The University of Michigan
College of Engineering
Curriculum Committee

Agenda
December 12, 2006
1:30-3:00 p.m.
GM Room
Fourth Floor Lurie Engineering Center

1. Approval of Minutes from November 7, 2006 Meeting
2. Creation of Subject Area for the Financial Engineering Degree Program – Jianjun Shi
3. Course Approvals
4. Undergraduate Admissions Overview – Christopher Lucier

University of Michigan
College of Engineering
Curriculum Committee Meeting
Tuesday November 7, 2006
1:30-3:30 p.m.
Lurie Engineering Center GM Room
Minutes

Richard Robertson called the meeting to order at 1:40 p.m.

Members Present: R.Robertson, L.Bernal, A. Hunt, K.Kearfott, C.Lastoskie, Y.Liu, P.Mazumder, K.Patel, M.Solomon, T.Teorey, A.Yagle

Members Absent: J Boyd, G.Herrin, G.Hulbert, D. Karr, S. Pang, H.Peng, R Rogers, R. Sulewski

Guests: Tim Mc Kay (Physics Dept), Peter Nagourney (sitting in for R. Sulewski,Tech Comm)

Motion to approve the minutes of the last meeting

The minutes of the last meeting were approved

Curriculum Committee Guidelines and Procedures Revisited

A draft copy of the corrected **Curriculum Committee Guidelines and Procedures** was included in the meeting packet.
Dick Robertson asked this Committee to read through and comment on this revised document. Some more changes were suggested for the first page of this document. Dick suggested that the information on the second page be titled as a *Tentative Policy* and that will be reviewed at a latter date.
Dick asked for a motion to adopt this Policy (the first page) with the corrections. Moved and Seconded. This has been approved. This will be corrected and sent to the program advisors and staff support.

Biology 163 as a Requirement for Engineering Students Update

Information regarding this course was included in the meeting packet for the previous (October 24, 2006) meeting.
Dick Robertson noted that Dan Klinosky (an LS&A professor in the Biological Chemistry department) had proposed teaching this as a required course for Engineering students. They both agreed that now is not a good time to have all Engineering students be required to take this class, maybe it would be better some time in the future. However, Dick would highly recommend this class for students who have an interest in Biology.

Physics 135 and 235 as Alternatives for Physics 140 and 240 Revisited – Tim McKay

Information regarding these courses was included in the meeting packet for the previous (October 24, 2006) meeting.

Dick Robertson introduced Tim McKay, the Associate Chair in Physics, who was at the meeting to discuss Physics 135 and 235. These courses were taught for the first time this year. Tim has taught every introductory Physics course for the past seven years. He said that there were many reasons for creating these courses, one being to revise the course and bring it up to date.
It was decided to wait until next Spring (after the Fall 2006 and Winter 2007 terms) to vote on adopting this policy.

Course Approval Forms

Richard Robertson called for a motion to approve the following courses. This was moved and seconded.

These Courses Were Approved

AOSS 323 Modification – Changed Description; Changed Credit Hours from: 2 **to: 4**
BME 417(X-Listed with EECS 417) Modification – Changed Prerequisites from: EECS 206 and 215 or graduate standing **to: Biomede 211 or 311 or EECS 215 or 216 or 314 or P.I.**
CHE 447(X-Listed with MFG 448) Deletion
CHE 507 Deletion
CHE 508 Deletion
CHE 509 Deletion
CHE 518(X-Listed with BME 518) Deletion
CHE 558(X-Listed with MSE 558) Modification – Added X-Listing with MACRO 558
CHE 566(X-Listed with MFG 566) Deletion
CHE 584(X-Listed with BME 584 and Biomaterials 584) Modification – Changed Home Department from: Chemical Engineering **to: Biomedical Engineering**; Changed Terms Offered from: Fall **to: Winter**
CHE 607 Deletion

The Following Course Was Tabled to work out the prerequisites

BME 458(X-Listed with EECS 458) Modification – Changing Prerequisites from: Biomede 211 or EECS 215 or EECS 314 or graduate standing **to: IOE 265 and Biomede 211 or EECS 215 or EECS 314 or graduate standing**

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

Next Meeting December 12, 2006
Johnson Rooms B&C – Third Floor LEC

UNIVERSITY OF MICHIGAN
COLLEGE OF ENGINEERING

273B CHRYSLER CENTER
2121 BONISTEEL BLVD
ANN ARBOR, MI 48109-2092 U.S.A.
PHONE 734 763 0480 FAX 734 763-2523
HTTP://INTERPRO.ENGIN.UMICH.EDU/

MEMORANDUM

TO: Richard Robertson
Curriculum Committee

FROM: H. Nejat Seyhun
Interim Director of Financial Engineering
Jerome B. and Eilene M. York Professor of Business Administration, and Professor of Finance

DATE: December 8, 2007

RE: Creation of SUBJECT AREA for the Financial Engineering Degree Program

As a result of the interdisciplinary nature, the College of Engineering Financial Engineering program is actively engaged in expanding its curricular activities, including the development of various study templates, the development of new courses, our new, mandatory summer program, and cross-listing of the variety of courses with the Ross Business School, MATH and Statistics Departments. To be able to engage in these activities expeditiously, Financial Engineering program needs to have its own subject area.

The creation of the SUBJECT AREA for the Financial Engineering program was approved by the Financial Engineering Executive Committee at its October 11, 2006 meeting and confirmed by the InterPro Council of Directors at its October 20, 2006 meeting and by Associate Dean of COE, Stella Pang during her meeting with me on October 26, 2006.

All three parties, Associate Dean Stella Pang, the FE Executive Committee and the Council of Directors felt that the FE Program would greatly benefit from the establishment of a focal identity for its various activities, in a manner similar to what has already been established for AUTO and PIM. I also concur.

We would therefore propose to establish the following subject area:

Preferred Subject Area:	FINENG
Preferred Campus Location:	273B Chrysler Center 2092
Effective Term:	Winter 2007

Please consider this memo as a formal request to initiate the necessary action, and advise if any further information is required.

Thank you in advance for your consideration.

COURSE APPROVAL FORMS

For December 12, 2006 CoE CC Meeting

AOSS 101 (X-Listed with ASTRO 103) New Course

AOSS 480 New Course

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

Print

Form Number 1771

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 10/4/2006
Effective Spring 2007

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 Work

Credit Hours Min Max

Contact Hrs/Wk

Number of Wks

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: Atmospheric, Oceanic, & Space Sciences | Div #: AOSS | Course Number: 101

Cross Listed Course Information: Astronomy 103

Course Title: Rocket Science

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

Course Description for Official Publication (Max = 50 words)
An introduction to the science of space and space exploration. Topics covered include history of spaceflight, rockets, orbits, the space environment, satellites, remote sensing, and the future human presence in space. The mathematics will be at the level of algebra and trigonometry.

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 Work

Credit Hours Min 3 Max 3

Contact Hrs/Wk 6

Number of Wks 7

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). Astronomy-Doug Richstone

Form Number

1771

SUPPORTING STATEMENT

Outer space, space exploration, and rocketry generate enduring excitement among the general population. They are recurring subjects for movies, while at the same time the term "rocket science" has become idiomatic for things that are really complicated. What better opportunity could there be to introduce these (mostly) young citizens to scientific methods, scientific analysis, and the process of science than to use their fascination with this area of human activity? We believe that the students will be motivated by the excitement associated with this area and that this will create a high-quality learning environment. The course will exploit this opportunity to help build their confidence that they can understand scientific issues through the process of learning about this area of interest.

We intend to offer this course in the spring term initially, although it could eventually be offered any term. This represents an experiment to probe the demand for this type of course in the spring from the College and the University.

This course will be cross-listed as Astronomy 103. In addition, we have consulted Prof. Alec Gallimore of the Aerospace Engineering Department, who is interested in this course, although that department does not at present have staff available to teach such courses.

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

Detail the Special requirements

Course Objectives

- Introduce students to the science of space exploration and the space environment.
- In this context, increase their familiarity with scientific methods of analyzing systems and solving problems.
- Lead the students to understand and appreciate the excitement of space exploration and understanding the space environment

Course Outcomes

- General, qualitative familiarity by the students with the science of space exploration and the space environment. (h,j)
- In this context, increased familiarity with scientific methods of analyzing systems and solving problems. (h)
- The broad education necessary to understand the impact of science and technology in a societal context (h)
- Improved ability to engage in life-long learning about science and engineering (i)
- Greater knowledge of contemporary issues relating to space exploration and the space environment (j)

Assessment Tools

- Regular homework problems
- Exams

Books

Introduction to Space: The Science of Spaceflight,
Author: Thomas D. Damon
Publisher: Kriegler Publishing Company
Third Edition, 2001
ISBN: 0-89464-065-8

Contents

Week 5b: Astronomy from space
Hubble Space Telescope
Chandra X-ray observatory
Other systems
Review

Week 6a: Space vehicles
Third exam
Older rockets
Space shuttle
Spaceship One
The Future

Week 6b: Living and working in space
The environment.
Gravity and weightlessness
The technology of working in space
The dangers

Week 7a: Space stations and space colonies
Long-term survival in space
Long-term survival on planets

Week 7b: Is there life out there?
Fundamentals for Life
The Drake equation
SETI
Review

Week 8
Final exam

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

Print

Form Number 1788

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 12/1/2006
Effective Winter 2007

A. CURRENT LISTING	B. REQUESTED LISTING
Home Department / Div # / Course Number	Home Department: Atmospheric, Oceanic, & Space Sciences / Div #: AOSS / Course Number: 480
Cross Listed Course Information	Cross Listed Course Information
Course Title	Course Title: Climate Change: The Move to Action
TITLE ABBREVIATION — Time Sched Max = 19 Spaces	Clim Change Action
TITLE ABBREVIATION — Transcript Max = 20 Spaces	Clim Change Action
Course Description	Course Description for Official Publication (Max = 50 words): All sectors of society are affected by climate change: science, policy, business, economics, public health, energy, ecosystems, environmental engineering, journalism, religion, etc. This course explores the intersections of these communities and exposes students the factual and contextual elements that will allow effective participation in the adaptation to climate change.
PROGRAM OUTCOMES: ☐ a ☐ b ☐ c ☐ d ☐ e ☐ f ☐ g ☐ h ☐ i ☐ j ☐	**PROGRAM OUTCOMES:** ☐ a ☐ b ☐ c ☐ d ☐ e ☐ f ☐ g ☐ h ☐ i ☐ j ☐ k
Degree Requirements: ○ Degree Requirement ○ Core Course ○ Free Elective ○ Tech Elective ○ Other	**Degree Requirements**: ○ Degree Requirement ○ Core Course (•) Free Elective ○ Tech Elective ○ Other
Prerequisites: ○ Enforced ○ Advised	Prerequisites: Graduate Standing — ○ 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 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 3 Max 3; Contact Hrs/Wk 3; Number of Wks Term
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; Half term ☐ 1st ☐ 2nd; ☒ Yearly ☐ Alter Years ☐ Even Years ☐ Odd Years
	Cognizant Faculty Member: Richard B. Rood; 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

1788

SUPPORTING STATEMENT

This course follows from the experimental course AOSS 605 / SNRE 639 taught in Winter 2006. The title of that course was Climate Change: The Intersection of Science, Policy, and Economics. There were ~ 15 students in the experimental course, attracting students from seven departments and five schools. The experimental course included lectures and team projects focused on complex problems of climate change, policy, and economics. The course described here, builds from the successful elements of the experimental course and has changes based on experience from that course.

This course is a contribution to evolving University of Michigan plans to develop an integrated investigation of ways to adapt to climate change.

The Earth is predicted to warm rapidly in the next 100 years. The temperature increase will be consequential as it requires adaptation on personal, regional, national, and global scales. Ecosystems will change. The increase of the greenhouse gases, which are responsible for the warming, is directly correlated with the use of fossil fuels. Therefore, strategies to reduce the emissions of greenhouse gases require changes in energy use, which sits at the foundation of successful global economies. Virtually all sectors of society are directly or indirectly affected by climate change.

Climate change is, therefore, of interest to many departments in the university. Strategies to address climate change requires the participation of many communities; e.g., science, policy, business, economics, public health, energy, ecosystems, environmental engineering, information science, journalism, religion, etc. This course explores the intersections of these communities and introduces the student to the perspectives that different communities bring to challenges that accompany climate change. The students will work in multi-disciplinary teams to develop adaptation strategies for real problems. The goal of the course is to expose students the fundamental factual and contextual elements surrounding climate change in order to facilitate effective participation in the response to predicted and realized climate change.

The knowledge that climate will warm and that the distribution of heat and water will change offers us unique opportunity. We can plan and invest to increase societal resilience, to anticipate adaptation needs, and to mitigate risk. To exploit this opportunity will require people with expertise in many fields. They will be required to integrate information from many fields and to evaluate science-based information. This course trains students for this challenge, and strives to advance the challenges of climate change beyond rhetoric to concrete actions.

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

Detail the Special requirements

COURSE OUTLINE

Significant class time will be devoted to discussion of integrating themes and concepts. Projects will be defined after, approximately, Week 6, and students will be bringing project-related discoveries to class.

Week 1: Description of course and course goals. Scientific investigation of climate – how is it done? What is climate variability? What are the fundamental balances of energy and how might these change? (Conservation principle.) What's the relation between weather and climate?

Week 2: What are the elements of the climate system? What are the roles of these elements? Where can we expect the unexpected? Incremental versus abrupt climate change.

Week 3: How is the climate variability measured? What are the sources of observations and how reliable are these observations? How do we build modern climate data records from weather data?

Week 4: What are the components of modern climate models? How well do these models represent the fundamental balances and the observed variability? Why are the model predictions controversial? What do the models tell us about the observations, and what do the observations tell us about the model? How do we determine cause and effect, the attribution of observed signals to specific mechanisms?

Week 5: Coherent and Convergent Evidence of Climate Change. What are the signals of climate change and how do these stack up against theory and predictions? Physical climate, ecosystems, coastal societies.

Week 6: Social and Ethical Considerations: What are the potential social issues and ethical ramifications for mitigation and adaptation associated, primarily, with changes in energy sources, production, and use? Climate change in wealthy countries versus not so wealthy countries.

Week 7: Global/International Policy Response: What are the strategy, role, impact and future direction of Global and International Multi/Bi/Unilateral and Sectoral Climate Regimes? How does the United States play in the international arean?

Week 8: Sub-National Policy Response: What are the strategy, role and impact of, Sub-National Climate Regimes? Are bottom-up approaches more promising than top-down? What are U.S. states and communities doing? Will it impact federal policy?

Week 9: Impact of Climate Change on Public Health: Are their health risks (advantages) associated with climate change? Emerging diseases. Heat waves. Air quality and climate change.

Week 10: Private Sector Perception and Response: What issues are seen by the business community? How does this change from sector to sector? What is the role of liability risk? Business and policy: the need for national policy. Opportunity, competitiveness, risk.

Week 11: Economics, Markets, and Trading: How is the value of the climate integrated into our economies? Carbon market and carbon trading, is this the strategy for controlling emissions through cost? What is the role of taxes and incentives?

Week 12-13: Adapting to Climate Change: Vulnerability, resilience and adaptive capacity. When do societies adapt to climate change? Who pays? What is the best scale for measuring, implementing and monitoring adaptation options? Who gains, who loses? What are the strategies for integrating and mainstreaming climate change into the fabric and practices of society (planning, management and policy making)? What is the role of geo-engineering? Finally, how does the prospect of abrupt climate change influence these questions?

Week 14: Project presentations.

COURSE TEXTBOOK

Readings are drawn from journal articles and reports, e.g. National Academy of Sciences, Pew Center on Global Climate Change, etc. Since public opinion and news are important to societies response to climate change, RSS feeds are used to update course discussions.

ASSESSMENT TOOLS:

Regular homework
Projects and project presentations