

**The University of Michigan
College of Engineering
Curriculum Committee
September 13th, 2016- 1:30-3:00 p.m.
1180 Duderstadt Center**

Attending

Kevin Compton (Chair), Leanna Foster (Grad), Patrick Hammett, Edward Larson, Erik Hildinger, Michael Bernitsas, Yavuz Bozer, Jwo Pan, Susan Montgomery, Richard Robertson, Brian Noble, Jamie Phillips, Fred Terry, Jeffrey Scruggs, Luis Bernal, Luis Hernandez-Garcia, Mark Moldwin, Tassos Perakis, Amber Dryden (supporting staff)

Notes/Minutes Start time 1:38pm

1. Kevin Compton was elected the new Curriculum Committee Chair for Fall 2016.
2. April 12th meeting minutes **APPROVED**. Uploaded on the Cur. Com. webpage on 9/14/16.
3. "Proposal for Clarification of Auditing of CoE Coursework" presented by Susan Montgomery. **APPROVED with slight changes to wording**. Proposal needs to be updated so that "nine weeks" is changed to "three weeks". After 3 weeks a petition needs to be done to the SSC.
4. "Proposal for Clarification of I and Y Grade" presented by Susan Montgomery. **APPROVED**. Some discussion regarding use of "I" and "Y" grades.
5. "Proposal for Clarification of Timeframe to Complete Two Degrees Within CoE" presented by Susan Montgomery. **APPROVED with slight changes to wording**. Need to specify this is concerning "undergraduate" degrees. Use the wording highlighted in bold (not the alternate version), but insert "undergraduate" into the following sentence: "A student completing the requirements for a College of Engineering undergraduate degree and a second degree either from"
6. "Proposal to include dual degree students not eligible for SUGS 2016" presented by Susan Montgomery. The original proposal for updating wording was **NOT APPROVED**. However, the Curr. Comm. did **APPROVE** updating the wording to include "**and restrictions**". Please insert into this sentence – "Consult with the appropriate graduate departmental coordinator for specific deadlines and restrictions."
7. Proposal for clarification regarding CoE policies for double counting AP math credits presented by Amber Dryden. Some discussion, but item is **TABLED** pending further review.

CARF DECISIONS

SUBJECT	Course #	ACTION	EFFECTIVE TERM	Approved	Notes Regarding CARFs	TABLED
EARTH	465	MOD	FT 2016? WT 2017?	X	Presented by Mark Moldwin. Change in home department from CLaSP to EARTH. Form currently says Fall 2016 as effective term. Betsy- Does this need a new form? AD 9/14/16	
EECS	203	MOD	FT 2016	X	Presented by Kevin Compton. Correction to prior CARF to include additional acceptable enforced prerequisite options. Refining the two-take policy for EECS 203, 280, & 281 to include Visit/Audit status in what counts as an "attempt" in the course.	

EECS	376	MOD	WT 2017	X	Presented by Kevin Compton. Course description change.	
EECS	475	MOD	FT 2017	X	Presented by Kevin Compton. Related to EECS 376 change.	
EECS	477	MOD	FT 2017	X	Presented by Kevin Compton. Related to EECS 376 change.	
EECS	569	MOD	WT 2017 (updated)	X	Presented by Jaime Phillips. Course description, cross listed course information. First request said WT 2016, updated form to WT 2017. WIATING ON UPDATED SIGNATURE FOR PROCESSING. AD 9/15/16.	
MFG	501	MOD	FT 2016	X	Approved via email vote on 8/8/16. The course has been changed from 3 to 1.5 credit hours. Fred Terry "We are now at 12 yes votes and the matters carry."	
MFG	605	MOD	FT 2016	X	Approved in email vote along with MFG 501. There used to be two sections typically offered during the Winter Semester—one was 14 weeks long and the other was a turbo version offered in 7 weeks. The Tauber students told us that the shorter 7 week section moved so fast that it was difficult to assimilate the material well. We listened and now intend to offer both versions as 14 week versions. One will be offered during Fall B + Winter A. The other will be offered during Winter A+B.	
ROB	990	NEW	FT 2016	X	Approved via email vote on 8/31/16. Fred Terry - "Thanks all for the fast replies. We have 12 positive votes and no others. The matter carries."	
ROB	995	NEW	FT 2016	X	Same as above	
UARTS	101	DELETE	FT 2016		Dean Noble said that UARTS do not need to be reviewed by the CoE Curr. Comm., but rather they have a separate process. <u>Betsy</u> – Could you look into these three UARTS requests? You may have already completed these (looking back at emails from 7/14/16 with Krista Quinn). I cannot tell. AD 9/15/16	
UARTS	102	DELETE	FT 2016		See UARTS 101.	
UARTS	200	DELETE	FT 2016		See UARTS 101.	

End time 3:00pm

UNIVERSITY OF MICHIGAN
College of Engineering
Curriculum Committee Meeting

UPCOMING MEETING: Tuesday, September 13, 2016 – 1:30-3:00pm

Location: 1180 Duderstadt Center

MEETING AFTER NEXT: Tuesday, September 27th, 2016, 1:30-3:00pm,

Room 1180, Duderstadt Center

AGENDA

1. Vote for Chair of the Curriculum Committee for FALL 2016.
2. Recap of April 12th meeting. Request for approval of mtg. minutes. (Page 3-4)
3. Deadline for enforced prerequisites (Page 5)
4. Proposal for Clarification of Auditing of CoE Coursework (Page 6-8)
5. Proposal for Clarification of I and Y Grade Use p (Page 9-12)
6. Proposal for Clarification of Timeframe to Complete Two Degrees Within CoE (Page 13-14)
7. Proposal to include dual degree students not eligible for SUGS 2016 (Page 15)
8. Proposal for clarification regarding CoE policies for double counting AP math credits (16-20)

CARF SUMMARIES

Page	SUBJECT	Course #	ACTION	SUMMARY	EFFECTIVE TERM	MIN. GRADE REQ. FOR ENF. PREPREQ	Approved	Notes & Revisions	TABLED
21-22	EARTH	465	MOD	Due to retirement and updates to CLASP curriculum, the department does not plan to offer CLIMATE 467 in future terms. Requesting to have the home department transferred from CLASP to Earth.	WT 2017			Tabled from last mtg. Betsy- Have you processed anything for this yet? I believe it was recommended to hold off on the updates until WT 2017. Currently the form says FT 2016, but that might need to be updated for processing.	
23-24	EECS	203	MOD	Correction to prior CARF to include additional acceptable enforced prerequisite options. Refining the two-take policy for EECS 203, 280, & 281 to include Visit/Audit status in what counts as an "attempt" in the course.	FT 2016	C			
25-26	EECS	376	MOD	Course description	WT 2017	C			

27-28	EECS	475	MOD	Prereq changes	FT 2017	C			
29-30	EECS	477	MOD	Prereq changes	FT 2017	C			
31-32	EECS	569	MOD	Course description, cross listed course information	WT 2016			Does this need to be WT 2017?	
33-48	MFG	501	MOD	The course has been changed from 3 to 1.5 credit hours.	FT 2016		X	Approved via email vote on 8/8/16. Fred Terry "We are now at 12 yes votes and the matters carry."	
49-50	MFG	605	MOD	The course is being modified. There used to be two sections typically offered during the Winter Semester—one was 14 weeks long and the other was a turbo version offered in 7 weeks. The Tauber students told us that the shorter 7 week section moved so fast that it was difficult to assimilate the material well. We listened and now intend to offer both versions as 14 week versions. One will be offered during Fall B + Winter A. The other will be offered during Winter A+B.	FT 2016		X	Same as above	
51-52	ROB	990	NEW	Fred Terry via email 8/30/16 -The new program in Robotics has an urgent need to get two classes on the books for FA16 so that Ph.D. students in the program can properly register for their dissertation research credit. The CARF's were done on RO standard forms, not CoE ones, but I believe the critical information is there. I don't see an explicit restriction of the classes to Robotics program students and we may want that added. Functionally, I don't think this is a real issue since these are the only students that would register for the class anyway.	FT 2016		X	Approved via email vote on 8/31/16. Fred Terry "Thanks all for the fast replies. We have 12 positive votes and no others. The matter carries."	
53-54	ROB	995	NEW	Same as above	FT 2016		X	Same as above	
55-56	UARTS	101	DELETE	Course has been replaced by UARTS 150.	FT 2016				
57-58	UARTS	102	DELETE	Course has been replaced by UARTS 150.	FT 2016				
59-60	UARTS	200	DELETE	Course has been replaced by UARTS 250.	FT 2016				

The University of Michigan
College of Engineering
Curriculum Committee
April 12th, 2016- 1:30-3:00 p.m.
1180 Duderstadt Center

Attending

Brian Noble, Igor Markov, John Boyd, Susan Montgomery, Jamie Phillips, Fred Terry (Chair), Clive D'Souza, Richard Robertson, Tassos Perakis, Edward Larson, David Bielski (ESG), Mikhail Zollikoff (Guest), David Wentzloff (Guest), Ashleigh Bell (Guest), Matt Gibson (Guest), Amber Dryden (supporting staff), Betsy Dodge (supporting staff)

Notes/Minutes Start time 1:40pm

1. Fred Terry announced that CC Meetings will start back up again FT 2016 on September 13, 2016. The schedule is available on this link <http://cc.engin.umich.edu/schedule>
2. March 22nd meeting minutes **APPROVED**. Uploaded on the Cur. Com. webpage on 5/13/16 .
3. David Wentzloff presented on "The Center for Entrepreneurship (CFE) A Proposal for a Graduate Certificate in Innovation" outlined on page 6-41 in the April 12th agenda. Several discussion questions from committee members including, but not limited to; what is the appropriate process for review, what is the CoE Curriculum Committee authority regarding certificates, how does Rackham view this proposal, what is the degree granting authority for the certificates, and discussion regarding use of "Certificate". This proposal was **tabled**.
4. MSE Minor Proposal (pg. 42) presented by Richard Robertson. **APPROVED**. Still needs to be voted on at the next faculty meeting starting back up Fall 2016. Betsy- This needs to go to Faculty Mtg. for 10/26/16 as an action item.

CARF DECISIONS

SUBJECT	Course #	ACTION	EFFECTIVE TERM	Approved	Notes Regarding CARFs	TABLED
CLIMATE & SPACE	501	MOD	FT 2016	X	Added late to agenda – reviewed as separate attachment. A little odd to have two cross listed courses within the same department, but no objections.	
EARTH	465	MOD	FT 2016		Added late to agenda – reviewed as separate attachment. Students enrolled in Earth 465 right now. This class currently exists under 467 & is cross listed. AOSS does not want to be home department anymore. Wait to do effective term Winter 2017. <u>Betsy</u> – Was this already processed by the RO or does it need to move forward to Fall 2016 for review?	X
EECS	441	MOD	FT 2016	X	Tabled from last meeting due to time constraints. Presented by Igor Markov. Going from 3 credits to 4 credits. RECOMMENDED TO INCLUDE ALL CREDIT TYPES IN LEVEL OF CREDIT.	
EECS	442	MOD	FT 2016	X	Presented by Jamie Phillips. Credit Restrictions. RECOMMENDED TO INCLUDE ALL CREDIT TYPES IN LEVEL OF CREDIT.	

EECS	486	NEW	FT 2016	X	Tabled from last meeting due to time constraints. Presented by Igor Markov.	
EECS	492	MOD	FT 2016	X	Presented by Igor Markov. Recommended to add “Not for Graduate Credit” on the prerequisite line.	
EECS	526	NEW	FT 2016	X	Presented by Jamie Phillips. Susan mentioned would like to see course evaluations.	
EECS	592	MOD	FT 2016	X	Presented by Igor Markov.	
EECS	692	MOD	FT 2016	X	Presented by Igor Markov.	
EECS	792	MOD	FT 2016	X	Presented by Igor Markov. Question as to whether EECS 492 is really needed as enforced prereq. or if it is just recommended.	
ENTR	409	MOD	FT 2016	X	Presented by Matt Gibson. Requested updates on form to show “X” where changes are made. Put old course name on the left hand side.	
ENTR	410	NEW	FT 2016	X	Presented by Matt Gibson.	
ENTR	412	NEW	FT 2016	X	Presented by Matt Gibson. Fred asked about the order of courses, & Matt said it is not necessary to take in a certain order.	
ENTR	415	NEW	FT 2016	X	Presented by Matt Gibson.	
ENTR	550	NEW	FT 2016	X	Tabled from last meeting due to time constraints. Presented by Matt Gibson.	
IOE	537	NEW	FT 2016	X	Tabled from last meeting due to time constraints. Presented by Clive D’Souza.	
MATSCIE	365	MOD	WT 2017	X	Presented by Richard Robertson. Question regarding whether it is possible to set up courses in the system to have both advised and enforced prerequisites.	
MFG	501	MOD	FT 2016	X	Tabled at this meeting, but later voted on through email and approved. See 9/13/16 agenda notes for record of approval & additional information.	

End time 3:00pm

Curriculum Calendar - Deadline for ENFORCED PREREQUISITES for CARFs

Elizabeth Dodge <elibunce@umich.edu>

Wed, Jun 8, 2016 at 10:14 AM

To: COECURRICULUMCOMMITTEE <COECURRICULUMCOMMITTEE@umich.edu>, CoE Curriculum Committee
Department Support Staff <coeccsupport@umich.edu>

Cc: Amber Dryden <amdryden@umich.edu>, Elizabeth Dodge <elibunce@umich.edu>

Hello All,

The Registrar's Office has posted the [Curriculum Resources - Key Dates and Deadlines](#). This is the UM RO calendar for curriculum maintenance. Please pay special attention regarding when Course Approval Forms (CARFs) need to be submitted to the UM Registrar's Office with ENFORCED PREREQUISITES are on the CARF. Plan accordingly when submitting your CARFs to the CoE Curriculum Committee for approval. The deadline for Winter 2017 courses is **September 19, 2016**.

I have received several frustrated communications from the Registrar's Office regarding Engineering's submission of these CARFs well past that deadline. They are adamant about the deadline, state that other schools and colleges are able to follow this guideline and want us to follow suit. I don't want to get into the habit of policing the CARF submissions and would appreciate it if those in your department or programs could be cognizant of these deadlines and plan their submissions accordingly.

Thank you for your cooperation and patience!

Sincerely,

Betsy

Betsy Dodge

Undergraduate School Registrar
University of Michigan College of Engineering
Office of Student Affairs, 145A Chrysler Center
2121 Bonisteel Boulevard
Ann Arbor, MI 48109-2092
Office: [734-647-7117](tel:734-647-7117)
Email: elibunce@umich.edu

MEMORANDUM

TO: CoE Curriculum Committee

FROM: Betsy Dodge, CoE Undergraduate Registrar

Susan Montgomery, Brian Noble, Fred Terry, CoE Curriculum Committee Members

RE: Bulletin wording regarding time of auditing/visiting CoE courses

DATE: August 22, 2016

There have been several questions about the CoE policy on Official Auditing of coursework. LSA defines it this way: <http://lsa.umich.edu/lsa/academics/degrees-requirements/academic-policies/auditing-courses.html>

“Auditing Courses

Students are expected to elect courses for credit. Occasionally, however, a student may wish to attend a course but not elect it for credit. This arrangement can take the form of an *official audit* (sometimes called *Visitor* status).

An *official audit* obligates a student to attend classes regularly and complete course requirements (*e.g.*, papers, laboratory assignments, tests, and the final examination). Regular tuition fees apply, and the course appears on the transcript with the grade *VI (Audit)*; and no degree credit is earned. To arrange an official audit, a student must submit a [Request for Audit Status form](#) to the Academic Standards Board, 1255 Angell Hall. A request to officially audit a course must be approved by the end of the third week of a full term or second week of a half-term. Students who do not fulfill course requirements earn the grade ED to indicate that the course was unofficially dropped. In these cases, the term and cumulative grade point averages remain unaffected.”

In engineering, work is typically not expected. The College of Engineering Bulletin website states the following: <http://www.engin.umich.edu/college/academics/bulletin/rules/standing>

“VISIT

With permission of the advisor and course instructor, a student may enroll in a course as a visitor. In such a case, the course will be entered on the permanent record with a "VI" instead of a letter grade. The same fee will be charged whether the student enrolls for credit or as a visitor. A course elected as "VI" does not count toward a student's full time status.

A change in elections from credit to visit must be made during the first nine weeks of a term. Note that advisors typically will not approve changes in Visit elections after the third week (second week in Spring and Summer half terms). In such cases, withdrawing or changing to an election of Pass/Fail is generally more appropriate. After the ninth week, students must petition for an exception to College Rules to change Visit status. Required courses may not be elected as a visit."

The ME website has a description that explicitly states that work is optional at: <http://me.engin.umich.edu/academics/ugsh/courses>

"Visiting/Auditing a Class

"Visiting" is the official University term for taking a class for no grade and no credit toward your degree. This is also commonly referred to as "auditing" a course.

According to the [College of Engineering Bulletin](#):

"With permission of the advisor and course instructor, a student may enroll in a course as a visitor. In such a case, the course will be entered on the permanent record with a "VI" instead of a letter grade. The same fee will be charged whether the student enrolls for credit or as a visitor. A course elected as "VI" does not count toward a student's full time status. A change in elections from credit to visit must be made during the first nine weeks of a term. Signed petitions are required after this point. Required courses may not be elected as a visit.

- If you plan on visiting a class, please stop by the ME Academic Services Office to pick up an Add/Drop/Modify form to take to your instructor. To visit a class, you must receive permission from the course instructor and negotiate with your responsibilities as a student with the instructor. This typically involves regular attendance in lecture and optional homework/exams. The amount of time and effort you put into the class is then up to you.
- Once the instructor has signed the Add/Drop/Modify form, bring it to the ASO for a staff member to review and sign. You will then take the completed form to the Registrar's Office.
- Courses required for your curriculum may **NOT** be elected as "Visit".

Keep in mind that the class will be on your transcript with "VI" instead of a grade, but **will not** be counted toward your degree requirements. In addition, a class that is visited must be paid for just like any other class. This means that if you visit a summer class, or if visiting a class takes you over 18 credits for a term, you will pay extra for it. "

It seems that there is no standard, across-the-board policy for the College of Engineering. It has been reported that in some cases, students had to do the homework to stay immersed in the material but do not need to take the exams. We propose editing the Visit section of the curriculum to read (bolds added here to emphasize new text only. Final text would not be bolded):

"VISIT/AUDIT

With permission of the advisor and course instructor, a student from the University of Michigan Ann Arbor may enroll in a College of Engineering course as a visitor, also referred informally as auditing a course. The student is expected to attend classes regularly but is not required to complete any course requirements, (e.g., homework sets, laboratory assignments, tests, and the final examination). In such a case, the course will be entered on the permanent record with a "VI" instead of a letter grade. **If the student does not attend the class regularly, the faculty has the option to enter a grade of "NR" for no report.** The same fee will be charged whether the student enrolls for credit or as a visitor. A course elected as "VI" does not count toward a student's full time status.

A change in elections from credit to visit must be made during the first nine weeks of a term. Note that advisors typically will not approve changes in Visit elections after the third week (second week in Spring and Summer half terms). In such cases, withdrawing or changing to an election of Pass/Fail is generally more appropriate. After the ninth week students must petition for an exception to College Rules to change Visit status. Required courses may not be elected as a visit".

MEMORANDUM

TO: CoE Curriculum Committee

FROM: Betsy Dodge, CoE Undergraduate Registrar

Susan Montgomery, Brian Noble, Fred Terry, CoE Curriculum Committee Members

RE: Bulletin wording regarding time of I and Y grades

DATE: August 22, 2016

There have been some discrepancies about the use of “I” and “Y” grades in Engineering. The College of Engineering’s Bulletin states this about Incomplete grades:

<http://www.engin.umich.edu/college/academics/bulletin/rules/standing>

“Incompletes

When a student is prevented by illness, or by any other cause beyond the student’s control, from taking an examination or from completing any part of a course, or if credit in a course is temporarily withheld for good reason, the mark “I” may be reported to indicate the course has not been completed. This mark should be used only when there is a good probability that the student can complete the course. The instructor and student should mutually understand the reasons for the “I” mark and agree on methods and timeline for completing the work.

No qualifying grade will be recorded on the student’s academic record. The “I” mark will not be used in computing either the term or cumulative grade point averages. Scholastic standing at the end of any term is determined on the basis of work graded as “A+” through “E”, or “ED”.

The required work may be completed and the grade submitted by the instructor whether or not this student is enrolled in the subsequent term. The student should plan to complete the work as soon as possible. To secure credit, the required work must be completed by the end of the first full term (not including Spring or Summer terms) in which the student is enrolled after the term in which the “I” mark was recorded. It is the student’s responsibility to remind the instructor to submit a grade report through the grading system in Wolverine Access when the work is completed. {See below text to be inserted here} If the final grade is not reported by the last day of classes, the University Registrar will automatically change the “I” to an “ILE”.

Incomplete extensions must be arranged with the instructor. Forms are available at the College Registrar's Office, 145A Chrysler Center.

Any grade changes made to the student record as a result of incompletes either being completed or lapsed will result in reevaluation of a student's academic record by the Scholastic Standing Committee and may result in changes to their academic standing."

LSA has the following statement: <https://lsa.umich.edu/advising/policies-procedures/incompletes.html>

"Incompletes

Summary

An "Incomplete" (denoted on the transcript by the symbol "I") may be reported only if the amount of unfinished work is small, the work is unfinished for reasons acceptable to the instructor, and the student's standing in the course is at least "C-". An "I" grade not finished by the incomplete deadline or an approved extended deadline lapses to "ILE".

Incompletes

Students who find themselves unable to finish all of the assignments for a course before the end of the term may request a grade of Incomplete from the instructor. The instructor is under no obligation to grant this request, and can only grant it if:

- the student has already finished about 70% of the work;
- the student's current grade in the course is at least "C-".

If the instructor agrees to give an incomplete, the student will have up to the end of the 4th week of the next Fall or Winter term of registration to complete the work. If the instructor has not submitted a grade for the student by 10 days past the deadline, the incomplete will lapse to an "ILE".

The "I" grade itself does not affect the term or cumulative grade point averages. Students may finish the work for Incompletes while not in residence even if the Board has dismissed them from the College for reasons of unsatisfactory academic performance.

If the student does complete the work within the allowed period, the Registrar will post the final grade on the transcript; however, the "I" will remain next to the grade on the transcript.

Students who are not able to finish the work within the allowed period may apply to the Academic Standards Board for an extension of the incomplete deadline. In order to qualify for an extension, the student must present documented unexpected circumstances that prevented completion of the course within the allotted time period. Unfinished "I" grades will lapse to "ILE" grades beyond the regular or extended incomplete deadline. In such cases, the student will earn no degree credit and lower his/her term and overall GPAs. Unfinished courses elected on a non-

graded pattern (Pass/Fail, Credit/No Credit) lapse to "Fail or "No Credit" but do not affect the term or cumulative grade point averages."

Note that the CoE statement does not explicitly state that the "I" does not get removed later when the student earns a final grade, which is the case across the university. Also, if a student has an "I" grade and the instructor enters the final grade without the "I" (IA), this is coded and the CoE RO's office is notified automatically by email to follow-up with the instructor to include the "I" as part of the final grade.

Since the "I" grade will not be removed from the final grade, it should be used only when the student DID NOT complete the work in the expected amount of time.

Another pertinent issue is the use of "Y" grades vs. "I" grades and when to use them. Tim Taylor, Associate Registrar for Student Services outlined:

"The Y grade is not intended for a single term class, only an approved extended multi-term class. "Y" grades are used if there is enrollment in the class spanning two terms (the student gets the Y grade for the first term and then at the end of the second term, gets the final grade, which replaces the Y in the first term).

"I" grades are to be used for an incomplete of a one term class. Generally used once the class is over, and a significant portion of the work is completed. The grade change will result in an "I" as part of the final grade (IA, IA-, IB+, etc.)."

The College of Engineering must have a clear understanding of the use of the "I" grade and the "Y" grade and when to use them. "Y" grades can only be used in courses that are approved for such purpose as noted on the grading section of a CARF approved by the CoE Curriculum Committee. There is also an unintentional byproduct of the current practice, if a student has a "Y" grade and the CoE RO's Office is running the Dean's Honor List Report every term, and the student has a "Y" grade, the report may drop the student for not have 12 graded credits and the student will not be selected for this honor.

We propose:

- A. Adding, "If the student does complete the work within the allowed period, the Registrar will post the final grade on the transcript; however, the "I" will remain next to the grade on the transcript." To the current text for the "I" grade, in the position noted above.
- B. Adding a statement regarding "Y" grades to the bulletin reading:

"Y" grades:

The "Y" grade can be assigned only for an approved extended multi-term class. "Y" grades are used if there is enrollment in the class spanning two terms, such as year-long

research or design courses. The student is assigned a grade of “Y” for the first term and then at the end of the second term is assigned the same final grade for both semesters, which replaced the “Y” in the first term.

MEMORANDUM

TO: CoE Curriculum Committee

FROM: Betsy Dodge, CoE Undergraduate Registrar

Susan Montgomery, Brian Noble, Fred Terry, CoE Curriculum Committee Members

RE: Bulletin wording regarding time of awarding of dual degrees

DATE: August 22, 2016

Our CoE Bulletin only refers to the circumstances in which a student is seeking one CoE degree and one from another college with regards to the rules for timeframe for applying to graduate.

[Http://www.engin.umich.edu/college/academics/bulletin/rules/graduation#requirementsforanadditionalbachelorsdegree](http://www.engin.umich.edu/college/academics/bulletin/rules/graduation#requirementsforanadditionalbachelorsdegree)

“For the College of Engineering to recommend the granting of a degree, a student who satisfies all other requirements must apply for graduation through Wolverine Access. A student completing the requirements for a College of Engineering degree and a second degree in one of the other schools/colleges on the University of Michigan-Ann Arbor campus must apply for graduation for each of the degrees for the same graduation date.”

Though by practice we follow this rule for students earning two degrees from the College of Engineering, this is not explicitly stated in the bulletin. We propose updating the text above to read:

“For the College of Engineering to recommend the granting of a degree, a student who satisfies all other requirements must apply for graduation through Wolverine Access. A student completing the requirements for a College of Engineering degree and a second degree **either from the College of Engineering or from** one of the other schools/colleges on the University of Michigan-Ann Arbor campus must apply for graduation for each of the degrees for the same graduation date.”

Alternate version:

“For the College of Engineering to recommend the granting of a degree, a student who satisfies all other requirements must apply for graduation through Wolverine Access. A student completing the requirements for two degrees from the University of Michigan-Ann Arbor

campus, including at least one from the College of Engineering, must apply for graduation for each of the degrees for the same graduation date.”

Also under **Dual Baccalaureate Degree Opportunities** in the bulletin,

<http://www.engin.umich.edu/college/academics/undergrad/degrees> -
dualbaccalaureatedegreeopportunities

“Students with interest in more than one program offered by the College may work for an additional bachelor’s degree concurrently if they plan their course elections carefully. Students will find that it is possible to satisfy the subject requirements of both programs in a minimum amount of time by conferring early with the respective program advisors. Approval by involved departments is required. See the Rules section of the Bulletin: <http://engin.umich.edu/college/academics/bulletin/rules/graduation>. The College generally recommends that students consider pursuing some of the many co- and extra-curricular activities offered as an alternative to a second CoE degree.”

There are a few issues that need to be reviewed in this discussion.

MEMORANDUM

TO: CoE Curriculum Committee

FROM: Betsy Dodge, CoE Undergraduate Registrar

Susan Montgomery, Brian Noble, Fred Terry, COE Curriculum Committee members

RE: Bulletin wording regarding dual degree students not eligible for SUGS program

DATE: August 22, 2016

The issue regarding dual degree students not being eligible for the SUGS program came up last year. We realized that, while the policy is outlined in the Rackham website, it is not included in the College bulletin, and there is no policy listed in the College bulletin for College of Engineering masters programs.

Currently in the 2016-2017 CoE Bulletin, under the SUGS section in <http://www.engin.umich.edu/college/academics/bulletin/ug-ed/combined> reads:

The five-year Sequential Undergraduate/Graduate Study (SUGS) Program permits students who enter the program in the first term of their senior year to receive the B.S.E. and M.S.E. degrees (or the B.S.E. and M.Eng. degrees) upon completion of a minimum of 149 credit hours (depending on program). The baccalaureate may be awarded upon completion of the undergraduate requirements or concurrently with the Master's degree. (proposed addition to go here) Students apply to the SUGS program at the end of their junior year or early in the first semester of their senior year. Consult with the appropriate graduate departmental coordinator for specific deadlines. Recommendation from the appropriate Undergraduate Program Advisor is required, and the standard department graduate admission process is used. SUGS admissions requirements will vary and each program will have a minimum GPA for admission; interested students should contact the department in which they would like to pursue graduate study. For a list of SUGS programs by department, please refer to the degree program listings under the B.S.E. home department.

We propose adding "Students earning dual bachelors degrees are NOT eligible for SUGS." to that paragraph, in the position noted above. This would apply both to Rackham and College of Engineering SUGS program.

CoE Rules MATH Rules Regarding AP Credit (MATH 120 & 121) & Double Counting

10 messages

Amber Dryden <amdryden@umich.edu>

Tue, Apr 19, 2016 at 10:04 AM

To: Elizabeth Dodge <elibunce@umich.edu>, Amy Bishop <albishop@umich.edu>, Fred Terry <fredty@umich.edu>, Susan Montgomery <smontgom@umich.edu>, Robert Freidhoff <freidhro@umich.edu>

Hello All,

I sent this question over to the Math Department below to see what LSA policies are concerning (possible?) double counting for MATH 120/121 for AP. I was wondering if we have any official policies for CoE regarding this, if we just follow the Math Dept. policies, or if there have been any previous discussions on it (Cur. Comm., etc) that I am not aware of. I can let you all know any additional information when Math responds.

Question sent to MATH Dept. below (pending reply)

Could we please know...

If student got AP MATH 120 credit, should they STILL get credit for it if they end up taking any of the following:

MATH 115 YES OR NO
MATH 185 YES OR NO
MATH 295 YES OR NO

If student got AP MATH 121 credit, should they STILL get credit for it if they end up taking any of the following:

MATH 116? YES OR NO
MATH 119? YES OR NO
MATH 156? YES OR NO
MATH 176? YES OR NO
MATH 186? YES OR NO
MATH 296? YES OR NO

We are trying to look at the Math courses in the LSA course guide to see rules about double counting, but the AP versions of credit do not seem to be mentioned in the course guide.

The AP guidelines page seems to be saying that MATH 120 & 121 are not representative of any specific U-M mathematics course, therefore, it seems that students should be getting both the AP & U-M course credit in all of these scenarios, is that correct? For instance, if a student takes MATH 115 here are they still allowed to have the MATH 120 AP credit without it considered double counting?

<http://admissions.umich.edu/apply/freshmen-applicants/ap-ib-credit>

No credit for either Math 120 or Math 121 if Math 105 or 115 is elected.

** 2 additional credits for Math 120 granted after successful completion of this course with grade of C or better.

*** 2 additional credits for each of Math 120 and Math 121 granted upon successful completion of this course with grade of C or better.

The Mathematics Department does not award credit for the AB subscore of the BC exam.

Math 120 and 121 are designated to represent AP credit only (AB and BC respectively). They are not representative of any specific U-M mathematics course.

The Department strongly encourages students with AP credit to elect one of the honors courses, Math 156, 174, 175, 185, or 295. All such elections require permission of the Math Honors Advisor and placement may depend on factors other than AP score.

Thank you,
Amber Dryden

Credit Evaluator
University of Michigan- College of Engineering
Chrysler Center, Room 145C, 2121 Bonisteel Boulevard
Ann Arbor, MI 48109-2092

Amber Dryden <amdryden@umich.edu>

Tue, Apr 19, 2016 at 2:01 PM

To: Elizabeth Dodge <elibunce@umich.edu>, Amy Bishop <albishop@umich.edu>, Fred Terry <fredty@umich.edu>, Susan Montgomery <smontgom@umich.edu>, Robert Freidhoff <freidhro@umich.edu>

Hello All,

Rob & his staff, and then Rob & I discussed the policies.

We came to the conclusion that the policy is --- it does not matter if the student takes the standard version or honors version, and that in either case the AP credit would need to be zeroed out. We discussed that his advising office receives a notification once in a while which indicates the students that are in this type of situation, and that advising is done to help them decide which route to take. I was mainly concerned because I have been getting a few requests from a departmental advisor asking for AP credit to be removed, & was curious as to why it did not seem to already be set up in the system. It seems that although there are searches to find these instances (Julia & I think the main Registrar Office), a few students at least are getting through the cracks. I don't think it is many, but something for advisors to look out for. I am going to ask Julia to do a quick query to look into it a bit.

Thanks for your time.

Amber Dryden

Credit Evaluator
University of Michigan- College of Engineering
Chrysler Center, Room 145C, 2121 Bonisteel Boulevard
Ann Arbor, MI 48109-2092

[Quoted text hidden]

Robert Freidhoff <freidhro@umich.edu>

Tue, Apr 19, 2016 at 2:06 PM

To: Amber Dryden <amdryden@umich.edu>

Cc: Elizabeth Dodge <elibunce@umich.edu>, Amy Bishop <albishop@umich.edu>, Fred Terry <fredty@umich.edu>, Susan Montgomery <smontgom@umich.edu>

Hey Everyone,

We share at orientation that students will receive credit for the course only one time. If they have credit via AP and then decide to repeat the course, the credit from AP will be removed. We do get a report sometime in August that lets us know who has AP credit and selected to take the same course in the fall.

Rob

Go Blue!

Rob Freidhoff, M.Ed.

Director, Engineering Advising Center
University of Michigan - College of Engineering

230 Chrysler Center
2121 Bonisteel Blvd.
734.647.7106
[SCHEDULE AN APPOINTMENT WITH ME](#)
freidhro@umich.edu
<http://advising.engin.umich.edu>



[Quoted text hidden]

Amber Dryden <amdryden@umich.edu>
To: [engincredit](mailto:engincredit@umich.edu) <engincredit@umich.edu>

Tue, Apr 19, 2016 at 2:14 PM

Thank you,
Amber Dryden

Credit Evaluator
University of Michigan- College of Engineering
Chrysler Center, Room 145C, 2121 Bonisteel Boulevard
Ann Arbor, MI 48109-2092

[Quoted text hidden]

Susan Montgomery <smontgom@umich.edu>
To: Robert Freidhoff <freidhro@umich.edu>
Cc: Amber Dryden <amdryden@umich.edu>, Elizabeth Dodge <elibunce@umich.edu>, Amy Bishop <albishop@umich.edu>, Fred Terry <fredty@umich.edu>

Tue, Apr 19, 2016 at 4:53 PM

Hi all,

My two cents that I agree that AP credit should be removed regardless of which version of that calculus class they took.

Susan

Susan Montgomery, Ph.D., P.E.
G. Brymer Williams Collegiate Lecturer
Undergraduate Program Advisor
Chemical Engineering Dept, University of Michigan
3142 Dow, 2300 Hayward St., Ann Arbor, MI 48109-2136
On campus hours M - F 8 am - 4 pm
smontgom@umich.edu , phone & fax (734) 936-1890
<http://www.engin.umich.edu/che> <http://encyclopedia.che.engin.umich.edu>
Appointments in Dow: Click on link in blue box at www.engin.umich.edu/che/undergraduate

[Quoted text hidden]

Amber Dryden <amdryden@umich.edu>
To: Susan Montgomery <smontgom@umich.edu>

Wed, Apr 20, 2016 at 10:11 AM

Thanks for you two cents Susan!

Thank you,
Amber Dryden

Credit Evaluator
University of Michigan- College of Engineering
Chrysler Center, Room 145C, 2121 Bonisteel Boulevard
Ann Arbor, MI 48109-2092

[Quoted text hidden]

Amber Dryden <amdryden@umich.edu>
To: Robert Freidhoff <freidhro@umich.edu>

Mon, Apr 25, 2016 at 1:06 PM

Hi Rob,

This is an interesting response from the Math Department in that in many circumstances they are advocating that the student should get the credit.

Any thoughts on this?

Hi Amber,

The committee came up with an official decision on AP credit.

Thanks!

Christina

----- Forwarded message -----

From: **Give IT A Shot** <giveitashot@umich.edu>

Date: Fri, Apr 22, 2016 at 4:34 PM

Subject: Re: MATH Rules Regarding AP Credit (MATH 120 & 121) & Double Counting

To: Math Transfer-Credit <math-transfer-credit@umich.edu>

Here are our answers. I think we got it right.

If student got AP MATH 120 credit, should they STILL get credit for it if they end up taking any of the following:

MATH 115 NO
MATH 185 YES
MATH 295 YES

If student got AP MATH 121 credit, should they STILL get credit for it if they end up taking any of the following:

MATH 116? YES (but not the additional two -- just two in total)
MATH 119? YES OR NO -- I think we don't have a math 119, what is it?
MATH 156? YES (but not the additional two -- just two in total)

MATH 176? YES
MATH 186? YES
MATH 296? YES

Thank you,
Amber Dryden

Credit Evaluator
University of Michigan- College of Engineering
Chrysler Center, Room 145C, 2121 Bonisteel Boulevard
Ann Arbor, MI 48109-2092

On Tue, Apr 19, 2016 at 2:06 PM, Robert Freidhoff <freidhro@umich.edu> wrote:
[Quoted text hidden]

Robert Freidhoff <freidhro@umich.edu>
To: Amber Dryden <amdryden@umich.edu>

Tue, Apr 26, 2016 at 8:15 AM

Hello Amber,

It is interesting. I think it would need to be looked at by our curriculum committee to get approval, but I'm not certain. You could bring it up to Jeanne if you like and then I can touch base with her as well.

Rob



Go Blue!

Rob Freidhoff, M.Ed.
Director, Engineering Advising Center
University of Michigan - College of Engineering
230 Chrysler Center
2121 Bonisteel Blvd.
734.647.7106
[SCHEDULE AN APPOINTMENT WITH ME](#)
freidhro@umich.edu
<http://advising.engin.umich.edu>



[Quoted text hidden]

Amber Dryden <amdryden@umich.edu>
To: Robert Freidhoff <freidhro@umich.edu>

Tue, Apr 26, 2016 at 3:01 PM

Hi Rob,

Yes, I do not think it is completely urgent to get down pack right away, but it would be nice to have more documented policies/procedures. I will try to bring it up with Jeanne at a meeting when we have one.

Thank you,

THE UNIVERSITY OF MICHIGAN -- COLLEGE OF ENGINEERING
Course Approval Request

College Curriculum Committee, 1420 Lurie Engineering Center Building

Form Number

2747

Date 12/11/2015

Action Requested

- ☐ New Course
☒ Modification of Existing Course
☐ Deletion of Course

Complete the following sections:

- New Courses - B & C completely
Modifications - A modified information, B & C completely
Deletions - A & C completely

Effective Term Fall 2016

Course Offer Freq ☒ Indefinitely
☐ One term only

A. CURRENT LISTING

B. REQUESTED LISTING

Home Department		Course Number	Home Department		Course Number
AOSS Atmos, Oceanic & Space Sci		467	EARTH Earth and Envir Sci		465
Cross Listed Course Information			Cross Listed Course Information		
CHEM Chemistry		467	CHEM		467
GEOSCI Geological Sciences		465	CLIMATE Climate & Meteorology		467
ENSCEN		467	ENSCEN Environmental Sciences & Engin		467
ENVIRON-Environment			ENVIRON		467
Course Title			Course Title		
			Biogeochemical Cycles		
TITLE	Time Sched Max = 19 Spaces		TITLE	Time Sched Max = 19 Spaces	Biogeochem. Cycles
ABBRE- VIATION	Transcript Max = 20 Spaces		ABBRE- VIATION	Transcript Max = 20 Spaces	Biogeochem
Course Description			Course Description for Official Publication (Max = 50 words)		
			The biogeochemical cycles of water, carbon, nitrogen, and sulfur; the atmosphere and oceans as reservoirs and reaction media; the fate of natural and man-made sources of carbon, nitrogen, and sulfur compounds; the interactions among the major biogeochemical cycles and resultant global change; greenhouse gases, acid rain and ozone depletion.		
PROGRAM OUTCOMES:		☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j	PROGRAM OUTCOMES:		☒ a ☐ c ☐ e ☒ g ☒ i ☐ k ☒ b ☒ d ☒ f ☒ h ☒ j
Degree Requirements		☐ Degree Requirement ☐ Free Elective ☐ Other ☐ Core Course ☐ Tech Elective	Degree Requirements		☐ Degree Requirement ☐ Free Elective ☐ Other ☐ Core Course ☒ Tech Elective
Prereq			Prereq		Math 116, Chem 210, Phys 240
☐ Enforced ☐ Advised			☐ Enforced ☒ Advised		
Credit Restrictions			Credit Restrictions		
Level of Credit		Credit Hours Min Max	Level of Credit		Credit Hours Min Max
☐ Undergrad only ☐ Ugrad or Non-Rckhm Grad ☐ Rackham Grad ☐ All Credit types ☐ Non-Rckhm Grad ☐ Rckhm Grad w/add'l Work ☐ Ugrad or Rackhm Grad			☐ Undergrad only ☐ Ugrad or Non-Rckhm Grad ☐ Rackham Grad ☒ All Credit types ☐ Non-Rckhm Grad ☐ Rckhm Grad w/add'l Work ☐ Ugrad or Rackhm Grad		
		Contact Hrs/Wk Number of Wks			Contact Hrs/Wk Number of Wks
					3 14
Repeatability (Indi Research, Dir. Study, Dissertation: Is this course repeatable?)		☐ Yes ☒ No	Max Hours? _____		Max Times? _____
			Can it be repeated in the same term? ☐ Yes ☒ No		
Class Type(s)		Grading	Location		
☒ Lec ☐ Sem ☐ Dis ☐ Other _____ ☐ Rec ☐ Lab ☐ Ind		☒ A-E ☐ CR/NC ☐ P/F ☐ S/U	☒ Ann Arbor ☐ Biological Station ☐ Camp Davis ☐ Extension		
Graded Section			Cognizant Faculty Member:		Title
☐ Lec ☐ Sem ☐ Dis ☐ Other _____ ☐ Rec ☐ Lab ☐ Ind					
Course is Y Graded ☐			Grad Course: Attach nomination if Cognizant Faculty is not a regular graduate faculty		
Approval Info		Approved by Name	Approved Date		Submitted By: ☐ Home Dept. ☒ Cross-listed Dept.
☐ Curriculum Comm.					
☐ Faculty					Department Chair Name
☐ Cross listed Unit 1					Chair Signature
☐ Cross listed Unit 2					
			Home Dept. EARTH		
			Cross-listed Dept(s). CHEM		
			Climate & Meteorology		
			ENSCEN		

3/21/16

SUPPORTING STATEMENT

Due to retirement and the updates to the CLASP curriculum, the Department does not plan to offer CLIMATE 467 in future terms. Since this course is cross-listed with EARTH and the Department of Earth and Environmental Sciences does have faculty who are interested in teaching it, we are requesting to have the home department transferred from CLASP to EARTH.

Are any special resources or facilities required for this course? ☐ Yes ☒ No

Detail the Special requirements

THE UNIVERSITY OF MICHIGAN -- COLLEGE OF ENGINEERING
Course Approval Request

College Curriculum Committee, 1420 Lurie Engineering Center Building

Form Number

2769

Action Requested

- ☐ New Course
☒ Modification of Existing Course
☐ Deletion of Course

Complete the following sections:

New Courses - B & C completely
 Modifications - A modified information, B & C completely
 Deletions - A & C completely

Date **2/18/2016**

Effective Term **Fall 2016**

Course Offer Freq ☒ Indefinitely
☐ One term only

A. CURRENT LISTING

B. REQUESTED LISTING

Home Department _____ Course Number _____ ☐ Cross Listed Course Information ☐ Course Title <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">TITLE</td> <td style="width:15%;">Time Sched Max = 19 Spaces</td> <td style="width:70%;"></td> </tr> <tr> <td>ABBREVIATION</td> <td>Transcript Max = 20 Spaces</td> <td></td> </tr> </table> ☐ Course Description PROGRAM OUTCOMES: ☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j Degree Requirements ☐ Degree Requirement ☐ Tech Elective ☐ Core Course ☐ Other Prereq Math 115 ☒ Enforced ☐ Advised ☒ Credit Restrictions [Fewer than 2 previous elections of EECS 203 (incl. grades of W & I) and [No credit in EECS 203; (C or better)] <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:30%;">Level of Credit</td> <td style="width:20%;">Credit Hours</td> <td style="width:20%;">Contact Hrs/Wk</td> <td style="width:30%;">4</td> </tr> <tr> <td>☐ Undergrad only</td> <td>Min</td> <td>Max</td> <td></td> </tr> <tr> <td>☐ Rackham Grad</td> <td>4</td> <td>4</td> <td></td> </tr> <tr> <td>☐ Non-Rackham Grad</td> <td></td> <td></td> <td></td> </tr> <tr> <td>☐ Ugrad or Rackham Grad</td> <td></td> <td></td> <td></td> </tr> </table>	TITLE	Time Sched Max = 19 Spaces		ABBREVIATION	Transcript Max = 20 Spaces		Level of Credit	Credit Hours	Contact Hrs/Wk	4	☐ Undergrad only	Min	Max		☐ Rackham Grad	4	4		☐ Non-Rackham Grad				☐ Ugrad or Rackham Grad				Home Department _____ Course Number 203 ☐ Cross Listed Course Information ☐ Course Title Discrete Mathematics <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">TITLE</td> <td style="width:15%;">Time Sched Max = 19 Spaces</td> <td style="width:70%;">Discrete Math</td> </tr> <tr> <td>ABBREVIATION</td> <td>Transcript Max = 20 Spaces</td> <td>Discrete Math</td> </tr> </table> ☐ Course Description for Official Publication (Max = 50 words) Introduction to the mathematical foundations of computer science. Topics covered include: propositional and predicate logic, set theory, function and relations, growth of functions and asymptotic notation, introduction to algorithms, elementary combinatorics and graph theory, and discrete probability theory. PROGRAM OUTCOMES: ☒ a ☒ c ☒ e ☐ g ☐ i ☒ k ☐ b ☐ d ☐ f ☐ h ☐ j Degree Requirements ☐ Degree Requirement ☐ Tech Elective ☒ Core Course ☐ Other Prereq [(MATH 115 or 116 or 119 or 120 or 121 or 156 or 175 or 176 or 185 or 186 or 214 or 215 or 216 or 217 or 255 or 256 or 285 or 286 or 295 or 296 or 417 or 419); C or better.] ☒ Enforced ☐ Advised ☒ Credit Restrictions [Fewer than two previous elections of EECS 203 (incl. grades of W, I, VI, and AUD)] <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:30%;">Level of Credit</td> <td style="width:20%;">Credit Hours</td> <td style="width:20%;">Contact Hrs/Wk</td> <td style="width:30%;">4</td> </tr> <tr> <td>☒ Undergrad only</td> <td>Min</td> <td>Max</td> <td></td> </tr> <tr> <td>☐ Rackham Grad</td> <td>4</td> <td>4</td> <td></td> </tr> <tr> <td>☐ Non-Rackham Grad</td> <td></td> <td></td> <td></td> </tr> <tr> <td>☐ Ugrad or Rackham Grad</td> <td></td> <td></td> <td></td> </tr> </table>	TITLE	Time Sched Max = 19 Spaces	Discrete Math	ABBREVIATION	Transcript Max = 20 Spaces	Discrete Math	Level of Credit	Credit Hours	Contact Hrs/Wk	4	☒ Undergrad only	Min	Max		☐ Rackham Grad	4	4		☐ Non-Rackham Grad				☐ Ugrad or Rackham Grad			
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C.

Class Type(s) ☒ Lec ☐ Sem ☒ Dis ☐ Other ☐ Rec ☐ Lab ☐ Ind Grading ☒ A-E ☐ CR/NC ☐ P/F ☐ S/U Location ☒ Ann Arbor ☐ Biological Station ☐ Camp Davis ☐ Extension Graded Section ☒ Lec ☐ Sem ☐ Dis ☐ Other ☐ Rec ☐ Lab ☐ Ind Course Is Y Graded ☐	Cognizant Faculty Member: _____ Title _____ Kevin Compton Asso Prof. Satinder Baveja Prof. Grad Course: Attach nomination if Cognizant Faculty is not a regular graduate faculty
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Approval Info	Approved by Name	Approved Date	Submitted By: ☒ Home Dept. ☐ Cross-listed Dept.	
☐ Curriculum Comm.	_____	_____		
☐ Faculty	_____	_____	Department Chair Name	Chair Signature
☐ Cross listed Unit 1	_____	_____	Home Dept. EECS	
☐ Cross listed Unit 2	_____	_____	Cross-listed	

Form Number

2769

SUPPORTING STATEMENT

This is a correction to a prior version of the CARF which had inadvertently left off some of the previously acceptable enforced prerequisite options. We are also refining the two-take policy for EECS 203, 280, and 281 to include Visit/Audit status in what counts as an "attempt" in the course.

Are any special resources or facilities required for this course? ☐ Yes ☐ No

Detail the Special requirements

THE UNIVERSITY OF MICHIGAN -- COLLEGE OF ENGINEERING
Course Approval Request

College Curriculum Committee, 1420 Lurie Engineering Center Building

Form Number

2846

Action Requested

- ☐ New Course
☒ Modification of Existing Course
☐ Deletion of Course

Complete the following sections:

New Courses - B & C completely
 Modifications - A modified information, B & C completely
 Deletions - A & C completely

Date **8/29/2016**

Effective Term **Winter 2017**

Course Offer Freq ☒ Indefinitely
☐ One term only

A. CURRENT LISTING

B. REQUESTED LISTING

Home Department Course Number	Home Department Course Number																								
EECS Elec Engin & Computer Sci 376	EECS Elec Engin & Computer Sci 376																								
Cross Listed Course Information Cross Listed Course Information																									
Course Title Course Title																									
Foundations of Computer Science 	Foundations of Computer Science 																								
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	Transcript																								
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Course Description Course Description for Official Publication (Max = 50 words)																									
An introduction to computation theory: finite automata, regular languages, pushdown automata, context-free languages, Turing machines, recursive languages and functions, and computational complexity. 	Introduction to theory of computation. Models of computation: finite state machines, Turing machines. Decidable and undecidable problems. Polynomial time computability and paradigms of algorithm design. Computational complexity emphasizing NP-hardness. Coping with intractability. Exploiting intractability: cryptography. 																								
PROGRAM OUTCOMES: ☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j 																									
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Prereq Prereq																									
☒ Enforced EECS 280 and (EECS 203 or Math 465 or Math 565)	☒ Enforced EECS 280 and (EECS 203 or Math 465 or Math 565)																								
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Credit Restrictions Credit Restrictions																									
Level of Credit Level of Credit																									
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Credit Hours Contact Hrs/Wk	Credit Hours Contact Hrs/Wk																								
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Class Type(s) Grading Location																									
 ☒ Lec ☐ Sem ☒ Dis ☐ Other ☐ Rec ☐ Lab ☐ Ind ☒ A-E ☐ CR/NC ☐ P/F ☐ S/U ☒ Ann Arbor ☐ Biological Station ☐ Camp Davis ☐ Extension 	Cognizant Faculty Member: Title																								
Graded Section 	Kevin Compton Assoc. Prof.																								
 ☒ Lec ☐ Sem ☐ Dis ☐ Other ☐ Rec ☐ Lab ☐ Ind Course Is Y Graded ☐	Grad Course: Attach nomination if Cognizant Faculty is not a regular graduate faculty 																								
Approval Info Approved by Name Approved Date																									
 ☐ Curriculum Comm. ☐ Faculty ☐ Cross listed Unit 1 ☐ Cross listed Unit 2 Submitted By: ☒ Home Dept. ☐ Cross-listed Dept. Department EECS Chair Name Kevin Compton Chair Signature _____ 																									

College Curriculum Committee, 1420 Lurie Engineering Center Building

Action Requested

- ☐ New Course
☒ Modification of Existing Course
☐ Deletion of Course

Complete the following sections:

New Courses - B & C completely
 Modifications - A modified information, B & C completely
 Deletions - A & C completely

Date 8/29/2016

Effective Term Fall 2017

Course Offer Freq ☒ Indefinitely
☐ One term only

A. CURRENT LISTING

B. REQUESTED LISTING

Home Department Course Number	Home Department Course Number														
☐ Cross Listed Course Information	☐ Cross Listed Course Information														
☐ Course Title	☐ Course Title Introduction to Cryptography														
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">TITLE ABBRE- VIATION</td> <td style="width: 15%;">Time Sched Max = 19 Spaces</td> <td style="width: 70%;"></td> </tr> <tr> <td></td> <td>Transcript Max = 20 Spaces</td> <td></td> </tr> </table>	TITLE ABBRE- VIATION	Time Sched Max = 19 Spaces			Transcript Max = 20 Spaces		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">TITLE ABBRE- VIATION</td> <td style="width: 15%;">Time Sched Max = 19 Spaces</td> <td style="width: 70%;">Intro Cryptography</td> </tr> <tr> <td></td> <td>Transcript Max = 20 Spaces</td> <td>Intro Cryptography</td> </tr> </table>	TITLE ABBRE- VIATION	Time Sched Max = 19 Spaces	Intro Cryptography		Transcript Max = 20 Spaces	Intro Cryptography		
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TITLE ABBRE- VIATION	Time Sched Max = 19 Spaces	Intro Cryptography													
	Transcript Max = 20 Spaces	Intro Cryptography													
☐ Course Description	☐ Course Description for Official Publication (Max = 50 words) Covers fundamental concepts, algorithms, and protocols in cryptography. Topics: ancient ciphers, Shannon theory, symmetric encryption, public key encryption, hash functions, digital signatures, key distribution. Highlights AES, RSA, Discrete Log, Elliptic Curves. Emphasizes rigorous mathematical study in terms of algorithmic complexity. Includes necessary background from algorithms, probability, number theory, and algebra.														
PROGRAM OUTCOMES: ☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j	PROGRAM OUTCOMES: ☒ a ☐ c ☒ e ☐ g ☐ i ☒ k ☐ b ☐ d ☐ f ☐ h ☒ j														
Degree Requirements ☐ Degree Requirement ☐ Tech Elective ☐ Core Course ☐ Other ☐ Free Elective	Degree Requirements ☐ Degree Requirement ☒ Tech Elective ☐ Core Course ☐ Other ☐ Free Elective														
Prereq (EECS 203 or Math 312 or Math 412) & (EECS 183 or EECS 280) & EQ C or better ☒ Enforced ☐ Advised	Prereq (EECS 203 or Math 312 or Math 412) & (EECS 183 or EECS 280) and EECS 376 & EQ C or better ☒ Enforced ☐ Advised														
☐ Credit Restrictions	☐ Credit Restrictions														
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Level of Credit</th> <th rowspan="2">Credit Hours Min Max</th> <th rowspan="2">Contact Hrs/Wk</th> <th rowspan="2">Number of Wks</th> </tr> <tr> <td> ☐ Undergrad only ☐ Rackham Grad ☐ Non-Rckhm Grad ☐ Ugrad or Rckhm Grad </td> <td> ☐ Ugrad or Non-Rckhm Grad ☐ All Credit types ☐ Rckhm Grad w/add'l Work </td> </tr> </table>	Level of Credit		Credit Hours Min Max	Contact Hrs/Wk	Number of Wks	☐ Undergrad only ☐ Rackham Grad ☐ Non-Rckhm Grad ☐ Ugrad or Rckhm Grad	☐ Ugrad or Non-Rckhm Grad ☐ All Credit types ☐ Rckhm Grad w/add'l Work	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Level of Credit</th> <th rowspan="2">Credit Hours Min Max</th> <th rowspan="2">Contact Hrs/Wk</th> <th rowspan="2">Number of Wks</th> </tr> <tr> <td> ☐ Undergrad only ☐ Rackham Grad ☐ Non-Rckhm Grad ☒ Ugrad or Rckhm Grad </td> <td> ☐ Ugrad or Non-Rckhm Grad ☐ All Credit types ☐ Rckhm Grad w/add'l Work </td> </tr> </table>	Level of Credit		Credit Hours Min Max	Contact Hrs/Wk	Number of Wks	☐ Undergrad only ☐ Rackham Grad ☐ Non-Rckhm Grad ☒ Ugrad or Rckhm Grad	☐ Ugrad or Non-Rckhm Grad ☐ All Credit types ☐ Rckhm Grad w/add'l Work
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Repeatability (Indi Research, Dir. Study, Dissertation: Is this course repeatable?) ☐ Yes ☒ No Max Hours? ____ Max Times? ____ Can it be repeated in the same term? ☐ Yes ☒ No															
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Approval Info ☒ Curriculum Comm. ☐ Faculty ☐ Cross listed Unit 1 ☐ Cross listed Unit 2	Approved by Name _____ _____ _____	Approved Date _____ _____ _____	Submitted By: ☐ Home Dept. ☐ Cross-listed Dept. Department EECS Kevin Compton Chair Name _____ Chair Signature _____												

Dept(s).

Form Number

2848

SUPPORTING STATEMENT

Some of the material from EECS 475 will move to EECS 376. This will allow more extensive coverage of the topics listed in the EECS 475 description.

Are any special resources or facilities required for this course? ☐ Yes ☐ No

Detail the Special requirements

THE UNIVERSITY OF MICHIGAN -- COLLEGE OF ENGINEERING
Course Approval Request

College Curriculum Committee, 1420 Lurie Engineering Center Building

Form Number

2847

Action Requested

- ☐ New Course
☒ Modification of Existing Course
☐ Deletion of Course

Complete the following sections:

New Courses - B & C completely
 Modifications - A modified information, B & C completely
 Deletions - A & C completely

Date **8/29/2016**

Effective Term **Fall 2017**

Course Offer Freq ☒ Indefinitely
☐ One term only

A. CURRENT LISTING

B. REQUESTED LISTING

Home Department Course Number	Home Department Course Number
PROGRAM OUTCOMES: ☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j	PROGRAM OUTCOMES: ☒ a ☒ c ☒ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j
Degree Requirements ☐ Degree Requirement ☒ Tech Elective ☐ Other	Degree Requirements ☐ Degree Requirement ☒ Tech Elective ☐ Other
Prereq EECS 281 or EECS 398, Winter 2005, Section 001 or Graduate Standing ☒ Enforced ☐ Advised	Prereq EECS 281 and EECS 376 and (c or better) ☒ Enforced ☐ Advised
Credit Restrictions	Credit Restrictions
Level of Credit ☐ Undergrad only ☐ Rackham Grad ☐ Non-Rckhm Grad ☐ Ugrad or Rckhm Grad ☐ Ugrad or Non-Rckhm Grad ☐ All Credit types ☐ Rckhm Grad w/add'l Work Credit Hours Contact Hrs/Wk Min Max	Level of Credit ☐ Undergrad only ☐ Rackham Grad ☐ Non-Rckhm Grad ☒ Ugrad or Rckhm Grad ☐ Ugrad or Non-Rckhm Grad ☐ All Credit types ☐ Rckhm Grad w/add'l Work Credit Hours Contact Hrs/Wk Min Max
Repeatability (Indi Research, Dir. Study, Dissertation: Is this course repeatable?) ☐ Yes ☒ No	Can it be repeated in the same term? ☐ Yes ☒ No
Class Type(s) ☒ Lec ☐ Sem ☒ Dis ☐ Other ☐ Rec ☐ Lab ☐ Ind	Cognizant Faculty Member: K. Compton Asso. Prof. Q. Stout Prof.
Graded Section ☒ Lec ☐ Sem ☐ Dis ☐ Other ☐ Rec ☐ Lab ☐ Ind	Grad Course: Attach nomination if Cognizant Faculty is not a regular graduate faculty
Approval Info ☐ Curriculum Comm. ☐ Faculty ☐ Cross listed Unit 1 ☐ Cross listed Unit 2	Approved by Name _____ Approved Date _____ Submitted By: ☒ Home Dept. ☐ Cross-listed Dept. Department EECS Kevin Compton Chair Name _____ Chair Signature _____

Dept(s).

Form Number

2847

SUPPORTING STATEMENT

Some of the material from EECS 477 will move to EECS 376. This will allow more extensive coverage of the topics listed in the EECS 477 description.

Are any special resources or facilities required for this course? ☐ Yes ☐ No

Detail the Special requirements

THE UNIVERSITY OF MICHIGAN -- COLLEGE OF ENGINEERING
Course Approval Request

College Curriculum Committee, 1420 Lurie Engineering Center Building

Form Number

2724

Date 11/18/2015

Effective Term Winter 2016

Action Requested

- ☐ New Course
☒ Modification of Existing Course
☐ Deletion of Course

Complete the following sections:

New Courses - B & C completely
 Modifications - A modified information, B & C completely
 Deletions - A & C completely

Course Offer Freq ☒ Indefinitely
☐ One term only

A. CURRENT LISTING

B. REQUESTED LISTING

Home Department _____ Course Number _____ ☒ Cross Listed Course Information Course Title _____ <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">TITLE ABBREVIATION</td> <td style="width:25%;">Time Sched Max = 19 Spaces</td> <td style="width:60%;"></td> </tr> <tr> <td></td> <td>Transcript Max = 20 Spaces</td> <td></td> </tr> </table> ☒ Course Description Production systems in large volume manufacturing (e.g., automotive, semiconductor, computer, etc.) are studied. Topics include quantitative methods for analysis of production systems; analytical methods for design of lean in-process and finished goods buffering; measurement-based methods for identification and elimination of production system bottlenecks; and system-theoretic properties of production lines. PROGRAM OUTCOMES: ☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j Degree Requirements ☐ Degree Requirement ☐ Tech Elective ☐ Core Course ☐ Other ☐ Free Elective Prereq ☐ Enforced ☐ Advised Credit Restrictions _____ <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th align="left" colspan="2">Level of Credit</th> <th rowspan="2">Credit Hours Min Max</th> <th rowspan="2">Contact Hrs/Wk Number of Wks</th> </tr> <tr> <td> ☐ Undergrad only ☐ Rackham Grad ☐ Non-Rackham Grad ☐ Ugrad or Rackham Grad </td> <td> ☐ Ugrad or Non-Rackham Grad ☐ All Credit types ☐ Rackham Grad w/add'l Work </td> </tr> </table>	TITLE ABBREVIATION	Time Sched Max = 19 Spaces			Transcript Max = 20 Spaces		Level of Credit		Credit Hours Min Max	Contact Hrs/Wk Number of Wks	☐ Undergrad only ☐ Rackham Grad ☐ Non-Rackham Grad ☐ Ugrad or Rackham Grad	☐ Ugrad or Non-Rackham Grad ☐ All Credit types ☐ Rackham Grad w/add'l Work	Home Department _____ Course Number _____ EECS Elec Engin & Computer Sci 569 Cross Listed Course Information MFG Manufacturing 564 Course Title Production Systems Engineering <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:15%;">TITLE ABBREVIATION</td> <td style="width:25%;">Time Sched Max = 19 Spaces</td> <td style="width:60%;">Prod. Syst. Eng.</td> </tr> <tr> <td></td> <td>Transcript Max = 20 Spaces</td> <td>Prod. Syst. Eng.</td> </tr> </table> Course Description for Official Publication (Max = 50 words) Production Systems Engineering (PSE) investigates fundamental laws that govern production systems and utilizes them for analysis, design, and continuous improvement. The topics covered include quantitative methods for analysis and design, improvability, measurement-based management, and the PSE Toolbox. The skills acquired will make students marketable as engineering managers of manufacturing organizations. PROGRAM OUTCOMES: ☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j Degree Requirements ☐ Degree Requirement ☒ Tech Elective ☐ Core Course ☐ Other ☐ Free Elective Prereq ☐ Enforced ☐ Advised Credit Restrictions _____ <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th align="left" colspan="2">Level of Credit</th> <th rowspan="2">Credit Hours Min Max</th> <th rowspan="2">Contact Hrs/Wk Number of Wks</th> </tr> <tr> <td> ☐ Undergrad only ☐ Rackham Grad ☐ Non-Rackham Grad ☐ Ugrad or Rackham Grad </td> <td> ☐ Ugrad or Non-Rackham Grad ☒ All Credit types ☐ Rackham Grad w/add'l Work </td> </tr> </table>	TITLE ABBREVIATION	Time Sched Max = 19 Spaces	Prod. Syst. Eng.		Transcript Max = 20 Spaces	Prod. Syst. Eng.	Level of Credit		Credit Hours Min Max	Contact Hrs/Wk Number of Wks	☐ Undergrad only ☐ Rackham Grad ☐ Non-Rackham Grad ☐ Ugrad or Rackham Grad	☐ Ugrad or Non-Rackham Grad ☒ All Credit types ☐ Rackham Grad w/add'l Work
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Repeatability (Indi Research, Dir. Study, Dissertation): Is this course repeatable? ☐ Yes ☒ No Max Hours? _____ Max Times? _____ Can it be repeated in the same term? ☐ Yes ☒ No

C.

Class Type(s) ☒ Lec ☐ Sem ☐ Dis ☐ Other _____ ☐ Rec ☐ Lab ☐ Ind Graded Section ☒ Lec ☐ Sem ☐ Dis ☐ Other _____ ☐ Rec ☐ Lab ☐ Ind	Grading ☒ A-E ☐ CR/NC ☐ P/F ☐ S/U	Location ☒ Ann Arbor ☐ Biological Station ☐ Camp Davis ☐ Extension
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Course Is Y Graded ☐

Approval Info ☐ Curriculum Comm. ☐ Faculty ☐ Cross listed Unit 1 ☐ Cross listed Unit 2	Approved by Name _____ Approved Date _____	Submitted By: ☐ Home Dept. ☐ Cross-listed Dept. Department Chair Name _____ Home Dept. EECS Mingyan Liu Cross-listed MFG Judy Jin
--	--	---

Chair Signature _____

Dept(s)	

Form Number

2724

SUPPORTING STATEMENT

I have been teaching "Production Systems Engineering" for the last 12 years, first as a special topics course (EECS 598) and then (starting from 2007) as EECS 569. In every offering, along with EECS students, there were students from other CoE departments and, specifically, from the Manufacturing programs of ISD division. In fact, EECS 569 is a core course in this program.

Therefore, to reflect the fact that this course is relevant for and accessible to ISD students, I propose to have it cross-listed with the Manufacturing program. This program supports this suggestion.

Are any special resources or facilities required for this course? ☐ Yes ☐ No

Detail the Special requirements

Action Requested

- ☐ New Course
☒ Modification of Existing Course
☐ Deletion of Course

Complete the following sections:

New Courses - B & C completely

Modifications - A modified information, B & C completely

Deletions - A & C completely

Date **3/4/2016**

Effective Term **Fall 2016**

Course Offer Freq ☒ Indefinitely
☐ One term only

A. CURRENT LISTING

B. REQUESTED LISTING

Home Department		Course Number		Home Department		Course Number	
MFG Manufacturing		501		MFG Manufacturing		501	
Cross Listed Course Information				Cross Listed Course Information			
Course Title				Course Title			
TITLE ABBREVIATION		Time Sched Max = 19 Spaces		TITLE ABBREVIATION		Time Sched Max = 19 Spaces	
		Transcript Max = 20 Spaces				Transcript Max = 20 Spaces	
Course Description				Course Description for Official Publication (Max = 50 words)			
This course is intended to provide students with an overview of various topics in operations, such as lean production systems, supply chain management, design for manufacturability, facilities planning, the environmental, legal, and ethical issues in operations, and product design. Students learn how all these aspects of operations interconnect.				This course is intended to provide students an overview of a broad range of operations-related topics including corporate strategy, lean production systems, supply chain management, design for manufacturability, facilities planning, the environment, legal, and ethical issues in operations, and product design. Students learn how all these aspects of operations interconnect and how they may apply to Tauber team projects.			
PROGRAM OUTCOMES:		☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j		PROGRAM OUTCOMES:		☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j	
Degree Requirements		☐ Degree Requirement ☐ Free Elective ☐ Other ☐ Core Course ☐ Tech Elective		Degree Requirements		☒ Degree Requirement ☐ Free Elective ☐ Other ☐ Core Course ☐ Tech Elective	
Prereq				Prereq			
☐ Enforced ☐ Advised				☒ Enforced ☐ Advised			
Credit Restrictions				Credit Restrictions			
Level of Credit		Credit Hours		Level of Credit		Credit Hours	
☐ Undergrad only ☐ Rackham Grad ☐ Non-Rackham Grad ☐ Ugrad or Rackham Grad		☐ Ugrad or Non-Rckhm Grad ☐ All Credit types ☐ Rckhm Grad w/add'l Work		☐ Undergrad only ☐ Rackham Grad ☒ Non-Rackham Grad ☐ Ugrad or Rckhm Grad		☐ Ugrad or Non-Rckhm Grad ☐ All Credit types ☐ Rckhm Grad w/add'l Work	
Min		Max		Min		Max	
3		3		1.5		1.5	
Contact Hrs/Wk		Number of Wks		Contact Hrs/Wk		Number of Wks	
3		14		3		7	

Repeatability (Indi Research, Dir. Study, Dissertation): Is this course repeatable? ☐ Yes Max Max Can it be repeated ☐ Yes
☒ No Hours? Times? in the same term? ☒ No

Class Type(s)

☒ Lec ☐ Sem ☐ Dis ☐ Other _____
☐ Rec ☐ Lab ☐ Ind

Graded Section

☒ Lec ☐ Sem ☐ Dis ☐ Other _____
☐ Rec ☐ Lab ☐ Ind

Grading

☒ A-E ☒ Ann Arbor
☐ CR/NC ☐ Biological Station
☐ P/F ☐ Camp Davis
☐ S/U ☐ Extension

Course Is Y Graded ☐

Location

☒ Ann Arbor
☐ Biological Station
☐ Camp Davis
☐ Extension

Cognizant Faculty Member:

Amitabh Sinha

Title

Assoc. Professor

Grad Course: Attach nomination if Cognizant Faculty is not a regular graduate faculty

Approval Info

☐ Curriculum Comm.

Approved by Name

Approved Date

Submitted By: ☒ Home Dept. ☐ Cross-listed Dept.

☐ Faculty

☐ Cross listed Unit 1

☐ Cross listed Unit 2

Department Chair Name

Chair Signature

Home Dept.	Judy Jin
------------	----------

Cross-listed

Dept(s).

SUPPORTING STATEMENT

See attached syllabus.....
 T.O. 701 (cross-listed as MFG 501), Topics in Global Operations, is a seminar-style course that is required for all Tauber.....
 students in their first year. The aim of the course is to provide an overview of global operations to a set of students with.....
 varying backgrounds and understanding of operations.....

In the past, the course met for weekly 3-hour sessions. Each session focused on a single topic, usually by means of a guest.....
 lecturer (typically, 9 of 12 sessions were by guest lecturers). The guest lecturers are senior faculty members in Ross/CoE.....
 who are experts in the topic being discussed. The guest lecturer would lead the entire 3-hour session. Most guest lectures.....
 included some combination of a standard lecture, one or two case discussions, and a hands-on exercise using quantitative.....
 or other tools for that topic.....

Although the course has been reasonably successful, the feedback as well as an evaluation of the overall Tauber academic.....
 program suggests that a change is warranted. Specifically, the guest lecture format makes continuity of the material difficult.....
 and makes it harder to hold individual students accountable because there is a new guest lecturer almost every time. The.....
 Tauber program now allows for many more electives than it used to, so students are better off getting in-depth treatment of.....
 topics they're interested in through those electives than superficial treatment in T.O. 701. There are also more demands on.....
 students' time, so a reduction in this course would address that need.....

The proposed change is to cut the course in half, only have 6 weekly sessions instead of 12. Additionally, each guest.....
 lecturer would run only the first half of the class. In the second half, the primary instructor (Amitabh Sinha) would lead the.....
 class on a topic that builds on the preceding guest lecture but also draws connections to global operations more generally.....
 and the overall arc of the course, ensuring continuity of the academic narrative of the course. Having the primary instructor.....
 directly engaged in every weekly session will also enhance student accountability and academic rigor.....

Are any special resources or facilities required for this course? ☐ Yes ☐ No

Detail the Special requirements

.....

TO 701 Fall A 2016

Topics in Global Operations

Syllabus

Instructor:

Amitabh Sinha, R4424, amitabh@umich.edu.

Meet:

Tuesdays, 6:00 pm to 9:00 pm.

Overview:

This course provides an overview of a broad range of operations-related topics that should be of interest and importance to all Tauber students. In addition to providing background information for your future studies in operations and business-process improvement, the topics should be applicable to the Summer Team Projects that you will begin next spring. Also, you will be introduced to several instructors who engage in various Tauber activities, including teaching broadly operations-related courses and advising summer project teams.

Each session of the course deals with a different topic. The first half of each session will be taught by a guest instructor who is an expert in that topic. In the second half, Prof. Sinha will teach using a combination of case discussions, traditional lectures, and in-class activities; the second half will complement the guest lecture with a more in-depth treatment of the topic.

Topics covered will include the following, although the precise list of topics may change depending on the evolving nature of modern business, instructor availability, and the scope of Tauber Institute projects. The topics currently planned are: overview of operations and supply chain management; globalization and the world economy; sustainable design and manufacturing; lean and six sigma; integrated operations; and strategic sourcing and procurement.

Required Materials:

Course Pack: The coursepack contains the course outline, cases, teaching notes, and supporting articles. Some additional materials will be distributed in class and on the Canvas site (see below).

My Expectations:

I expect that you will

- (1) attend every class and arrive early enough to permit starting promptly at 6:00 pm,
- (2) be well prepared for each session and participate in class discussions.

Both expressing your point of view and sharing illustrations from your personal experience will be welcomed. Even though there is a significant diversity in years of experience among students taking the course, in the past it did not translate into lack of opportunities for full active participation for anybody. Similarly, this year I expect all of you (undergraduate or graduate,

business or engineering, older or younger) to equally participate in the classes and find the most effective ways to express yourselves and to contribute to everybody's learning.

At a risk of saying the obvious, consistent with an overriding Tauber norm, I expect you to conduct yourselves professionally in the classroom. Such conduct includes (1) paying attention to whomever is speaking, be it the professor or a classmate, (2) not demeaning an individual when expressing a viewpoint different from that person's, and (3) not distracting other students or the instructor, such as by carrying on distracting side conversations with those seated near you or accessing any information on your cell phone.

Most classes will have handouts. Some instructors will give me electronic files of these, but others prefer not to. Thus, if you are going to have to miss a class, please have a classmate pick up a copy of any such handouts for you. Also, please notify me in advance that you will be missing a class.

Website (Canvas):

The Canvas website is intended to supplement other means of communicating outside of class meetings. Instructors occasionally provide additional material after their session and these will be posted on the website. In case of any changes, you will find updated materials on Canvas. In addition, this is the place to find information on administrative matters (including exam information). Finally, after each session you will be asked (see below) to provide session feedback on Canvas.

Session Feedback:

You are required before the next session to provide feedback on the content of each session. A feedback form for each session will appear in the Assignments section of the course website. Instructions on how to use it are in the Resources section. This feedback will enable me to ensure that the topics and depth of coverage are appropriate.

Grading:

Your grade will be based on the weekly homeworks/case assignments, class participation, submitting session feedback before the deadline, and a final paper. A tentative distribution of these elements is as follows:

Weekly homework/case assignments (group)	30%
Class participation	15%
Session feedback	10%
Final paper	45%

Honor policy:

Personal integrity and professionalism are fundamental values of business and the Ross School community. This course will be conducted in strict conformity with the Academic

Honor Code. The code and its related procedures can be found at the following website:

<http://www.bus.umich.edu/Academics/Resources/communityvalues.htm>

This site also contains comprehensive information on how to be sure that you have not plagiarized the work of others.

Claimed ignorance of the code and the related information on the site will be viewed as irrelevant should a violation take place. Non-Ross Business School students taking the course should also familiarize themselves with the Code as they will be subject to the Ross Code while in the course.

Students: If you need an accommodation for a disability, you must let your instructor know by no later than the end of the second week. If you expect to receive an accommodation, but do not yet have formal paperwork, you should also let me know that by the end of the second week. Some aspects of the course, the assignments, and the in-class activities may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the Office of Services for Students with Disabilities to help us determine appropriate accommodations. I will treat information you provide as private and confidential

Course Outline: The following is a brief outline of the entire course, listing a tentative schedule with 6 sessions. Depending on instructor availability, the evolving business landscape, and the scope of projects sponsored by the Tauber Institute, a few sessions may be swapped for some other topics.

Course Outline

1. An Overview of Supply Chain Management

Prof. Roman Kapuscinski will be the guest lecturer for the first half of this session. He is Professor of Technology and Operations and department chair, and also a former co-director of the Tauber Institute. Topics to be covered include supply chain coordination, role of inventory management, mass customization, and some other issues in modern supply chain management.

Assignment:

Read the “Hewlett-Packard: DeskJet Printer Supply Chain” (A) and (B) cases, and prepare thorough answers to the following questions:

1. What caused the so-called Inventory/Service "crisis"?
2. How would the different alternatives available to Brent affect the supply chain?
3. Consider the air freight option by examining the cost of inventory for all models in Europe, using the data given in Table 1. The lead time is 5 weeks for sea freight and 1 week

by air. Shipping by air costs \$32/printer and shipping by sea costs \$9/printer. Orders continue to be placed once per week for each option. Which option do you recommend? (Be ready to defend your recommendation.)

4. In order to implement a generic European product option (i.e., a European product that would be assembled to order in the European Distribution Center):

- a. What changes in the supply chain and its management (operations, engineering, marketing and sales, distribution) would be necessary?
- b. How do you think the different stakeholders felt about this proposal? How would you sell your recommendation to the many different organizations involved?

5. Think about how to evaluate the savings associated with the generic European product option. Which costs will be decreased? How would you estimate them?

2. Globalization and the World Economy

Professor John Branch currently teaches a variety of marketing and international business courses at the undergraduate, MBA, and executive levels at the Stephen M. Ross School of Business. Until recently, he also served as Director of Educational Outreach at the University's William Davidson Institute, which focuses on emerging and transitional economies; he was responsible for the development and dissemination of pedagogical materials. He is also affiliated with the University's Center for Russian and East European Studies.

Professor Branch has been involved in a variety of European Union and other government-funded development projects, most notably in the republics of the former U.S.S.R., including Kyrgyzstan, Ukraine, and Uzbekistan, and in those of Eastern and Central Europe. He has also conducted management training and consulting in numerous international companies, including British American Tobacco, Anheuser-Busch, British Telecom, Cargill, Mercedes Benz, Oracle, Coca-Cola, Michelin, Ericsson, and Nestlé.

The first half of this session will provide an overview of globalization and the world economy, led by Prof. Branch, following the agenda below. In the second half, I will bring the focus to operations: how globalization impacts operations and supply chains, and how firms and managers deal with those issues.

Readings and Assignment:

After the class, consider the following questions. You will be asked to submit a write-up that addresses some of these questions.

- What is globalization, and what are its principal economic characteristics?
- What factors have contributed to globalization?
- Who is involved in globalization, and how has globalization affected each of these actors?

- What is the relationship between globalization, the world economy, and international trade?
- What is the nature of the world economy, and how has it evolved?
- Why is it important for organizations and managers to understand the world economy?

3. Sustainable Design and Manufacturing: Traps, Trade-Offs, and Triumphs

Professor Steve Skerlos is a UM Distinguished Faculty Fellow in Sustainability and Director of the UM Program in Sustainable Engineering. He is an award-winning Mechanical Engineering Professor with an additional appointment in Civil and Environmental Engineering, and will teach the first half of this session. Professor Skerlos has gained national recognition and press for his research and teaching in the fields of technology policy and sustainable design. He has co-founded two successful start-up companies, co-founded BLUElab, served as Director of the Graduate Program in Mechanical Engineering, and served as associate and guest editor for four different academic journals.

For the first half, Professor Skerlos has prepared a Web-based assignment. In the second half, I will expand the class discussion to include other aspects of social responsibility in manufacturing and operations: labor, ethical issues, and managing sustainability and social responsibility in global, multi-tiered supply chains.

Readings and Assignment:

All materials are now available through Google Documents. The link is posted on Canvas: The materials include a number of videos (about 1 hour of various videos) to watch plus questions to be prepared before the class.

4. Lean and Six Sigma

Dr. Patrick Hammett is the Lead Faculty for the University of Michigan College of Engineering 's Six Sigma Programs and teaches related Quality and Statistical Analysis Method courses as a Lecturer for the Integrative Systems +Design Department. As lead instructor for live and online Six Sigma training, including Lean-Six Sigma Green Belt, Black Belt, Master Black Belt, and Design for Six Sigma courses, Dr. Hammett has taught over 10,000 students and mentored hundreds of continuous improvement and student research projects. Additionally, Pat also teaches several courses in the ISD Automotive Engineering and Manufacturing Engineering degree programs.

Outside his teaching duties, Dr. Hammett s primary research focus involves data analysis methods to support the validation phase of new product development. Among his areas of interest are dimensional engineering, usability engineering, tolerance adjustment methods, functional build manufacturing validation strategies, and 3D non-contact measurement

technology. Among his past research sponsors are General Motors, Ford, Chrysler, Visteon, and Harley Davidson.

In the first half, Dr. Hammett will provide an overview of Lean and Six Sigma techniques. In the second half, I will teach in detail two specific tools from the Lean-Six Sigma toolkit: the DMAIC framework, and Value Stream Mapping. These are two of the most valuable and widely deployed tools in Tauber projects.

Readings:

- “What is Six Sigma”
- “Luxury Wine” Case
- Instructions for installing QE-Tools Excel Add-in for the 6-sigma class

Assignment:

Become familiar with the data. You do not need to solve the case before the class, but you need to understand the case and available data.

Two spreadsheet files are available on Canvas. During the class there will be group assignment in groups of about 3 people, which will require a laptop with the software installed. Professor Hammett recommends that everybody installs the software (QE-Tools Excel Add-in) on their laptop.

5. Integrated Operations

This session will be led by Prof. Bill Lovejoy, Chair of the RSB Operations and Management Science group for 15 years and designer of the Integrated Product Development course. Professor Lovejoy’s description of the class and assignment follows.

This class will challenge you to design a manufacturing operation paying attention to both the business and engineering aspects of that challenge. Designing an operations system requires the joint consideration of the technical system, the social system, and the information/control system. The medium for discussion will be two related cases, one building on the other. In LanServe I, you will consider what human resource, information, and quality systems are appropriate given that the firm wishes to maintain an assembly-line operation. In LanServe II, all possible flow configurations (not just an assembly line) are possible, which increases the degrees of freedom with which you can work. In each case, you will need to consider these questions:

1. How does LanServe compete? What capabilities must the operations system have?
2. What are appropriate metrics by which alternative operations systems can be assessed? That is, how would you identify a good system if you saw it? How do you measure “good”?
3. Which of the many different mosaics of physical flow, human resource, information, and

quality systems is appropriate for LanServe?

Assignment for Part I of class:

Read the LanServe I case. Recommend one of the 16 possible operations system designs and be prepared to defend your answer in detail.

Assignment for Part II of class:

Read the LanServe II case. The design problem is to recommend the combination of process flow layout, human resource policy, information system, and quality control organization that is best for LanServe. You do not have to do these calculations in detail (in contrast with LanServe I, where calculations are expected); but be prepared to discuss how your analysis would proceed. In contrast with LanServe I, what additional considerations are needed and how would you include those in the analysis? Do you have an opinion about what LanServe should do?

6. Strategic Sourcing and Procurement; Wrap-up

Damian R. Beil is a Professor of Technology and Operations and Ross, and Associate Dean for the MBA program. Damian teaches the core MBA Operations Management course, as well as MBA- and Doctoral level electives on Strategic Sourcing. He has won two school-wide teaching awards. His research focuses on sourcing and he serves on the editorial boards of several top operations journals. Professor Beil has collaborated widely with industry, and has worked with companies in areas ranging from aerospace to retail.

The first half of this session will cover three key elements of strategic sourcing: Make vs. Buy decisions, Cost modeling, and Supplier partnering. In the second half, we will develop an integrated view of global operations, synthesizing from all of the sessions in the 6 lectures. I will also provide an overview of other topics that we have not covered, and offer suggestions for elective classes that Tauber students take in their second year.

Assignment:

- Read Venkatesan, “Strategic Sourcing: To Make or Not to Make”, HBR, Nov-Dec 92.
- Read the Reissco case prepared by the instructor and prepare a 1/2 to 1 page write up addressing the questions found at the end of the case. This write-up is meant to ensure that you read the case and put forth a meaningful effort in analyzing it. Submit the write-up on Canvas before the session.



Date: June 13, 2016

From: Stacie J. Edington *Stacie J. Edington*
Director, Honors & Engagement Programs Office

To: CoE Curriculum Committee

Re: Changes to MFG 501 – Topics in Global Operations

The Engineering Global Leadership (EGL) Honors Program is offered through the Honors & Engagement Programs Office. MFG 501: Topics in Global Operations is required for students in the EGL Program, while preparing for a project through the Tauber Institute for Global Operations. This course is only available to students in Tauber and students must enroll by permission of instructor.

The reduction of MFG 501 from a 14-week (3 credits) offering to a 7-week (1.5 credits) offering does not affect completion of the EGL Program. EGL students will continue to fulfill their required Global Business/Operation Focus Area by taking elective courses in the Ross School of Business. Students will complete an additional 1.5 credits of graduate-level Ross School of Business electives to balance this course change.

After Fall term, the EGL program will review this change to determine if there are any adjustments necessary, but none are expected at this time.

Two urgent matters for e-mail vote

10 messages

Fred Terry <fredty@umich.edu>

Fri, Aug 5, 2016 at 1:16 PM

To: COECURRICULUMCOMMITTEE <COECURRICULUMCOMMITTEE@umich.edu>

Cc: "Lawrence M. Seiford" <seiford@umich.edu>

Dear CoE Curriculum Committee:

I am sorry to bring matters to you for a late summer vote, but there are two matters that we need to act on for FA 16. Both require us to approve changes in cross-listed course for which Ross is the home unit. Ross has implemented changes already, so the choice in both cases is to approve or to drop the cross-listing. Dropping the cross-listing would have negative consequences, so I am recommending passage. Ross is aware that in the future we would like these things to come to CoE sooner.

Please respond with your votes on both matters directly to me as soon as possible.

(1) MFG 501 / TO 701 Topics in Global Operations (CARF attached)

The course has been changed from 3 to 1.5 credit hours.

This is a required class for EGL and they are adapting to the change (attached memo from Stacie Edington). We receive the CARF for this prior to our last meeting, but had insufficient information to act and tabled it (in particular since we did not know how it would affect EGL). EGL students must register for it for FA16, and it would be much simpler if they could use the MFG number.

(2) MFG 605 / TO 605 (CARF to follow later)

The course is being modified as described in Larry Seiford's description below (blue). There are some issues generating a CoE style CARF as the class will be a full 14 week class, but one offering will take place in the second 1/2 term fall (A) and the first half-term (winter). I believe that the course content is not being altered. Those involved in EGL feel this change will benefit our students.

As you may recall this is a course on Manufacturing and Supply Operations that all Tauber students take. There used to be two sections typically offered during the Winter Semester—one was 14 weeks long and the other was a turbo version offered in 7 weeks. The Tauber students told us that the shorter 7 week section moved so fast that it was difficult to assimilate the material well. We listened and now intend to offer both versions as 14 week versions. One will be offered during Fall B + Winter A. The other will be offered during Winter A+B.

The courses do have involvement from both Ross and CoE faculty. A statement from Larry Seiford addressing these issues follows below:

The courses have been and/or are co-taught by CoE faculty and RSB faculty.

The first (TO701/MFG501) has different topic modules taught by CoE and RSB faculty. This coming year Amy Cohn and Pat Hammett will be involved in teaching the course.

The 2nd (TO605/MFG605) has been taught over the years by both CoE and RSB faculty. It's currently taught by Professor Roman Kapuscinski (former Tauber Co-Director) of the Operations Management group. It uses Wally Hopp's Factory Physics textbook and could be easily taught by a number of current IOE faculty. (When I step down as Tauber Co-director it's a course I'd like to teach.)

Both courses have been cross-listed in the past as Tauber is a joint program between Ross and CoE — both of the course offerings are shared between CoE and Ross.

And, just to clarify, the only changes to the courses are

(1) TO701/MFG501 is being changed to 1.5 credits.

(2) TO605/MFG605 had one of its sections that was a 7week accelerated version. This accelerated section is being changed to a full semester (14 weeks) version. (So I'm not sure this even requires CC approval.)

--

Fred L. Terry, Jr.

Professor of EECS

Director of Academic Programs, College of Engineering

734-763-9764 (EECS)

2 attachments

 **MFG 501 CARF 3-18-16 (SEARCHABLE WITH SYLLABUS).pdf**
176K

 **MFG501_EGL.pdf**
154K

Kevin Compton <kjc@umich.edu> Fri, Aug 5, 2016 at 1:36 PM
To: Fred Terry <fredty@umich.edu>
Cc: "COECURRICULUMCOMMITTEE@umich.edu" <COECURRICULUMCOMMITTEE@umich.edu>, "Lawrence M. Seiford" <seiford@umich.edu>

Fred,

I'm not sure when I take over from Igor again, but if my vote counts, I vote yes for both changes.

Kevin

[Quoted text hidden]

[Quoted text hidden]

<MFG 501 CARF 3-18-16 (SEARCHABLE WITH SYLLABUS).pdf><MFG501_EGL.pdf>

Richard Robertson GMail <rer@umich.edu> Fri, Aug 5, 2016 at 2:11 PM
To: Fred Terry <fredty@umich.edu>
Cc: COECURRICULUMCOMMITTEE <COECURRICULUMCOMMITTEE@umich.edu>, "Lawrence M. Seiford" <seiford@umich.edu>

I approve both.

Richard E. Robertson
Professor of Materials Science & Engineering,
Professor of Macromolecular Science & Engineering, and
MSE Undergraduate Program Advisor

University of Michigan
2146B HH Dow
2300 Hayward St
Ann Arbor, MI 48109-2136

rer@umich.edu

Phone: [734-763-9867](tel:734-763-9867)
Fax: [734-763-4788](tel:734-763-4788)

On Aug 5, 2016, at 1:16 PM, Fred Terry <fredty@umich.edu> wrote:

[Quoted text hidden]

<MFG 501 CARF 3-18-16 (SEARCHABLE WITH SYLLABUS).pdf><MFG501_EGL.pdf>

A. N. (Tassos) Perakis <tassos@umich.edu>

Fri, Aug 5, 2016 at 2:32 PM

To: Fred Terry <fredty@umich.edu>, COECURRICULUMCOMMITTEE <COECURRICULUMCOMMITTEE@umich.edu>

Cc: "Lawrence M. Seiford" <seiford@umich.edu>

ok

From: Fred Terry [mailto:fredty@umich.edu]

Sent: Friday, August 05, 2016 1:17 PM

To: COECURRICULUMCOMMITTEE

Cc: Lawrence M. Seiford

Subject: Two urgent matters for e-mail vote

[Quoted text hidden]

Figueroa Alvarez, C. Alberto <figueroc@med.umich.edu>

Sat, Aug 6, 2016 at 12:44 PM

To: "A. N. (Tassos) Perakis" <tassos@umich.edu>, Fred Terry <fredty@umich.edu>, COECURRICULUMCOMMITTEE <COECURRICULUMCOMMITTEE@umich.edu>

Cc: "Lawrence M. Seiford" <seiford@umich.edu>, Luis Hernandez-Garcia <hernan@umich.edu>

I approve both as well.

- Alberto Figueroa

C. Alberto Figueroa, PhD

Edward B. Diethrich Associate Professor of Biomedical Engineering and Vascular Surgery

University of Michigan

North Campus Research Complex B20-211W

(e) figueroc@med.umich.edu

(p) +1-734-763-8680

(w) <http://bloodflow.engin.umich.edu/>

(w) <http://www.crimson.software/>

Honorary Senior Lecturer of Biomedical Engineering

Kings College London

(e) alberto.figueroa@kcl.ac.uk

(w) <http://www.isd.kcl.ac.uk/cafa/>

From: A. N. (Tassos) Perakis [mailto:tassos@umich.edu]
Sent: Friday, August 5, 2016 2:33 PM
To: 'Fred Terry' <fredty@umich.edu>; 'COECURRICULUMCOMMITTEE' <COECURRICULUMCOMMITTEE@umich.edu>
Cc: 'Lawrence M. Seiford' <seiford@umich.edu>
Subject: RE: Two urgent matters for e-mail vote

[Quoted text hidden]

Electronic Mail is not secure, may not be read every day, and should not be used for urgent or sensitive issues

Fred Terry <fredty@umich.edu> Mon, Aug 8, 2016 at 9:31 AM
To: "Figueroa Alvarez, C. Alberto" <figueroc@med.umich.edu>
Cc: "A. N. (Tassos) Perakis" <tassos@umich.edu>, COECURRICULUMCOMMITTEE <COECURRICULUMCOMMITTEE@umich.edu>, "Lawrence M. Seiford" <seiford@umich.edu>, Luis Hernandez-Garcia <hernan@umich.edu>

I have received 9 "yes" votes, 0 "no" votes, and "0" abstentions. I believe we currently have 16 voting members (14 departments/divisions, 2 Dean's staff-me and Brian, 1 student). To make it clean and legal, I need 2 more yes votes for the 2/3 vote.

If you have not yet responded, please do so today. As promised in the earlier message, I have attached the CARF from Ross. There have been some Filemaker issues in generating a CoE style CARF.

I have "yes" votes from

1. Dean's Staff (Fred Terry)
2. ECE (Jamie Philips)
3. CSE (Igor Markov & Kevin Compton)
4. ISD (Pat Hammett)
5. BME (Alberto Figueroa)
6. MSE (Richard Robertson)
7. NAVARCH (Tassos Perakis)
8. AEROSP (Luis Bernal)
9. Student (David Bielski)

[Quoted text hidden]



TO605-for-MFGsig-VarCred.pdf
87K

Fred Terry <fredty@umich.edu> Mon, Aug 8, 2016 at 9:40 AM
To: Luis Hernandez-Garcia <hernan@umich.edu>
Cc: "Alberto Figueroa C. PhD" <figueroc@med.umich.edu>, "A. N. (Tassos) Perakis" <tassos@umich.edu>, COECURRICULUMCOMMITTEE <COECURRICULUMCOMMITTEE@umich.edu>, "Lawrence M. Seiford" <seiford@umich.edu>

Thanks Luis and welcome. Are you replacing Alberto for BME? I have already recorded a "yes" for BME. I appreciate your quick response but if I am correct, then your department is already counted.

Best,
Fred

On Mon, Aug 8, 2016 at 9:37 AM, Luis Hernandez-Garcia <hernan@umich.edu> wrote:
I vote YES.

thanks

-L

PS - Sorry for the delay - I just joined this committee and I don't think I'm fully up to speed.

Luis Hernández-García

<http://fmri.research.umich.edu/about/faculty/herandez.php>

[Quoted text hidden]

> <TO605-for-MFGsig-VarCred.pdf>

--

Fred L. Terry, Jr.

Professor of EECS

Director of Academic Programs, College of Engineering

[734-763-9764](tel:734-763-9764) (EECS)

[734-764-2244](tel:734-764-2244) (LEC)

Edward Larsen <edlarsen@umich.edu>

Mon, Aug 8, 2016 at 9:44 AM

To: Fred Terry <fredty@umich.edu>

Cc: Luis Hernandez-Garcia <herman@umich.edu>, "Alberto Figueroa C. PhD" <figueroc@med.umich.edu>, "A. N. (Tassos) Perakis" <tassos@umich.edu>, COECURRICULUMCOMMITTEE <COECURRICULUMCOMMITTEE@umich.edu>, "Lawrence M. Seiford" <seiford@umich.edu>

Sorry Fred, I was out of town. I vote yes on both matters. -Ed Larsen

[Quoted text hidden]

Fred Terry <fredty@umich.edu>

Mon, Aug 8, 2016 at 9:50 AM

To: Edward Larsen <edlarsen@umich.edu>

Cc: Luis Hernandez-Garcia <herman@umich.edu>, "Alberto Figueroa C. PhD" <figueroc@med.umich.edu>, "A. N. (Tassos) Perakis" <tassos@umich.edu>, COECURRICULUMCOMMITTEE <COECURRICULUMCOMMITTEE@umich.edu>, "Lawrence M. Seiford" <seiford@umich.edu>

Thanks Ed. We are now at 10 "yes" votes. At a normal meeting, this would certainly be sufficient but I would like to have the clean 11 to move forward.

1. Dean's Staff (Fred Terry)
2. ECE (Jamie Philips)
3. CSE (Igor Markov & Kevin Compton)
4. ISD (Pat Hammett)
5. BME (Alberto Figueroa & Luis Hernandez-Garcia)
6. MSE (Richard Robertson)
7. NAVARCH (Tassos Perakis)
8. AEROSP (Luis Bernal)
9. Student (David Bielski)
10. NERS (Ed Larsen)

[Quoted text hidden]

Fred Terry <fredty@umich.edu>

Mon, Aug 8, 2016 at 10:10 AM

To: COECURRICULUMCOMMITTEE <COECURRICULUMCOMMITTEE@umich.edu>

Cc: "Lawrence M. Seiford" <seiford@umich.edu>

We are now at 12 yes votes and the matters carry. I will ask Amber to record the vote and Betsy to try to move this forward for the Registrar.

1. Dean's Staff (Fred Terry)
2. ECE (Jamie Philips)

3. CSE (Igor Markov & Kevin Compton)
4. ISD (Pat Hammett)
5. BME (Alberto Figueroa & Luis Hernandez-Garcia)
6. MSE (Richard Robertson)
7. NAVARCH (Tassos Perakis)
8. AEROSP (Luis Bernal)
9. Student (David Bielski)
10. NERS (Ed Larsen)
11. ME (Jwo Pan)
12. CEE (Jeff Scruggs)

[Quoted text hidden]



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: 4/6/16
Effective Term: Fall 2016

☐	Course Offered	RO USE ONLY Date Received: Date Completed: Completed By:
	☐ Indefinitely	
	☐ One term only	

CURRENT LISTING

REQUESTED LISTING

☐	Dept (Home): Business Admin Subject: TO Catalog: 605			Dept (Home): Subject: Catalog:		
☒	☒ Course is Cross-Listed with Other Departments			☐ Course is Cross-Listed with Other Departments		
	Department	Subject	Catalog Number	Department	Subject	Catalog Number
	Engineering	MFG	605			
☐	Course Title (full title)			Course Title (full title)		
☐	Abbreviated Title (20 char)			Abbreviated Title (20 char)		
☐	Course Description (Please limit to 50 words and attach separate sheet if necessary)					
☒	Full Term Credit Hours			Half Term Credit Hours		
	Undergraduate Min:	Graduate Min: 3.0		Undergraduate Min:	Graduate Min: 1.50	
	Undergraduate Max:	Graduate Max: 3.00		Undergraduate Max:	Graduate Max: 1.50	
☐	Course Credit Type select one					
☒	Repeatability			☐ Course is Y graded		
	☒ Course is Repeatable for Credit Maximum number of repeatable credits: 3.0			☐ Can be taken more than once in the same term		

Subject: TO Catalog: 605

☐	Grading Basis		
	☐ Graded (A – E)		
	☐ Credit/No Credit		
	☐ Satisfactory/Unsatisfactory	Add Consent	Drop Consent
	☐ Pass/Fail	☐ Department Consent	☐ Department Consent
	☐ Business Administration	☐ Instructor Consent	☐ Instructor Consent
	Grading	☐ No Consent	☐ No Consent
	☐ Not for Credit		
	☐ Not for Degree Credit		
	☐ Degree Credit Only		

CURRENT LISTING

REQUESTED LISTING

☐	Advisory Prerequisite (254 char)	Advisory Prerequisite (254 char)
☐	Enforced Prerequisite (254 char)	Enforced Prerequisite (254 char)
	Minimum grade requirement:	Minimum grade requirement:
☐	Credit Exclusions	Credit Exclusions
☐	Course Components	Graded Component
	☐ Lecture	☐
	☐ Seminar	☐
	☐ Recitation	☐
	☐ Lab	☐
	☐ Discussion	☐
	☐ Independent Study	☐
Terms Typically Offered (Please select only one) [blank] or [blank]		
Instructor Name:		Instructor Title:

SIGNATURES ARE REQUIRED FROM ALL DEPARTMENTS INVOLVED

Contact Person: Jeff Tenza

Email: jmtenza@umich.edu

Phone: 43206

Curriculum Committee:

Date:

Dept Chair(s):

Home Department:

KAPUSANSKI Kym

Date:

4/7/2006

Cross-Listed Department:

Date:

Cross-Listed Department:

Date:

Cross-Listed Department:

Date:

THE UNIVERSITY OF MICHIGAN -- COLLEGE OF ENGINEERING
Course Approval Request
College Curriculum Committee, 1420 Lurie Engineering Center Building

Form Number **2851**

Action Requested

- ☒ New Course
☐ Modification of Existing Course
☐ Deletion of Course

Complete the following sections:

- New Courses - B & C completely
Modifications - A modified information, B & C completely
Deletions - A & C completely

Date **8/31/2016**

Effective Term **Fall 2016**

Course Offer Freq ☒ Indefinitely
☐ One term only

A. CURRENT LISTING

B. REQUESTED LISTING

Home Department		Course Number	Home Department		Course Number
			ROB Robotics		990
Cross Listed Course Information			Cross Listed Course Information		
Course Title			Course Title		
Precandidacy Dissertation Research			Dissertation/Pre-Candidate		
TITLE ABBRE- VIATION	Time Sched Max = 19 Spaces		TITLE ABBRE- VIATION	Time Sched Max = 19 Spaces	Diss-Precand
	Transcript Max = 20 Spaces			Transcript Max = 20 Spaces	Diss-Precand
Course Description			Course Description for Official Publication (Max = 50 words)		
			Dissertation work by doctoral student not yet admitted to status as candidate. The defense of the dissertation, that is, the final oral examination, must be held under a full-term candidacy enrollment.		
PROGRAM OUTCOMES			PROGRAM OUTCOMES		
☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j			☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j		
Degree Requirements			Degree Requirements		
☐ Degree Requirement ☐ Free Elective ☐ Other ☐ Core Course ☐ Tech Elective			☐ Degree Requirement ☐ Free Elective ☐ Other ☐ Core Course ☐ Tech Elective		
Prereq			Prereq		
☐ Enforced ☐ Advised			☐ Enforced ☐ Advised		
Credit Restrictions			Credit Restrictions		
Level of Credit		Credit Hours	Level of Credit		Credit Hours
☐ Undergrad only ☐ Rackham Grad ☐ Non-Rackham Grad ☐ Ugrad or Rackham Grad	☐ Ugrad or Non-Rackham Grad ☐ All Credit types ☐ Rackham Grad w/add'l Work	Min Max	☒ Undergrad only ☐ Rackham Grad ☐ Non-Rackham Grad ☐ Ugrad or Rackham Grad	☐ Ugrad or Non-Rackham Grad ☐ All Credit types ☐ Rackham Grad w/add'l Work	Min Max 2 8
		Contact Hrs/Wk			Contact Hrs/Wk
		Number of Wks			Number of Wks

C.

Repeatability (Indl Research, Dir. Study, Dissertation): Is this course repeatable? ☒ Yes ☐ No Max Hours? Max Times? Can it be repeated in the same term? ☐ Yes ☒ No

Class Type(s)	Grading	Location	Cognizant Faculty Member:	Title
☐ Lec ☐ Sem ☐ Dis ☐ Other ☐ Rec ☐ Lab ☐ Ind	☐ A-E ☐ CR/NC ☐ P/F ☒ S/U	☒ Ann Arbor ☐ Biological Station ☐ Camp Davis ☐ Extension	Ella Atkins	Professor
Graded Section			Grad Course: Attach nomination if Cognizant Faculty is not a regular graduate faculty	
☐ Lec ☐ Sem ☐ Dis ☐ Other ☐ Rec ☐ Lab ☒ Ind		Course Is Y Graded ☐		

Approval Info Approved by Name Fred Jerry (BD) Approved Date 8/31/16

- ☐ Faculty
☐ Cross listed Unit 1
☐ Cross listed Unit 2

CARF sent to Univ RO - 9/1/16
CARF in M+Box -
CARF info in Web CoE Bulletin -
CARF info in G Docs (paper Bulletin) -
CARF in Binder --

Submitted By: ☐ Home Dept. ☐ Cross-listed Dept.

Department Chair Name

me Dept. Jessy Grizzle

ross-listed
Dept(s).

Chair Signature

[illegible]

Detail the Special requirements

[illegible]

THE UNIVERSITY OF MICHIGAN -- COLLEGE OF ENGINEERING
Course Approval Request
College Curriculum Committee, 1420 Lurie Engineering Center Building

Form Number **2852**

Date **8/31/2016**

Action Requested

- ☒ New Course
☐ Modification of Existing Course
☐ Deletion of Course

Complete the following sections:

- New Courses - B & C completely
Modifications - A modified Information, B & C completely
Deletions - A & C completely

Effective Term **Fall 2016**

Course Offer Freq ☒ Indefinitely
☐ One term only

A. CURRENT LISTING

B. REQUESTED LISTING

Home Department		Course Number	
Cross Listed Course Information		Cross Listed Course Information	
Course Title		Course Title	
Dissertation Research		Dissertation/Candidate	
TITLE ABBRE- VIATION	Time Sched Max = 19 Spaces	TITLE ABBRE- VIATION	Time Sched Max = 19 Spaces
	Transcript Max = 20 Spaces		Transcript Max = 20 Spaces
Course Description		Course Description for Official Publication (Max = 50 words)	
PROGRAM OUTCOMES: ☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j		PROGRAM OUTCOMES: ☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j	
Degree Requirements		Degree Requirements	
☐ Degree Requirement ☐ Free Elective ☐ Other ☐ Core Course ☐ Tech Elective		☐ Degree Requirement ☐ Free Elective ☐ Other ☐ Core Course ☐ Tech Elective	
Prereq		Prereq	
☐ Enforced ☐ Advised		☐ Enforced ☐ Advised	
Credit Restrictions		Credit Restrictions	
Level of Credit		Level of Credit	
☐ Undergrad only ☐ Ugrad or Non-Rckhm Grad ☐ Rackham Grad ☐ All Credit types ☐ Non-Rckhm Grad ☐ Rckhm Grad w/add'l Work ☐ Ugrad or Rckhm Grad		☐ Undergrad only ☐ Ugrad or Non-Rckhm Grad ☐ Rackham Grad ☐ All Credit types ☐ Non-Rckhm Grad ☐ Rckhm Grad w/add'l Work ☐ Ugrad or Rckhm Grad	
Credit Hours		Credit Hours	
Min Max		Min Max	
Contact Hrs/Wk		Contact Hrs/Wk	
Number of Wks		Number of Wks	

Repeatability (Indi Research, Dir. Study, Dissertation): Is this course repeatable? ☒ Yes ☐ No Max Hours? Max Times? Can it be repeated in the same term? ☐ Yes ☒ No

C.

Class Type(s)	Grading	Location	Cognizant Faculty Member:	Title
☐ Lec ☐ Sem ☐ Dis ☐ Other ☐ Rec ☐ Lab ☐ Ind	☐ A-E ☐ CR/NC ☐ P/F ☒ S/U	☒ Ann Arbor ☐ Biological Station ☐ Camp Davis ☐ Extension	Ella Atkins	Professor
Graded Section	Course Is Y Graded ☐			
☐ Lec ☐ Sem ☐ Dis ☐ Other ☐ Rec ☐ Lab ☒ Ind				

Approval Info Approved by Name Ined Joruy (BD) Approved Date 8/31/16

- ☐ Faculty
☐ Cross listed Unit
☐ Cross listed Unit
- CARF sent to Univ RO - 9/1/16
CARF in M+Box -
CARF info in Web CoE Bulletin -
CARF info in G Docs (paper Bulletin) -
CARF in Binder --

Submitted By: ☐ Home Dept. ☐ Cross-listed Dept.

Department Chair Name Chair Signature

Home Dept. Jessy Grizzle

Cross-listed
Dept(s).

[illegible]

Action Requested

- ☐ New Course
☐ Modification of Existing Course
☒ Deletion of Course

Complete the following sections:

New Courses - B & C completely
 Modifications - A modified information, B & C completely
 Deletions - A & C completely

Effective Term **Fall 2016**

Course Offer Freq ☒ Indefinitely
☐ One term only

A. CURRENT LISTING

B. REQUESTED LISTING

Home Department		Course Number	Home Department		Course Number	
UARTS University Arts		101				
Cross Listed Course Information			Cross Listed Course Information			
Course Title			Course Title			
TITLE	Time Sched Max = 19 Spaces	Create & Collaborate	TITLE	Time Sched Max = 19 Spaces		
ABBRE- VIATION	Transcript Max = 20 Spaces		ABBRE- VIATION	Transcript Max = 20 Spaces		
Course Description			Course Description for Official Publication (Max = 50 words)			
Creativity and Collaboration is the required class for members of Living Arts. This hands-on, yearlong workshop will provide students with an opportunity to explore their own creative processes and collaborative styles as they work on projects and performances that engage North Campus, the University of Michigan, and the surrounding community. Creativity and Collaboration will feature workshops led by faculty and visiting artists and entrepreneurs, and interdisciplinary student teams will be given the opportunity to brainstorm, draft, edit, revise, present (or perform), and critique original projects.						
PROGRAM OUTCOMES: ☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j			PROGRAM OUTCOMES: ☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j			
Degree Requirements ☐ Degree Requirement ☒ Free Elective ☐ Other ☐ Core Course ☐ Tech Elective			Degree Requirements ☐ Degree Requirement ☐ Free Elective ☐ Other ☐ Core Course ☐ Tech Elective			
Prereq			Prereq			
☐ Enforced ☐ Advised			☐ Enforced ☐ Advised			
Credit Restrictions			Credit Restrictions			
Level of Credit ☒ Undergrad only ☐ Ugrad or Non-Rckhm Grad ☐ Rackham Grad ☐ All Credit types ☐ Non-Rckhm Grad ☐ Rckhm Grad w/add'l Work ☐ Ugrad or Rckhm Grad		Credit Hours Min Max 1 1	Contact Hrs/Wk Number of Wks	Level of Credit ☐ Undergrad only ☐ Ugrad or Non-Rckhm Grad ☐ Rackham Grad ☐ All Credit types ☐ Non-Rckhm Grad ☐ Rckhm Grad w/add'l Work ☐ Ugrad or Rckhm Grad	Credit Hours Min Max _____	Contact Hrs/Wk Number of Wks _____

Repeatability (Indi Research, Dir. Study, Dissertation): Is this course repeatable? ☐ Yes ☒ No
 Max Hours? _____ Max Times? _____ Can it be repeated in the same term? ☐ Yes ☐ No

C.

Class Type(s) ☐ Lec ☐ Sem ☐ Dis ☐ Other _____ ☐ Rec ☒ Lab ☐ Ind		Grading ☐ A-E ☒ CR/NC ☒ P/F ☐ S/U	Location ☒ Ann Arbor ☐ Biological Station ☐ Camp Davis ☐ Extension	Cognizant Faculty Member: Brian Noble _____ _____ _____	Title Dept. Chair _____ _____ _____
Graded Section ☒ Lec ☐ Sem ☐ Dis ☐ Other _____ ☐ Rec ☐ Lab ☐ Ind		Course Is Y Graded ☐		Grad Course: Attach nomination if Cognizant Faculty is not a regular graduate faculty	

Approval Info **Approved by Name** **Approved Date** Submitted By: ☒ Home Dept. ☐ Cross-listed Dept.

☐ Curriculum Comm. _____
☐ Faculty _____
☐ Cross listed Unit 1 _____
☐ Cross listed Unit 2 _____

Department Chair Name **Chair Signature**
 Home Dept. _____
 Cross-listed _____
 Dept(s). _____

~~This course number is no longer valid: it has been replaced by UARTS.150.~~

Detail the Special requirements

Action Requested

- ☐ New Course
☐ Modification of Existing Course
☒ Deletion of Course

Complete the following sections:

New Courses - B & C completely
 Modifications - A modified information, B & C completely
 Deletions - A & C completely

Effective Term Fall 2016

Course Offer Freq ☒ Indefinitely
☐ One term only

A. CURRENT LISTING

B. REQUESTED LISTING

Home Department		Course Number	Home Department		Course Number	
UARTS University Arts		102				
Cross Listed Course Information			Cross Listed Course Information			
Course Title			Course Title			
TITLE	Time Sched	Create & Collaborate	TITLE	Time Sched		
ABBREVIATION	Max = 19 Spaces		ABBREVIATION	Max = 19 Spaces		
	Transcript			Transcript		
	Max = 20 Spaces			Max = 20 Spaces		
Course Description			Course Description for Official Publication (Max = 50 words)			
Creativity and Collaboration is the required class for members of Living Arts. This hands-on, yearlong workshop will provide students with an opportunity to explore their own creative processes and collaborative styles as they work on projects and performances that engage North Campus, the University of Michigan, and the surrounding community. Creativity and Collaboration will feature workshops led by faculty and visiting artists and entrepreneurs, and interdisciplinary student teams will be given the opportunity to brainstorm, draft, edit, revise, present (or perform), and critique original projects.						
PROGRAM OUTCOMES: ☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j			PROGRAM OUTCOMES: ☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j			
Degree Requirements ☐ Degree Requirement ☒ Free Elective ☐ Other ☐ Core Course ☐ Tech Elective			Degree Requirements ☐ Degree Requirement ☐ Free Elective ☐ Other ☐ Core Course ☐ Tech Elective			
Prereq			Prereq			
☐ Enforced ☐ Advised			☐ Enforced ☐ Advised			
Credit Restrictions			Credit Restrictions			
Level of Credit ☒ Undergrad only ☐ Ugrad or Non-Rckhm Grad ☐ Rackham Grad ☐ All Credit types ☐ Non-Rckhm Grad ☐ Rckhm Grad w/add'l Work ☐ Ugrad or Rckhm Grad		Credit Hours Min Max 1 1	Contact Hrs/Wk Number of Wks _____	Level of Credit ☐ Undergrad only ☐ Ugrad or Non-Rckhm Grad ☐ Rackham Grad ☐ All Credit types ☐ Non-Rckhm Grad ☐ Rckhm Grad w/add'l Work ☐ Ugrad or Rckhm Grad	Credit Hours Min Max _____	Contact Hrs/Wk Number of Wks _____

Repeatability (Indi Research, Dir. Study, Dissertation): Is this course repeatable? ☐ Yes ☒ No
 Max Hours? _____ Max Times? _____ Can it be repeated in the same term? ☐ Yes ☐ No

Class Type(s) ☐ Lec ☐ Sem ☐ Dis ☐ Other _____ ☐ Rec ☒ Lab ☐ Ind		Grading ☐ A-E ☒ CR/NC ☒ P/F ☐ S/U	Location ☒ Ann Arbor ☐ Biological Station ☐ Camp Davis ☐ Extension	Cognizant Faculty Member: Brian Noble _____ _____ _____	Title Dept. Chair _____ _____ _____
Graded Section ☐ Lec ☐ Sem ☐ Dis ☐ Other _____ ☐ Rec ☒ Lab ☐ Ind		Course Is Y Graded ☐		Grad Course: Attach nomination if Cognizant Faculty is not a regular graduate faculty	

Approval Info ☐ Curriculum Comm. ☐ Faculty ☐ Cross listed Unit 1 ☐ Cross listed Unit 2	Approved by Name _____ _____ _____	Approved Date _____ _____ _____	Submitted By: ☐ Home Dept. ☐ Cross-listed Dept. Department Chair Name Home Dept. _____ Cross-listed _____ Dept(s). _____ _____	Chair Signature _____ _____ _____
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~~This course number is no longer valid: it has been replaced by UARTS.150.~~

Detail the Special requirements

Action Requested

- ☐ New Course
☐ Modification of Existing Course
☒ Deletion of Course

Complete the following sections:

New Courses - B & C completely
 Modifications - A modified information, B & C completely
 Deletions - A & C completely

A. CURRENT LISTING

B. REQUESTED LISTING

Home Department		Course Number		Home Department		Course Number	
UARTS University Arts		200					
Cross Listed Course Information				Cross Listed Course Information			
Course Title				Course Title			
TITLE	Time Sched			TITLE	Time Sched		
ABBRE-	Max = 19 Spaces			ABBRE-	Max = 19 Spaces		
VATION	Transcript			VATION	Transcript		
	Max = 20 Spaces				Max = 20 Spaces		
Course Description				Course Description for Official Publication (Max = 50 words)			
Students in this experiential class learn strategies for effective peer mentoring and engage their mentees in discussions regarding transition issues commonly experienced by first year students. Class time is dedicated to learning campus resources and discussing case studies. Peer mentors develop an electronic portfolio that requires reflection on their identities as students, leaders, and creators. This class is only open to Living Arts Peer Mentors.							
PROGRAM OUTCOMES: ☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j				PROGRAM OUTCOMES: ☐ a ☐ c ☐ e ☐ g ☐ i ☐ k ☐ b ☐ d ☐ f ☐ h ☐ j			
Degree Requirements ☐ Degree Requirement ☐ Free Elective ☐ Other ☐ Core Course ☐ Tech Elective				Degree Requirements ☐ Degree Requirement ☐ Free Elective ☐ Other ☐ Core Course ☐ Tech Elective			
Prereq				Prereq			
☐ Enforced ☐ Advised				☐ Enforced ☐ Advised			
Credit Restrictions				Credit Restrictions			
Level of Credit ☒ Undergrad only ☐ Ugrad or Non-Rckhm Grad ☐ Rackham Grad ☐ All Credit types ☐ Non-Rckhm Grad ☐ Rckhm Grad w/add'l Work ☐ Ugrad or Rckhm Grad		Credit Hours Min Max 1 1		Level of Credit ☐ Undergrad only ☐ Ugrad or Non-Rckhm Grad ☐ Rackham Grad ☐ All Credit types ☐ Non-Rckhm Grad ☐ Rckhm Grad w/add'l Work ☐ Ugrad or Rckhm Grad		Credit Hours Min Max _____	
		Contact Hrs/Wk Number of Wks				Contact Hrs/Wk Number of Wks	

Repeatability (Indi Research, Dir. Study, Dissertation): Is this course repeatable? ☐ Yes ☐ No Max Hours? _____ Max Times? _____ Can it be repeated in the same term? ☐ Yes ☐ No

C.

Class Type(s) ☒ Lec ☐ Sem ☐ Dis ☐ Other _____ ☐ Rec ☐ Lab ☐ Ind		Grading ☐ A-E ☒ CR/NC ☒ P/F ☐ S/U		Location ☒ Ann Arbor ☐ Biological Station ☐ Camp Davis ☐ Extension		Cognizant Faculty Member: Brian Noble _____ _____ _____		Title Dept. Chair _____ _____ _____	
Graded Section ☒ Lec ☐ Sem ☐ Dis ☐ Other _____ ☐ Rec ☐ Lab ☐ Ind		Course Is Y Graded ☐				Grad Course: Attach nomination if Cognizant Faculty is not a regular graduate faculty			

Approval Info ☐ Curriculum Comm. ☐ Faculty ☐ Cross listed Unit 1 ☐ Cross listed Unit 2		Approved by Name _____ _____ _____		Approved Date _____ _____ _____		Submitted By: ☐ Home Dept. ☐ Cross-listed Dept. _____ _____ _____		Department Chair Name _____ _____ _____		Chair Signature _____ _____ _____	
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~~This course number is no longer valid: it has been replaced by UARTS.250.~~

[illegible]

Detail the Special requirements

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