SOUTH DAKOTA BOARD OF REGENTS  
New Course Request

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<td>SDSU</td>
<td>Mechanical Engineering</td>
<td>Laurie Stenberg Nichols</td>
<td>1/22/2013</td>
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**Section 1. Course Title and Description**

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<th>Prefix &amp; No.</th>
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<td>ME 442/542</td>
<td>Applications of Computational Fluid Dynamics</td>
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**Course Description** This course provides a background and working knowledge of software analysis tools, techniques and methodologies utilized in modern engineering practice in computational fluid dynamics (CFD). The course builds upon fundamental concepts of thermodynamics, fluid mechanics, and computer-aided design and analysis and applies these principles within high-fidelity computational models to solve theoretical and practical problems commonly encountered with thermal fluid and energy systems. This course provides students with team-centered collaborative opportunities to practice CFD analysis in engineering design applications.

**Pre-requisites:** MATH 321, EM 331, ME 311 (undergraduate only)

**Section 2. Review of Course**

Will this be a common or unique course? (select the appropriate option below)

- [X] This course will be a unique course. (Go to Section 3.)

**Section 3. Other Course Information**

1. Are there instructional staffing impacts?

- [X] No, schedule management. Explain: This is a technical elective course, previously offered as special topics. It will be offered in rotation with other technical electives with no net change in staffing required.

2. Existing program in which course will be offered:

   Mechanical Engineering

3. Proposed instructional method:

   R (Lecture)

   Provide a brief justification: The course will be delivered primarily in a traditional lecture format with opportunities for active learning.

4. Proposed primary delivery:

   001 Face to Face Term Based Instruction

5. Term in which change will be effective:

   Fall 2013

Course Form #5  
Updated AAC 03/2007
6. Can this course be repeated for additional credit? No

7. Will the grade for this course be limited to S/U (pass/fail)? No

8. Will section enrollments be capped? Yes, maximum per section 25 (15 undergrad, 10 grad)

9. Will this course be equated (i.e. considered the same course for degree completion) with any other unique or common course in the course database? No

10. Is this prefix already approved for your university? Yes

Section 4. To be completed by Academic Affairs

1. University department code: SME

2. Proposed CIP code: 141901

   Is this a new CIP code for this university? Yes No

NEW COURSE REQUEST
Supporting Justification for On-Campus Review

Stephen Gent
Request Originator
Signature 10/12/12/

Kurt Bassett
Department Chair
Signature 10/12/12

Lewis Brown
School/College Dean
Signature Date

1. Provide specific reasons for the proposal of this course and explain how the changes enhance the curriculum.

   Computational Fluid Dynamics (CFD) analysis is widely used in modern engineering practice. This course provides students with a sound basis in the theory and applications of CFD, enabling them to enter the workforce ready to use these techniques. The course will improve the relevance of the program to current engineering methods. It has proven very popular under previous offerings as a Special Topics course.

2. Note whether this course is: Required Elective

   Required

3. In addition to the major/program in which this course is offered, what other majors/programs will be affected by this course?

   None.

4. If this will be a dual listed course, indicate how the distinction between the two levels will be made.
Both undergraduate students and graduate students will attend the classes and labs and will need to successfully complete required assignments and coursework. Graduate students will be assigned separate exercises and projects requiring advanced analytical and reporting skills. These exercises will be used to evaluate graduate students differently from undergraduate students.

5. Desired section size  25 (15 undergrad, 10 (grad)

6. Provide qualifications of faculty who will teach this course. List name(s), rank(s), and degree(s).

Stephen Gent, Ph.D. Assistant Professor of Mechanical Engineering

7. Note whether adequate facilities are available and list any special equipment that will be needed for the course.

The current facilities are adequate for offering this course. No additional facilities are required.

8. Note whether adequate library and media support are available for the course.

Adequate library and media support are available for this course.

9. Will the new course duplicate courses currently being offered on this campus?

X Yes  No

If yes, provide justification. N/A.

10. If this course may be offered for variable credit, explain how the amount of credit at each offering is to be determined.

This course will not be offered for variable credit.