



College of Engineering

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Date: 8 May 2013

To: Randy Smith
Vice Provost, Office of Academic Affairs (OAA)

From: Ed McCaul
Secretary, College of Engineering Committee on Academy Affairs (CCAA)

Subject: Proposed Changes to Industrial & Systems Engineering Undergraduate Curriculum

CCAA reviewed and approved the attached proposal to revise our Industrial and Systems Engineering Undergraduate Program on the 17th of April 2013. I am forwarding it to you so that it can be approved by the Council on Academic Affairs. If you have any questions concerning this proposal please let me know.



Department of Integrated Systems Engineering
1971 Neil Ave., Rm 210
Columbus, OH 43210

8 April 2013

RE: Proposed changes to the Industrial & Systems Engineering undergraduate curriculum

The ISE Department is proposing to make two changes to its undergraduate curriculum:

1. Replace Math 2173 and 2174 with Math 2568 (Linear Algebra) and 2415 (Ordinary and Partial Diff. Eq.) in Semesters 2/1 and 2/2, respectively.

Math 2173 and 2174 will switch with Math 2568 and 2415 to become the alternative path for ISE.

2. Eliminate choice in our second Engineering Science, by requiring ISE students to take ME 2850 (Numerical Methods in Mechanical Engineering).

We believe our students will benefit from these modifications, given the importance of Linear Algebra and programming skills later in our curriculum and in their careers.

The total number of credit hours in our program will not change.

The ISE faculty have reviewed, discussed, and approved the proposed changes to the curriculum.

The Department of Mechanical and Aerospace Engineering is supporting this modification by offering to provide a special section of ME 2850 for ISE students in the Fall and Spring semesters. Please see the email from Dan Mendelsohn that is included with this letter.

Changes will need to be made to two ISE courses, to change prerequisites to reflect the changes to the curriculum.

We are requesting that these modifications be approved before the end of the 2012-2013 school year, so that the proposed, modified curriculum will be the curriculum for new freshmen starting Autumn 2013.

A handwritten signature in black ink that reads "Carolyn M. Sommerich".

Sincerely,

Carolyn M. Sommerich, PhD
ISE Undergraduate Studies Program Chair
Associate Professor
ph: 614.292.9965
email: sommerich.1@osu.edu

Attachments:

- Current ISE curriculum
- Proposed ISE curriculum with changes marked
- Proposed ISE curriculum, clean copy
- Copy of supporting email from Department of Mechanical and Aerospace Engineering

Industrial and Systems Engineering Semester Curriculum

Semester 1/1		Semester 1/2	
Physics 1250 – Mechanics, Thermal Physics, Waves (Physics I)	5	Physics 1251 – E&M, Optics, Modern Physics (Physics II)*	5
Math 1151 – Engineering Calculus I	5	Math 1172 - Engineering Math A	5
ENGR 1181 – Intro to Engineering I	2	ENGR 1182 – Intro to Engineering II	2
ENGR 1100 – Engineering Survey	1	CSE 1222 Programming in C++	3
Gen Ed: Literature	3	Gen Ed: Writing I (English 1110.0x)	3
Total	16	Total	18
Semester 2/1		Semester 2/2	
Math 2173 Engineering Math B	3	Math 2174 Linear Algebra & Diff. Eqns.	3
Stats 3470 Probability & Statistics	3	ISE 2400 Design of Work	2
ME 2040 Statics & Strength of Materials	4	Engineering Science ²	3
Additional Science ¹	4	ISE 2040 Engineering Economics	2
Gen Ed: Arts	3	Gen Ed: Writing II, (ENGR 2367 American Attitudes About Technology)	3
Total	17	Total	13
Semester 3/1		Semester 3/2	
ISE 3200 Linear & Integer Programming	3	ISE 3210 Non-linear Programming	3
ISE 3400 Prod Plan & Fac Design	4	ISE 3800 Project Management	3
ISE 2500 Intro to Manufacturing eng.	3	ISE 4120 Quality Control & DOE	3
ISE 3700 Cognitive Systems Eng.	3	ISE 3600 Workplace Ergonomics	3
Gen Ed: Culture and Ideas (Ethics) ³	3	Gen Ed: Historical Study	3
Total	16	Total	15
Semester 4/1		Semester 4/2	
ISE 5100 Stoch. Modeling & Simulation	4	ISE 4900 Capstone Design	4
Technical Elective ⁴	3	Technical Elective	3
Technical Elective	3	Technical Elective	3
Technical Elective	3	Technical Elective	3
Gen Ed: Social Science I	3	Gen Ed: Social Science II	3
Total	16	Total	16
Total Credit Hours		127	

Notes

Courses required for admission to major and used to calculate Eligibility Point-Hour Ratio (EPHR): *Physics 1251 will be counted in the EPHR starting in Autumn 2013.

¹ Choose either Chemistry 1250 (4) or Biology 2100 (4)

² Choose one: MSE 2010 (3), ECE 2300 (3), CSE 2111 (3), CSE 2122 (3), ME 2030 (3), ME 2850 (3), ME 3500 (3) (Note that ME 3500 and MSE 2010 require Chemistry 1250 as prerequisite; ME 2850 requires permission of instructor)

³ Philosophy 1332, or approved alternative

⁴ At least three technical electives (TEs) must be taken as a set, from a list of approved ISE TE packages; a maximum of two technical electives may come from programs other than Industrial & Systems Engineering.

**Proposed changes to Industrial and Systems Engineering Semester Curriculum,
for New Freshman Autumn 2013
(Proposed – 8 April 2013)**

Semester 1/1		Semester 1/2	
<u>Physics 1250 – Mechanics, Thermal Physics, Waves (Physics I)</u>	5	<u>Physics 1251 – E&M, Optics, Modern Physics (Physics II)</u>	5
<u>Math 1151 – Engineering Calculus I</u>	5	<u>Math 1172 - Engineering Math A</u>	5
<u>ENGR 1181 – Intro to Engineering I</u>	2	<u>ENGR 1182 – Intro to Engineering II</u>	2
<u>ENGR 1100 – Engineering Survey</u>	1	<u>CSE 1222 Programming in C++</u>	3
Gen Ed ⁵	3	<u>Gen Ed: Writing I (English 1110.0x)</u>	3
Total	16	Total	18
Semester 2/1		Semester 2/2	
Math 2173 Engineering Math B⁶	3	Math 2174 Linear Algebra & Diff. Eqns. ⁶	3
MATH 2568 Linear Algebra⁶	3	MATH 2415 Ordinary & Partial Diff. Eq.⁶	3
Stats 3470 Probability & Statistics	3	ISE 2400 Design of Work	2
ME 2040 Statics & Strength of Materials	4	ISE 2040 Engineering Economics	2
Additional Science ¹	4	ME 2850 Numerical Methods in Mechanical Engineering² (replaces Eng. Sci choice; teaches Matlab programming and Numerical Methods using Matlab; great prep for 3200 and 3210; ME will offer special section for ISE)	3
Gen Ed: Writing II, (ENGR 2367 American Attitudes About Technology) (moved from 2/2 semester to 2/1 semester)	3	Gen Ed ⁵	3
Total	17	Total	13
Semester 3/1		Semester 3/2	
ISE 3200 Linear & Integer Programming	3	ISE 3210 Non-linear Programming	3
ISE 3600 Workplace Ergonomics	3	ISE 3800 Project Management	3
ISE 2500 Intro to Manufacturing eng.	3	ISE 4120 Quality Control & DOE	3
ISE 3700 Cognitive Systems Eng.	3	ISE 3400 Prod Plan & Fac Design	4
Gen Ed: Culture and Ideas (Ethics) ³	3	Gen Ed ⁵	3
Total	15	Total	16
Semester 4/1		Semester 4/2	
ISE 5100 Stoch. Modeling & Simulation	4	ISE 4900 Capstone Design	4
Technical Elective ⁴	3	Technical Elective	3
Technical Elective	3	Technical Elective	3
Technical Elective	3	Technical Elective	3
Gen Ed ⁵	3	Gen Ed ⁵	3
Total	16	Total	16
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Notes

Underlined courses are required for admission to major. Bold font indicates courses used to calculate Eligibility Point-Hour Ratio (EPHR).

¹ Choose either Chemistry 1250 (4) or Biology 2100 (4)

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⁴ At least three technical electives (TEs) must be taken as a set, from a list of approved ISE TE packages; a maximum of two technical electives may come from programs other than Industrial & Systems Engineering.

⁵ Gen Eds – others not specified include Social Sci I and II, Literature, Arts, Historical Studies

⁶ MATH 2568 + 2415 were on the alternative Maths path for ISE (and for AAE, ME, Eng. Phys) and is part of the main Maths sequence for ECE ; 2173 + 2174 will remain an alternative path for ISE

Pre-reqs to be revised, related to the proposed changes to the curriculum:

ISE course	Current pre-reqs	Proposed pre-reqs
3200	Prereq: Math 2153 or 2173, and 2568 or 2174; and CSE 1222, and major in ISE or major in Eng. Phys.	Prereq: Math 2153 or 2173, and 2568 or 2174; and CSE 1222, and ME 2850, and major in ISE or major in Eng. Phys.
3210	Prereq: 3200, 520, Math 2174 (568 or 571), or IndEng 522, and major in ISE; or permission of instructor.	Prereq: (ISE 3200 or ISE 520 or Ind Eng 522) and Math 2174 or 2568 (568 or 571) and major in ISE; or permission of instructor.

FOR EASIER READING, A CLEAN COPY IS PROVIDED ON THE NEXT TWO PAGES

**Proposed changes to Industrial and Systems Engineering Semester Curriculum,
for New Freshman Autumn 2013
(Proposed – 8 April 2013)**

Semester 1/1		Semester 1/2	
<u>Physics 1250 – Mechanics, Thermal Physics, Waves (Physics I)</u>	5	<u>Physics 1251 – E&M, Optics, Modern Physics (Physics II)</u>	5
<u>Math 1151 – Engineering Calculus I</u>	5	<u>Math 1172 - Engineering Math A</u>	5
<u>ENGR 1181 – Intro to Engineering I</u>	2	<u>ENGR 1182 – Intro to Engineering II</u>	2
<u>ENGR 1100 – Engineering Survey</u>	1	<u>CSE 1222 Programming in C++</u>	3
Gen Ed ⁵	3	<u>Gen Ed: Writing I (English 1110.0x)</u>	3
Total	16	Total	18
Semester 2/1		Semester 2/2	
MATH 2568 Linear Algebra	3	MATH 2415 Ordinary & Partial Diff. Eq.	3
Stats 3470 Probability & Statistics	3	ISE 2400 Design of Work	2
ME 2040 Statics & Strength of Materials	4	ISE 2040 Engineering Economics	2
Additional Science ¹	4	ME 2850 Numerical Methods in Mechanical Engineering	3
Gen Ed: Writing II, (ENGR 2367 American Attitudes About Technology)	3	Gen Ed ⁵	3
Total	17	Total	13
Semester 3/1		Semester 3/2	
ISE 3200 Linear & Integer Programming	3	ISE 3210 Non-linear Programming	3
ISE 3600 Workplace Ergonomics	3	ISE 3800 Project Management	3
ISE 2500 Intro to Manufacturing eng.	3	ISE 4120 Quality Control & DOE	3
ISE 3700 Cognitive Systems Eng.	3	ISE 3400 Prod Plan & Fac Design	4
Gen Ed: Culture and Ideas (Ethics) ³	3	Gen Ed ⁵	3
Total	15	Total	16
Semester 4/1		Semester 4/2	
ISE 5100 Stoch. Modeling & Simulation	4	ISE 4900 Capstone Design	4
Technical Elective ⁴	3	Technical Elective	3
Technical Elective	3	Technical Elective	3
Technical Elective	3	Technical Elective	3
Gen Ed ⁵	3	Gen Ed ⁵	3
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⁵ Gen Eds – others not specified include Social Sci I and II, Literature, Arts, Historical Studies

Re ME 2850 in the ISE curriculum - support from ME.txt
Fri, 5 Apr 2013 09:07:40 -0400 (EDT)
Date: Fri, 5 Apr 2013 09:07:40 -0400
From: Daniel Mendelsohn <mendelsohn.1@osu.edu>
To: Carolyn Sommerich <sommerich.1@osu.edu>
CC: Kristen Arra <arra.7@osu.edu>, Rosie Quiñon-Bonello
<quiñon-bonello.1@osu.edu>, Ahmet Selamet <selamet.1@osu.edu>, "Vish
Subramani am" <vi shsubramani am.1@gmail.com>, Gilat 1 <gilat.1@osu.edu>,
Kimberly Clavin <clavin.2@osu.edu>
Message-ID:
<650102321.2112878.1365167260321.JavaMail.root@mecheng.ohio-state.edu>
In-Reply-To: <201303261452.r2QEqax2006747@defang6.it.ohio-state.edu>
Subject: Re: ME 2850 in the ISE curriculum

Hi Carolyn,

Mechanical and Aerospace Engineering will be happy to run one section each semester of ME 2850 for ISE students. Just to be clear, please verify that the expected annual numbers are around 150, with about 75 per semester. The sections will be segregated and your students will be in sections taught by an MAE GTA. The GTA will get guidance and course materials from Amos Gilat and Vish Subramani am, who run the course for us, but the GTA will also consult with ISE faculty of your choosing to help slant the examples used in the course towards ISE topics. This latter piece may take a fair amount of effort and I would like to ask that whomever from your department helps, that they invest an appropriate amount of development time working with the GTA and Amos and Vish.

Since this is a new type of venture for us I think that we all can agree that this will be on a trial basis. Below you state that the plan is for the requirement to kick in in Spring 2015. That is fine, but if you want to start the above arrangement in Autumn 2014 that is OK too. Please let us know. Until then ISE students will be let into our regular sections of ME 2850, seats permitting, after ME demand has been fulfilled.

I look forward to working with you on this.

Dan Mendelsohn

Associate Chair

Department of Mechanical and Aerospace Engineering

From: "Carolyn Sommerich" <sommerich.1@osu.edu>
To: "mendelsohn 1" <mendelsohn.1@osu.edu>
Cc: "Kristen Arra" <arra.7@osu.edu>
Sent: Tuesday, March 26, 2013 10:49:15 AM
Subject: Re: ME 2850 in the ISE curriculum

Hi Dan,

I would like to submit the proposed change to CCAA this year if at all possible (and there is just one more CCAA meeting - which is next month). But I also understand that you want to make sure that there is documentation from Ahmet, so that everyone knows for certain what is being asked and promised. Would it be possible to get his written ok by 5 April? CCAA meets the 17th, but I'm thinking that this will go to one of the subcommittees and it might meet the week prior.

Re ME 2850 in the ISE curriculum - support from ME.txt

Kristen can give you an estimate for the upcoming semesters until the requirement kicks in. As she meets with students to advise them, she will have an idea of how many would be interested and can provide that information to you.

Regards,
Carolyn

Re: ME 2850 in the ISE curriculum
Daniel Mendelsohn [mendelsohn.1@osu.edu]
Sent: Monday, March 25, 2013 7:15 PM
To:
Sommerich, Carolyn
Cc:
Arra, Kristen E.; Quiñzon-Bonello, Rosario

Hi Carolyn,

Is there a particular CCAA meeting date that you are trying to get this done for. Ahmet is out of town and I am out part of this week too. Before I provide the letter I want to make sure that we are absolutely OK with this. I have already talked to him once so I think we are fine.

As to getting some of your students in before the requirement officially hits we can work on that too. The problem for AU 13 was timing. We need to know more in advance of what your needs are. So let us start with SP 14. Give me an estimate of how many of your students would want this. I will then put that with the ME numbers and see where we are section-wise before I make a hard decision on how many to let in. I am not sure of the exact timing of all of that, but the sooner we get an estimate from you the better. We will have to do this term by term until the requirement kicks in.

Thanks,

Dan

From: "Carolyn Sommerich" <sommerich.1@osu.edu>
To: "mendelsohn 1" <mendelsohn.1@osu.edu>
Cc: "Kristen Arra" <arra.7@osu.edu>
Sent: Sunday, March 24, 2013 10:53:13 AM
Subject: ME 2850 in the ISE curriculum

Hello Dan,

We want to thank the ME department for its willingness to support the proposed change in the ISE curriculum to require ME 2850 as our additional engineering science course.

I am preparing a packet for CCAA about the changes we are proposing to make to the ISE curriculum, including the change in the last 2 maths courses that we discussed with you and Dave Tomasko a few weeks ago, and the requirement for our students to take ME 2850 as their additional Engineering Science course. Students who follow this new program would begin to need ME 2850 in spring 2015 (there should be about 75 students who would need the course in that semester and thereafter).

However, we have already begun to encourage our students to take this course to fulfill their additional engineering science requirement,

Re ME 2850 in the ISE curriculum - support from ME.txt because of the expectation that we have that it will ensure that they will be well-prepared for ISE 3210, wherein Matlab is used somewhat now and for which are students are not prepared, since their brief and only introduction to Matlab occurred in their first year. Students are receptive to the suggestion to take this course, so if you have additional capacity in your current offering of the course, we think we could fill more than 10 seats in the upcoming semesters, before the requirement hits.

I would appreciate it if you would respond to the email to show that ME is willing to support this proposed change in the ISE curriculum. I will include your email with my package to CCAA.

Regards,
Carol yn Sommeri ch

Carol yn M. Sommeri ch, PhD, CPE
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