

DOCUMENTS OF THE GENERAL FACULTY

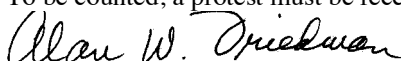
**PROPOSED CHANGES TO THE COMPUTATIONAL ENGINEERING DEGREE PROGRAM IN
THE COCKRELL SCHOOL OF ENGINEERING CHAPTER IN THE *UNDERGRADUATE CATALOG*
2018-2020**

Dean Sharon L. Wood in the Cockrell School of Engineering has filed with the Secretary of the Faculty Council the following proposal to change the Computational Engineering degree program in the Cockrell School of Engineering chapter in the *Undergraduate Catalog, 2018-2020*. The Computational Engineering faculty approved the proposal on April 27, 2017; the Degrees and Courses Committee approved it on May 24, 2017; the Dean and the College faculty approved it on September 18, 2017. The Secretary has classified this proposal as legislation of exclusive interest to one college or school.

The Committee on Undergraduate Degree Program Review recommended approval of the proposal on December 5, 2017, and forwarded it to the Office of the General Faculty. The Faculty Council has the authority to approve this legislation on behalf of the General Faculty. The authority to grant final approval on this legislation resides with the Provost on behalf of the President.

If no objection is filed with the Office of the General Faculty by the date specified below, the legislation will be held to have been approved by the Faculty Council. If an objection is filed within the prescribed period, the legislation will be presented to the Faculty Council at its next meeting. The objection, with reasons, must be signed by a member of the Faculty Council.

To be counted, a protest must be received in the Office of the General Faculty by December 12, 2017.



Alan W. Friedman, Secretary of the General Faculty and Faculty Council
The University of Texas at Austin

Arthur J. Thaman and Wilhelmina Doré Thaman Professor of English and Comparative Literature

**PROPOSED CHANGES TO THE COMPUTATIONAL ENGINEERING DEGREE PROGRAM IN
THE COCKRELL SCHOOL OF ENGINEERING CHAPTER IN THE *UNDERGRADUATE CATALOG*
2018-2020**

TYPE OF CHANGE: Academic Change
 Degree Program Change (THECB form required)

PROPOSED CLASSIFICATION: Exclusive General Major

1. IF THE ANSWER TO ANY OF THE FOLLOWING QUESTIONS IS YES, THE COLLEGE MUST CONSULT LINDA DICKENS, DIRECTOR OF ACCREDITATION AND ASSESSMENT, TO DETERMINE IF SACSCOC APPROVAL IS REQUIRED.

- | | | |
|--|------------------------------|--|
| • Is this a new degree program? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| • Is this program being deleted? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| • Does the program offer courses that will be taught off campus? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |
| • Will courses in this program be delivered electronically? | Yes <input type="checkbox"/> | No <input checked="" type="checkbox"/> |

2. EXPLAIN CHANGE TO DEGREE PROGRAM AND GIVE A DETAILED RATIONALE FOR EACH INDIVIDUAL CHANGE:

Deleted the ‘Design systems...’ bullet-point from the Program Educational Objectives to better reflect the implementation of the degree program.

Updated the ‘Portable Computing Devices’ section: 1) changed listed software to reflect the proper capitalization of the name of the software, 2) added additional software that is now a component of a required class, 3) added information about the need to access a remote server, and 4) updated the information about where to find minimum and required computing specifications.

Degree requirement updates (reflected in the ‘Requirements’ section and the ‘Suggested Arrangement of Courses’) that will not require inventory updates: 1) remove COE 111L from required coursework-- the content of this course will be moved to a new course added as COE 322 and outlined below; 2) remove SDS 322 from required coursework and change to an optional substitute for COE 322 outlined below; 3) remove SDS 329C from required coursework; 4) remove COE 373 from required coursework—the intention of this class will be covered in a new course added as COE 332 and outlined below; and 5) add three hours of technical elective coursework.

Inventory updates (reflected in the ‘Requirements’ section and the ‘Suggested Arrangement of Courses’) already submitted for fall 2017 and spring 2018: 1) changed ASE 321K to COE 321K to reflect the content of the coursework that is more Computational than Aerospace-related; 2) changed ASE 347 to COE 347 to reflect the content of coursework that is more Computational than Aerospace-related; and 3) changed ME 320 to ME 310T to reflect the inventory change that was completed by the Department of Mechanical Engineering in fall 2016.

Inventory updates (reflected in the ‘Requirements’ section and the ‘Suggested Arrangement of Courses’) planned to be submitted for fall 2018: 1) Change COE 211K to 311K (two-hour to three-hour) in order to reflect the actual coursework and teaching hours needed for the course content; 2) Add COE 322 (Intro to Scientific Computation)—this course will take the place of SDS 322 in degree requirements (although SDS 322 will also still be allowed to count as a substitute for COE 322) and will be designed alongside TACC to incorporate content once covered in COE 111L as well as new content in data structures; and 3) Add COE 332 (Software Design)—this course will offer three hours of design in software engineering.

3. THIS PROPOSAL INVOLVES: (Please check all that apply)

- | | | |
|--|--|--|
| <input type="checkbox"/> Courses in other colleges | <input type="checkbox"/> Courses in proposer's college that are frequently taken by students in other colleges | <input type="checkbox"/> Flags |
| <input type="checkbox"/> Course in the core curriculum | <input type="checkbox"/> Change in course sequencing for an existing program | <input checked="" type="checkbox"/> Courses that have to be added to the inventory |
| <input type="checkbox"/> Change in admission requirements (external or internal) | <input type="checkbox"/> Requirements not explicit in the catalog language (e.g., lists of acceptable courses maintained by department office) | |

4. SCOPE OF PROPOSED CHANGE:

- a. Does this proposal impact other colleges/schools? Yes No
If yes, then how would you do so?
- b. Do you anticipate a net change in the number of students in your college? Yes No
If yes, how many more (or fewer) students do you expect?
- c. Do you anticipate a net increase (or decrease) in the number of students from outside of your college taking classes in your college? Yes No
If yes, please indicate the number of students and/or class seats involved.
- d. Do you anticipate a net increase (or decrease) in the number of students from your college taking courses in other colleges? Yes No
If yes, please indicate the number of students and/or class seats involved.

If 4 a, b, c, or d was answered with yes, please answer the following questions:

If the proposal has potential budgetary impacts for another college/school, such as requiring new sections or a non-negligible increase in the number of seats offered, at least one contact must be at the college-level.

How many students do you expect to be impacted?

Impacted schools must be contacted and their response(s) included:

Person communicated with:

Date of communication:

Response:

- e. Does this proposal involve changes to the core curriculum or other basic education requirements (42-hour core, signature courses, flags)? If yes, explain:

If yes, Undergraduate Studies must be informed of the proposed changes and their response included:

Person communicated with:

Date of communication:

Response:

- f. Will this proposal change the number of hours required for degree completion? NO

Note: THECB Semester Credit Hour Change Form required, download from URL:

<http://www.thecb.state.tx.us/reports/DocFetch.cfm?DocID=2419&format=doc>

If yes, explain:

5. COLLEGE/SCHOOL APPROVAL PROCESS

| | | |
|---------------------------|--------------------|--|
| Department approval date: | May 12, 2017 | Dr. Noel Clemens, Chair |
| | May 11, 2017 | ASE/EM Faculty |
| | April 27, 2017 | COE Undergraduate Curriculum Committee |
| College approval date: | May 24, 2017 | CSE Degrees & Courses Committee |
| Dean approval date: | September 18, 2017 | CSE Faculty and Sharon L. Wood, Dean |

PROPOSED NEW CATALOG TEXT:

BACHELOR OF SCIENCE IN COMPUTATIONAL ENGINEERING

{No changes up to this point.}

Program Educational Objectives

Within a few years of graduation, computational engineering graduates should:

- Contribute to the economic development of Texas and beyond through the ethical practice of computational engineering in industry and public service
- Exhibit leadership in technical or business activity through engineering ability, communication skills, and knowledge of contemporary and global issues
- Continue to educate themselves through professional study and personal research
- Be prepared for admission to, and to excel in, the best graduate programs in the world
- ~~[Design systems to collect, encode, store, transmit, and process energy and information, and to evaluate system performance, either individually or in teams]~~
- Use their engineering ability and creative potential to create technology that will improve the quality of life in society

Portable Computing Devices

Students entering computational engineering are required to have access to a portable computing device capable of running the software tools required for undergraduate engineering analyses (~~[MatLab]~~ MATLAB, SOLIDWORKS, Word, Excel, etc) and accessing to the remote server for the department. This device does not need to be brought to campus on a daily basis, but individual courses may require that the device be brought to certain lectures, labs, and/or exams. ~~[Once admitted, students will be informed by the Aerospace Engineering and Engineering Mechanics Department office about specific device requirements.]~~ Minimum and recommended specifications may be found on the department website.

Curriculum

Course requirements include courses within the Cockrell School of Engineering and other required courses. In addition, each student must complete the University's Core Curriculum. In some cases, a course that fulfills one of the following requirements may also be counted toward core curriculum or flag requirements; these courses are identified below.

In the process of fulfilling engineering degree requirements, students must also complete coursework to satisfy the following flag requirements: one independent inquiry flag, one quantitative reasoning flag, one ethics and leadership flag, one global cultures flag, one cultural diversity in the United States flag, and two writing flags. The independent inquiry flag, the quantitative reasoning flag, the ethics and leadership flag, and both writing flags are carried by courses specifically required for the degree; these courses are identified below. Courses that may be used to fulfill flag requirements are identified in the *Course Schedule*.

Courses used to fulfill technical elective requirements must be approved by the computational engineering faculty before the student enrolls in them.

The student must take all courses required for the degree on the letter-grade basis and must earn a grade of at least C- in each course, except for those listed as Remaining Core Curriculum Courses. He or she must also maintain grade point averages of at least 2.00 in the major area of study and in required technical courses as described in Academic Standards, and a cumulative University grade point average of at least 2.00 as described in *General Information*.

| Requirements | | Hours |
|--|---|-------------------------|
| Computational Engineering Courses | | |
| [COE 111L | Engineering Computation Laboratory | 1] |
| COE [211K] 311K | Engineering Computation | <u>3</u> [2] |
| COE 301 | Introduction to Computer Programming | 3 |
| <u>COE 321K</u> | <u>Computational Methods for Structural Analysis</u> | <u>3</u> |
| <u>COE 322</u> | <u>Intro to Scientific Computation</u> | <u>3</u> |
| <u>COE 332</u> | <u>Software Engineering</u> | <u>3</u> |
| <u>COE 347</u> | <u>Introduction to Computational Fluid Dynamics</u> | <u>3</u> |
| COE 352 | Advanced Scientific Computation | 3 |
| COE 371 | Applied Mathematics I | 3 |
| COE 372 | Applied Mathematics II | 3 |
| [COE 373 | Systems Engineering Design | 3] |
| COE 374 | Senior Design Project (writing flag and independent inquiry flag) | 3 |
| Aerospace Engineering | | |
| ASE 320 | Low-Speed Aerodynamics | 3 |
| [ASE 321K | Computational Methods for Structural Analysis | 3] |
| ASE 330M | Linear System Analysis | 3 |
| ASE 333T | Engineering Communication (writing flag and ethics and leadership flag) | 3 |
| [ASE 347 | Introduction to Computational Fluid Dynamics | 3] |
| ASE 375 | Electromechanical Systems | 3 |
| Chemistry | | |
| CH 301 | Principles of Chemistry I (part II science and technology) | 3 |
| Engineering Mechanics | | |
| E M 306 | Statics | 3 |
| E M 311M | Dynamics | 3 |
| E M 319 | Mechanics of Solids | 3 |
| Mathematics | | |
| M 408C | Differential and Integral Calculus (mathematics; quantitative reasoning flag) | 4 |
| M 408D | Sequences, Series, and Multivariable Calculus | 4 |
| M 427J | Differential Equations with Linear Algebra (quantitative reasoning flag) | 4 |
| or M 427K | Advanced Calculus for Applications I | |
| M 427L | Advanced Calculus for Applications II | 4 |
| M 362K | Probability I | 3 |

Mechanical Engineering Courses

| | | |
|-------------------------|-----------------------------|---|
| M E 210 | Engineering Design Graphics | 2 |
| M E 320 310T | Applied Thermodynamics | 3 |

Physics

| | | |
|----------|---|---|
| PHY 103M | Laboratory for Physics 303K | 1 |
| PHY 103N | Laboratory for Physics 303L | 1 |
| PHY 303K | Engineering Physics I (part I science and technology; quantitative reasoning flag) | 3 |
| PHY 303L | Engineering Physics II (part I science and technology; quantitative reasoning flag) | 3 |

Other required courses

| | | |
|------------------------------|---|---------------|
| Approved technical electives | | 9 [6] |
| [SDS 322 | Introduction to Scientific Programming | 3] |
| [SDS 329C | Practical Linear Algebra I | 3] |

Rhetoric and Writing

| | | |
|---------|--|---|
| RHE 306 | Rhetoric and Writing (English composition) | 3 |
|---------|--|---|

Remaining Core Curriculum Courses

| | | |
|-------------|--|-----|
| E 316L | British Literature (humanities; in E 316L, 316M, 316N, and 316P some sections carry a global cultures or cultural diversity flag) | 3 |
| or E 316M | American Literature (humanities; some sections carry a global cultures or cultural diversity flag) | |
| or E 316N | World Literature (humanities; some sections carry a global cultures or cultural diversity flag) | |
| or E 316P | Masterworks of Literature (humanities; some sections carry a global cultures or cultural diversity flag) | |
| | American and Texas government (some sections carry a cultural diversity flag) | 6 |
| | American history (some sections carry a cultural diversity flag) | 6 |
| | Social and behavioral sciences (some sections carry a global cultures and/or cultural diversity flag) | 3 |
| | Visual and performing arts (some sections carry a global cultures and/or cultural diversity flag) | 3 |
| UGS 302 | First-Year Signature Course (in UGS 302 all sections carry writing flag; in UGS 303 some sections carry a writing flag) | 3 |
| or UGS 303 | First-Year Signature Course (in UGS 303 some sections carry a writing flag) | |
| Total Hours | | 122 |

SUGGESTED ARRANGEMENT OF COURSES

First Year

| First Term | Hours | Second Term | Hours |
|--|-------|--|----------------|
| UGS 302 or 303 | 3 | COE 301 | 3 |
| CH 301 | 3 | M 408D | 4 |
| M 408C | 4 | PHY 303K | 3 |
| RHE 306 | 3 | PHY 103M | 1 |
| Social and behavioral sciences or visual and performing arts | 3 | [American and Texas government] <u>ME 210</u> | <u>2</u> [3] |
| | | American history | 3 |
| | 16 | | <u>16</u> [17] |

Second Year

| First Term | Hours | Second Term | Hours |
|------------------------------------|----------------|--|--------------|
| E M 306 | 3 | COE [211K] <u>311K</u> | <u>3</u> [2] |
| M 427J or 427K | 4 | [COE 111L] | [1] |
| PHY 303L | 3 | E M 311M | 3 |
| PHY 103N | 1 | [E M 319] <u>COE 332</u> | 3 |
| [ME 210] <u>COE 322</u> | <u>3</u> [2] | M 427L | 4 |
| <u>M E 310T</u> | 3 | [ASE 333T] <u>American and Texas government</u> | 3 |
| | <u>17</u> [16] | | 16 |

Third Year

| First Term | Hours | Second Term | Hours |
|--|-------|---|-------|
| ASE 320 | 3 | [ASE] COE 321K | 3 |
| [ASE 330M] <u>COE 352</u> | 3 | ASE COE 347 | 3 |
| M 362K | 3 | [SDS 322] <u>ASE 330M</u> | 3 |
| [SDS 329C] <u>E M 319</u> | 3 | [American and Texas government] <u>E 316L, 316M, 316N, or 316P</u> | 3 |
| [E 316L, 316M, 316N, or 316P] <u>ASE 333T</u> | 3 | [Social and behavioral sciences or visual and performing arts] <u>Technical elective</u> | 3 |
| | 15 | | 15 |

Fourth Year

| First Term | Hours | Second Term | Hours |
|--|--------------|--------------------|--------------|
| ASE 375 | 3 | COE 372 | 3 |
| [COE 352] <u>Social and behavioral sciences or visual and performing arts</u> | 3 | COE 374 | 3 |
| COE 371 | 3 | American history | 3 |
| [COE 373] <u>American and Texas government</u> | 3 | Technical elective | 3 |
| Technical elective | 3 | | |
| | 15 | | 12 |

Total credit hours: 122