

## COURSE MODIFICATION PROPOSAL

College: [ **Engineering and Computer Science** ] Department: [ **Mechanical Engineering** ]

### 1. Current Catalog Entry Information:

Subject Abbreviation and Number: [ **ME 590** ]

Course Title: [ **Advanced Fluid Dynamics** ]

Units: [ **3** ] units

General Education Section [     ] (if applicable)

### 2. Date of Proposed Implementation: (Semester/Year): [ **Fall** ] / [ **2016** ] *Comments*

### 3. Course Level:

☐ Undergraduate Only

☒ Graduate Only

☐ Graduate/Undergraduate

### 4. Nature of Request:

☐ Delete Course (*Note: Record of course will remain in inactive course file*)

☐ Change unit value from [   ] units to [   ] units

☐ Change course type (classification) such as lecture-discussion, laboratory, activity, etc.:

**From:** [   ] units @ [   ] to [   ] units @ [   ]

**From:** [   ] units @ [   ] to [   ] units @ [   ]

☐ Change course title to: [   ]

☐ Change course abbreviation "Short title" (Maximum of 17 characters and spaces) to

NEW Short Title: [ ..... ]

☒ Change current catalog course description (*Attach current and proposed catalog course description*)

**Notes:** If grading is NC/CR only, please state in course description. If a course numbered less than 500 is available for graduate credit, please state "Available for graduate credit in the catalog description."

☐ Change subject abbreviation number to: (*Example: HSCI 100 to PT 105*) [   ]

☒ Change requisites (*Prerequisites, Corequisites, Preparatory, Recommended Corequisites*)

**From:** [ **Prerequisite: ME 490** ]

**To:** [ **Prerequisites: Background equivalent to a two semester undergraduate course sequence in fluid mechanics; enrollment for graduate students only.**

**Corequisite: ME 501A or equivalent. ]**

☐ Change Current Basis of Grading

**From:** ☐ Credit/No Credit Only

☐ Letter Grade Only

☐ CR/NC or Letter Grade

**To:** ☐ Credit/No Credit Only

☐ Letter Grade Only

☐ CR/NC or Letter Grade

☐ Add course to GE Section [     ]

☐ Remove course from GE Section [     ]

- ☐ Change course from GE section [    ] to GE section [    ]
- ☐ Change course to a Community Service Learning course (CS)
- ☐ Allow multiple enrollments within a semester.
- ☐ Change number of times this course may be taken:  
May be taken for credit for a total of [    ] times, or for a maximum of [    ] units
- ☐ Multiple enrollments are allowed within a semester
- ☐ Crosslist this course with [    ]
- ☐ Other: [    ]

**5. Justification and Clarification of Request** *(Attach)*

**6. Estimated Impact on Resources within the Department, for other Departments and the University.***(Attach)*

*(See Resource List)*

**7. Impact on other Departments' programs** *(Attach)*

**8. Indicate which of the Program's Measurable Student Learning Outcomes are addressed in this course.** *(Attach)*

*(see Course Alignment Matrix and the Course Objectives Chart)*

**9. If this is a General Education course, indicate how the General Education Measurable Student Learning Outcomes (from the appropriate section) are addressed in this course.** *(Attach)*

**10. Methods of Assessment for Measurable Student Learning Outcomes** *(Attach)*

- A. Assessment tools
- B. Describe the procedure dept/program will use to ensure the faculty teaching the course will be involved in the assessment process (refer to the university's policy on assessment.)

**11. Record of Consultation:** *(Normally all consultation should be with a department chair or program coordinator.) If more space is needed attach statement and supporting memoranda.*

Date:		Dept/College:		Department Chair/Program Coordinator		Concur (Y/N)
[ 3/5/2015 ]		[ CECM/ECS ]		[ N. Dermendjian ]		[ Y ]
[ 3/5/2015 ]		[ CS/ECS ]		[ R. Covington ]		[ Y ]
[ 3/5/2015 ]		[ ECE/ECS ]		[ A. Amini ]		[ Y ]
[ 3/5/2015 ]		[ E/ECS ]		[ H. Johari ]		[ Y ]

[ 3/5/2015 ]	[ MSEM/ECS ]	[ K. Chang ]	[ Y ]
[ ]	[ ]	[ ]	[ ]

Consultation with the Oviatt Library is **recommended** for course modifications to ensure the availability of appropriate resources to support proposed course curriculum.

**Collection Development Coordinator**

**Please send an email to:** collection.development@csun.edu

**Date**

[ ]

## 12. Approvals:

Department Chair/Program Coordinator:	Hamid Johari	Date:	[3/5/2015]
College (Dean or Associate Dean):	Robert Ryan	Date:	[4/15/2015]
Educational Policies Committee:		Date:	[ ]
Graduate Studies Committee:		Date:	[ ]
Provost:		Date:	[ ]

## 5. Justification and Clarification of the Request

Advanced Fluid Dynamics ME 590 is a course on the fundamentals of fluid motion at the graduate level. The current course description refers to the content in earlier offerings of the course, which was geared toward compressible fluid flow instead of the fundamentals. Thus, it is proposed to modify the course catalog description to more accurately reflect the current content of the course.

Moreover, due to the increased student enrollment in the department, a number of undergraduate students tend to take this course. This modification requests changing the prerequisite to restrict the enrollment to graduate students to better reflect the advanced nature of this course. In this manner our graduate students will be able to take this course without being crowded out by undergraduate enrollment.

### Current Catalog Course Description

ME 590. Advanced Fluid Dynamics (3)

Prerequisite: ME 490. Analytical and computational techniques for the solution of fluid dynamic problems. Topics include generalized 1-dimensional compressible flows, unsteady and 2-dimensional compressible flows, method of characteristics, compressible laminar and turbulent boundary layers, transition to turbulence, turbulent stress models and application of computational codes to the solution of practical problems.

## **Proposed Catalog Course Description**

ME 590. Advanced Fluid Dynamics (3)

Prerequisites: Background equivalent to a two semester undergraduate course sequence in fluid mechanics; enrollment for graduate students only. Corequisite: ME 501A or equivalent. Derivation of conservation equations from fundamental principles and the constitutive relations for Newtonian fluids. Exact solutions of the Navier-Stokes equations, including transient and oscillatory solutions. Laminar and turbulent boundary layers as well as Stokes flow solutions. Introduction to the vorticity equation and vortex dynamics. Potential flow applications.

### **6. Estimated Impact on Resources within the Department, for other Departments and the University**

This change will reduce the overall course enrollment, which will improve access to the course for graduate students and allow the course to be taught at the appropriate level.

### **7. Impact on other Department's programs**

There is none. This course is only taken by mechanical engineering majors.