (ROB 498 and ROB 599). DeepRob offerings were essential for meeting enrollment demands during the launch of the Robotics Department. Student enthusiasm for the DeepRob course has been exceptionally high. Students have been able to build on their DeepRob projects for pathways into research and advanced development, in several cases leading to research publications. DeepRob has the potential to serve as a capstone-style course on the horizon, if this possibility would be beneficial.

Course Syllabus: Deep Learning for Robot Perception

TABLE OF CONTENTS

- 1 [About](#)
- 2 [Topics and Course Structure](#)
- 3 [Prerequisites](#)
- 4 [Textbook](#)
- 5 [Lectures](#)
- 6 [Discussion Sections](#)
- 7 [Programming Projects](#)
- 8 [Final Project](#)
- 9 [Quizzes](#)
- 10 [Grading Policy](#)
- 11 [Collaboration Policy](#)
- 12 [Discussion Forum](#)

About

Robots need to see and understand their world to be able to interact with objects and perform useful tasks autonomously. Perception is the essential first step in the process for endowing robots to perform autonomously. Autonomous robots need to make sense of their sensory observations to represent the world around them – and enable their reasoning and action to a goal. Visual perception with cameras as sensors has matured due to the recent advancements in neural networks – which is especially true for performing visual recognition tasks such as object classification, detection, pose estimation, grasp pose detection, etc.

This course aims to cover the necessary background of neural-network-based deep learning for robot perception – building on advancements in computer vision and enabling – for enabling robots to dexterously manipulate physical objects. During the first part of this course, students will learn to implement, train and debug their own neural networks. During the second part of this course,

students will explore recent emerging topics in deep learning for robot perception and manipulation. This exploration will include analysis of research publications in the area, building up to reproducing and implementing state-of-the-art deep learning approaches as a final course project.

This course builds on and is indebted to these existing courses (as a “star” and a “fork” in the open source sense):

- [University of Michigan - ROB 498-002 / 599-009: Deep Learning for Robot Perception](#) instructed by [Anthony Opipari](#), [Chad Jenkins](#), and [Karthik Desingh](#)
- [University of Michigan - EECS 498-007 / 598-005: Deep Learning for Computer Vision](#) instructed by [Justin Johnson](#)
- [Stanford - CS231n: Deep Learning for Computer Vision](#) instructed by [Fei-Fei Li](#) and [Andrej Karpathy](#)

Topics and Course Structure

The first half of the course will cover deep learning fundamentals in computer vision catered to robot perception problems.

- Linear classifiers
- Stochastic gradient descent
- Fully-connected networks
- Convolutional networks

The second half of the course will switch to seminar style covering following advanced topics in robot perception and manipulation via discussing publications.

- 3D vision in robotics
- Pose estimation
- Object perception for robot manipulation
- Neural radiance fields for perception
- Robot grasp pose detection

Prerequisites

- Strongly encouraged prerequisites:
 - Programming: ROB 320, EECS 281, or equivalent

- Linear Algebra: ROB 101, MATH 214, MATH 217, or equivalent
- Recommended prerequisites:
 - Prior experience with the [Python programming language](#) is recommended.
 - Familiarity with gradients and how to calculate them from vector calculus.
 - Familiarity with random variables and probability distributions from probability theory.
 - Familiarity with concepts from machine learning (e.g. EECS 445) will be helpful.

Textbook

There is no required textbook for this course, however optional readings will be suggested from the textbook, [“Deep Learning” by Ian Goodfellow and Yoshua Bengio and Aaron Courville](#).

For additional references, consider the following textbooks:

- [“Introduction to Robotics and Perception”](#) by Frank Dellaert and Seth Hutchinson
- [“Robotics, Vision and Control”](#) by Peter Corke
- [“Computer Vision: Algorithms and Applications”](#) by Richard Szeliski
- [“Foundations of Computer Vision”](#) by Antonio Torralba, Phillip Isola, and William T. Freeman

Lectures

Lectures will take place in-person.

In-person lectures will be held on **Tuesdays and Thursdays from 3:00-4:30 PM EST in room COOL G906**. Remote access will be available through [Zoom \(Meeting ID: 965 2450 4025\)](#) (Passcode: [deeprob](#))

Discussion Sections

Discussions will take place in-person.

In-person discussions will be held on **Wednesdays from 3:30-5:30 PM EST in room EECS 1311**. Remote access will be available through [Zoom \(Meeting ID: 965 2450 4025\)](#) (Passcode: [deeprob](#))

Programming Projects

You will complete 5 programming [projects](#) over the course of the semester. All projects will be implemented using Python, Pytorch and Google Colab.

Final Project

Instead of a final exam at the end of the semester, you will complete a final project working in groups of 1 to 3 students.

The final project will entail five core deliverables: (1) a written paper review, (2) an in-class paper presentation, (3) reproducing the published results of an existing deep learning paper, (4) extending the chosen paper's methods and (5) documenting your reproduction and extension in a written report.

The objective of the final project is for you to gain experience with state of the art approaches in deep learning and a sense of how research in the area is conducted.

Quizzes

Throughout the semester, there will be a total of 16 quizzes administered through [gradescope](#). These quizzes will be posted before lecture sections throughout the semester and be available to take until the beginning of lecture that same day. Quizzes will be released at 7:00AM EST and must be submitted by 5:00PM EST. Each quiz will have a 15 minute time limit. Each quiz will consist of 1 or 2 short questions within the scope of previously covered lectures and graded projects. Use of lecture, project and other course materials is permitted while taking the quizzes. Use of external sources (i.e. from the internet) is not permitted during quizzes.

Grading Policy

Course grades will be determined according to the following criteria:

- [Project 0](#): 6%
- [Project 1](#): 12%
- [Project 2](#): 12%
- [Project 3](#): 12%
- [Project 4](#): 12%
- [Final Project](#):
 - Paper Review: 5%
 - Paper Presentation: 10%
 - Paper Reproduction: 5%
 - Algorithmic Extension: 5%
 - Written Report: 5%

- 16 Pre-Lecture Quizzes: 16% (1% each)

Collaboration Policy

The free flow of discussion and ideas is encouraged. **However, all work submitted must be your own.**

All code submitted must comply with the [College of Engineering Honor Code](#).

No code can be communicated, including verbally. Explicit use of external sources must be clearly cited. Experimentation with and use of generative AI as an educational tool is encouraged, however any use of AI for course work must abide by the College of Engineering Honor Code and must be clearly cited.

Discussion Forum

The [Piazza](#) discussion forum is available for discussion of course materials including lectures and projects. **Students are not required to participate, use or join the Piazza forum.**

Any discussion of quizzes and verbatim code on the Piazza forum must be posted privately.



University of Michigan

Winter 2024 Instructor Report

ROB 498 011 - ROB 599 011

Xiaoxiao Du

28 out of 69 students responded to this evaluation.

Responses to University-wide questions about the course:

	SA	A	N	D	SD	N/A	Your Median	School/College Median	Univ-Wide Median
This course advanced my understanding of the subject matter. (Q1631)	16	11	1	0	0	0	4.6	4.4	4.5
My interest in the subject has increased because of this course. (Q1632)	17	8	2	0	1	0	4.7	4.2	4.2
I knew what was expected of me in this course.(Q1633)	13	10	4	1	0	0	4.4	4.4	4.6
I had a strong desire to take this course.(Q4)	18	6	3	1	0	0	4.7	4.0	4.1
As compared with other courses of equal credit, the workload for this course was (SA=Much Lighter, A=Lighter, N=Typical, D=Heavier, SD=Much Heavier). (Q891)	4	3	8	7	6	0	2.6	2.9	3.0

Responses to University-wide questions about the instructor:

	SA	A	N	D	SD	N/A	Your Median	School/College Median	Univ-Wide Median
Xiaoxiao Du seemed well prepared for class meetings.(Q230)	21	5	2	0	0	0	4.8	4.7	4.8
Xiaoxiao Du explained material clearly.(Q199)	17	6	5	0	0	0	4.7	4.6	4.7
Xiaoxiao Du treated students with respect.(Q217)	24	3	1	0	0	0	4.9	4.8	4.8

Responses to questions about the course:

	SA	A	N	D	SD	N/A	Your Median
Overall, this was an excellent course. (Q1)	17	5	6	0	0	0	4.7
I gained a good understanding of concepts/principles in this field. (Q121)	18	5	5	0	0	0	4.7
The amount of work required was appropriate for the credit received. (Q239)	14	6	7	1	0	0	4.5
Grades were assigned fairly and impartially. (Q365)	16	7	4	1	0	0	4.6

Responses to questions about the instructor:

12-

	SA	A	N	D	SD	N/A	Your Median
Overall, Xiaoxiao Du was an excellent teacher. (Q2)	17	9	2	0	0	0	4.7
Xiaoxiao Du appeared to have a thorough knowledge of the subject. (Q207)	21	6	1	0	0	0	4.8
Xiaoxiao Du acknowledged all questions insofar as possible. (Q216)	21	6	1	0	0	0	4.8

The medians are calculated from Winter 2024 data. University-wide medians are based on all UM classes in which an item was used. The school/college medians in this report are based on classes that are upper division with enrollment of 16 to 74 in College of Engineering.

University of Michigan
Winter 2024 Instructor Report
ROB 498 012 - ROB 599 012
Xiaoxiao Du

23 out of 69 students responded to this evaluation.

Responses to University-wide questions about the course:

	SA	A	N	D	SD	N/A	Your Median	School/College Median	Univ-Wide Median
This course advanced my understanding of the subject matter. (Q1631)	15	6	2	0	0	0	4.7	4.4	4.5
My interest in the subject has increased because of this course. (Q1632)	16	4	2	0	1	0	4.8	4.2	4.2
I knew what was expected of me in this course.(Q1633)	14	7	2	0	0	0	4.7	4.4	4.6
I had a strong desire to take this course.(Q4)	17	4	2	0	0	0	4.8	4.0	4.1
As compared with other courses of equal credit, the workload for this course was (SA=Much Lighter, A=Lighter, N=Typical, D=Heavier, SD=Much Heavier). (Q891)	4	2	9	5	3	0	2.9	2.9	3.0

Responses to University-wide questions about the instructor:

	SA	A	N	D	SD	N/A	Your Median	School/College Median	Univ-Wide Median
Xiaoxiao Du seemed well prepared for class meetings.(Q230)	17	4	2	0	0	0	4.8	4.7	4.8
Xiaoxiao Du explained material clearly.(Q199)	15	6	2	0	0	0	4.7	4.6	4.7
Xiaoxiao Du treated students with respect.(Q217)	18	4	1	0	0	0	4.9	4.8	4.8

Responses to questions about the course:

	SA	A	N	D	SD	N/A	Your Median
Overall, this was an excellent course. (Q1)	15	6	2	0	0	0	4.7
The lab instructions are clear and complete. (Q1765)	11	7	3	1	0	1	4.5
The provided lab materials (templates, tutorials, etc.) are clear and helpful. (Q1766)	14	4	5	0	0	0	4.7
Overall, my experience with my assigned group members has been excellent. (Q1767)	14	3	5	0	0	1	4.7
The amount of assistance given outside scheduled lab time has been sufficient. (Q1768)	14	5	3	1	0	0	4.7

12-18-24

Responses to questions about the instructor:

	SA	A	N	D	SD	N/A	Your Median
Overall, Xiaoxiao Du was an excellent teacher. (Q2)	16	5	2	0	0	0	4.8

The medians are calculated from Winter 2024 data. University-wide medians are based on all UM classes in which an item was used. The school/college medians in this report are based on classes that are upper division with enrollment of 16 to 74 in College of Engineering.

University of Michigan
Winter 2023 Instructor Report
ROB 498 002 - ROB 599 009
Anthony Opipari III

27 out of 81 students responded to this evaluation.

Responses to University-wide questions about the course:

	SA	A	N	D	SD	N/A	Your Median	School/College Median	Univ-Wide Median
This course advanced my understanding of the subject matter. (Q1631)	14	10	2	1	0	0	4.5	4.4	4.5
My interest in the subject has increased because of this course. (Q1632)	13	10	3	1	0	0	4.5	4.1	4.2
I knew what was expected of me in this course.(Q1633)	10	12	3	2	0	0	4.2	4.3	4.6
I had a strong desire to take this course.(Q4)	11	13	3	0	0	0	4.3	4.0	4.1
As compared with other courses of equal credit, the workload for this course was (SA=Much Lighter, A=Lighter, N=Typical, D=Heavier, SD=Much Heavier). (Q891)	3	2	17	4	1	0	3.0	2.8	3.0

Responses to University-wide questions about the instructor:

	SA	A	N	D	SD	N/A	Your Median	School/College Median	Univ-Wide Median
Anthony Opipari III seemed well prepared for class meetings.(Q230)	16	11	0	0	0	0	4.7	4.7	4.8
Anthony Opipari III explained material clearly.(Q199)	15	11	1	0	0	0	4.6	4.6	4.7
Anthony Opipari III treated students with respect.(Q217)	21	6	0	0	0	0	4.9	4.8	4.8

Responses to questions about the course:

	SA	A	N	D	SD	N/A	Your Median
Overall, this was an excellent course. (Q1)	10	12	3	1	0	0	4.3
I gained a good understanding of concepts/principles in this field. (Q121)	10	14	1	0	2	0	4.3
The amount of work required was appropriate for the credit received. (Q239)	9	14	3	1	0	0	4.2
Grades were assigned fairly and impartially. (Q365)	8	15	2	1	0	1	4.2

Responses to questions about the instructor:

	SA	A	N	D	SD	N/A	Your Median
Overall, Anthony Opipari III was an excellent teacher. (Q2)	12	14	0	1	0	0	4.4
Anthony Opipari III appeared to have a thorough knowledge of the subject. (Q207)	14	12	1	0	0	0	4.5
Anthony Opipari III acknowledged all questions insofar as possible. (Q216)	15	10	1	0	1	0	4.6

The medians are calculated from Winter 2023 data. University-wide medians are based on all UM classes in which an item was used. The school/college medians in this report are based on classes that are upper division with enrollment of 75 or greater in College of Engineering.

University of Michigan

Winter 2023 Instructor Report

ROB 498-003: Spec Topics Robotics

Anthony Opipari III

1 out of 13 students responded to this evaluation.

Responses to University-wide questions about the course:

	SA	A	N	D	SD	N/A	Your Median	School/College Median	Univ-Wide Median
This course advanced my understanding of the subject matter. (Q1631)	1	0	0	0	0	0	5.0	4.4	4.5
My interest in the subject has increased because of this course. (Q1632)	1	0	0	0	0	0	5.0	4.1	4.2
I knew what was expected of me in this course.(Q1633)	0	1	0	0	0	0	4.0	4.3	4.6
I had a strong desire to take this course.(Q4)	1	0	0	0	0	0	5.0	4.0	4.1
As compared with other courses of equal credit, the workload for this course was (SA=Much Lighter, A=Lighter, N=Typical, D=Heavier, SD=Much Heavier). (Q891)	0	0	1	0	0	0	3.0	2.8	3.0

Responses to University-wide questions about the instructor:

	SA	A	N	D	SD	N/A	Your Median	School/College Median	Univ-Wide Median
Anthony Opipari III seemed well prepared for class meetings.(Q230)	1	0	0	0	0	0	5.0	4.7	4.8
Anthony Opipari III explained material clearly.(Q199)	0	1	0	0	0	0	4.0	4.6	4.7
Anthony Opipari III treated students with respect.(Q217)	1	0	0	0	0	0	5.0	4.8	4.8

Responses to questions about the course:

	SA	A	N	D	SD	N/A	Your Median
Overall, this was an excellent course. (Q1)	1	0	0	0	0	0	5.0
The lab instructions are clear and complete. (Q1765)	0	1	0	0	0	0	4.0
The provided lab materials (templates, tutorials, etc.) are clear and helpful. (Q1766)	0	1	0	0	0	0	4.0
Overall, my experience with my assigned group members has been excellent. (Q1767)	1	0	0	0	0	0	5.0
The amount of assistance given outside scheduled lab time has been sufficient. (Q1768)	1	0	0	0	0	0	5.0

Responses to questions about the instructor:

	SA	A	N	D	SD	N/A	Your Median
Overall, Anthony Opipari III was an excellent teacher. (Q2)	1	0	0	0	0	0	5.0

The medians are calculated from Winter 2023 data. University-wide medians are based on all UM classes in which an item was used. The school/college medians in this report are based on classes that are upper division with enrollment of 1 to 15 in College of Engineering.