REQUEST FOR A COURSE CHANGE
University of Central Oklahoma

Course Subject (Prefix), Number, and Title:

Existing: ENGR 4313 Fluid Dynamics

Proposed: ENGR 4313 Intro. to Comp. Fluid Dynamics

Proposed Title: (full course title if longer than 30 characters)

Introduction to Computational Fluid Dynamics

Proposed change(s) to this course: Mark all that apply.

Credit Hour Level X Title X Description Prerequisite Enrollment Restriction

Other:

CIP Code If changing, what is the new code?

For more information regarding CIP codes contact your department chair or visit:
http://www.uco.edu/academic-affairs/ir/program_inventory.asp.

Course description:

As it appears in the current catalog. (required)

The fundamental equations and solution methods of fluid dynamics are presented with particular attention to solving the Navier-Stokes equation. Topics covered will include mass conservation, momentum and energy equations, potential flow, incompressible and compressible flows, viscous flow, similarity and dimensional analysis, boundary layer theory, vorticity, and turbulent flow.

Existing: As it will appear in the next catalog or indicate no change. (Please use standard American English including full sentences.) Course descriptions only. Do not include prerequisites or enrollment restrictions, these should be added under questions 9-15.

This course covers the fundamentals and analysis of Navier-Stokes equation and its solution methods using computational fluid dynamics. Topics include fundamentals of mass conservation, momentum and energy equations, potential flow, incompressible and compressible flows, viscous flows, and basic concepts and application of finite volume methods in designing fluidic systems.

Proposed:

Engineering and Physics

Department submitting the proposal

Mohammad Robi Hossan mhossan@uco.edu 5295 Ext. number

Person to contact with questions email address

Approved by:

Department Chairperson Date

College Curriculum Committee Chair Date

(Please notify department chair when proposal is forwarded to dean.)

College Dean Date

(Please notify department chair when proposal is forwarded to AA.)

JCGS Dean (for Graduate Proposals) Date

Academic Affairs Curriculum or Graduate Council Date

(undergraduate proposals only)

Office of Academic Affairs Date

Effective Term (assigned by AA)

Functional Review CF 9/29/20

Digital signature by Brittany Hopkins

Date: 2020.09.28
18:28:17-05'00'
1. Does this course have an undergraduate/graduate counterpart?  
   X  Yes  ____ No

2. Is this proposal part of a larger submission package including a program change?  
   ____ Yes  X  No

3. Does this course affect a teacher preparation program? (All courses required for any teacher preparation program must have approval from the Council on Teacher Education (CTE) before approval from AACC or Graduate Council.)  
   ____ Yes  X  No  If yes, send copy of proposal to the Education Curriculum Committee Chair, Dr. Darla Fent
   CTE Approval (Stamp or initial): _______________________

4. Is this course currently listed in the University Core?  
   ____ Yes  X  No  If you wish this course be listed in the University Core, submit University Core course proposal.

5. Is this course a prerequisite for any other course(s)?  
   ____ Yes  X  No  If this change affects the prerequisite, complete course change proposal to delete or change prerequisite.

6. Is this course a requirement in any major or minor?  
   ____ Yes  X  No  If this change impacts the requirement of any major or minor, complete program change proposal.

7. Does this course affect majors or minors outside the department?  
   ____ Yes  X  No  If yes, provide name(s) of department chair(s) contacted, the dates, and the results of the discussion.

8. List all majors or minors which include this changed course as a requirement or elective.  
   (list major or minor by title not major code)
   Mechanical Engineering – Mechanical Engineering, Engineering Physics – Physics, Biomedical Engineering – Biomedical Engineering

9. Prerequisite courses:  
   Will the prerequisite courses change?  ____ Yes  X  No  If yes, fill out below, if no leave blank.

   NOTE: Adding a “new course” as a prerequisite to an existing course will likely cause enrollment problems.

   As listed at the end of the course description in the current catalog. (Required)

   Existing: ____________________________

   Proposed: ____________________________

   Example 1: MATH 1213 and (MATH 2165 or MATH 2185) and CHEM 1213
   Example 2: (ACCT 2113 and 2213) and (MGMT 3013 or 3613)
   Example 3: 8 hours of biology including BIO 1404

10. Co-requisite(s): Prerequisite courses that may be taken in the same semester.  
    Will the co-requisite(s) change?  ____ Yes  X  No  If yes, fill out below, if no leave blank.

    As listed at the end of the course description in the current catalog. (Required)

    Existing: ____________________________

    Proposed: ____________________________

11. Concurrent enrollment: Courses that must be taken the same semester. Example: lab courses.  
    Will the concurrent enrollment change?  ____ Yes  X  No  If yes, fill out below, if no leave blank.

    As listed at the end of the course description in the current catalog. (Required)

    Existing: ____________________________

    Proposed: ____________________________
12. Does this course currently have enrollment restrictions?  
   If adding or changing enrollment restrictions answer questions 13-15. If not changing or add enrollment restrictions leave questions 13-15 blank.

   ____ Yes  X  No

13. Specify which major(s) may or may not take this course.

   Will the major(s) restriction change?  ____ Yes  X  No  If yes, fill out below, if no leave blank.

   Specifying a major, excludes all other majors from enrolling.

   **Existing** (as appears in current catalog)
   
   Check one:  ____ May  ____ May not

   **Major Code:**

   **Proposed** (if changing)
   
   Check one:  ____ May  ____ May not

   **Major Code:**

14. Which of the following student classification(s) may enroll in this course?

   Will the classification restriction change?  ____ Yes  X  No  If yes, fill out below, if no leave blank.

   **Existing** (as appears in current catalog)  
   Check all that apply:

   - Graduate  (2) 19 + hours
   - Graduate  (1) 0-18 hours
   - Post  
     - Baccalaureate
     - Senior
     - Junior
     - Sophomore
     - Freshman

   **Proposed** (if changing)
   Check all that apply:

   - Graduate  (2) 19 + hours
   - Graduate  (1) 0-18 hours
   - Post  
     - Baccalaureate
     - Senior
     - Junior
     - Sophomore
     - Freshman

15. Specify other restrictions for this course, if any.

   Will other restrictions change?  ____ Yes  X  No  If yes, fill out below, if no leave blank.

   **Existing** (as appears in current catalog)  

   **Proposed** (if changing)

   **Admission to Graduate Programs**

   **Admission to Nursing Program**

   **Admission to Teacher Education**

   **Other:**

16. Course objectives for this course: (Please refer to instructional objectives documents at: https://spaces.uco.edu/display/aaceproposals/UCO+AACC-main+page#UCOAACC-mainpage-faq-helpful-hints.)

   If previously approved objectives will be used without any changes, check here  ____

   As they appear in the course syllabus.

   **Existing:**
   1. Analyze complex fluid systems using the Navier-Stokes equation.
   2. Design fluid systems to achieve well-defined engineering objectives.
   3. Derive the basic equations and state the underlying concepts of fluid dynamics
   4. Demonstrate the importance of the Reynolds number and other non-dimensional parameters
   5. Be able to visualize simple flow patterns and sketch them
   6. Be able to solve problems involving viscous flow.

   As they will appear in the updated syllabus.

   **Proposed:**
   Upon completion of this course, students will be able to
   1. Analyze complex fluid systems using the Navier-Stokes equation;
   2. Design fluid systems to achieve well-defined engineering objectives;
3. Derive the basic equations and state the underlying concepts of fluid dynamics;
4. Demonstrate the understanding of the solution methodologies of fluid mechanics, and be able relate them
to design methods for common aerodynamic and hydraulic systems;
5. Apply basic computational fluid dynamics principles in solving fluid dynamic problems;
6. Demonstrate the understanding of the basics of finite volume methods and its application in analyzing
 thermo-fluid systems;
7. Demonstrate the ability to perform mathematical modeling and simulation using computer software.

17. Please provide a concise, yet comprehensive, statement that explains the specific reasons for
requesting the change(s). Include any documentation or assessment information available supporting this
specific request.
   The course content has been broadened and upgraded to accommodate computational aspects
   of fluid dynamics and relevant details of computer simulation. Mathematical modeling and
   computer simulation aspects of fluid dynamics have become important to design thermal and
   fluidic systems in modern engineering designs. This will be the first exposure of students to the
   advanced topics. The upgraded content will provide students necessary skills and backgrounds to
   be successful in future careers.

18. Clearly explain how the characteristics of this course meet or exceed those outlined in Course
Level Characteristics. Complete this question only if requesting a course level change. (Copy and paste
   table from “Course Level Characteristics” document for the appropriate course level of proposed course.
   Document may be found on: https://spaces.uco.edu/display/aaccproposals/UCO+AACC-main+page#UCO+AACC-
   mainpage-faq-helpful-hints .
   N/A