REQUEST FOR ADDING, CHANGING, SUSPENDING OR DROPPING UNDERGRADUATE MINOR

Department: Biological and Agricultural Engineering
College: Engineering
Name of Minor: Sugar Engineering Minor
Date: 1/26/18

Has this change been discussed with and approved by all departments/colleges affected? Yes (✓) No ( ) N/A ( )

ATTACH JUSTIFICATION for all actions: Use separate sheet.
ATTACH RESPONSE from any departments affected (i.e. any department whose course(s) are to be added).

ACTION (check appropriate box):

✓ ADDING: Show the entire new minor using catalog format. Use plain sheets and attach
( ) CHANGING: List present catalog description which is to be changed (left column) and the changes proposed (right column). In proposed column use strikeout and bold to indicate deletions and additions. Explain all changes adequately on attachment
( ) SUSPENDING: Provide an adequate explanation for suspending the minor on plain sheets and attach
( ) DROPPING: Provide an adequate explanation for dropping the minor on plain sheets and attach

MINOR

<table>
<thead>
<tr>
<th>PRESENT</th>
<th>PROPOSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total semester hours in current minor</td>
<td>14</td>
</tr>
</tbody>
</table>

To earn a minor in sugar engineering, students in the College of Engineering must complete BE 4342, BE 4989*, BIOL 2083 or CHE 4260, EE 3950, ME 4433, and an approved design project. A grade of "C" or better in each course is required.

*BE 4989 can only be taken when the topic is related to Sugar Engineering.

To earn a minor in sugar engineering, students in the College of Engineering must complete BE 4342 or BE 3340, BE 4989*, BIOL 2083 or CHE 4260, EE 3950, ME 4433, and an approved design project. A grade of "C" or better in each course is required.

*BE 4989 can only be taken when the topic is related to Sugar Engineering.

APPROVALS:

Department Faculty Approval Date 1/29/18
Department Chair’s Signature (Date) 1/29/18
Chair, FS C & C Committee (Date) 2/8/18

College Faculty Approval Date 2/7/18
College Dean’s Signature (Date) 2/8/18

Academic Affairs Approval (Date) 3/2/18

(Please print name)

Contact Email

(Signed)
Justification

Due to low interest BE 4342 has not been taught in several years. To maintain feasibility to achieve the Sugar Engineering Minor the addition of BE 3340 will cover similar process design concepts and BE 3340 is taught every spring semester with high enrollment.
REQUEST FOR ADDING, CHANGING, SUSPENDING OR DROPPING AN UNDERGRADUATE CURRICULUM

Department: Chemical Engineering  
College: Engineering  
Name of Curriculum/Major: Chemical Engineering  
Type of Degree: BS  
Date: 2/9/18

Has this change been discussed with and approved by all departments/colleges affected? Yes (X) No ( ) N/A ( )

ATTACH JUSTIFICATION for all actions: Use separate sheet.  
ATTACH RESPONSE from any departments affected [i.e. any department whose course(s) are to be added.]  
ATTACH FORM D ADDENDUM for all new curricula or changes involving General Education courses.

ACTION (check appropriate box):

( ) ADDING: The entire new curriculum, by semester, must be typed on plain sheets and attached to Form D. (See sample layout attached.)

(X) CHANGING: Regardless if all semesters of a curriculum are to be changed or only parts, the present and proposed (eight-semester) recommended path should be attached on separate pages. On the Present recommended path, use strikeout and on the Proposed recommended path, highlight areas to identify deletions and additions. Do not use boldface to designate changes as boldface is reserved for critical requirements within the recommended path. Explain all changes adequately on attachment.

( ) SUSPENDING: Provide an adequate explanation for suspending the curriculum on plain sheets and attach.

( ) DROPPING: Provide an adequate explanation for dropping the curriculum on plain sheets and attach.

<table>
<thead>
<tr>
<th>CURRICULUM</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>PRESENT</td>
<td>PROPOSED</td>
</tr>
<tr>
<td>Total semester hours in current curriculum: 128</td>
<td>Total semester hours in proposed curriculum: 128</td>
</tr>
</tbody>
</table>

APPROVALS:

Department Faculty Approval Date: 1/26/2018  
Department Chair's Signature: 

College Faculty Approval Date: 2/5/2018  
College Dean's Signature: 

Chair, FS C & C Committee: John Hopen  
(Date): 2/5/18

Academic Affairs Approval:  
(Date): 3/2/18

College/Division/Department Contact: Frank Blystad  
(Please print name.): 

Contact E-mail: fblyst13@lsu.edu
Justification to Change the Requirement of CHEM 3491 to CHEM 3492 in the ChE Curriculum

The Cain Department of Chemical Engineering proposes to modify our undergraduate curriculum by replacing CHEM 3491 Physical Chemistry I with CHEM 3492 Physical Chemistry II. Whereas CHEM 3491 focuses on quantum mechanics, CHEM 3492 focuses on kinetics and thermodynamics, both of. The consensus of our faculty is that CHEM 3492 would be more beneficial to our students. Likewise, the material covered in CHEM 3492 is more similar to the physical chemistry required by our peer ChE departments.

Transition Plan for Replacing CHEM 3491 with CHEM 3492

The transition plan for replacing CHEM 3491 with CHEM 3492 requires two-three years:

1. All students who enter the ChE curriculum beginning with the 2018-2019 General Catalog year and all subsequent years will be required to take CHEM 3492.

2. Students who entered the ChE curriculum prior to the 2018-2019 General Catalog year will be permitted to substitute CHEM 3492 for CHEM 3491. Working with the Chemistry Department, we will permit ChE students to take CHEM 3492 instead of CHEM 3491 (with permission).

3. Currently, CHEM 3492 is allowed as a group B elective for our technical (aka no concentration) degree. For all students who enter the ChE curriculum in the 2018-2019 General Catalog year, CHEM 3491 would be allowed as a Group B elective, while CHEM 3492 would be part of the required curriculum.

4. Beginning with the 2018-2019 General Catalog year, CHEM 3492 will be a prerequisite to CHE 4190 (prereq will be installed fall 2020). In addition, students will be required to earn a grade of "C" or better in CHEM 3492 before enrolling in CHE 4190.

The Chemistry Department has agreed to our proposal. Email included.
Begin forwarded message:

From: "John C. Flake" <johnflake@lsu.edu>
Subject: Re: Chem 3492
Date: February 9, 2018 at 10:04:28 AM CST
To: Linda Allen <lallen3@lsu.edu>
Cc: Carol M Taylor <cmtaylor@lsu.edu>, Barry Guillory <barryguillory@lsu.edu>, Mike Benton <benton@lsu.edu>

Linda,

Great! We appreciate the willingness to help with our curriculum. I will ask Mike and Barry to send you a draft of the transition plan. From my understanding, the curriculum change would be for student entering in fall 2018. These students would typically reach their physical chemistry class in fall of their junior year, so it wouldn’t be until fall of 2021 that all of our students would be in 3492. Until then, we would allow students to take either class with approval from their ChE advisor (we can control the percentages as you need). Until fall of 2021, 3492 would remain an elective ChE. After fall of 2021 3491 would become an elective for ChE.

Thanks, John

On Feb 9, 2018, at 9:46 AM, Linda Allen <lallen3@lsu.edu> wrote:

Hello John, Barry & Mike,
The Chemistry Department has discussed your proposal and has approved it. We have enough Physical Chemistry faculty that we can handle the shift of your students from CHEM 3491 to CHEM 3492.
We also agree with your usage of CHEM 3492 as a prerequisite for ChE 4190.

Good luck with your changes.
Linda Allen

<image001.png>

Linda R. Allen, PhD
Director of Undergraduate Laboratories,
Undergraduate Chemistry Office
Department of Chemistry
Louisiana State University
105 Choppin Hall, Baton Rouge, LA 70803
From: John C Flake
Sent: Monday, January 29, 2018 9:27 AM
To: Carol M Taylor; Linda Allen
Cc: Barry Guillory; Mike Benton
Subject: Chem 3492

Dear Carol and Linda,

Our faculty finally voted on the curriculum change from Chem 3491 to 3192 if Chemistry allows removing the 3491 prerequisite for 3492. Some key points:

1. The transition would take 2-3 years. Once the proposal is approved by C&C, we would allow ChE students to substitute 3492 for 3491 (with approval from chemistry). We would require 3492 for students entering in Fall of 2019 (presumable these students would hit 3492 in Fall of 2021).

2. Chem 3491 would remain as an elective for ChE students.

3. We would require 3492 as a pre-requisite for ChE 4190 (reactor design).

Let us know if this plan is acceptable. If so, we can submit the plan to our college level C&C committee before the deadline (Feb. 16th I think). Oh, I should introduce you to Barry Guillory via this mail. Barry is taking over as the undergraduate director from Mike.

Many Thanks,
John
Frank Blystad

From: Barry Guillory
Sent: Friday, February 09, 2018 11:46 AM
To: Frank Blystad
Subject: FW: Chem 3492

Barry Guillory, PE, MSChE
ChE Instructor/Undergraduate Coordinator
Phone: 225 578 2173
Louisiana State University
3308A Patrick F Taylor Hall, Baton Rouge, LA 70803

From: John C Flake
Sent: Monday, January 29, 2018 10:23 AM
To: Carol M Taylor <cmtaylor@lsu.edu>
Cc: Linda Allen <lallen3@lsu.edu>; Barry Guillory <barryguillory@lsu.edu>; Mike Benton <benton@lsu.edu>
Subject: Re: Chem 3492

Carol -

Thanks! One mistake in my email below: our curriculum would require 3492 for students entering in "fall of 2018" if we are able to get the proposal through C&C this round. They would hit 3492 in fall of 2020 (that seems like way in the future).

John

On Jan 29, 2018, at 10:12 AM, Carol M Taylor <cmtaylor@lsu.edu> wrote:

Thanks, John.
Hi, Barry.
We are going to put the proposal to the full faculty on February 7th.
Not sure of the timeline after that with C&C.
Carol

From: John C Flake <johnflake@lsu.edu>
Date: Monday, January 29, 2018 at 9:27 AM
To: Carol Maree Taylor <cmtaylor@lsu.edu>, Linda Allen <lallen3@lsu.edu>
Cc: Barry Guillory <barryguillory@lsu.edu>, Mike Benton <benton@lsu.edu>
Subject: Chem 3492
Dear Carol and Linda,

Our faculty finally voted on the curriculum change from Chem 3491 to 3192 if Chemistry allows removing the 3491 prerequisite for 3492. Some key points:

1. The transition would take 2-3 years. Once the proposal is approved by C&C, we would allow ChE students to substitute 3492 for 3491 [with approval from chemistry]. We would require 3492 for students entering in Fall of 2019 (presumably these students would hit 3492 in Fall of 2021).

2. Chem 3491 would remain as an elective for ChE students.

3. We would require 3492 as a pre-requisite for ChE 4190 (reactor design).

Let us know if this plan is acceptable. If so, we can submit the plan to our college level C&C committee before the deadline (Feb. 16th I think). Oh, I should introduce you to Barry Guillory via this mail. Barry is taking over as the undergraduate director from Mike.

Many Thanks,
John
Current Chemical Engineering, B.S.Ch.E. Curriculum

- Without Concentration
- Biomolecular
- Environmental
- Materials

Chemical Engineering

CRITICAL REQUIREMENTS

SEMESTER 1: MATH 1022 or MATH 1023.
SEMESTER 2: “C” or better in CHEM 1201, “C” or better in MATH 1550.
SEMESTER 3: “C” or better in PHYS 2110
SEMESTER 4: 2.00 GPA in CHE courses
SEMESTER 5: 2.00 GPA in CHE courses

Chemistry, Physics, Life Sciences and Mathematics Proficiency • A grade of “C” or better in each of the basic sciences preparatory courses—Biol 1201; CHEM 1201 and CHEM 1202; PHYS 2110 and PHYS 2113; MATH 1550, MATH 1552, and MATH 2090—is required before students may register for any chemical engineering course other than CHE 1100 and CHE 2171.

In addition, students must earn a “C” or better in CHE 2171, CHE 2176, CHE 3101, CHE 3102, CHE 3104, CHE 3171, CHE 3172, and CHE 3173 before registering for any subsequent course that requires one or more of these as a prerequisite.

Semester 1

CRITICAL: MATH 1022 or MATH 1023

- CHEM 1201 General Chemistry I (3)
- ENGL 1001 English Composition (3)
- MATH 1550 Analytic Geometry and Calculus I (5)
- General Education course - Humanities (3)
- CEE 1100 Introduction to Chemical Engineering (1)
- BIOL 1201 Biology for Science Majors I (3)

Total Semester Hours: 18

Semester 2

CRITICAL: “C” or better in CHEM 1201 and “C” or better in MATH 1550

- CHEM 1202 General Chemistry (3)
• CHEM 1212 General Chemistry Laboratory (2)
• MATH 1552 Analytic Geometry and Calculus II (4)
• PHYS 2110 Particle Mechanics (3)
• General Education course - Arts (3)

Total Semester Hours: 15

Semester 3

CRITICAL: "C" or better in PHYS 2110

• CHE 2171 Chemical Engineering Fundamentals: Material and Energy Balances (4)
• CHEM 2261 Organic Chemistry (3)
• MATH 2090 Elementary Differential Equations and Linear Algebra (4)
• PHYS 2113 Fields: Gravity, Electricity, and Magnetism (3)
• ENGL 2000 English Composition (3)

Total Semester Hours: 17

Semester 4

CRITICAL: 2.0 GPA in CHE courses

• CHE 2176 Numerical Methods and Programming for Chemical Engineers (4)
• CHEM 2262 Organic Chemistry (3)
• CHEM 2364 Organic Chemistry Laboratory (2)
• ECON 2030 Economic Principles (3)
• General Education course - Social Sciences (3)

Total Semester Hours: 15

Semester 5

CRITICAL: 2.0 GPA in CHE courses

• CHE 3101 Transport Sciences: Momentum Transfer (3)
• CHE 3172 Chemical Engineering Thermodynamics (3)
• CHEM 3491 Physical Chemistry I (3)
• ME 2733 Materials of Engineering (3)
• General Education course - Humanities (3)

Total Semester Hours: 15

Semester 6

• CHE 3102 Transport Sciences: Heat and Mass Transfer (4)
• CHE 3104 Engineering Measurements Laboratory (3)
• CHE 3171 Introduction to Design and Process Safety (3)
• CHE 3173 Heterogeneous Equilibrium (3)
• Approved Elective/Area of Concentration course (3)
Semester 7

- CHE 4151 Unit Operations Design (4)
- CHE 4162 Unit Operations Laboratory (3)
- CHE 4190 Chemical Reaction Engineering (3)
- CHE 4198 Process Dynamics (3)
- Approved Elective/Area of Concentration course (3)

Total Semester Hours: 16

Semester 8

- CHE 4172 Process Design (4)
- Approved Electives/Area of Concentration courses (9)
- General Education course - Humanities (3)

Total Semester Hours: 16

128 Total Sem. Hrs.

Areas of Concentration

Lists of approved area electives approved for the chemical engineering concentrations are available from the department. Depending on the particular area electives selected, students may be required to take one or more additional prerequisite course(s).

Biomolecular

CRITICAL REQUIREMENTS

SEMESTER 1: MATH 1022 or MATH 1023.
SEMESTER 2: "C" or better in CHEM 1201, "C" or better in MATH 1550.
SEMESTER 3: "C" or better in PHYS 2110.
SEMESTER 4: 2.00 GPA in CHE courses
SEMESTER 5: 2.00 GPA in CHE courses

Semester 1

CRITICAL: MATH 1022 or MATH 1023

- CHEM 1201 General Chemistry I (3)
- CHE 1100 Introduction to Chemical Engineering (1)
- BIOL 1201 Biology for Science Majors I (3)
- ENGL 1001 English Composition (3)
- MATH 1550 Analytic Geometry and Calculus I (5)
- General Education course - Humanities (3)

Total Semester Hours: 18
Semester 2

CRITICAL: “C” or better in CHEM 1201 and “C” or better in MATH 1550

- CHEM 1202 General Chemistry (3)
- CHEM 1212 General Chemistry Laboratory (2)
- MATH 1552 Analytic Geometry and Calculus II (4)
- PHYS 2110 Particle Mechanics (3)
- General Education course - Arts (3)

Total Semester Hours: 15

Semester 3

CRITICAL: “C” or better in PHYS 2110

- CHE 2171 Chemical Engineering Fundamentals: Material and Energy Balances (4)
- CHEM 2261 Organic Chemistry (3)
- MATH 2090 Elementary Differential Equations and Linear Algebra (4)
- PHYS 2113 Fields: Gravity, Electricity, and Magnetism (3)
- ENGL 2000 English Composition (3)

Total Semester Hours: 17

Semester 4

CRITICAL: 2.0 GPA in CHE courses

- CHE 2176 Numerical Methods and Programming for Chemical Engineers (4)
- CHEM 2262 Organic Chemistry (3)
- CHEM 2364 Organic Chemistry Laboratory (2)
- ECON 2030 Economic Principles (3)
- General Education course - Social Sciences (3)

Total Semester Hours: 15

Semester 5

CRITICAL: 2.0 GPA in CHE courses

- CHE 3101 Transport Sciences: Momentum Transfer (3)
- CHE 3172 Chemical Engineering Thermodynamics (3)
- CHEM 3491 Physical Chemistry I (3)
- ME 2733 Materials of Engineering (3)
- General Education course - Humanities (3)

Total Semester Hours: 15

Semester 6

- CHE 3102 Transport Sciences: Heat and Mass Transfer (4)
Degrees programs/curriculums/majors: Chemical Engineering, B.3.Ch E. - Louisiana State University - Acalog ACMS™

- CHE 3104 Engineering Measurements Laboratory (3)
- CITE 3171 Introduction to Design and Process Safety (3)
- CHE 3173 Heterogeneous Equilibrium (3)
- Approved Elective/Area of Concentration course (3)

**Total Semester Hours: 16**

**Semester 7**

- CHE 4151 Unit Operations Design (4)
- CHE 4162 Unit Operations Laboratory (3)
- CHE 4190 Chemical Reaction Engineering (3)
- CHE 4198 Process Dynamics (3)
- Approved Elective/Area of Concentration course (3)

**Total Semester Hours: 16**

**Semester 8**

- CHE 4172 Process Design (4)
- Approved Electives/Area of Concentration courses (9)
- General Education course - Humanities (3)

**Total Semester Hours: 16**

128 Total Sem. Hrs.

**Environmental**

**CRITICAL REQUIREMENTS**

**SEMESTER 1**: MATH 1022 or MATH 1023.
**SEMESTER 2**: "C" or better in CHEM 1201, "C" or better in MATH 1550.
**SEMESTER 3**: "C" or better in PHYS 2110.
**SEMESTER 4**: 2.00 GPA in CHE courses
**SEMESTER 5**: 2.00 GPA in CHE courses

**Semester 1**

**CRITICAL**: MATH 1022 or MATH 1023

- CHEM 1201 General Chemistry I (3)
- CHE 1100 Introduction to Chemical Engineering (1)
- BIOL 1201 Biology for Science Majors I (3)
- ENGL 1001 English Composition (3)
- MATH 1550 Analytic Geometry and Calculus I (5)
- General Education course - Humanities (3)

**Total Semester Hours: 18**

**Semester 2**
CRITICAL: “C” or better in CHEM 1201 and “C” or better in MATH 1550

- CHEM 1202 General Chemistry (3)
- CHEM 1212 General Chemistry Laboratory (2)
- MATH 1552 Analytic Geometry and Calculus II (4)
- PHYS 2110 Particle Mechanics (3)
- General Education course - Arts (3)

Total Semester Hours: 15

Semester 3

CRITICAL: “C” or better in PHYS 2110

- CHE 2171 Chemical Engineering Fundamentals: Material and Energy Balances (4)
- CHEM 2261 Organic Chemistry (3)
- MATH 2090 Elementary Differential Equations and Linear Algebra (4)
- PHYS 2113 Fields: Gravity, Electricity, and Magnetism (3)
- ENGL 2000 English Composition (3)

Total Semester Hours: 17

Semester 4

CRITICAL: 2.0 GPA in CHE courses

- CHE 2176 Numerical Methods and Programming for Chemical Engineers (4)
- CHEM 2262 Organic Chemistry (3)
- CHEM 2364 Organic Chemistry Laboratory (2)
- ECON 2030 Economic Principles (3)
- General Education course - Social Sciences (3)

Total Semester Hours: 15

Semester 5

CRITICAL: 2.0 GPA in CHE courses

- CHE 3101 Transport Sciences: Momentum Transfer (3)
- CHE 3172 Chemical Engineering Thermodynamics (3)
- CHEM 3491 Physical Chemistry I (3)
- ME 2733 Materials of Engineering (3)
- General Education course - Humanities (3)

Total Semester Hours: 15

Semester 6

- CHE 3102 Transport Sciences: Heat and Mass Transfer (4)
- CHE 3104 Engineering Measurements Laboratory (3)
Degrees programs/curriculums/majors: Chemical Engineering, B.S.Ch.E. - Louisiana State University - Acalog ACMS™

- CHE 3171 Introduction to Design and Process Safety (3)
- CHE 3173 Heterogeneous Equilibrium (3)
- Approved Elective/Area of Concentration course (3)

Total Semester Hours: 16

Semester 7

- CHE 4151 Unit Operations Design (4)
- CHE 4162 Unit Operations Laboratory (3)
- CHE 4190 Chemical Reaction Engineering (3)
- CHE 4198 Process Dynamics (3)
- Approved Elective/Area of Concentration course (3)

Total Semester Hours: 16

Semester 8

- CHE 4172 Process Design (4)
- Approved Elective/Area of Concentration courses (9)
- General Education course - Humanities (3)

Total Semester Hours: 16

128 Total Sem. Hrs.

Materials

CRITICAL REQUIREMENTS

SEMESTER 1: MATH 1022 or MATH 1023.
SEMESTER 2: "C" or better in CHEM 1201, "C" or better in MATH 1550.
SEMESTER 3: "C" or better in PHYS 2110.
SEMESTER 4: 2.00 GPA in CHE courses
SEMESTER 5: 2.00 GPA in CHE courses

Semester 1

CRITICAL: MATH 1022 or MATH 1023

- CHEM 1201 General Chemistry I (3)
- CHE 1100 Introduction to Chemical Engineering (1)
- BIOL 1201 Biology for Science Majors I (3)
- ENGL 1001 English Composition (3)
- MATH 1550 Analytic Geometry and Calculus I (5)
- General Education course - Humanities (3)

Total Semester Hours: 18

Semester 2
Degrees programs/curriculums/majors: Chemical Engineering, B.S.Ch.E. - Louisiana State University - Acalog ACMS™

CRITICAL: "C" or better in CHEM 1201 and "C" or better in MATH 1550

- CHEM 1202 General Chemistry (3)
- CHEM 1212 General Chemistry Laboratory (2)
- MATH 1552 Analytic Geometry and Calculus II (4)
- PHYS 2110 Particle Mechanics (3)
- General Education course - Arts (3)

Total Semester Hours: 15

Semester 3

CRITICAL: "C" or better in PHYS 2110

- CHE 2171 Chemical Engineering Fundamentals: Material and Energy Balances (4)
- CHEM 2261 Organic Chemistry (3)
- MATH 2090 Elementary Differential Equations and Linear Algebra (4)
- PHYS 2113 Fields: Gravity, Electricity, and Magnetism (3)
- ENGL 2000 English Composition (3)

Total Semester Hours: 17

Semester 4

CRITICAL: 2.0 GPA in CHE courses

- CHE 2176 Numerical Methods and Programming for Chemical Engineers (4)
- CHEM 2262 Organic Chemistry (3)
- CHEM 2364 Organic Chemistry Laboratory (2)
- ECON 2030 Economic Principles (3)
- General Education course - Social Sciences (3)

Total Semester Hours: 15

Semester 5

CRITICAL: 2.0 GPA in CHE courses

- CHE 3101 Transport Sciences: Momentum Transfer (3)
- CHE 3172 Chemical Engineering Thermodynamics (3)
- CHEM 3401 Physical Chemistry I (3)
- ME 2733 Materials of Engineering (3)
- General Education course - Humanities (3)

Total Semester Hours: 15

Semester 6

- CHE 3102 Transport Sciences: Heat and Mass Transfer (4)
- CHE 3104 Engineering Measurements Laboratory (3)
- CHE 3171 Introduction to Design and Process Safety (3)
Degrees programs/curriculums/majors: Chemical Engineering, B.S.Ch.E. - Louisiana State University - Acatalog ACMS™

- CHE 3173 Heterogeneous Equilibrium (3)
- Approved Elective/Area of Concentration course (3)

**Total Semester Hours: 16**

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**Semester 7**

- CHE 4151 Unit Operations Design (4)
- CHE 4162 Unit Operations Laboratory (3)
- CHE 4190 Chemical Reaction Engineering (3)
- CHE 4198 Process Dynamics (3)
- Approved Elective/Area of Concentration course (3)

**Total Semester Hours: 16**

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**Semester 8**

- CHE 4172 Process Design (4)
- Approved Electives/Area of Concentration courses (9)
- General Education course - Humanities (3)

**Total Semester Hours: 16**

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128 Total Sem. Hrs.
Proposed Chemical Engineering, B.S.Ch.E. Curriculum

- Without Concentration
- Biomolecular
- Environmental
- Materials

Chemical Engineering

CRITICAL REQUIREMENTS

SEMESTER 1: MATH 1022 or MATH 1023.
SEMESTER 2: "C" or better in CHEM 1201, "C" or better in MATH 1550.
SEMESTER 3: "C" or better in PHYS 2110
SEMESTER 4: 2.00 GPA in CHE courses
SEMESTER 5: 2.00 GPA in CHE courses

Chemistry, Physics, Life Sciences and Mathematics Proficiency - A grade of "C" or better in each of the basic sciences preparatory courses—Biol 1201; Chem 1201 and Chem 1202; Phys 2110 and Phys 2113; Math 1550, Math 1552, and Math 2090—is required before students may register for any chemical engineering course other than CHE 1100 and CHE 2171.

In addition, students must earn a "C" or better in CHE 2171, CHE 2176, CHE 3101, CHE 3102, CHE 3104, CHE 3171, CHE 3172, and CHE 3173 before registering for any subsequent course that requires one or more of these as a prerequisite.

Semester 1

CRITICAL: MATH 1022 or MATH 1023

- CHEM 1201 General Chemistry I (3)
- ENGL 1001 English Composition (3)
- MATH 1550 Analytic Geometry and Calculus I (5)
- General Education course - Humanities (3)
- CHE 1100 Introduction to Chemical Engineering (1)
- BIOL 1201 Biology for Science Majors I (3)

Total Semester Hours: 18

Semester 2

CRITICAL: "C" or better in CHEM 1201 and "C" or better in MATH 1550

- CHEM 1202 General Chemistry (3)

http://catalog.lsu.edu/preview_program.php?catoid=16&poid=8615&returnto=1234&print
- CHEM 1212 General Chemistry Laboratory (2)
- MATH 1552 Analytic Geometry and Calculus II (4)
- PHYS 2110 Particle Mechanics (3)
- General Education course - Arts (3)

**Total Semester Hours: 15**

### Semester 3

**CRITICAL:** "C" or better in PHYS 2110

- CHE 2171 Chemical Engineering Fundamentals: Material and Energy Balances (4)
- CHEM 2261 Organic Chemistry (3)
- MATH 2090 Elementary Differential Equations and Linear Algebra (4)
- PHYS 2113 Fields: Gravity, Electricity, and Magnetism (3)
- ENGL 2000 English Composition (3)

**Total Semester Hours: 17**

### Semester 4

**CRITICAL:** 2.0 GPA in CHE courses

- CHE 2176 Numerical Methods and Programming for Chemical Engineers (4)
- CHEM 2262 Organic Chemistry (3)
- CHEM 2364 Organic Chemistry Laboratory (2)
- ECON 2030 Economic Principles (3)
- General Education course - Social Sciences (3)

**Total Semester Hours: 15**

### Semester 5

**CRITICAL:** 2.0 GPA in CHE courses

- CHE 3101 Transport Sciences: Momentum Transfer (3)
- CHE 3172 Chemical Engineering Thermodynamics (3)
- **CHEM 3492 Physical Chemistry II (3)**
- ME 2733 Materials of Engineering (3)
- General Education course - Humanities (3)

**Total Semester Hours: 15**

### Semester 6

- CHE 3102 Transport Sciences: Heat and Mass Transfer (4)
- CHE 3104 Engineering Measurements Laboratory (3)
- CHE 3171 Introduction to Design and Process Safety (3)
- CHE 3173 Heterogeneous Equilibrium (3)
- Approved Elective/Area of Concentration course (3)
Total Semester Hours: 16

Semester 7

- CHE 4151 Unit Operations Design (4)
- CHE 4162 Unit Operations Laboratory (3)
- CHE 4190 Chemical Reaction Engineering (3)
- CHE 4198 Process Dynamics (3)
- Approved Elective/Area of Concentration course (3)

Total Semester Hours: 16

Semester 8

- CHE 4172 Process Design (4)
- Approved Electives/Area of Concentration courses (9)
- General Education course - Humanities (3)

Total Semester Hours: 16

128 Total Sem. Hrs.

Areas of Concentration

Lists of approved area electives approved for the chemical engineering concentrations are available from the department. Depending on the particular area electives selected, students may be required to take one or more additional prerequisite course(s).

Biomolecular

CRITICAL REQUIREMENTS

SEMESTER 1: MATH 1022 or MATH 1023.
SEMESTER 2: “C” or better in CHEM 1201, “C” or better in MATH 1550.
SEMESTER 3: “C” or better in PHYS 2110.
SEMESTER 4: 2.00 GPA in CHE courses
SEMESTER 5: 2.00 GPA in CHE courses

Semester 1

CRITICAL: MATH 1022 or MATH 1023

- CHEM 1201 General Chemistry I (3)
- CHE 1100 Introduction to Chemical Engineering (1)
- BIOL 1201 Biology for Science Majors I (3)
- ENGL 1001 English Composition (3)
- MATH 1550 Analytic Geometry and Calculus I (5)
- General Education course - Humanities (3)

Total Semester Hours: 18
Semester 2

CRITICAL: "C" or better in CHEM 1201 and "C" or better in MATH 1550

- CHEM 1202 General Chemistry (3)
- CHEM 1212 General Chemistry Laboratory (2)
- MATH 1552 Analytic Geometry and Calculus II (4)
- PHYS 2110 Particle Mechanics (3)
- General Education course - Arts (3)

Total Semester Hours: 15

Semester 3

CRITICAL: "C" or better in PHYS 2110

- CHE 2171 Chemical Engineering Fundamentals: Material and Energy Balances (4)
- CHEM 2261 Organic Chemistry (3)
- MATH 2090 Elementary Differential Equations and Linear Algebra (4)
- PHYS 2113 Fields: Gravity, Electricity, and Magnetism (3)
- ENGL 2000 English Composition (3)

Total Semester Hours: 17

Semester 4

CRITICAL: 2.0 GPA in CHE courses

- CHE 2176 Numerical Methods and Programming for Chemical Engineers (4)
- CHEM 2262 Organic Chemistry (3)
- CHEM 2364 Organic Chemistry Laboratory (2)
- ECON 2030 Economic Principles (3)
- General Education course - Social Sciences (3)

Total Semester Hours: 15

Semester 5

CRITICAL: 2.0 GPA in CHE courses

- CHE 3101 Transport Sciences: Momentum Transfer (3)
- CHE 3172 Chemical Engineering Thermodynamics (3)
- CHEM 3492 Physical Chemistry II (3)
- ME 2733 Materials of Engineering (3)
- General Education course - Humanities (3)

Total Semester Hours: 15

Semester 6

- CHE 3102 Transport Sciences: Heat and Mass Transfer (4)
Degrees programs/curriculums/majors: Chemical Engineering, B S.Ch.E. - Louisiana State University - Acatalog ACMS™

- CHE 3104 Engineering Measurements Laboratory (3)
- CHE 3171 Introduction to Design and Process Safety (3)
- CHE 3173 Heterogeneous Equilibrium (3)
- Approved Elective/Area of Concentration course (3)

Total Semester Hours: 16

Semester 7

- CHE 4151 Unit Operations Design (4)
- CHE 4162 Unit Operations Laboratory (3)
- CHE 4190 Chemical Reaction Engineering (3)
- CHE 4198 Process Dynamics (3)
- Approved Elective/Area of Concentration course (3)

Total Semester Hours: 16

Semester 8

- CHE 4172 Process Design (4)
- Approved Electives/Area of Concentration courses (9)
- General Education course - Humanities (3)

Total Semester Hours: 16

128 Total Sem. Hrs.

Environmental

CRITICAL REQUIREMENTS

SEMESTER 1: MATH 1022 or MATH 1023.
SEMESTER 2: "C" or better in CHEM 1201, "C" or better in MATH 1550.
SEMESTER 3: "C" or better in PHYS 2110.
SEMESTER 4: 2.00 GPA in CHE courses
SEMESTER 5: 2.00 GPA in CHE courses

Semester 1

CRITICAL: MATH 1022 or MATH 1023

- CHEM 1201 General Chemistry I (3)
- CHE 1100 Introduction to Chemical Engineering (1)
- BIOL 1201 Biology for Science Majors I (3)
- ENGL 1001 English Composition (3)
- MATH 1550 Analytic Geometry and Calculus I (5)
- General Education course - Humanities (3)

Total Semester Hours: 18

Semester 2
CRITICAL: "C" or better in CHEM 1201 and "C" or better in MATH 1550

- CHEM 1202 General Chemistry (3)
- CHEM 1212 General Chemistry Laboratory (2)
- MATH 1552 Analytic Geometry and Calculus II (4)
- PHYS 2110 Particle Mechanics (3)
- General Education course - Arts (3)

**Total Semester Hours: 15**

**Semester 3**

CRITICAL: "C" or better in PHYS 2110

- CHE 2171 Chemical Engineering Fundamentals: Material and Energy Balances (4)
- CHEM 2261 Organic Chemistry (3)
- MATH 2090 Elementary Differential Equations and Linear Algebra (4)
- PHYS 2113 Fields: Gravity, Electricity, and Magnetism (3)
- ENGL 2000 English Composition (3)

**Total Semester Hours: 17**

**Semester 4**

CRITICAL: 2.0 GPA in CHE courses

- CHE 2176 Numerical Methods and Programming for Chemical Engineers (4)
- CHEM 2262 Organic Chemistry (3)
- CHEM 2364 Organic Chemistry Laboratory (2)
- ECON 2030 Economic Principles (3)
- General Education course - Social Sciences (3)

**Total Semester Hours: 15**

**Semester 5**

CRITICAL: 2.0 GPA in CHE courses

- CHE 3101 Transport Sciences: Momentum Transfer (3)
- CHE 3172 Chemical Engineering Thermodynamics (3)
- **CHEM 3492 Physical Chemistry II (3)**
- ME 2733 Materials of Engineering (3)
- General Education course - Humanities (3)

**Total Semester Hours: 15**

**Semester 6**

- CHE 3102 Transport Sciences: Heat and Mass Transfer (4)
- CHE 3104 Engineering Measurements Laboratory (3)
Degrees programs/curriculums/majors: Chemical Engineering, B.S.Ch.E. - Louisiana State University - Acalog ACMS™

- CHE 3171 Introduction to Design and Process Safety (3)
- CHE 3173 Heterogeneous Equilibrium (3)
- Approved Elective/Area of Concentration course (3)

**Total Semester Hours: 16**

**Semester 7**

- CHE 4151 Unit Operations Design (4)
- CHE 4162 Unit Operations Laboratory (3)
- CHE 4190 Chemical Reaction Engineering (3)
- CHE 4198 Process Dynamics (3)
- Approved Elective/Area of Concentration course (3)

**Total Semester Hours: 16**

**Semester 8**

- CHE 4172 Process Design (4)
- Approved Elective/Area of Concentration courses (9)
- General Education course - Humanities (3)

**Total Semester Hours: 16**

**128 Total Sem. Hrs.**

**Materials**

**CRITICAL REQUIREMENTS**

**SEMESTER 1:** MATH 1022 or MATH 1023.
**SEMESTER 2:** "C" or better in CHEM 1201, "C" or better in MATH 1550.
**SEMESTER 3:** "C" or better in PHYS 2110.
**SEMESTER 4:** 2.00 GPA in CHE courses
**SEMESTER 5:** 2.00 GPA in CHE courses

**Semester 1**

**CRITICAL:** MATH 1022 or MATH 1023

- CHEM 1201 General Chemistry I (3)
- CHE 1100 Introduction to Chemical Engineering (1)
- BIOL 1201 Biology for Science Majors I (3)
- ENGL 1001 English Composition (3)
- MATH 1550 Analytic Geometry and Calculus I (5)
- General Education course - Humanities (3)

**Total Semester Hours: 18**

**Semester 2**
Degrees programs/curriculums/majors: Chemical Engineering, B.S.Ch.E. - Louisiana State University - Acatalog ACMS™

**CRITICAL:** "C" or better in CHEM 1201 and "C" or better in MATH 1550

- CHEM 1202 General Chemistry (3)
- CHEM 1212 General Chemistry Laboratory (2)
- MATH 1552 Analytic Geometry and Calculus II (4)
- PHYS 2110 Particle Mechanics (3)
- General Education course - Arts (3)

**Total Semester Hours: 15**

**Semester 3**

**CRITICAL:** "C" or better in PHYS 2110

- CHE 2171 Chemical Engineering Fundamentals: Material and Energy Balances (4)
- CHEM 2261 Organic Chemistry (3)
- MATH 2090 Elementary Differential Equations and Linear Algebra (4)
- PHYS 2113 Fields: Gravity, Electricity, and Magnetism (3)
- ENGL 2000 English Composition (3)

**Total Semester Hours: 17**

**Semester 4**

**CRITICAL:** 2.0 GPA in CHE courses

- CHE 2176 Numerical Methods and Programming for Chemical Engineers (4)
- CHEM 2262 Organic Chemistry (3)
- CHEM 2364 Organic Chemistry Laboratory (2)
- ECON 2030 Economic Principles (3)
- General Education course - Social Sciences (3)

**Total Semester Hours: 15**

**Semester 5**

**CRITICAL:** 2.0 GPA in CHE courses

- CHE 3101 Transport Sciences: Momentum Transfer (3)
- CHE 3172 Chemical Engineering Thermodynamics (3)
- **CHEM 3492 Physical Chemistry II (3)**
- ME 2733 Materials of Engineering (3)
- General Education course - Humanities (3)

**Total Semester Hours: 15**

**Semester 6**

- CHE 3102 Transport Sciences: Heat and Mass Transfer (4)
- CHE 3104 Engineering Measurements Laboratory (3)
- CHE 3171 Introduction to Design and Process Safety (3)
- CHE 3173 Heterogeneous Equilibrium (3)
- Approved Elective/Area of Concentration course (3)

**Total Semester Hours: 16**

### Semester 7

- CHE 4151 Unit Operations Design (4)
- CHE 4162 Unit Operations Laboratory (3)
- CHE 4190 Chemical Reaction Engineering (3)
- CHE 4198 Process Dynamics (3)
- Approved Elective/Area of Concentration course (3)

**Total Semester Hours: 16**

### Semester 8

- CHE 4172 Process Design (4)
- Approved Electives/Area of Concentration courses (9)
- General Education course - Humanities (3)

**Total Semester Hours: 16**

128 Total Sem. Hrs.
Physical Chemistry II
CHEM3492 Fall 2017

Section 1 (TTh 10:30 – 11:50 AM) 201 Williams HALL

Instructor: Dr. Daniel Kuroda
Office: 327 Choppin Hall
Phone: 578-1780
Office Hours: T @ 9:30 AM – 10:20 pm, F @ 2:00 PM – 3 PM.
E-mail: dkuoda@lsu.edu
Moodle course ID: 2017 Fall CHEM 3492 for Daniel Kuroda

Text: Physical Chemistry: A Molecular Approach 2nd printing

Supplements: A copy of my class lecture presentations will be posted in Moodle.

Exams: There will be THREE 80 minute in-class exams and a comprehensive final exam. If an exam is missed due to a University allowed absence, make-up exams will be given. You must bring the appropriate written documentation (bring dated proof within a week of the missed day). For make-up final exams; we require written permission from your Dean. Unexcused absences for exams will receive a zero for that exam.

The reason for your absence must be written on a paper with a formal letterhead and signed by a person of authority and include the date of the absence, for example coach for the track team, a doctors excuse, letter for a court date, etc. It may be a copy of some other legal-type form, for example a copy of an accident report.

For every exam you must bring the following: your student ID, a calculator, and pen/pencil. NO OTHER FORM OF TECHNOLOGY ALLOWED.

Our in-class exams are schedule for the following days:
Sep. 21st, Oct 26th, Nov. 28th
Note: Barring school closure due to inclement of weather, every effort will be made to keep these exams dates unchanged.

Final Exam: December 8th, 3:00-5:00 pm

Final date to request rescheduling of a final examination when three examinations are schedule in 24 hours is Monday, October 31st.

What will be on the Exam? You are responsible for all of the material presented in the class and contained in the homework assignments. The exams will come from these materials. The homework prepares you for the exam. YOU MUST DO THE HOMEWORK TO SURVIVE IN THIS COURSE.

Homework: There will be between 10 graded homework assignments. Each assignment will be posted in Moodle at least one week in advance. Homework handed in late (without justification) WON'T be accepted. The due dates of homework will be posted in the class schedule which it could be found in Moodle. All the homework assignments are due that day
before 11:59 PM. You have **one week** since posting the grade in Moodle to correct any **mistake** in the grade of your homework.

**Suggested Problems:** Suggested end-of-the-chapter problems will be also given, but they will not be turned in for grades. It is very important that you do the suggested problems because questions based on these will also appear on the exams.

**Quizzes:** In-class quizzes will be added to your total points through the semester. Quizzes will be given during the semester without previous notice. At least 5 quizzes will be evaluated during the semester.

**Grading scheme:** The final course grade will be based on a score of 1000 points. The score of your lowest in-class exam will not be taken into consideration in the final grade, but **unexcused absences are not included.** However, to **pass the class** a C- or greater grade is required in the final exam.

The overall grade will be determined using the following scheme:

<table>
<thead>
<tr>
<th></th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 in-class exams</td>
<td>45% 450 total, 225 points each</td>
</tr>
<tr>
<td>Homework assignments</td>
<td>15% 150 total, 15 points each</td>
</tr>
<tr>
<td>Final Exam</td>
<td>35% 350</td>
</tr>
<tr>
<td>Quiz/ in class participation</td>
<td>5% 50</td>
</tr>
<tr>
<td>Total Points</td>
<td>1000</td>
</tr>
</tbody>
</table>

**Grading Scale:**

<table>
<thead>
<tr>
<th>Letter grade</th>
<th>Percentage range</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>A+</td>
<td>94.5</td>
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<tr>
<td>A</td>
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<tr>
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<td>83.4</td>
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<tr>
<td>C+</td>
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<tr>
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</tr>
</tbody>
</table>

**Note 1:** The points will only have three significant figures.

**Note 2:** The grading scale is strictly adhered to. I cannot change your scores or the grading scale to "bump" you up to the next letter grade, because that is fraud!

**Course Expectations:** You are expected to spend **3 hours per week in the classroom** and a minimum of **6 hours per week outside of the class** for a total of **9 hours/week**. The outside of class time will include reading assigned chapters in the textbook, homework, and reviewing notes.
and other key concepts. Try to work problems within the chapters and the suggested problems (some you may not be able to do until after lecture). Work problems, work problems, work problems within and at the end of the chapter. Work problems until you fully comprehend the concept.

**Course Outline:** Topic, Chapters of book (# of Lectures)
- Gases, 16 (2)
- The three laws of thermodynamics, 19-22 (8)
- Phase equilibria & chemical equilibrium, 23-26 (8)
- Electrochemistry, additional chapter (3)
- Chemical kinetics, 28-29 (4)

**Students with Disability:** The University is committed to making reasonable efforts to assist individuals with disabilities in their efforts to avail themselves of services and programs offered by the University. To this end, Louisiana State University will provide reasonable accommodations for persons with documented qualifying disabilities. If you have a disability and feel you need accommodations in this course, you must present a letter to me from Disability Services in 115 Johnston Hall, indicating the existence of a disability and the suggested accommodations.