The University of Michigan
College of Engineering
Curriculum Committee

Agenda
February 19, 2008
1:30-3:00 p.m.
GM Room Fourth Floor
Lurie Engineering Center

1. Approval of Minutes from 1-8-08 Meeting
2. Physics 135/235 as an alternative to Physics 140/240
3. Course Approvals
4. New Undergraduate Concentration in Energy for Mechanical Engineering

University of Michigan
College of Engineering
Curriculum Committee Meeting
Tuesday February 5, 2008
1:30-3:00 p.m.
Room 2210 Lurie Engineering Center
Minutes

Toby Teorey called the meeting to order at 1:40 p.m.

Members Present: T. Teorey, J. Barker, L. Bernal, M. Epelman, J. Everett, J. Holloway, A Hunt, E. Jankowski, E. Larsen, M. Moghaddam, S. Montgomery, J. Pan, T. Perakis, R. Robertson, G. Wakefield, M. Wooldridge

Members Absent: J. Hu, M. Krug, R. Sulewski

Guests: Erik Hildinger, Huei Peng

The minutes of the last meeting (February 5, 2008) were approved

Course Approval Forms

Toby Teorey called for a motion to approve the following courses. This was moved and seconded.
These Courses were approved

AERO 285	New Course
AERO 290	New Course
AERO 351	Deletion
AERO 385	Deletion
AERO 390	Modification—Changed Description; added Prerequisite: Permission of Instructor; Changed Maximum hours from: 6 ***to: 3***.
AERO 445	Modification—Changed Description.
AERO 450	New
AERO 490	Modification—Changed Description; Changed Maximum hours from: arr ***to: 3***.
AERO 495	Modification—Changed Description
AERO 566	New Course
AERO 585	Modification—Added Prerequisite: Aero 385 or Senior Standing
AERO 590	Modification—Changed Description
AERO 592	Deletion
AERO 595	Deletion
AERO 596	Deletion
AERO 850	Deletion
AOSS 441	New Course

This Course was Tabled

ENGR 310	New Course (Law for Engineers)

Revised Aerospace Engineering Sample Schedule

A revised Aerospace Engineering sample schedule was also submitted with the Aerospace Engineering course approval forms. This was included in the meeting packet
Luis Bernal talked about this change. He noted that the basic schedule didn't change very much. Some courses were re-ordered. The word *unrestricted* (electives) was changed to *general* (electives) by this Committee, since it was noted that this word has changed at the College level. Toby Teorey asked for a motion to approve this schedule. Moved and Seconded. Approved. This sample schedule will be presented to the College of Engineering Faculty Meeting on Tuesday, February 19.

Discussion on Spring/Summer Course Offerings

Greg Wakefield asked to begin a discussion on Spring/Summer course offerings by the College of Engineering. Greg noted that in the past, the EECS department was reluctant to offer courses over the Spring/Summer terms, since the funding model for off-term courses doesn't make sense. He wondered if the College would like to try to have Spring/Summer courses offered. He asked that the Committee members look into this idea.

Master of Engineering – Robotics and Autonomous Vehicle

This proposal was included in the meeting packet. Huei Peng presented this proposal. This proposal follows the original MENG template. He noted that most of the courses already exist in the College. This Committee will be approving this degree, not the courses. Toby Teorey asked for a motion to approve this proposal. Moved and Seconded. This Proposal was approved. This Proposal will be presented to the College of Engineering Faculty Meeting on February 19.

Physics 135/235 as an Alternative to Physics 140/240

Since there was not enough time to discuss the topic of Physics 135/325 as an alternative to Physics 140/240, Toby Teorey said that this will be the first item on the Agenda for the February 19 meeting.

Adjournment: Motion to adjourn was made and seconded
Motion carried (approved)

Next Meeting: February 19, 2008 GM Room Fourth Floor Lurie Engineering Center

COURSE APPROVAL FORM

For February 19, 2008 CoE CC Meeting

AOSS 545	New Course
EECS 182(X-Listed with SI 182	New Course
EECS 282	New Course
EECS 382	New Course
EECS 455	Modification –Changing hours from: 3 ***to 4***; adding a recitation/discussion section once every 2 or 3 weeks
EECS 491(X-listed with ENGR 491)	New Course
MSE 242	Modification—Changing Description

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

Print

Form Number 1505

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 2/8/2005
Effective Fall 2008

A. CURRENT LISTING

Home Department | Div # | Course Number

Cross Listed Course Information

Course Title

TITLE ABBREVIATION — Time Sched Max = 19 Spaces | Transcript Max = 20 Spaces

Course Description

PROGRAM OUTCOMES: ☐ a ☐ b ☐ c ☐ d ☐ e ☐ f ☐ g ☐ h ☐ i ☐ j ☐ l

Degree Requirements ( ) Degree Requirement ( ) Core Course ( ) Free Elective (●) Tech Elective ( ) Other

Prerequisites ( ) Enforced ( ) Advised

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 Worl

Credit Hours Min | Max

Contact Hrs/Wk | Number of Wks

B. REQUESTED LISTING

Home Department: Atmospheric, Oceanic, & Space Sciences | Div #: AOSS | Course Number: 545

Cross Listed Course Information

Course Title: High Energy Density Physics

TITLE ABBREVIATION — Time Sched Max = 19 Spaces: High En Den Phys | Transcript Max = 20 Spaces: High En Den Phys

Course Description for Official Publication (Max = 50 words)
Introduces students to fundamental tools and discoveries of high-energy-density physics, where pressures are above a million atmospheres. Discusses fundamental physical models, equations of state, hydrodynamics including shocks and instabilities, radiation transport, radiation hydrodynamics, experimental technique, inertial fusion, experimental astrophysics, and relativistic systems.

PROGRAM OUTCOMES: ☐ a ☐ b ☐ c ☐ d ☐ e ☐ f ☐ g ☐ h ☐ i ☐ j ☐ k

Degree Requirements ( ) Degree Requirement ( ) Core Course ( ) Free Elective (●) Tech Elective ( ) Other

Prerequisites: Math 450, Physics 405 & Physics 406 ( ) Enforced (●) Advised

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 Min: 3 | Max: 3

Contact Hrs/Wk: 3
Number of Wks: 14

C.

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

Class Type(s) ☒ Lec ☐ Rec ☐ Sem ☐ Lab ☐ Dis ☐ Ind ☐ Other ____

Graded Section (●) Lec ( ) Rec ( ) Sem ( ) Lab ( ) Dis ( ) Ind ( ) Other

Grading ☒ A-E ☐ CR/NC ☐ S/U ☐ P/F ☐ Y

Location ☒ Ann Arbor ☐ Biological Station ☐ Camp Davis ☐ Extension

Printing Information (Optional) ☒ Print the course in the Bulletin ☒ Print the course in the Time Schedule

Terms & Freq. of Offering ☐ I ☒ II ☐ IIIa ☐ IIIb ☐ III — ☐ Yearly ☐ Alter Years ☒ Even Years ☐ Odd Years

Half term ☐ 1st ☐ 2nd

Cognizant Faculty Member: R. Paul Drake **Title** Professor

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

Approval

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

Submitted By: ☒ Home Dept. ☐ Cross-listed Dept.
Name, Signature & Department
Home Dept. AOSS - John Barker
Cross-listed Dept(s). _____

Form Number

1505

SUPPORTING STATEMENT

The study of high-energy-density physics is emerging as a distinct discipline. Several developments have led to this. The first is the construction in recent years of laboratory facilities able not only to drive shock waves at hundreds of km/s, to produce temperatures of millions of degrees, and to produce pressures that exceed 100 million atmospheres, but also to diagnose such systems. It is no surprise that matter under such extreme conditions behaves differently than in ordinary experience. The second is the emergence of growing funding for university research in this area. The third is the positive acceptance of two prominent NRC reports: Recent major reviews have called for a major expansion of activity in these areas. The report of the NRC committee chaired by Michael Turner of the University of Chicago, entitled "Connecting Quarks With the Cosmos: Eleven Science Questions for the New Century", called for the laboratory study of high-energy-density physics to help discern the principles that govern extreme astrophysical environments [1]. The report of the NRC committee chaired by Ronald Davidson of Princeton University, entitled "Frontiers in High Energy Density Physics: The X-games of Contemporary Science", highlighted the opportunities in this emerging field and called for the increased involvement of several U.S. agencies in its support [2]. Any Michigan graduate student planning a career in inertial fusion, in high-field science, or potentially at the weapons laboratories would be well advised to take this course.

The subjects discussed in this course have wide-ranging application to phenomena from combustion to fusion to space plasmas to astrophysics. This course will introduce graduate students to the fundamental tools and discoveries of high-energy-density physics. It will survey the production of such conditions, the fundamental plasma and hydrodynamic models that can describe them, the problem of scaling from the laboratory to the cosmos, inertial fusion, shocks and rarefactions, hydrodynamic instabilities, radiation transport, radiation hydrodynamics, and relativistic dynamics. Connections to astrophysics and space science will be discussed throughout. The student who completes the course will have an understanding of the basic elements of this field, and the ability to apply many of the standard tools and models that are used to describe high-energy-density systems.

The professor who has developed this course is a recognized authority in high-energy-density physics. His textbook was published by Springer-Verlag in spring 2006. The draft text was used in a special-topics course at UM in Fall 2003 and Fall 2005 and as the basis for a 16-day summer school attended by > 20 students in the summer of 2004 and the summer of 2006.

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

Detail the Special requirements

High-Energy-Density Physics

Material in support of Course Approval Form

Syllabus/Course Outline

Week 1 Introduction, Descriptions of plasmas
Week 2 Simple equations of state, Ionization balance
Week 3 Ionizing plasmas, Thomas-Fermi model, Shocks
Week 4 Rarefactions, self-similar waves,
Week 5 Blast waves, complex phenomena, Rayleigh Taylor Instability
Week 6 Kelvin Helmhohltz, Richtmeyer Meshkov, Turbulence
Week 7 Radiative transfer
Week 8 Radiative hydrodynamics – thermodynamics and waves
Week 9 Radiative shocks
Week 10 Laser-plasma interaction, heat transport
Week 11 Ablation, hohlraums, z pinches
Week 12 Inertial Confinements Fusion, Experimental Astrophysics
Week 13 Relativistic high-energy-density systems
Week 14 Final project presentations

High-Energy-Density Physics

Instructor:

Prof. R. Paul Drake
Email: rpdrake@umich.edu
Office R1420 Space Research Building

Office hours:

Text

High Energy Density Physics
By R. Paul Drake
Publisher: Springer-Verlag

Supplementary texts
These have been placed on reserve at the Media Union Library. These are all published by Dover books; you might consider purchasing them

Physics of Shock Waves and High-Temperature Hydrodynamic Phenomena
by Ia. B. Zeldovich, Yu. P. Raizer,
List Price: $34.95; ISBN: 0486420027

Foundations of Radiation Hydrodynamics
by Dimitri Mihalas, Barbara Weibel Mihalas,
List Price: $24.95; ISBN: 0486409252

Hydrodynamic and Hydromagnetic Stability
by S. Chandrasekhar
List Price: $21.95; ISBN: 048664071X

Work & Grades:

Weekly homework: mostly focused on derivations. 5 pts per problem. Net 60 % of grade. Problem sets are all due on Thursdays by the beginning of class. Use of modern tools such as Mathematica or MatLab to carry out computations for homework is encouraged. To obtain credit for such work it must be clearly annotated and must include a clearly written statement of the problem and the solution method. On homework, collaboration is fine to figure it out. But write out what you turn in on your own and think it through.

Exams: One take-home mid-term exam, mostly focused on applications with numbers. 15% of grade.
Do the exams entirely on your own.

Project: Each student to choose an area for deeper study, producing a report including some mathematics, some simulations, or both, for 25% of grade.

Grading

60% problem sets (weekly)
15% midterm exam
25% final project

Grading notes:
Grading is not on a curve. It is based on demonstration of capability.

Course Approval Request

College Curriculum Committee, 1420 Lurie Engineering Center Building

Print

Form Number 1903

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 1/31/2008

Effective Fall 2008

A. CURRENT LISTING

Home Department	Div #	Course Number

Cross Listed Course Information

Course Title

TITLE ABBREVIATION	Time Sched Max = 19 Spaces	
	Transcript Max = 20 Spaces	

Course Description

PROGRAM OUTCOMES:

☐a ☐b ☐c ☐d ☐e ☐f ☐g ☐h ☐i ☐j ☐k

Degree Requirements: ( ) Degree Requirement ( ) Tech Elective ( ) Core Course ( ) Other ( ) Free Elective

Prerequisites: ( ) Enforced ( ) Advised

Credit Restrictions

Level of Credit: ☐ Undergrad only ☐ All Credit types ☐ Rackham Grad ☐ Rckhm Grad w/add'l Work ☐ Non-Rckhm Grad ☐ Ugrad or Rckhm Grad ☐ Ugrad or Non-Rckhm Grad

Credit Hours Min ____ Max ____

Contact Hrs/Wk ____ Number of Wks ____

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

Class Type(s): ☒ Lec ☐ Rec ☐ Sem ☐ Lab ☐ Dis ☐ Ind ☐ Other ____

Graded Section: (•) Lec ( ) Rec ( ) Sem ( ) Lab ( ) Dis ( ) Ind ( ) Other

Grading: ☒ A-E ☐ CR/NC ☐ S/U ☐ P/F ☐ Y

Location: ☒ Ann Arbor ☐ Biological Station ☐ Camp Davis ☐ Extension

Approval

] Curriculum Comm. _____

] Faculty _____

] Rackham _____

] Cross listed Unit 1 _____

] Cross listed Unit 2 _____

B. REQUESTED LISTING

Home Department	Div #	Course Number
EECS	252	182

Cross Listed Course Information: SI 182

Course Title: Building Applications for Information Environments

TITLE ABBREVIATION	Time Sched Max = 19 Spaces	Bldg Apps for Inf Env
	Transcript Max = 20 Spaces	Bldg Apps for Inf Env

Course Description for Official Publication (Max = 50 words)

Fundamental programming skills in the context of end-user software applications using a high-level language, such as Ruby or Python. Rapid design of a variety of information-oriented applications to gather, analyze, transform, manipulate, and publish data. Applications drawn from statistics, pattern matching, social computing and computer games.

PROGRAM OUTCOMES:

☒a ☐b ☒c ☐d ☒e ☐f ☐g ☐h ☐i ☐j ☐k

Degree Requirements: (•) Degree Requirement ( ) Tech Elective ( ) Core Course ( ) Other ( ) Free Elective

Prerequisites: None ( ) Enforced ( ) Advised

Credit Restrictions

Level of Credit: ☒ Undergrad only ☐ All Credit types ☐ Rackham Grad ☐ Rckhm Grad w/add'l Work ☐ Non-Rckhm Grad ☐ Ugrad or Rckhm Grad ☐ Ugrad or Non-Rckhm Grad

Credit Hours Min 4 Max 4

Contact Hrs/Wk 5 Number of Wks 14

Printing Information (Optional): ☐ Print the course in the Bulletin ☐ Print the course in the Time Schedule

Terms & Freq. of Offering: ■ I ■ II ☐ IIIa ☐ IIIb ☐ III ■ Yearly ☐ Alter Years ☐ Even Years ☐ Odd Years

Half term ☐ 1st ☐ 2nd

Cognizant Faculty Member: Atul Prakash, Prof. / Charles Severance, Asst. Prof

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

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

Name, Signature & Department

Home Dept. EECS

Cross-listed Dept(s). SI

Form Number

1903

SUPPORTING STATEMENT

A new undergraduate major in Informatics is being developed. The program in Informatics is a new, innovative interdisciplinary undergraduate concentration, based in the College of Literature, Science & the Arts, but drawing on the expertise and disciplinary breadth of faculty in CSE, SI, Bioinformatics, and Statistics. Informatics deals with the structure, behavior, and interactions of natural and artificial systems that collect, analyze, process, and communicate information for specific and explicit sets of goals, such as effective decision making or scientific analysis. It studies the intersection of people, technology, and information systems.

EECS 182 will be the introductory programming course for this new major. The course will be cross-listed with School of Information as SI 182 with home in CSE. It will be taught by faculty from both CSE and SI. The course is currently being piloted as SI 182. It is expected to prepare students with general programming concepts, as in EECS 183 and Engin 101, but with a much more application-oriented focus and in a way that helps gets students, including women, motivated to learn programming. A high-level object-oriented scripting language, such as Python or Ruby, will be used so that students can focus on high-level applications and design first and see programming as a convenient way to meet the larger goal.

Unlike a discussion in some introductory programming courses, we plan to have a 2 hour programming lab where students have much more hands-on time in front of the instructor or a TA. The current pilot is being offered in the new Undergraduate Students Building on central campus, where there are excellent facilities to run the course. The current pilot encouages students to interact in the class as well as on programming homeworks. Students get regular podcasts on assignments, software installation and coding tips, and are encouraged to help each other out on early assignments. To help decide individual grades, a significant part of the grade is based on in-class programming exams in the lab where students individually

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

Print

Form Number **1904**

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 1/31/2008

Effective Fall 2008

A. CURRENT LISTING

Home Department | Div # | Course Number

Cross Listed Course Information

Course Title

TITLE ABBREVIATION — Time Sched Max = 19 Spaces | Transcript Max = 20 Spaces

Course Description

PROGRAM OUTCOMES:

☐ a ☐ b ☐ c ☐ d ☐ e ☐ f ☐ g ☐ h ☐ i ☐ j ☐ k

Degree Requirements ( ) Degree Requirement ( ) Tech Elective ( ) Core Course ( ) Other ( ) Free Elective

Prerequisites ( ) Enforced ( ) Advised

Credit Restrictions

Level of Credit
☐ Undergrad only ☐ All Credit types
☐ Rackham Grad ☐ Rckhm Grad w/add'l Work
☐ Non-Rckhm Grad
☐ Ugrad or Rckhm Grad
☐ Ugrad or Non-Rckhm Grad

Credit Hours Min ___ Max ___

Contact Hrs/Wk ___ Number of Wks ___

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

Class Type(s) ☒ Lec ☐ Rec ☐ Sem ☐ Lab ☒ Dis ☐ Ind ☐ Other ___

Graded Section (•) Lec ( ) Rec ( ) Sem ( ) Lab ( ) Dis ( ) Ind ( ) Other

Grading ☒ A-E ☐ CR/NC ☐ S/U ☐ P/F ☐ Y

Location ☒ Ann Arbor ☐ Biological Station ☐ Camp Davis ☐ Extension

B. REQUESTED LISTING

Home Department: EECS | Div #: 252 | Course Number: 282

Cross Listed Course Information

Course Title: Information Systems Design and Programming

TITLE ABBREVIATION — Time Sched Max = 19 Spaces: Info Sys Des Prog | Transcript Max = 20 Spaces: Info Sys Des Prog

Course Description for Official Publication (Max = 50 words)

Techniques for algorithm development and programming. Learning a programming language, such as Java, which is suitable for designing enterprise-scale information systems; data structures including stacks, queues, trees and dictionaries; recursion; program complexity; object-oriented design; handling exceptions, debugging, and testing; introduction to database design with JDBC and SQL.

PROGRAM OUTCOMES:

☒ a ☐ b ☒ c ☐ d ☒ e ☐ f ☒ g ☐ h ☐ i ☐ j ☒ k

Degree Requirements (•) Degree Requirement ( ) Tech Elective ( ) Core Course ( ) Other ( ) Free Elective

Prerequisites: EECS 182 or EECS 183 or Eng 101 ( ) Enforced (•) Advised

Credit Restrictions

Level of Credit
☒ Undergrad only ☐ All Credit types
☐ Rackham Grad ☐ Rckhm Grad w/add'l Work
☐ Non-Rckhm Grad
☐ Ugrad or Rckhm Grad
☐ Ugrad or Non-Rckhm Grad

Credit Hours Min 4 Max 4

Contact Hrs/Wk 4 Number of Wks 15

Printing Information (Optional) ☒ Print the course in the Bulletin ☒ Print the course in the Time Schedule

Terms & Freq. of Offering ☐ I ☒ II ☐ IIIa ☐ IIIb ☐ III — ☒ Yearly ☐ Alter Years ☐ Even Years ☐ Odd Years

Half term ☐ 1st ☐ 2nd

Cognizant Faculty Member: Atul Prakash **Title** Prof.

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

Approval

☐ Curriculum Comm. ___

☐ Faculty ___

☐ Rackham ___

☐ Cross listed Unit 1 ___

☐ Cross listed Unit 2 ___

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

Name, Signature & Department

Home Dept. EECS

Cross-listed Dept(s). ___

Form Number

1904

SUPPORTING STATEMENT

A new undergraduate major in Informatics is being developed. The program in Informatics is a new, innovative interdisciplinary undergraduate concentration, based in the College of Literature, Science & the Arts, but drawing on the expertise and disciplinary breadth of faculty in CSE, SI, Bioinformatics, and Statistics. Informatics deals with the structure, behavior, and interactions of natural and artificial systems that collect, analyze, process, and communicate information for specific and explicit sets of goals, such as effective decision making or scientific analysis. It studies the intersection of people, technology, and information systems.

EECS 282 will be part of the core for this new major. A key goal of the course is to further exploring programming and design in the context of enterprise information systems. Like 182, the course will be motivated by applications. The plan is to use Java as the programming language. For several tracks in Informatics, including Information Analysis and Social Computing, this will be the last programming course a student is required to take. We thus modified the course contents from a traditional CS2 course (like EECS 280). For example, the notion of accessing databases from programs is introduced in 282, whereas in the standard CS curriculum, that is first introduced at the 400-level. But some concepts, such as pointer safety, type safety, operator overloading, and multiple inheritance, are deferred. The course also uses Java, rather than C++, since it provides pointer and type safety and is more popular for implementing enterprise information systems. Data structures will also be covered more extensively in 282 than in 280, though not to the extent of 281. The goal will be to introduce students to the basic data structures, measuring complexity, and the use of container classes, but not to the design of advanced data structures as are typicallycovered in 281.

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

Print

Form Number 1905

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 1/31/2008

Effective Fall 2008

A. CURRENT LISTING

Home Department | Div # | Course Number

Cross Listed Course Information

Course Title

TITLE ABBREVIATION — Time Sched Max = 19 Spaces | Transcript Max = 20 Spaces

Course Description

B. REQUESTED LISTING

Home Department: EECS | Div #: 252 | Course Number: 382

Cross Listed Course Information

Course Title: Internet-scale Computing

TITLE ABBREVIATION — Time Sched Max = 19 Spaces: Internet-Scal Comp | Transcript Max = 20 Spaces: Internet-Scal Comp

Course Description for Official Publication (Max = 50 words)

Systems-level programming techniques and concepts for the design of software systems: computer memory model; pointer safety; concurrent programming using threads; coding vulnerabilities and secure coding; network programming and remote procedure calls; reading/writing objects to disk; client-server and distributed systems. No C++ background assumed. Programming labs in C++.

PROGRAM OUTCOMES:

☐ a ☐ b ☐ c ☐ d ☐ e ☐ f ☐ g ☐ h ☐ i ☐ j ☐ k

Degree Requirements — ○ Degree Requirement ○ Core Course ○ Free Elective ○ Tech Elective ○ Other

Prerequisites — ○ Enforced ○ Advised

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 Worl

Credit Hours Min / Max

Contact Hrs/Wk ____ Number of Wks ____

Repeatability (Indi Research, Dir. Study, Dissertation:
Is this course repeatable? ○ Yes ○ No
Maximum Hours? ____ Maximum Times? ____
Can it be repeated in the same term? ○ Yes ○ No

Class Type(s) — ☒ Lec ☐ Rec ☐ Sem ☐ Lab ☒ Dis ☐ Ind ☐ Other

Graded Section — ○ Lec ○ Rec ○ Sem ○ Lab ○ Dis ○ Ind ○ Other

Grading — ☒ A-E ☐ CR/NC ☐ S/U ☐ P/F ☐ Y

Location — ☒ Ann Arbor ☐ Biological Station ☐ Camp Davis ☐ Extension

PROGRAM OUTCOMES:

☒ a ☐ b ☒ c ☐ d ☒ e ☐ f ☒ g ☐ h ☐ i ☐ j ☒ k

Degree Requirements — (•) Degree Requirement ○ Core Course ○ Free Elective ○ Tech Elective ○ Other

Prerequisites: EECS 281 or EECS 282 — (•) Enforced ○ Advised

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 Min: 4 / Max: 4

Contact Hrs/Wk: 4 Number of Wks: 14

Printing Information (Optional) ☐ Print the course in the Bulletin ☐ Print the course in the Time Schedule

Terms & Freq. of Offering — ☒ I ☐ II ☐ IIIa ☐ IIIb ☐ III ☒ Yearly ☐ Alter Years ☐ Even Years ☐ Odd Years

Half term ☐ 1st ☐ 2nd

Cognizant Faculty Member: Brian Noble, Atul Prakash — **Title** Asso. Prof., Prof

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

Approval

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

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

Name, Signature & Department

Home Dept. EECS

Cross-listed Dept(s). _____

Form Number

1905

SUPPORTING STATEMENT

A new undergraduate major in Informatics is being developed. The program in Informatics is a new, innovative interdisciplinary undergraduate concentration, based in the College of Literature, Science & the Arts, but drawing on the expertise and disciplinary breadth of faculty in CSE, SI, Bioinformatics, and Statistics. Informatics deals with the structure, behavior, and interactions of natural and artificial systems that collect, analyze, process, and communicate information for specific and explicit sets ofgoals, such as effective decision making or scientific analysis. It studies the intersection of people, technology, and information systems.

EECS 382 will be a technical elective in this new major for all tracks, except for the Computational Informatics track, where it will be a required course. This course will cover concurrent and network programming and provide a bridge to existing 300 and 400-level software courses in CSE that primarily use C++ as the programming language. Since students at this point will be expected to be familiar with programming in general, having completed two courses, this course is not intended to be a C++ language course. Instead, differences between C++ and Java will be introduced, especially in terms of pointer safety and memory management. Students expected to pick up C++ in the first month. Then the course will move to introducing advanced systems programming concepts of threads, synchronization, network programming to design client-server systems, and reading/writing various data types to disk.

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

Detail the Special requirements

Course Approval Request

College Curriculum Committee, 1420 Lurie Engineering Center Building

Print

1912

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 2/12/2008

Effective Fall 2008

A. CURRENT LISTING

Home Department	Div #	Course Number

Cross Listed Course Information:

Course Title:

TITLE ABBREVIATION		
	Time Sched Max = 19 Spaces	
	Transcript Max = 20 Spaces	

Course Description:

PROGRAM OUTCOMES:

☐a ☐b ☐c ☐d ☐e ☐f ☐g ☐h ☐i ☐j ☐k

Degree Requirements: ○ Degree Requirement ○ Tech Elective ○ Core Course ○ Other ○ Free Elective

Prerequisites: ○ Enforced ○ Advised

Credit Restrictions:

Level of Credit
☐ Undergrad only ☐ All Credit types
☐ Rackham Grad ☐ Rckhm Grad w/add'l Worl
☐ Non-Rckhm Grad
☒ Ugrad or Rckhm Grad
☐ Ugrad or Non-Rckhm Grad

Credit Hours: Min 3 Max 3

Contact Hrs/Wk 3

Number of Wks 14

C. Repeatability (Indi Research, Dir. Study, Dissertation:
Is this course repeatable? ○ Yes ○ No
Maximum Hours? ____ Maximum Times? ____
Can it be repeated in the same term? ○ Yes ○ No

Class Type(s): ☒ Lec ☐ Rec ☐ Sem ☐ Lab ☒ Dis ☐ Ind ☐ Other ____

Graded Section: ⊙ Lec ○ Rec ○ Sem ○ Lab ○ Dis ○ Ind ○ Other

Grading: ☒ A-E ☐ CR/NC ☐ S/U ☐ P/F ☐ Y

Location: ☒ Ann Arbor ☐ Biological Station ☐ Camp Davis ☐ Extension

B. REQUESTED LISTING

Home Department	Div #	Course Number
EECS	252	455

Cross Listed Course Information:

Course Title: Digital Communication Signals and Systems

TITLE ABBREVIATION		
	Time Sched Max = 19 Spaces	Digital Comm Sig Sys
	Transcript Max = 20 Spaces	Digital Comm Sig Sys

Course Description for Official Publication (Max = 50 words):
Digital transmission techniques in data communications, with application to computer and space communications; design and detection of digital signals for low error rate; forward and feedback transmission techniques; matched filters, modems, block and convolutional coding, Viterbi decoding.

PROGRAM OUTCOMES:

☒a ☐b ☐c ☐d ☐e ☐f ☐g ☐h ☐i ☐j ☒k

Degree Requirements: ○ Degree Requirement ○ Tech Elective ◉ Core Course ○ Other ○ Free Elective

Prerequisites: EECS(216 or 306), EECS401 or Graduate Standing
○ Enforced ⊙ Advised

Credit Restrictions:

Level of Credit
☐ Undergrad only ☐ All Credit types
☐ Rackham Grad ☐ Rckhm Grad w/add'l Work
☐ Non-Rckhm Grad
☒ Ugrad or Rckhm Grad
☐ Ugrad or Non-Rckhm Grad

Credit Hours: Min 4 Max 4

Contact Hrs/Wk 4

Number of Wks 14

Printing Information (Optional): ☐ Print the course in the Bulletin ☐ Print the course in the Time Schedule

Terms & Freq. of Offering: ■ I ☐ II ☐ IIIa ☐ IIIb ☐ III — ■ Yearly ☐ After Years ☐ Even Years ☐ Odd Years

Half term ☐ 1st ☐ 2nd

Cognizant Faculty Member: Wayne Stark Title Prof.

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

Approval

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

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

Name, Signature & Department

Home Dept. EECS

Cross-listed Dept(s). _____

Form Number

1912

SUPPORTING STATEMENT

EECS 455 is the capstone course in communication for our undergraduate students (although there are a few that go on to take 555 in the Winter semester). We would like this course to be more relevant to a student that might want to continue in a career in the communication industry. In order to make this course somewhat more hands on we would like to add a few projects to the course (e.g. a synchronization project, a Viterbi decoder project). In order to do so we would like to increase the credit hours from 3 hours to 4 hours. We will also add a recitation/discussion section once every 2 or 3 weeks.

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

Print

Form Number 1907

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 2/7/2008
Effective Fall 2008

A. CURRENT LISTING

Home Department | Div # | Course Number

Cross Listed Course Information

Course Title

TITLE ABBREVIATION: Time Sched Max = 19 Spaces | Transcript Max = 20 Spaces

Course Description

PROGRAM OUTCOMES:
☐a ☐b ☐c ☐d ☐e ☐f ☐g ☐h ☐i ☐j ☐k

Degree Requirements ○ Degree Requirement ○ Tech Elective ○ Core Course ○ Other ○ Free Elective

Prerequisites ○ Enforced ○ Advised

Credit Restrictions

Level of Credit
☐ Undergrad only ☐ All Credit types
☐ Rackham Grad ☐ Rckhm Grad w/add'l Worl
☐ Non-Rckhm Grad
☐ Ugrad or Rckhm Grad
☐ Ugrad or Non-Rckhm Grad

Credit Hours Min ____ Max ____
Contact Hrs/Wk ____
Number of Wks ____

Repeatability (Indi Research, Dir. Study, Dissertation:
Is this course repeatable? ○ Yes ○ No
Maximum Hours? ____ Maximum Times? ____
Can it be repeated in the same term? ○ Yes ○ No

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

B. REQUESTED LISTING

Home Department: EECS | Div #: 252 | Course Number: 491

Cross Listed Course Information: ENGR | 258 | 491

Course Title: High-Tech Entrepreneurship

TITLE ABBREVIATION: Time Sched Max = 19 Spaces: High-Tech Entrep | Transcript Max = 20 Spaces: High-Tech Entrep

Course Description for Official Publication (Max = 50 words)

Technology Entrepreneurship is a style of business leadership that involves identifying high-potential, technology-intensive commercial opportunities, gathering resources such as talent and capital, and managing rapid growth and significant risks using principled decision-making skills. Technology ventures exploit break-through advancements in science and engineering to develop better products and services for customers. The leaders of technology ventures demonstrate focus, passion, and an unrelenting will to succeed.

PROGRAM OUTCOMES:
☐a ☐b ☐c ☐d ☐e ☐f ☐g ☐h ☐i ☐j ☐k

Degree Requirements ○ Degree Requirement ○ Tech Elective ○ Core Course ○ Other (•) Free Elective

Prerequisites None ○ Enforced ○ Advised

Credit Restrictions

Level of Credit
☐ Undergrad only ☐ All Credit types
☐ Rackham Grad ☐ Rckhm Grad w/add'l Work
☐ Non-Rckhm Grad
☒ Ugrad or Rckhm Grad
☐ Ugrad or Non-Rckhm Grad

Credit Hours Min 4 Max 4
Contact Hrs/Wk 4
Number of Wks 14

Printing Information (Optional) ☐ Print the course in the Bulletin ☐ Print the course in the Time Schedule

Terms & Freq. of Offering: ■ I ☐ II ☐ IIIa ☐ IIIb ☐ III ■ Yearly ☐ Alter Years ☐ Even Years ☐ Odd Years
Half term ☐ 1st ☐ 2nd

Cognizant Faculty Member: Mohammed Islam **Title** Prof.

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

Approval
☐ Curriculum Comm. ____
☐ Faculty ____
☐ Rackham ____
☐ Cross listed Unit 1 ____
☐ Cross listed Unit 2 ____

Submitted By: ☐ Home Dept. ☐ Cross-listed Dept.
Name, Signature & Department
Home Dept. EECS
Cross-listed Dept(s) X ____

Form Number

1907

SUPPORTING STATEMENT

"High Tech Entrepreneurship" was funded by Steve Forrest and Dave Munson, and it was run as EECS 498 in Fall of 2007.

All of the class notes, home works, and lecture materials were created for the course. The students have asked for less homework from the textbook and more case studies. I will look to updating this material the next time I teach the course. Also, there will be more refinement of the lecture notes to deviate more from the textbook and give more real world examples.

The scores on the course from the students are as follows: Q1: 4.50 out of 5 (overall, this was an excellent course); Q2: 4.63 out of 5 (overall, the instructor was an excellent teacher).

I would like to petition to have the course now adopted as a regular course.

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

Detail the Special requirements

EECS 498: High-Tech Entrepreneurship

Instructor: Professor Mohammed N. Islam (647-9700, mni@umich.edu, 2417B EECS)

Lectures: xxx (3 Hours per week)
Recitations: xxx (1 Hour per week)
[4 Credit Course]

Prerequisites: Senior or Graduate Standing (Juniors or Sophomores will also be permitted, depending on available slots in the class)

Grading:

Class Participation and Attendance	15%
Homework	20%
Book Review and Case Studies	20%
Elevator Pitch, Project Presentation	15%
Executive Summary, Business Plan	30%

Textbooks:
Technology Ventures: From Ideas to Enterprise, 2nd Ed., 2007
Course Pack (selected articles on business plans, emotional intelligence, etc.)

Supplemental Reading Material (on loan in library):
New Venture Creation: Entrepreneurship for the 21st Century (7th Ed., 2007)
Entrepreneurial Small Business (2007)
The Entrepreneurial Venture (2nd Ed., 1999)

Summary of Course:

The technology sector represents a significant portion of the economy of every industrialized nation. In the U.S., more than one third of the gross national product and about half of private-sector spending on capital goods are related to technology. Therefore, particularly in the U.S. economic growth depends on the health and contributions of technology businesses.

This course is about "Technology Entrepreneurship," which is a style of business leadership that involves identifying high-potential, technology-intensive commercial opportunities, gathering resources such as talent and capital, and managing rapid growth and significant risks using principled decision-making skills. Technology ventures exploit break-through advancements in science and engineering to develop better products and services for customers. The leaders of technology ventures demonstrate focus, passion, and an unrelenting will to succeed.

The course consists of three major parts. First, lectures on technology ventures twice a week will be supported by textbook reading and homework assignments. In addition, four of five guest lecturers will augment the lectures to give "real world" advice on certain aspects of small businesses. Second, recitations will be lead by student teams that review selected books on entrepreneurial traits, leadership style, and the life cycle and challenges of start-up businesses. Also, the student teams will lead discussions on

seven case studies illustrating some of the concepts covered in the lectures. Finally, the last few classes will have team presentations of business plans, where local entrepreneurs, angels, and VC's may be invited to critique.

The lectures will cover four major topic areas.

I. Opportunity and Strategy
This section focuses on core issues involved in deciding to pursue an entrepreneurial vision and the characteristics of the venture and entrepreneurs that are vital to success from the very beginning. The outcomes from this section are opportunity, concept, business model and strategy.

II. Creating New Ventures
This section examines the major strategic decisions that any group of entrepreneurs must deal with: how to balance risk and return, what entrepreneurial structure to pursue, how to find and cultivate the best employees and help make them productive, and the critical issues of intellectual property. The outcome from this section is an outline of a plan for a new technology venture.

III. Functional Development
This section discusses the operational and organizational challenges that entrepreneurs must tackle. Although good technology with a sustainable advantage is important, many of the operational and organizational issues will actually determine the success of the enterprise. The outcome from this section is a detailed functional plan for the new enterprise.

IV. Growth and Financing
This section is about putting together a solid financial plan for the company, including exit and funding strategies. The outcome of this section is financing and building an important enterprise.

Guest Lecturers will be sprinkled in with lectures during the term (primarily between the 4th and 10th weeks) to complement or reinforce some of the concepts being covered in the lectures and homework. Potential Guest Lecturers for this term include: (will be different semester to semester)

1) Local Entrepreneur: Dwight Carlson
2) Local VC: Tony Grover, Marc Weiser
3) Local Small Business Lawyer: Fred Steingold
4) Local CPA: Patsy Aiken
5) Local Banker: Mike Cole

The course is designed for upper-class undergraduates and graduate students in engineering who seek to learn the essentials of technology entrepreneurship. No prerequisite knowledge is assumed. Beyond just the textbook learning that engineering students are familiar with, there will be a strong team orientation in the course. Student teams will review books and case studies and develop a business plan, elevator pitch, and executive summary. Several oral presentations will be provided by each team throughout the semester.

For students interested in someday starting their own businesses or working in start-ups, this course should give valuable insights and a flavor of what is to come. Also, there is a companion course on "Patent Fundamentals for Engineers," which covers how to create the barrier to entry, so that start-up enterprises can be funded.

Tentative Schedule

Section 1: Opportunity and Strategy

Outcomes: Opportunity, concept, business model and strategy

Week#1: Introduction, Organization, Teaming
Capitalism and the Technology Entrepreneuer
Emotional Intelligence

Week #2: Opportunity and the Business Summary
Building a Competitive Advantage

Week #3: Creating a Strategy
Technology, Innovation and Timing

Section 2: Creating New Ventures

Outcome: Outline of a plan for a new technology venture

Week #4: Risk, Return and Product Design
Corporate Technology Ventures

Week # 5: Creating New Ventures and the Business Plan
Elements of the Business Plan

Week # 6: Building Knowledge and Learning in a New Enterprise
Legal Formation and Intellectual Property

Section 3: Functional Development

Outcome: Detailed functional plan for the new enterprise

Week #7: The Marketing and Sales Plan
The New Enterprise Organization

Week # 8: Acquiring, Organizing and Managing Resources
Acquisitions, Mergers, and Global Business

Week # 9: The Management of Operations

Section 4: Growth and Financing

Outcome: Financing and building an important enterprise

Week # 10: The Profit and Harvest Plan
The Financial Plan

Week # 11: Sources of Capital
SBIR/STTR Funding
Presenting the Plan and Negotiating the Deal
Leading a Technology Venture to Success

Week # 12: Ethics in Business: Avoiding the "Crooked-E" in Enron

Weeks # 12,13: Presentations of Business Plans

Books or Articles for Review: (each group must provide a ~30 minutes, 15+ power point slide presentation reviewing the concepts and teachings in one of the following. If you pick the short books marked by *, then you must review two of the * books):

1. The Monk and the Riddle
2. Crossing the Chasm
3. The Gorilla Game
4. Inside the Tornado
5. Living on the Fault Line
6. The Innovator's Dilemma
7. Working with Emotional Intelligence
8. On Becoming a Leader
9. How to Win Friends and Influence People
10. The 7 Habits of Highly Effective People
11. First Things First
12. The One Minute Manager (*)
13. Gung Ho (*)
14. Whale Done (*)
15. High Five (*)

Case Studies for Review:

1. Danger, Inc.
2. Biodiesel Incorporated
3. Yahoo!
4. Global Wireless Ventures
5. Jon Hirschtick's New Venture
6. Artemis Images
7. RADCO Electronics

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

Print

Form Number 1910

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 2/8/2008
Effective Fall 2008

A. CURRENT LISTING	B. REQUESTED LISTING
Home Department / Div # / Course Number	Home Department: MATSCIE / Div #: 281 / Course Number: 242
Cross Listed Course Information	Cross Listed Course Information
Course Title	Course Title: Physics of Materials
TITLE ABBREVIATION — Time Sched Max = 19 Spaces / Transcript Max = 20 Spaces	TITLE ABBREVIATION — Time Sched Max = 19 Spaces: Physics of Matls. / Transcript Max = 20 Spaces: Phys of Matls
Course Description: Basic principles and applications of solid state physics. Mathematical and physical description of classical and quantam mechanics, crystallography and diffraction. Applications to solids, including band structure, bonding and physical proerties.	Course Description for Official Publication (Max = 50 words): Basic principles of modern physics and quantum mechanics as pertain to solid state physics and the physical behavior of materials on the nanometer scale. Applications to solid state and nano-structured materials will be emphasized including band structure, bonding and magnetic, optical and electronic response.
PROGRAM OUTCOMES: ☐a ☐b ☐c ☐d ☐e ☐f ☐g ☐h ☐i ☐j ☐k	**PROGRAM OUTCOMES:** ☒a ☒b ☐c ☐d ☒e ☐f ☐g ☐h ☒i ☒j ☒k
Degree Requirements ○ Degree Requirement ○ Tech Elective ○ Core Course ○ Other ○ Free Elective	**Degree Requirements** ◉ Degree Requirement ○ Tech Elective ○ Core Course ○ Other ○ Free Elective
Prerequisites ○ Enforced ○ Advised	Prerequisites: Physics 240 and precede or accompanied by Math 216 ◉ 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 Worl; Credit Hours Min / Max; Contact Hrs/Wk; Number of Wks	**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 Min 4 / Max 4; Contact Hrs/Wk 4; Number of Wks 14
C. Repeatability (Indi Research, Dir. Study, Dissertation): Is this course repeatable? ○ Yes ◉ No; Maximum Hours? ____ Maximum Times? ____; Can it be repeated in the same term? ○ Yes ◉ No	**Printing Information (Optional)** ☒ Print the course in the Bulletin ☒ Print the course in the Time Schedule
Class Type(s) ☒ Lec ☒ Rec ☐ Sem ☐ Lab ☐ Dis ☐ Ind ☐ Other ____ **Graded Section** ◉ Lec ○ Rec ○ Sem ○ Lab ○ Dis ○ Ind ○ Other **Grading** ☒ A-E ☐ CR/NC ☐ S/U ☐ P/F ☐ Y **Location** ☒ Ann Arbor ☐ Biological Station ☐ Camp Davis ☐ Extension	Terms & Freq. of Offering ☐ I ☒ II ☐ IIIa ☐ IIIb ☐ III ☒ Yearly ☐ Alter Years ☐ Even Years ☐ Odd Years; Half term ☐ 1st ☐ 2nd
	Cognizant Faculty Member: R. Goldman / S. Yalisove; **Title** Asst. Professor / Assoc. Professor
	Grad Course: Attach nomination if Cognizant Faculty is not a regular graduate faculty

Approval

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

Submitted By: ☒ Home Dept. ☐ Cross-listed Dept.
Name, Signature & Department
Home Dept. Peter F. Green, Dept. Chair
Cross-listed Dept(s). _____

Form Number

1910

SUPPORTING STATEMENT

Request of course description change. To bring course description in the Bullettin up to date with the topics currently included in course.

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

Detail the Special requirements

DAVID R. DOWLING

PROFESSOR, UNDERGRADUATE PROGRAM DIRECTOR, ASSOCIATE DEPT. CHAIR
MECHANICAL ENGINEERING

UNIVERSITY OF MICHIGAN

COLLEGE OF ENGINEERING

2212 G. G. BROWN LABORATORY
ANN ARBOR, MICHIGAN 48109-2125
734 936-0423 FAX 734 647-7303
drd@umich.edu

1//29/08

College of Engineering
Curriculum Committee

Dear Colleagues,

The attached page describes a new undergraduate concentration in Energy for mechanical engineering (ME) students. This concentration does not require additional course work beyond that in the current BS ME degree. This concentration was approved by the ME yesterday, and has been sent to the CoE Curriculum committee for notification and/or final approval.

Please contact me if there are any questions.

Sincerely,

David R. Dowling
Professor, Associate Chair, Undergraduate Program Director
(734) 936-0423
drd@umich.edu

attachments:

ME UG Concentration in Energy
3/00 CoE Concentration guidelines

Mechanical Engineering (ME) Undergraduate Concentration in Energy

Preamble: Global economic, geopolitical, and environmental factors all suggest that improvements are needed in the way that energy is produced, converted, and utilized in the modern world. Mechanical systems are integral to all three of these activities. Thus, an undergraduate concentration in energy consisting of 12 credit hours is defined here for the ME curriculum (the number of credits for graduation is not changed).

Required 3-credit Course: ME 499 Advanced Energy Solutions[2,3a,4]

Must select 6 credits from this list of engineering science courses:
ME 336 Advanced Thermodynamics[1]
ME 432 Introduction to Combustion[2,3a]
ME 438 Internal Combustion Engines[2,3a]
ME 535 Thermodynamics III[1,2,3a]
ME 537 Advanced Combustion[2,3a]
ME 539 Heat Transfer Physics[2,3a]
ME 589 Ecologically Sustainable Design and Manufacturing[2,3a]
ME 599 Energy Technologies[2,3a,4]
ME 599 Fundamentals of Energy Conversion[2,3a,4]
AERO 335 Aircraft and Spacecraft Propulsion[GE,5]
AOSS 350 Atmospheric Thermodynamics[GE,5]
CEE 360 Environmental Process Engineering[3b,5]
AOSS 410 Earth System Modeling[GE,5]
NERS 442 Nuclear Power Reactors[3b]
CEE 460 Design of Environmental Engineering Systems[3b]
CHEM 467 Biogeochemical Cycles[GE]
AOSS 470 Solar Terrestrial Relations[GE]
AOSS 475 Earth-Ocean-Atmosphere Interactions[GE]
CHEME 496 Hydrogen Technology: Production and Storage[GE]
CHEME 496 Fuel Processors and Fuel Cells[GE]
AERO 533 Combustion Processes[3b]

Must select 3 credits from this list of natural resource and environment courses:
NRE 441 Remote Sensing of Environment[GE]
NRE 475/ENVIRON 475/EHS 588 - Environmental Law[GE]
NRE 559 International Environmental Policy and Law[GE]
NRE 560 Behavior & Environment[GE]
NRE 562 Environmental Policy, Politics and Organizations[GE]
NRE 571/ECON 471 – Environmental Economics[GE]

Students must be in good standing to declare the concentration, and must file a course plan with the ME UG ASO. Students must pass all classes with satisfactory grades, and may petition the ME UG program director and/or ME UG program committee to consider other courses for inclusion in this concentration.

Cognizant Faculty Member: Prof. Margaret Wooldridge

Approved by ME UG Program Committee: October 17, 2007
Approved by the ME faculty, January 28, 2008

[1] Category 1 ME technical elective
[2,3a] Category 2 or 3a ME technical elective
[3b] Category 3b ME technical elective
[GE] General elective
[4] These ME 499 and 599 courses should transition to permanent numbers in the next year or two.
[5] These courses are not part of the concentration for dual majors in ME and the course's home department

Approved 3/30/00

Memorandum

To: CoE Faculty

From: CoE Curriculum Committee (Peter Washabaugh, Chair for the Committee)

Date: 3/29/00

Re: Concentrations – DRAFT 3.0

One of the elements of curriculum reform has been to incorporate into our educational programs a certain degree of flexibility in the form of free and technical electives. In some cases, it is clear to a student and a prospective employer that a certain sequence of courses corresponds to a particular area of study. However, in other cases it is not obvious that a particular sequence of courses might have any relation to each other when in fact they do.

Here we propose to create a framework to encourage students to elect a certain coherent sequence of electives. We call this sequence a "concentration". The expectation is that this will improve a student's education, and it will encourage the development of course offerings by the faculty in the College and perhaps in rest of the University. A concentration will be an endorsement by the faculty that a student has fulfilled a certain area of study.

The definition of a Concentration is as follows:

1) The term "Concentration in <identifier>" will appear on the student's transcript, but not the Diploma.

2) It consists of an approved sequence of courses that are a minimum of 12 credit hours and count toward the elective requirements of a program.

3) The administrative responsibility for a concentration rests solely with the Program Advisor for the degree. The Program Advisor for the degree is responsible for advising and auditing the degree and concentration requirements.

4) The creation of a concentration is a program change, which requires the approval of the Faculty.

5) It is recommended that the number of credit hours to obtain a concentration be contained within a usual degree. A concentration that requires additional coursework requires justification.