Date: November 22, 2019

To: Dr. Mark Archambault, Chair Undergraduate Curriculum Committee
Assistant Dean of Academics
College of Engineering and Science

From: Dr. Jonathan Whitlow, Associate Professor
Chemical Engineering Program
Department of Biomedical & Chemical Engineering & Sciences

Through: Dr. Manolis Tomadakis, Professor
Program Chair Biomedical and Chemical Engineering
Department of Biomedical & Chemical Engineering & Sciences

Through: Dr. Ted Conway, Professor
Department Head Biomedical & Chemical Engineering & Sciences
Department of Biomedical & Chemical Engineering & Sciences

Subject: Request to Change Prerequisites for CHE 4240, CHE 4131 and CHE 4151 and the junior level flowchart

The faculty of the Chemical Engineering Program after conducting a review of the curriculum has decided that changes to the current curriculum are needed. Specifically, the current required course CHE 4122 - Chemical Process Control which traditionally has been taken in the spring semester of the junior year should be moved to the fall of the junior year. The required course CHE 4240 – Advanced Computational Methods which has been traditionally taken in the fall semester should be moved to the spring of the junior year.

Moving CHE 4240 to the spring semester should improve the student retention of the material. This is due to the fact that the course material taught in CHE 4240 is needed in CHE 4131 – Separation Processes and CHE 4151 Chemical Engineering Reactor Design which are both taught in the following fall semester of the senior year.

Moving CHE 4122 – Chemical Process Control to the fall semester should have no negative effect in terms of the curriculum as it is not a prerequisite for any other upper level courses. The change does increase the total number of credits in the fall semester by 1 from 17 to 18 while decreasing the total number of credits in the spring by 1 from 16 to 15.

CHE 4240 will now be made a new prerequisite for both CHE 4151 and CHE 4131 to reflect the need for the material taught in CHE 4240. In addition, the prerequisite of CHE 2102 - Chemical Process Principles 2 will be changed to a co-requisite for CHE 4240 which will allow students who have successfully completed MTH 2201 – Differential Equations and Linear Algebra and are in the second semester of the sophomore sequence in Chemical Engineering to take the course. This change will aid transfer students with junior level credit but sophomore standing in Chemical Engineering.

The change in prerequisite forms for CHE 4240, CHE 4131 and CHE 4151 are also included in this package along with the current and proposed curriculum flow chart for the junior year in Chemical Engineering which shows CHE 4122 now in the fall semester and CHE 4240 in the spring semester.
Florida Institute of Technology

REQUEST TO CHANGE THE REQUIREMENTS FOR A COURSE

Any change, addition or removal of any restriction, or change in credit hours or availability for a course requires this form, accompanied by any supporting documentation, be completed and approved as indicated below.

COLLEGE: Engineering and Science DEPARTMENT: Biomedical & Chemical Engineering & Sciences

REQUEST IS FOR CHANGE IN COURSE CHE 4131 Separation Processes

TO BE INCLUDED IN 2020/2021 CATALOG: Course changes are effective beginning with the fall term in which they appear in the University Catalog.

IS REQUEST FOR A CHANGE IN THE NAME LISTED ABOVE?  □ Yes  □ No
If yes, requested name

IS REQUEST FOR A CHANGE IN CREDITS FOR COURSE LISTED ABOVE?  □ Yes  □ No
If yes, current credits requested credits

IS REQUEST TO CHANGE RESTRICTIONS FOR COURSE LISTED ABOVE?  □ Yes  □ No
If yes, please check all that apply:

□ Add □ Remove □ Prerequisite □ Corequisite CHE 4240 □ and □ or
 Prefix Number

□ Add □ Remove □ Prerequisite □ Corequisite □ and □ or
 Prefix Number

□ Add □ Remove □ Other Restrictions* □ Yes  □ No
If yes, please use box below:

*Other restrictions may include changing the grade mode (P/F, S/F, A-F, CGU), deactivating a course already in the system, majors or class levels restricted from registration, or other restrictions.

Please enter the complete prerequisite/restriction list as it should appear if this change is approved:

Prerequisite CHE 3103 Heat Transfer Processes AND
Prerequisite CHE 3104 Mass Transfer Processes AND
Prerequisite CHE 3110 Chemical Engineering Thermodynamics AND
Prerequisite CHE 4240 Advanced Computational Methods for Engineering

□ Yes  □ No Is this request for the course to be used to measure program-level student learning outcomes?

□ Yes  □ No Is this request for the course to satisfy the scholarly inquiry requirement? If yes, attach "Q" materials for review.

□ Yes  □ No Will this change impact any existing programs? If yes, attach "Changing Graduation Requirements" form for each program that is impacted.

APPROVALS: Once appropriate department approvals are completed, submit to the Office of Graduate Programs, or Undergraduate Curriculum Committee Chair for placement on agenda.

1) Originator:  12/4/19
2) Department Head/Program Chair:  12/3/19
3) Dean or Associate Dean:  12/1/19
4) Chair, Graduate Council:  Date
   OR
   Chair, Undergraduate Curriculum Committee:  Date

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RGR-284-1015
Florida Institute of Technology

REQUEST TO CHANGE THE REQUIREMENTS FOR A COURSE

Any change, addition or removal of any restriction, or change in credit hours or availability for a course requires this form, accompanied by any supporting documentation, be completed and approved as indicated below.

COLLEGE: Engineering and Science

DEPARTMENT: Biomedical & Chemical Engineering & Sciences

REQUEST IS FOR CHANGE IN COURSE: CHE 4151 Chemical Engineering Reactor Design

TO BE INCLUDED IN 2020 / 2021 CATALOG

Course changes are effective beginning with the fall term in which they appear in the University Catalog.

IS REQUEST FOR A CHANGE IN THE NAME LISTED ABOVE?  □ Yes  ☑ No  If yes, requested name________

IS REQUEST FOR A CHANGE IN CREDITS FOR COURSE LISTED ABOVE?  □ Yes  ☑ No  If yes, current credits ______ requested credits ______

IS REQUEST TO CHANGE RESTRICTIONS FOR COURSE LISTED ABOVE?  □ Yes  ☑ No  If yes, please check all that apply:

☐ Add  ☑ Remove  ☑ Preerequisite  ☑ Corequisite

CHE  4240  ☐ and  ☑ or

☐ Add  ☑ Remove  ☑ Prequisite  ☑ Corequisite

☐ Add  ☑ Remove  ☑ Other Restrictions*  ☑ Yes  ☑ No  If yes, please use box below:

*Other restrictions may include changing the grade mode (P/FA, A-F, ELO), deactivating a course already in the system, majors or class levels restricted from registration, or other restrictions.

Please enter the complete prerequisite restriction list as it should appear if this change is approved:

Prerequisite CHE 3101 Transport Processes AND
Prerequisite CHE 3103 Heat Transfer Processes AND
Prerequisite CHE 4240 Advanced Computational Methods for Engineering

☐ Yes  ☑ No  Is this request for the course to be used to measure program-level student learning outcomes?

☐ Yes  ☑ No  Is this request for the course to satisfy the scholarly inquiry requirement? If yes, attach "Q" materials for review.

☐ Yes  ☑ No  Will this change impact any existing programs? If yes, attach "Changing Graduation Requirements" form for each program that is impacted.

APPROVALS: Once appropriate department approvals are completed, submit to the Office of Graduate Programs, or Undergraduate Curriculum Committee Chair for placement on agenda.

1) Originator __________________________ Date 12/1/19

2) Department Head/Program Chair __________________________ Date 12/3/19

3) Dean/Associate Dean __________________________ Date 12/16/19

4) Chair, Graduate Council __________________________ Date

Chair, Undergraduate Curriculum Committee __________________________ Date

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RGR-254-1015
REQUEST TO CHANGE THE REQUIREMENTS FOR A COURSE

Any change, addition or removal of any restriction, or change in credit hours or availability for a course requires this form, accompanied by any supporting documentation, be completed and approved as indicated below.

COLLEGE: Engineering and Science
DEPARTMENT: Biomedical & Chemical Engineering & Sciences

REQUEST IS FOR CHANGE IN COURSE: Advanced Computational Methods for Engineering
Prefix: CHE
Number: 2102
Course Title: CHE 2102

TO BE INCLUDED IN 20 20/20 21 CATALOG
Course changes are effective beginning with the fall term in which they appear in the University Catalog.

IS REQUEST FOR A CHANGE IN THE NAME LISTED ABOVE? □ Yes □ No
If yes, requested name: ________________________________

IS REQUEST FOR A CHANGE IN CREDITS FOR COURSE LISTED ABOVE? □ Yes □ No
If yes, current credits: ____________________ requested credits: ____________________

IS REQUEST TO CHANGE RESTRICTIONS FOR COURSE LISTED ABOVE? □ Yes □ No
If yes, please check all that apply:
[ ] Add □ Remove □ Prerequisite □ Corequisite
Prefix: CHE
Number: 2102
[ ] and [ ] or

[ ] Add □ Remove □ Prerequisite □ Corequisite
Prefix: CHE
Number: 2102
[ ] and [ ] or

[ ] Add □ Remove □ Other Restrictions*
[ ] Yes □ No
If yes, please use box below:

*Other restrictions may include changing the grade mode (P/F, S/U, A-E, CUI), deactivating a course already in the system, majors or class levels restricted from registration, or other restrictions.
Please enter the complete prerequisite/restriction list as it should appear if this change is approved:
Prerequisite / Co-requisite CHE 2102 Chemical Process Principles 2 AND
Prerequisite MTH 2201 Differential Equations / Linear Algebra

□ Yes □ No Is this request for the course to be used to measure program-level student learning outcomes?

□ Yes □ No Is this request for the course to satisfy the scholarly inquiry requirement? If yes, attach "Q" materials for review.

□ Yes □ No Will this change impact any existing programs? If yes, attach "Changing Graduation Requirements" form for each program that is impacted.

APPROVALS: Once appropriate department approvals are completed, submit to the Office of Graduate Programs, or Undergraduate Curriculum Committee Chair for placement on agenda.

1) Originator
Date: 12/12/19

4) Chair, Graduate Council
Date: ____________________

2) Department Head/Program Chair
Date: 12/12/19

5) Chair, Undergraduate Curriculum Committee
Date: ____________________

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RGR-254-1015
The addition or removal of any graduation requirement in a major or minor requires that this form, accompanied by supporting documentation, be completed and approved as indicated below. Incomplete or incorrect forms will not be processed.

COLLEGE: Engineering and Science

DEPARTMENT: Biomedical and Chemical Engineering & Science

DEGREE LEVEL: B.S.

PROGRAM TITLE: Chemical Engineering

TO BE INITIATED WITH CATALOG YEAR 2020

CHANGE REQUESTED FOR: ☐ major program  ☐ minor program 7033

Program changes are effective beginning with the fall term in which they appear in the University Catalog.

☐ Yes  ☐ No  Will this change impact the program's assessment process? If yes, attach a description of how the assessment will be impacted and the new process.

DESCRIPTION OF REQUESTED CHANGES: Attach a more detailed description and any supporting documentation

Move CHE 4240 from Fall Junior Year to Spring Junior Year
Move CHE 4122 from Spring Junior Year to Fall Junior Year

Approvals: On completion of appropriate department approvals, submit form to Chair, Graduate Council, or Chair, Undergraduate Curriculum Committee, for approval below and forward to the Catalog & Curriculum Manager.

Originator: __________________________ Date: 13/11/19

Chair, Graduate Council: __________________________ Date: __________________________

Department Head / Major Program Chair: __________________________ Date: 2/12/19

Chair, Undergraduate Curriculum Committee: __________________________ Date: __________________________

Dean or Associate Dean: __________________________ Date: 12/11/19

REGISTRAR'S USE ONLY

CAPP / Degree Evaluation

☐ Yes  ☐ No  Update completed: __________________________ Date: __________________________ Initials: __________________________

Catalog Management System

☐ Yes  ☐ No  Update completed: __________________________ Date: __________________________ Initials: __________________________

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The suggested changes to the 2019-2020 Catalog are highlighted below:

Chemical Engineering, B.S.

Curriculum

A Bachelor of Science in Chemical Engineering requires a minimum of 135 credit hours as specified below.

Junior Year

Fall (47 18 credit hours)

CHE 3101 Transport Processes
CHE 3170 Introduction to Environmental Engineering
CHE 4240 Advanced Computational Methods for Engineering Applications
CHE 4122 Chemical Process Control
CHM 3001 Physical Chemistry 1
CHM 3011 Physical Chemistry Laboratory 1
Select first HUM Core Course:

Spring (46 15 credit hours)

CHE 3103 Heat Transfer Processes
CHE 3104 Mass Transfer Processes
CHE 3110 Chemical Engineering Thermodynamics
CHE 4240 Advanced Computational Methods for Engineering Applications
CHE 4122 Chemical Process Control
Select second HUM Core Course:
HI Mark,

The requested course is a 4000 level undergrad course, I believe, that will be cross-list with the existing course by this name.

The reason we are requesting the course is that the course is suitable for undergraduate CHE students, as well as CHM students, and, particularly for the CHE students, being able to take it with the undergraduate designation allows them to more easily fit it into their program plan. The program faculty (and the CHE program chair) are all in agreement with adding the course.

Please let me know if you need more information.

Julia
New courses are available beginning with the fall term in which they appear in the University Catalog.

Subject C H M Course No.* 4 3 0 5 Credit Hours 3 Academic Year to be added to the file Fall 2020

Special topics require no prior learning

Class Hours 45/sem Lecture Hours 45/sem Lab Hours 0/sem Research Hours 0/sem Contact Hours (CEU) N/A

Department Biomedical & Chemical Engineering and Sci (e.g., Ocean Engineering and Marine Sciences)

Schedule Type Special Topics (S) (e.g., Lecture, Lab or Special Topics/Project)

College of Aeronautics—23
College of Engineering and Science—30
College of Psychology and Liberal Arts—25
Nathan M. Bisk College of Business—24

Computer Title Special Topics in Chem

This course will be entered into the system as: Bi-Level ☐ Cross-Listed ☐ Dual-Numbered ☐ Full-Load ☐ None of these/Standard Listing ☐

Catalog Title Special Topics in Chemistry

Catalog Description of Course Restricted to 350 characters, including spaces

Covers advanced topics in chemistry. May include such topics as electroanalytical, mass spectrometric and imaging techniques.

This description has been approved by the catalog office 01-27-2020

Catalog & Curriculum Manager Date

In addition, please attach a course syllabus and/or more detailed description.

Restrictions

☐ Prerequisite ONLY ☐ Corequisite ONLY ☐ BOTH Prerequisite/Corequisite ☐ and ☐ or

Course Prefix/Number

☐ Prerequisite ONLY ☐ Corequisite ONLY ☐ BOTH Prerequisite/Corequisite ☐ and ☐ or

Course Prefix/Number

☐ Prerequisite ONLY ☐ Corequisite ONLY ☐ BOTH Prerequisite/Corequisite ☐ and ☐ or

Course Prefix/Number

☐ Prerequisite ONLY ☐ Corequisite ONLY ☐ BOTH Prerequisite/Corequisite ☐ and ☐ or

Course Prefix/Number

☐ Prerequisite ONLY ☐ Corequisite ONLY ☐ BOTH Prerequisite/Corequisite ☐ and ☐ or

Course Prefix/Number

ADDITIONAL RESTRICTION ☐ and ☐ or Instructor Approval

(e.g., Major, Class Level, Department Head Approval)

Please indicate old course information and the date/term the course may be removed from the system:

☐ Yes ☐ No Will this course be used to measure program-level student learning outcomes? If yes, review and signature required.**

☐ Yes ☐ No Will this course be used to satisfy the scholarly inquiry requirement? If yes, attach "Q" materials for review.

☐ Yes ☐ No Will this course impact any existing programs? If yes, attach "Changing Graduation Requirements" form for each program impacted.

☐ Yes ☐ No Will this course be used to satisfy the Cross Cultural (CC) requirement? If yes, attach confirmation memo from QEP2 Committee.

Approvals: On completion of description and course number verification, affix appropriate signatures as indicated, and submit to the Office of Graduate Programs, or Undergraduate Curriculum Committee Chair for placement on agenda.

Originator Date

Department Head/Program Chair Date

Dean of Associate Dean Date

**Chair, APEC

Catalog & Curriculum Manager Date

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RGR-384-219
Instructor: Dr. Pavithra Pathirathna  
Office: OEC 257  
Office Hours: By appointment  

Phone: x7561 (emergency only)  
E-mail: ppathirathna@fit.edu

Recommended Reading Materials:  
- Laboratory Techniques in Electroanalytical Chemistry, (2nd edition) by Peter Kissinger and William Heineman (Marcell Dekker) 1996

Prerequisites:  
None

Course Overview:  
This comprehensive course covers the fundamental principles of electrochemistry and commonly used electroanalytical techniques. The student will learn both the theory and practical aspects of electrochemical measurements which will subsequently help students to be a success in future electroanalytical-related research and their scientific careers. The student will also develop critical thinking skills in method selection, method development, and data interpretation via a combination of teaching and learning strategies.

Course Outcomes:  
- Understand the basics of electrode processes, thermodynamics, and electron-transfer kinetics and apply those principles to solve real electrochemical problems.  
- Identify and explain the structure of basic electrochemical instrumentation.  
- Learn the importance of electrochemistry and electroanalytical as a powerful tool to answer both biological and environmental problems.  
- Understand how to design electrochemical experiments to solve real research questions.  
- Improve communication skills through the preparation of a literature-based research paper.

Grading:  
Homework Assignments: 20%  
In class quizzes (5): 20%  
Midterm Exams 1: 30%  
Final Exam: 30% (10% from research paper* for graduate students)
Research Paper (Graduate students only):
Graduate students are required to write a 10-page literature-based research/review paper (Times Roman/Arial, 12-point, 2 line spacing). The paper should discuss at least five research studies based on one of the electroanalytical techniques discussed during the class. The outline of the review paper should have the sections of 1. Background/Motivation 2. Experimental Approach 3. Data 4. Conclusions, and 5. Future Perspectives. References/Citations must be in ACS style.

Grading scale:
- 90-100% A
- 80-89% B
- 70-79% C
- 60-69% D
- 0-59% F

Class Schedule:
Two 75-minute classroom lectures per week

Topics Covered:
- Introduction and basics of electrochemistry (2 classes)
- Electrochemical Cells and Electrode Potentials (2 classes)
- Thermodynamics, Nemst eqn. (2 classes)
- Faradaic and non-faradaic current flow (2 classes)
- Double layer, Mass transport, Reversibility (3 classes)
- Electrochemical Kinetics, Butler-Volmer, Tafel plots (2 classes)
- Macro, Micro, Nano Electrodes (2 classes)
- Amperometry (2 classes)
- Voltammetry (3 classes)
- Ion transfer between liquid-liquid interfaces (2 classes)
- Scanning Electrochemical Microscopy (2 classes)
- Hydrodynamic voltammetry (2 classes)
- Potentiometry (2 classes)
- Instrumentation (2 classes)

Academic Integrity:
All coursework must meet the Florida Tech standards on academic integrity as outlined in “Academic Honesty”, https://www.fit.edu/policies/student-handbook/standards-and-policies/academic-honesty/. Students are responsible to inform themselves about those standards before performing academic work.