The University of Michigan
College of Engineering
Curriculum Committee

Agenda
September 27, 2011
1:30-3:00 p.m.
Room 265 Chrysler Center

1. Approval of Minutes From 04-05-2011 and 09 13-2011
2. Course Approval Forms
3. Proposal for the ME SJTU-SGUS Program

University of Michigan
College of Engineering
Curriculum Committee Meeting
Tuesday April 5, 2011
1:30-3:00 p.m.
GM ROOM 4TH FLOOR LEC
Minutes

Marina Epelman called the meeting to order at 1:40 p.m.

Members Present: M. Epelman, J. Barker, L. Bernal, E. Durfee, R. Hryciw, A. Hunt
D. Kieras, E. Larsen, L. Meadows, S. Montgomery, J. Pan, T. Perakis, R. Robertson, F. Terry, F. Ward

Members Absent: E. Gulari, J. Holloway, J. Li, S. Vozar

The minutes of the last meeting, March 22, 2011 were approved

Course Approval Forms

CHE 519	Modification—Adding X-Listing with Pharmaceutical Sciences 519
CHE 540	New Course
CHE 568	New Course
CHE 574	New Course
EECS 441	New Course

These Courses Were Tabled

CHE 563(X-Listing with BME 563 and MSE 563)	New Course
CHE 578	New Course

MEng SGUS

John Barker handed out 2 information sheets at the meeting. There was some discussion about this proposal.
Vote Moved and Seconded. Approved. This will be presented to the Faculty Committee on this same day.

Revised Course Approval Form

Marina Epelman suggested the draft should be finished over the Summer.

Transfer Credits for Minors

Marina suggested to leave the minor requirements as are they are now and postpone the discussion regarding any changes until the next year.

Election of New Chairperson

Fred Terry was nominated and approved unanimously as the new Chairperson.

Adjournment: Motion to adjourn was made and seconded

Motion carried (approved)
Next Meeting: Joint Meeting with LS&A April 12, 2011 1:30 PM BAER ROOM, 2206 COOLEY

University of Michigan
College of Engineering
Curriculum Committee Meeting
Tuesday September 13, 2011
1:30-3:00 p.m.
Room 265 CHRYSLER CENTER
Minutes

Fred Terry called the meeting to order at 1:40 p.m.

Members Present: F. Terry, L. Bernal, E. Durfee, D. Kieras, E. Larsen, S. Montgomery, T. Olson, J. Pan, T. Perakis, R. Robertson, S. Vozar, F. Ward

Members Absent: Y. Bozer, A. Gallimore J. Holloway, A. Hunt

The minutes from the last meeting (April 5, 2011) will be presented at the next (September 27, 2011) meeting.

Course Approval Forms
CHE 360 Modification—Changing Prerequisite from: CHE 342 ***to: CHE 342 & 343***
CHE 563(X-Listing with BME 563 and MSE 563) New Course (tabled at last meeting)
CHE 578 New Course (tabled at last meeting) (with some updates to be added)

Nuclear Engineering Concentration within BSE Che Program

Information regarding this was included in the meeting packet.
"We are seeking approval to offer our students the option of pursuing a Nuclear Engineering concentration with the BSE ChE program, to prepare students who might wish to pursue careers in the nuclear industry, or who might wish to apply for masters degrees in Nuclear Engineering. We have consulted on this concentration these selections with faculty in the Nuclear Engineering and Radiological Sciences program, specifically Prof. Alex Bielajew and Program Advisor Ms. Pam Derry."
Susan Montgomery presented this Concentration. There was some discussion regarding this Proposal.
This was voted on and approved.

Proposal for ME Combined Undergraduate/Graduate Program with the UM-SJTU Joint Institute

Information regarding this was included in the meeting packet.
Summary: We propose a Combined Undergraduate/Graduate Program (CUGP) for students receiving ME BS degrees from the UM-SJTU Joint Institute (JI) that will allow such students to earn a masters in ME, while double counting up to 6 credit hours between their bachelor's and master's programs.

CUGP is available to UM-SJTU JI students who study in Shanghai, but not those who come to Ann Arbor as part of the JI. The latter receive two degrees, one from UM and one fro SJTU, JI

whereas the former receive only one degree from the UM-SJTU, JI. Since credits earned here by the latter (SJTU students studying at UM) count towards two degrees, it is not considered appropriate that they count also towards a third degree (the masters).

The CUGP program is largely patterned after the SGUS programs offered by most CoE graduate programs. However, it allows double counting fewer credits than is typical for an SGUS program.

It is proposed here that the ME Graduate Program partners with the ME Undergraduate Program of the SJTU, JI.

Susan Montgomery suggested this be called an SJTU SGUS. Fred Terry also agreed with this. Jwo Pan will ask the ME department to send Judy a revised proposal with some changes.

This was tabled until the next meeting.

Adjournment: Motion to adjourn was made and seconded

Motion carried (approved)

Next Meeting: September 27, 2011 Room 265 Chrysler Center

COURSE APPROVAL FORMS

For September 27, 2011 CoE CC Meeting

NAVARCH 620 Modification—Changing title from: Computational Fluid Dynamics for Ship Design ***to: Numerical Marine Hydrodynamics***; Changing Description; Changing Prerequisite from: NA 500 ***to: none***; Changing Level of Credit and Contact Hours from: 3 ***to: 4***; changing cognizant Faculty Member from: Ana Srviente ***to: Steve Ceccio***

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

Form Number: 2232
Date: 9/13/2011
Effective Term: Winter 2012
Course Offer Freq: ☒ Indefinitely ☐ One term only

Action Requested
○ New Course
◉ Modification of Existing Course
○ Deletion of Course

Complete the following sections:
New Courses - B & C completely
Modifications - A modified information, B & C completely
Deletions - A & C completely

	A. CURRENT LISTING	B. REQUESTED LISTING
	Home Department / Course Number	Home Department: NAVARCH Naval Arch & Marine Engin / Course Number: 620
☐	Cross Listed Course Information	Cross Listed Course Information
X	Course Title: Computational Fluid Dynamics for Ship Design	Course Title: Numerical Marine Hydrodynamics
	TITLE ABBREVIATION — Time Sched Max = 19 Spaces: CFD in Ship Design	TITLE ABBREVIATION — Time Sched Max = 19 Spaces: Num Marine Hydro
	TITLE ABBREVIATION — Transcript Max = 20 Spaces: CFD in Ship Design	TITLE ABBREVIATION — Transcript Max = 20 Spaces: Num Marine Hydro
X	Course Description: Development of the necessary skills for the hydrodynamic design of hull shapes based on available Computational Fluid dynamic (CFD) tools. Topics: Potential Flows (Deeply submerged, Free-surface treatment, Status of CFD solvers), Viscous flows (Basics, Turbulence modeling, Grid generation, Discretization, Numerical techniques, Free-Surface, Status of CFD solvers), Design methodologies (Strategies for Wave Resistance, Viscous flows, Total resistance and Optimization work).	Course Description for Official Publication (Max = 50 words): Develop the necessary skills to numerically predict the hydrodynamic performance of bodies that move in the marine environment. Topics include numerical uncertainty analysis, panel methods for the free-surface Green function and Michell's integral, discretization fundamentals for unstructured finite-volume methods, interface capturing methods, and turbulence modeling for ship flows.
	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 ○ Free Elective ○ Other ○ Core Course ○ Tech Elective	Degree Requirements: ○ Degree Requirement ○ Free Elective ○ Other ○ Core Course ○ Tech Elective
X	Prereq: NA 500 ○ Enforced ◉ Advised	Prereq: ○ Enforced ○ Advised
☐	Credit Restrictions	Credit Restrictions
X	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	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

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

C.

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

Cognizant Faculty Member: Kevin Maki — Title: Asst. Professor

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

Approval Info	Approved by Name	Approved Date
☐ Curriculum Comm.		
☐ Faculty		
☐ Cross listed Unit 1		
☐ Cross listed Unit 2		

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

	Department Chair Name	Chair Signature
Home Dept.	Steve Ceccio	
Cross-listed Dept(s).		

Form Number

2232

SUPPORTING STATEMENT

This course approval request is based on the experience of teaching the course during the Winter 2011 term. The original version of the course was structured around a specific software package called ShipFlow. This program is no longer as important for industry as it was when the course was created in 2000. The majority of the material in the original course is still relevant, but numerical ship hydrodynamics has evolved and course was revised and expanded for the Winter 2011 offering.

The changes to the material are summarized in the following:

- A section on numerical uncertainty analysis was included at the beginning of the course to provide an objective means for the students to evaluate the uncertainty in their numerical predictions.
- The section on panel methods was retained but expanded to include Michell's theory for wave-resistance prediction. This section includes a programming assignment and the student is permitted to use any suitable language, FORTRAN and MATLAB being the most popular.
- A substantial section on the fundamentals of unstructured finite-volume numerics was added. This style of computational fluid dynamics (CFD) is dominant in the marine industry and exposure to this material is necessary for the students that are entering industry. The opensource CFD library OpenFOAM is used in this section. This choice of software gives the students exposure to a commercial-grade CFD program, and the object-oriented C++ programming language.
- A section on interface capturing was added. The popular methods of Level-Set Method and Volume-of-Fluid are covered. These techniques are used for solving for the free surface in ship flows.
- A section on selecting an appropriate turbulence model and discretization strategy was added with a focus on the application of external two-phase flow around a ship-like body at model and full scale Reynolds numbers.

It is requested to change the course title, update the short description of the course, change the credit hours from 3 to 4, and revise the special facilities and requirements statement. The original title was "Computational Fluid Dynamics for Ship Design". Strictly speaking, CFD refers to any fluid-dynamics simulation or analysis that utilizes a computer, but, the acronym has the conventional meaning of relating to viscous-flow simulations. Thus the title "Numerical Marine Hydrodynamics" is proposed as a more correct description of the material offered in the course with proper respect to the inviscid-flow topics.

The revised and expanded material should be reflected in the short description.

The increase in credit hours is necessary to accommodate the additional material in the new course. During the course that was taught in the Winter 2011, it was common for the students and instructor to remain in the classroom 20-30 minutes after the scheduled ending time to continue to discuss the lecture.

Finally, please remove NA 500 as an advised prerequisite as it is no longer offered.

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

Detail the Special requirements

The original course included a special request for the commercial software ShipFlow. This software is no longer relevant, and the revised course will use the opensource CFD library OpenFOAM. OpenFOAM has been installed on the CAEN network as part of their linux platform, and it is requested that CAEN continue to support this software for the purpose of this class.

Proposal for the ME SJTU-SGUS Program

Summary

We propose SGUS program for students receiving ME BS degrees from the UM-SJTU Joint Institute (JI) that will allow such students to earn a masters in ME, while double counting up to 6 credit hours between their bachelor's and master's programs.

SJTU-SGUS is available to UM-SJTU JI students who study in Shanghai, but not those who come to Ann Arbor as part of the JI. The latter receive two degrees, one from UM and one from SJTU JI, whereas the former receive only one degree from the UM-SJTU JI. Since credits earned here by the latter (SJTU students studying at UM) count towards two degrees, it is not considered appropriate that they count also towards a third degree (the masters).

The SJTU-SGUS program is largely patterned after the SGUS programs offered by most CoE graduate programs. However, it allows double counting fewer credits than is typical for an SGUS program.

It is proposed here that the ME Graduate Program partners with the ME Undergraduate Program of the SJTU JI.

SJTU-SUGS Requirements

1. Students admitted to the ME SJTU-SGUS will enroll in the chosen master degree plan program upon completion of their JI undergraduate degree. The undergraduate degree must be awarded before matriculation into the master's program.
2. Students must enroll in the masters program for at least two full terms, paying full tuition.
3. Students must complete at least 24 credit hours in residence at UM Ann Arbor.
4. Students may not be simultaneously enrolled in any other UM program.
5. Students may count up to 6 credits from their SJTU JI bachelor's degree towards the master's. These are the "double counted" credits. This happens by transferring the courses to their Rackham transcript. If the specific courses from which the double counted credits are to come total more than 6 credit hours, e.g. two 4 credit classes, then all of the credits appear on the graduate transcript, but only 6 count towards the 30 required for the master's degree. The balance of any credit hours cannot be counted toward any other graduate program at UM or SJTU. The balance can count towards the undergraduate program at the JI.
6. To be double counted, credits must
    a. be graduate level
    b. be taken during the Junior or Senior year
    c. have received a grade of B or better
    d. be acceptable towards the 30 credit Master's requirement
    e. be approved by the graduate program (normally at the time of admission) and approved also by the undergraduate program

f. not be part of the required core coursework for the JI BS; however, they can be courses taken to meet technical or general elective requirements

7. Double counted credits may have been taken prior to admission to the SJTU-SGUS.
8. No credits can be triple counted, i.e. counted towards any degree other than the JI BS and the ME MS.
9. A student's Rackham transcript, including transfer credits and credits in residence must fulfill all master's requirements, with the usual provision for equivalency for courses that do not appear on the transcript.
10. Students earning any two bachelor degrees (e.g. from both UM and the JI) are not eligible for the SJTU-SGUS.

Admissions

1. JI students apply for admission to the MS ME SJTU-SGUS by submitting the Rackham application (including statement of purpose, personal statement, letters of recommendation, etc.), application fee, other required credentials, ToEFL or MeLab scores, and the SJTU-SGUS Course Election Form (see attached draft). (Financial resource information will be needed if accepted.)
2. GRE scores are not required
3. Applications can be submitted at any time in the second semester (ending in August) of the 3rd year of study at the JI, through January 15 of the senior year. An academic transcript through at least the second semester of the 3rd year is needed for the admissions decision. If the student applies during the second semester of the 3rd year, the transcript will need to be sent immediately after the term ends.
4. On the SJTU-SGUS Election Form, the applicant lists JI courses proposed for double counting and a plan of study for the master's, both approved by the SJTU-SGUS undergraduate advisor. Approval by the grad chair is required for admission.
5. The ME Program will make admission decisions based on the qualifications of the applicant and the number of students the program can accommodate. For admission, applicants must have a minimum GPA of 3.6 and maintain this.
6. It is anticipated that when JI students apply during or after the second (summer) semester of the 3rd year, an admissions decision can be made soon enough to permit admitted students to choose the Fall schedule of their senior year to take a class or classes that can be double counted. For this to happen, admissions decisions would need to be made by mid-September, and be based on informal transcripts from the summer semester (followed later by an official transcript).
7. An admission letter and pre-enrollment materials will be sent to applicants offered admission.

SJTU-SGUS Course Election Form

As part of the application process, the student, in consultation with the SJTU JI undergraduate SGUS advisor, will submit a SJTU-SGUS course election form, which proposes a plan of study for the MS degree, and courses proposed for double counting. If the student is admitted, the plan of study and the courses proposed for double counting will either be approved, or a modification will be proposed. Changes to the MS plan of study or the courses proposed for double counting may also be made after the student arrives in Ann Arbor, subject to the approval of a graduate advisor.

SJTU-SGUS Course Election Form

Student Name _____ ID # _____

Rackham Degree Program Mechanical Engineering

JI Degree Expected _____ Date/Year to be Awarded _____

JI Courses to double count & transfer (≤ 6)		UM Courses to Complete program (≥24)	
Course	Credits	Course	Credits
Total		Total	

SIGNATURES:

Student _____

(signature) (name printed) (date)

JI Advisor _____

(signature) (name printed) (date)

UM Grad Chair _____

(signature) (name printed) (date)

Rackham Graduate Approval (For Rackham MS degrees)

_____

(signature) (name printed) (date)