REQUEST FOR ADDING, CHANGING, SUSPENDING OR DROPPING AN UNDERGRADUATE CURRICULUM

Department: Construction Management
College: College of Engineering
Name of Curriculum/Major: Construction Management
Type of Degree: BS

Date: 12.6.16

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.

CURRICULUM

<table>
<thead>
<tr>
<th>PRESENT</th>
<th>PROPOSED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total semester hours in current curriculum: 122</td>
<td>Total semester hours in proposed curriculum: 122</td>
</tr>
</tbody>
</table>

APPROVALS:

Department Faculty Approval Date 12.1.16

12.6.16

Department Chair's Signature (Date)

College Faculty Approval Date 12/20/16

1/6/16

College Dean's Signature (Date)

Chair, FS C & C Committee (Date)

Academic Affairs Approval (Date)

Contact E-mail: sheumann@lsu.edu

College/Division/Department Contact: Stephanie Heumann (Please print name.)
When CATS was enacted the College of Engineering believed that there were enough mechanisms in place to track students who were encountering academic difficulties. These include the “two F grade policy,” C requirements, pre- and co-requisites, and in the case of Chemical engineering, departmental drop. This led to the adoption of very unrestricted CATS requirements. For example, students are not required to have earned credit in MATH 1550, the first math credit applicable to a degree in the College of Engineering and an entry requirement, until the end of the fourth semester. (The College of Science has a first semester requirement for MATH 1550.)

Since 2012, however, the College of Engineering’s undergraduate enrollment has soared. This enrollment growth has included a number of students who are not well prepared for math and physics courses. For example, in fall 2015, 10% of the freshman class earned a 20 or lower on the ACT. The average ACT for a May 2016 College of Engineering graduate was 26.

While our goal is not to restrict enrollment for underprepared students, we recognize the need to intervene earlier with students do not successfully complete MATH 1550 within the first year. Doing so will enable us to direct them to resources, and in cases in which a student may not be successful, help find a suitable major well before the student has lost valuable quality points and spent considerable financial aid.

Our proposal is to adopt a second semester CATS requirement for MATH 1550 (MATH 1550 is a course with a prerequisite of a passing score on the ALEKS test). For students who do not earn the necessary ALEKS score and do not enroll in MATH 1550 in their first or second semester but do well in MATH 1021 and/or MATH 1022/1023 during their first year, then we will permit them to continue even if they have not completed MATH 1550 by the end of their first year. The summer term will provide an ample opportunity to catch up. In addition to this strategy, we will also begin targeting our less prepared students and inviting them to attend summer term prior to their first year, again in an effort to improve their readiness.
MEMORANDUM

To: John B. Hopkins, Chair, Courses and Curricula Committee
    Faculty Senate Courses and Curricula Committee

From: Charles W Berryman, Chair
      Department of Construction Management

CC: File

Date: January 25, 2017

Re: RESPONSE to Faculty Senate Courses and Curricula Committee Comments Meeting Jan 19, 2017

Thank you for your comments about our recent proposals. Please review our response and don't hesitate to contact Stephanie Heumann at sheumann@lsu.edu with any questions or clarification.

1. Justification as requested
2. CM originally removed MATH 1021 from the first semester. Copy attached.
**Critical Requirements**

<table>
<thead>
<tr>
<th>PRESENT CATALOG</th>
<th>Construction Management PROPOSED CHANGES</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CRITICAL REQUIREMENTS:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEMESTER 1: MATH 1021.</td>
<td>SEMESTER 1: &quot;C&quot; or better in MATH 1550.</td>
<td></td>
</tr>
<tr>
<td>SEMESTER 2: MATH 1022 OR MATH 1023.</td>
<td>SEMESTER 2: &quot;C&quot; or better in CM 1011 and CM 1112.</td>
<td></td>
</tr>
<tr>
<td>SEMESTER 3: General Education Arts or Humanities course.</td>
<td>SEMESTER 3: &quot;C&quot; or better in PHYS 2001 and CM 2112.</td>
<td></td>
</tr>
<tr>
<td>SEMESTER 4: &quot;C&quot; or better in MATH 1550.</td>
<td>SEMESTER 4: &quot;C&quot; or better in CM 2113, CM 2116, and CM 2501; &quot;C&quot; or better in PHYS 2002.</td>
<td></td>
</tr>
<tr>
<td>SEMESTER 5: &quot;C&quot; or better in PHYS 2001.</td>
<td>SEMESTER 5: &quot;C&quot; or better in CM 3111 and CM 3502.</td>
<td></td>
</tr>
<tr>
<td>Admission into the College of Engineering is required for construction management majors prior to taking any construction management course numbered above CM 2101.</td>
<td>Admission into the College of Engineering is required for construction management majors prior to taking any construction management course numbered above CM 2112.</td>
<td></td>
</tr>
<tr>
<td>A grade of &quot;C&quot; or better is required in all CM courses and prerequisite courses: ENGL 1001 and ENGL 2000; MATH 1550; PHYS 2001 and PHYS 2002.</td>
<td>A grade of &quot;C&quot; or better is required in all CM courses and prerequisite courses: ENGL 1001 and ENGL 2000; MATH 1550; PHYS 2001 and PHYS 2002.</td>
<td></td>
</tr>
<tr>
<td>Registration in any CM course above CM 2101 is restricted to students admitted to a senior college with a declared CM major or minor.</td>
<td>Registration in any CM course above CM 2112 is restricted to students admitted to a senior college with a declared CM major or minor.</td>
<td></td>
</tr>
</tbody>
</table>
### Semester 1

<table>
<thead>
<tr>
<th>PRESENT CATALOG</th>
<th>Construction Management PROPOSED CHANGES</th>
<th>Actions</th>
</tr>
</thead>
</table>
| **CRITICAL: MATH 1021.**  
- CM 1011 Introduction to Construction Management (3)  
- General Education course – Art (3)  
- General Education course – Humanities (3)  
- MATH 1550 Analytic Geometry and Calculus I (5)  
- English 1001 (3) | **CRITICAL: “C” or better in MATH 1550**  
- CM 1011 Introduction to Construction Management (3)  
- General Education course – Art (3)  
- General Education course – Humanities (3)  
- MATH 1550 Analytic Geometry and Calculus I (5)  
- English 1001 (3) | Changed critical requirement |

*Total Semester Hours: 17*

### Semester 2

<table>
<thead>
<tr>
<th>PRESENT CATALOG</th>
<th>Construction Management PROPOSED CHANGES</th>
<th>Actions</th>
</tr>
</thead>
</table>
| **CRITICAL: MATH 1022 or MATH 1023.**  
- CM 1102 Plan and Cost Analysis for Residential Construction (3)  
- CSC 1240 Statistics and Graphics with MATLAB (3)  
- ISDS 1100 Introduction to Management Information Systems (3)  
- ENVS 1126 Introduction to Environmental Sciences (3)  
- General Education course - Humanities (3) | **CRITICAL: “C” or better in CM 1101 and CM 1112.**  
- CM 1112 Construction Material and Methods I (3)  
- CSC 1240 Statistics and Graphics with MATLAB (3)  
- ISDS 1100 Introduction to Management Information Systems (3)  
- ENVS 1126 Introduction to Environmental Sciences (3)  
- General Education course - Humanities (3) | CATS Change-Critical requirement.  
Approved by C&C at January meeting. In review at Academic Affairs |

*Total Semester Hours: 15*
### Semester 3

<table>
<thead>
<tr>
<th>PRESENT CATALOG</th>
<th>Construction Management PROPOSED CHANGES</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CRITICAL:</strong> General Education Arts or Humanities course</td>
<td><strong>CRITICAL:</strong> &quot;C&quot; or better in PHYS 2001 and CM 2112</td>
<td>Changed critical requirements.</td>
</tr>
<tr>
<td>• ACCT 2000 Survey of Accounting (3)</td>
<td>• CM 2112 Construction Materials and Methods II (3)</td>
<td>Approved by C&amp;C at January meeting. In review at Academic Affairs</td>
</tr>
<tr>
<td>• CM 2101 Materials, Methods and Equipment I (3)</td>
<td>• ACCT 2000 Survey of Accounting (3)</td>
<td></td>
</tr>
<tr>
<td>• ECON 2030 Economic Principles (3)</td>
<td>• ECON 2030 Economic Principles (3)</td>
<td></td>
</tr>
<tr>
<td>• PHYS 2001 General Physics (3)</td>
<td>• PHYS 2001 General Physics (3)</td>
<td></td>
</tr>
<tr>
<td>• CMST 1061 Fundamentals of Communication (3) or</td>
<td>• CMST 1061 Fundamentals of Communication (3) or</td>
<td></td>
</tr>
<tr>
<td>• CMST 2060 Public Speaking (3)</td>
<td>• CMST 2060 Public Speaking (3)</td>
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<td><strong>Total Semester Hours: 15</strong></td>
<td><strong>Total Semester Hours: 15</strong></td>
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### Semester 4

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td><strong>CRITICAL:</strong> &quot;C&quot; or better in MATH 1550</td>
<td><strong>CRITICAL:</strong> &quot;C&quot; or better in CM 2113, CM 2116, and CM 2501; &quot;C&quot; or better in PHYS 2002</td>
<td>Changed critical requirements</td>
</tr>
<tr>
<td>• CM 2102 Construction Equipment (3)</td>
<td>• CM 2113 Construction Equipment (3)</td>
<td>Approved by C&amp;C at January meeting. In review at Academic Affairs</td>
</tr>
<tr>
<td>• CM 2103 Construction Materials and Methods II (3)</td>
<td>• CM 2116 Construction Plan Reading (3)</td>
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<tr>
<td>• PHYS 2002 General Physics (3)</td>
<td>• PHYS 2002 General Physics (3)</td>
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<tr>
<td>• CM 2501 Structural Principles and Practices (3)</td>
<td>• CM 2501 Structural Principals and Practices (3)</td>
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<tr>
<td>• CM 2105 Construction Surveying (3)</td>
<td>• CM 2105 Construction Surveying (3)</td>
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<tr>
<td><strong>Total Semester Hours: 15</strong></td>
<td><strong>Total Semester Hours: 15</strong></td>
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### Semester 5

<table>
<thead>
<tr>
<th>PRESENT CATALOG</th>
<th>Construction Management PROPOSED CHANGES</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRITICAL: &quot;C&quot; or better in PHYS 2001.</td>
<td>CRITICAL: &quot;C&quot; or better in CM 3111 and CM 3502</td>
<td>Changed critical requirements</td>
</tr>
<tr>
<td>- CM 3111 Construction Estimating (3)</td>
<td></td>
<td></td>
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<tr>
<td>- BLAW 3201 Business Law (3)</td>
<td></td>
<td></td>
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<tr>
<td>- CM 3502 Construction and Civil Materials (3)</td>
<td></td>
<td></td>
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<tr>
<td>- Industry Emphasis Area Course (3)</td>
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<td></td>
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<tr>
<td>- ENGL 2000 Composition II (3)</td>
<td></td>
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<tr>
<td><strong>Total Semester Hours: 15</strong></td>
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### Semester 6

<table>
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<tr>
<th>PRESENT CATALOG</th>
<th>Construction Management PROPOSED CHANGES</th>
<th>Actions</th>
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</thead>
<tbody>
<tr>
<td>- CM 4101 Scheduling and Cost Control (3)</td>
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<td>No Changes to Semester 6</td>
</tr>
<tr>
<td>- CM 4211 Construction Contracting (3)</td>
<td></td>
<td></td>
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<tr>
<td>- CM 3201 or ARCH 3008 Mechanical/Electrical Systems (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- CM 3503 Soils in Construction (3)</td>
<td></td>
<td></td>
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<tr>
<td>- Industry Emphasis Area Course (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Semester Hours: 15</strong></td>
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</table>
### Semester 7

<table>
<thead>
<tr>
<th>PRESENT CATALOG</th>
<th>Construction Management PROPOSED CHANGES</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• CM 4221 Construction Project Management (3)</td>
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<td>No Changes to Semester 7</td>
</tr>
<tr>
<td>• CM 2215 Construction Safety (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• FIN 3715 (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• CM 3504 Applied Structural Design (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Industry Emphasis Area Course (3)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Semester Hours: 15**

### Semester 8

<table>
<thead>
<tr>
<th>PRESENT CATALOG</th>
<th>Construction Management PROPOSED CHANGES</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• CM 4202 Construction Enterprise (3)</td>
<td></td>
<td>No Changes to Semester 8</td>
</tr>
<tr>
<td>• MKT 3401 Marketing Principles (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• MGT 3200 Management Principles (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• General Education course – Social Science (3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Industry Emphasis Area Course (3)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total Semester Hours: 15**
REQUEST FOR ADDING, CHANGING, SUSPENDING OR DROPPING AN UNDERGRADUATE CURRICULUM

Department: Chemical Engineering
College: Engineering
Name of Curriculum/Major: BS Chemical Engineering
Type of Degree: Bachelor
Date: 1-5-2017

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.

CURRICULUM

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

APPROVALS:

Department Faculty Approval Date 1/5/2017
Department Chair's Signature 1/5/2017
Chair, FS C & C Committee 1/19/17

College Faculty Approval Date 1/20/16
College Dean's Signature 1/1/17
Academic Affairs Approval 1/25/17

College/Division/Department Contact:

(Please print name.)

Contact E-mail:
When a department adds a new curriculum or makes changes in an existing one, a Form D Addendum must also be submitted. This form is simply a list of those courses in the curriculum that satisfy the General Education requirement. Include course rubric, number, and credit hours when curricula differ from the default values. Indicate the curriculum semester for all General Education courses.

<table>
<thead>
<tr>
<th>General Education Requirement</th>
<th>Course(s)</th>
<th>Credit Hours</th>
<th>Curriculum Semester</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Composition (6 hrs.)</td>
<td>ENGL 1001 or 1004</td>
<td>3</td>
<td>(x) 1st (6th) (4th) 8th</td>
</tr>
<tr>
<td></td>
<td>ENGL 2000</td>
<td>3</td>
<td>(x) 1st (6th) (4th) 8th</td>
</tr>
<tr>
<td>Analytical Reasoning (6 hrs.)</td>
<td>General Education analytical reasoning course (from mathematics department)</td>
<td>3</td>
<td>(x) 1st (6th) (4th) 8th</td>
</tr>
<tr>
<td>(At least 3 hours credit must be from a MATH course.)</td>
<td>General Education analytical reasoning course</td>
<td>3</td>
<td>(x) 1st (6th) (4th) 8th</td>
</tr>
<tr>
<td>Arts (3 hrs.)</td>
<td>General Education arts course</td>
<td>3</td>
<td>(x) 1st (6th) (4th) 8th</td>
</tr>
<tr>
<td>Humanities (9 hrs.)</td>
<td>General Education humanities course</td>
<td>3</td>
<td>(x) 1st (6th) (4th) 8th</td>
</tr>
<tr>
<td></td>
<td>General Education humanities course</td>
<td>3</td>
<td>(x) 1st (6th) (4th) 8th</td>
</tr>
<tr>
<td></td>
<td>General Education humanities course</td>
<td>3</td>
<td>(x) 1st (6th) (4th) 8th</td>
</tr>
<tr>
<td>Natural Sciences (9 hrs.)</td>
<td>General Education natural science course sequence</td>
<td>6</td>
<td>(x) 1st (6th) (4th) 8th</td>
</tr>
<tr>
<td>(If 2 course sequence is taken in the physical sciences, the additional 3 hour course must be from the life sciences, and vice versa.)</td>
<td>General Education natural science course</td>
<td>3</td>
<td>(x) 1st (6th) (4th) 8th</td>
</tr>
<tr>
<td>Social Sciences (6 hrs.)</td>
<td>General Education social science course</td>
<td>3</td>
<td>(x) 1st (6th) (4th) 8th</td>
</tr>
<tr>
<td>(At least three hours at the 2000-level.)</td>
<td>General Education social science course (2000-level)</td>
<td>3</td>
<td>(x) 1st (6th) (4th) 8th</td>
</tr>
</tbody>
</table>
Justification:

The current CATS requirements for the Department of Chemical Engineering in the College of Engineering are as follows:

SEMESTER 1: MATH 1021.
SEMESTER 2: MATH 1022 or MATH 1023.
SEMESTER 3: "C" or better in CHEM 1201.
SEMESTER 4: "C" or better in MATH 1550.
SEMESTER 5: "C" or better in PHYS 2110.

However, this critical path assignment will not put a student on the path to graduation in 4 years. If a student starts their curriculum in MATH 1021, based on the current flow chart, it will take 5 academic years for a student to graduate with a BS degree in Chemical Engineering. (Note: The curriculum below is based on Fall 2017 curriculum with recent approved changes):

CURRENT CATS TRACK DEGREE PROGRESSION:

Semester 1: MATH 1021 (3 credits) (Note: Student is likely not eligible to take any of the required science courses for CHE)
GEN ED REQUIREMENTS (6 total credits)
ENGL 1001 (3 credits)
CHE 1100 (1 credit) (It should be noted that some of the math in this course might be more rigorous than what a MATH 1021 student knows)

Semester 2: MATH 1022 (3 credits)
CHEM 1201 (3 credits)
GEN ED REQUIREMENTS (6 total credits)

At the end of the freshman year, student has taken 5 of the 11 courses that are recommended on the CHE Flowchart for 4-year graduation.

Semester 3: MATH 1550 (5 credits)
CHEM 1202 (3 credits)
BIOL 1201 (3 credits)
CHEM 1212 (2 credits)
ECON 2030 (3 credits)

Semester 4: MATH 1552 (4 credits)
PHYS 2110 (3 credits)
CHE 2171 (4 credits)
CHEM 2261 (3 credits)
ENGL 2000 (3 credits)

At the end of the sophomore year, student has taken 16 of the 21 courses that are recommended on the CHE Flowchart for 4-year graduation.

Semester 5: MATH 2090 (4 credits)
CHEM 2262 (3 credits)
PHYS 2113 (3 credits)
CHEM 2364 (2 credits)

Semester 6: CHE 2176 (4 credits)  
CHEM 3491 (3 credits)  
ME 2733 (3 credits)  
GROUP B ELECTIVE (3 credits)

At the end of the junior year, student has taken 25 of the 31 courses that are recommended on the CHE Flowchart for 4-year graduation.

Semester 7 – Semester 10: Student would take remaining courses as listed on the flowchart.

Notes on this track:
- Students who begin their studies with MATH 1021 are currently advised to take summer classes to “catch up” to the flow chart. This solution offers issues:
  - Students give up the opportunity to do a co-op or internship if they take classes over the summer.
  - Students are still paying for tuition for extra semester, the summer plan should bring about their graduation in 4 calendar years.
- If a student opts to not take summer courses, convincing them to prolong graduation by one additional year (6-years to graduation) to obtain a co-op or internship is a challenge.
- Co-ops and internships are critical in chemical engineering with respect to earning full-time employment post-graduation.
- Students on this track who struggle in CHE courses would not be identified until they have been enrolled at LSU for 4 semesters. This is problematic in that the student has invested time and money into a curriculum that they may have to change. Futher, it is possible that if students are struggling in CHE 2171, they are likely struggling in MATH, CHEM or PHYS. Doing so will have an effect on the overall LSU GPA and may make it more difficult for them to transfer to another major in a timely fashion.

PROPOSED CATS TRACK:
Semester 1: “C” or better in MATH 1022 or 1023
Semester 2: “C” or better in CHEM 1201, “C” or better in MATH 1550
Semester 3: “C” or better in PHYS 2110, P in CHE 1100
Semester 4: 2.00 GPA in CHE courses
Semester 5: 2.0 GPA in CHE courses

PROPOSED CATS TRACK DEGREE PROGRESSION:

Semester 1: MATH 1022 or MATH 1023 (3 credits)  
CHEM 1201 (3 credits)  
GEN ED REQUIREMENTS (3 credits)  
CHE 1100 (3 credits)  
ENGL 1001 (3 credits)

Semester 2: MATH 1550 (5 credits)  
CHEM 1202 (3 credits)  
CHEM 1201 (2 credits)  
GEN ED REQUIREMENTS (3 credits)  
BIOL 1201 (3 credits)
At the end of the freshman year, student has taken 9 of the 11 courses that are recommended on the CHE flowchart for 4-year graduation.

Semester 3:  MATH 1552 (4 credits)  
PHYS 2110 (3 credits)  
CHE 2171 (4 credits)  
CHEM 2261 (3 credits)  
GEN ED REQUIREMENT (3 credits)

Semester 4:  MATH 2090 (4 credits)  
PHYS 2113 (3 credits)  
CHEM 2262 (3 credits)  
CHEM 2364 (2 credits)  
ENGL 2000 (3 credits)  
ECON 2030 (3 credits)

At the end of the sophomore year, student has taken 20 of the 21 courses that are recommended on the CHE Flowchart for 4-year graduation.

Semester 5:  CHE 2176 (4 credits)  
CHE 3101 (3 credits)  
CHE 3172 (3 credits)  
CHEM 3491 (3 credits)  
ME 2733 (3 credits)  
GEN ED REQUIREMENT (3 credits)

Semester 6:  CHE 3104 (3 credits)  
CHE 3171 (3 credits)  
CHE 3102 (4 credits)  
CHE 3173 (3 credits)  
GROUP B ELECTIVE (3 credits)

At the end of the junior year, student has taken 31 of the 31 courses that are recommended on the CHE Flowchart for 4-year graduation.

Semester 7 – Semester 8:  Student is on track for a 4-year graduation and is able to take all classes as prescribed by the CHE flowchart.

Benefits to this track:
- Students would have summers available to obtain a co-op or internship.
- Students would be on track to graduate in 4 years.
- Students might be more amenable to the idea of extending graduation for a year to obtain a co-op or internship.
- Students on this track who struggle in CHE courses would be identified one semester sooner than with the current CATS requirements. It is more likely that their LSU GPA would be higher, making it easier for students to transfer to another major within the University.
- Students who are struggling in CHE courses will be identified by GPA early in their curriculum.
Without Concentration
Biomolecular
Environmental
Materials

Chemical Engineering

CRITICAL REQUIREMENTS

SEMESTER 1: MATH 1021.
SEMESTER 2: MATH 1022 or MATH 1023.
SEMESTER 3: "C" or better in CHEM 1201.
SEMESTER 4: "C" or better in MATH 1550.
SEMESTER 5: "C" or better in PHYS 2110.

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, CHE 2162, and CHE 2171.

Semester 1

CRITICAL: MATH 1021.

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: MATH 1022 or MATH 1023.

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 CHEM 1201.

CHE 2162 Introduction to Computer Modeling and Simulation of Chemical Engineering Systems (2)
CHE 2171 Chemical Engineering Fundamentals: Material and Energy Balances (3)
CHEM 2261 Organic Chemistry (3)
MATH 2090 Elementary Differential Equations and Linear Algebra (4)
PHYS 2113 Fields: Gravity, Electricity, and Magnetism (3)
Total Semester Hours: 15

Semester 4

CRITICAL: “C” or better in MATH 1550.

CHE 2176 Mathematical Modeling of Chemical Engineering Systems (3)
CHEM 2262 Organic Chemistry (3)
CHEM 2364 Organic Chemistry Laboratory (2)
ECON 2030 Economic Principles (3)
ENGL 2000 English Composition (3)
General Education course - Social Sciences (3)
Total Semester Hours: 17

Semester 5

CRITICAL: “C” or better in PHYS 2110.

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 Process Economics and Optimization (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 1021.
SEMESTER 2: MATH 1022 or MATH 1023.
SEMESTER 3: "C" or better in CHEM 1201.
SEMESTER 4: "C" or better in MATH 1550.
SEMESTER 5: "C" or better in PHYS 2110.

Semester 1

CRITICAL: MATH 1021.

CHEM 1201 General Chemistry I (3)
ENGL 1001 English Composition (3)
MATH 1550 Analytic Geometry and Calculus I (5)
General Education course - Arts (3)
General Education course - Humanities (3)
Total Semester Hours: 17

Semester 2

CRITICAL: MATH 1022 or MATH 1023.

BIOL 1201 Biology for Science Majors I (3)
CHEM 1202 General Chemistry (3)
CHEM 1212 General Chemistry Laboratory (2)
MATH 1552 Analytic Geometry and Calculus II (4)
CHE 1100 Introduction to Chemical Engineering (1)
PHYS 2110 Particle Mechanics (3)
Total Semester Hours: 16

Semester 3

CRITICAL: "C" or better in CHEM 1201.

CHE 2162 Introduction to Computer Modeling and Simulation of Chemical Engineering Systems (2)
CHE 2171 Chemical Engineering Fundamentals: Material and Energy Balances (3)
CHEM 2261 Organic Chemistry (3)
MATH 2090 Elementary Differential Equations and Linear Algebra (4)
PHYS 2113 Fields: Gravity, Electricity, and Magnetism (3)
General Education course - Humanities (3)
Total Semester Hours: 18

Semester 4

CRITICAL: "C" or better in MATH 1550.

CHE 2176 Mathematical Modeling of Chemical Engineering Systems (3)
CHEM 2262 Organic Chemistry (3)
CHEM 2364 Organic Chemistry Laboratory (2)
ECON 2030 Economic Principles (3)
ENGL 2000 English Composition (3)
Total Semester Hours: 14

Semester 5

CRITICAL: "C" or better in PHYS 2110.

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)
General Education course - Social Sciences (3)
Total Semester Hours: 18

Semester 6

CHE 3102 Transport Sciences: Heat and Mass Transfer (4)
CHE 3104 Engineering Measurements Laboratory (3)
CHE 3171 Process Economics and Optimization (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)
Total Semester Hours: 13

128 Total Sem. Hrs.

Environmental

CRITICAL REQUIREMENTS

SEMESTER 1: MATH 1021.
SEMESTER 2: MATH 1022 or MATH 1023.
SEMESTER 3: “C” or better in CHEM 1201.
SEMESTER 4: “C” or better in MATH 1550.
SEMESTER 5: “C” or better in PHYS 2110.

Semester 1

CRITICAL: MATH 1021.

CHEM 1201 General Chemistry I (3)
ENGL 1001 English Composition (3)
MATH 1550 Analytic Geometry and Calculus I (5)
General Education course - Arts (3)
General Education course - Humanities (3)
Total Semester Hours: 17

Semester 2

CRITICAL: MATH 1022 or MATH 1023.

BIOL 1201 Biology for Science Majors I (3)
CHEM 1202 General Chemistry (3)
CHEM 1212 General Chemistry Laboratory (2)
MATH 1552 Analytic Geometry and Calculus II (4)
CHE 1100 Introduction to Chemical Engineering (1)
PHYS 2110 Particle Mechanics (3)
Total Semester Hours: 16
Semester 3

CRITICAL: "C" or better in CHEM 1201.

CHE 2162 Introduction to Computer Modeling and Simulation of Chemical Engineering Systems (2)
CHE 2171 Chemical Engineering Fundamentals: Material and Energy Balances (3)
CHEM 2261 Organic Chemistry (3)
MATH 2090 Elementary Differential Equations and Linear Algebra (4)
PHYS 2113 Fields: Gravity, Electricity, and Magnetism (3)
General Education course - Humanities (3)
Total Semester Hours: 18

Semester 4

CRITICAL: "C" or better in MATH 1550

CHE 2176 Mathematical Modeling of Chemical Engineering Systems (3)
CHEM 2262 Organic Chemistry (3)
CHEM 2364 Organic Chemistry Laboratory (2)
ECON 2030 Economic Principles (3)
ENGL 2000 English Composition (3)
Total Semester Hours: 14

Semester 5

CRITICAL: "C" or better in PHYS 2110.

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)
General Education course - Social Sciences (3)
Total Semester Hours: 18

Semester 6

CHE 3102 Transport Sciences: Heat and Mass Transfer (4)
CHE 3104 Engineering Measurements Laboratory (3)
CHE 3171 Process Economics and Optimization (3)
CHE 3173 Heterogeneous Equilibrium (3)
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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

Semester 8

CHE 4172 Process Design (4)
Approved Elective/Area of Concentration courses (9)
Total Semester Hours: 13

128 Total Sem. Hrs.

Materials

CRITICAL REQUIREMENTS

SEMESTER 1: MATH 1021.
SEMESTER 2: MATH 1022 or MATH 1023.
SEMESTER 3: "C" or better in CHEM 1201.
SEMESTER 4: "C" or better in MATH 1550.
SEMESTER 5: "C" or better in PHYS 2110.

Semester 1

CRITICAL: MATH 1021

CHEM 1201 General Chemistry I (3)
ENGL 1001 English Composition (3)
MATH 1550 Analytic Geometry and Calculus I (5)
General Education course - Arts (3)
General Education course - Humanities (3)
Total Semester Hours: 17

Semester 2

CRITICAL: MATH 1022 or MATH 1023.

BIOL 1201 Biology for Science Majors I (3)
CHEM 1202 General Chemistry (3)
CHEM 1212 General Chemistry Laboratory (2)
MATH 1552 Analytic Geometry and Calculus II (4)
CHE 1100 Introduction to Chemical Engineering (1)
PHYS 2110 Particle Mechanics (3)
Total Semester Hours: 16

Semester 3
CRITICAL: "C" or better in CHEM 1201.

CHE 2162 Introduction to Computer Modeling and Simulation of Chemical Engineering Systems (2)
CHE 2171 Chemical Engineering Fundamentals: Material and Energy Balances (3)
CHEM 2261 Organic Chemistry (3)
MATH 2090 Elementary Differential Equations and Linear Algebra (4)
PHYS 2113 Fields: Gravity, Electricity, and Magnetism (3)
General Education course - Humanities (3)
Total Semester Hours: 18

Semester 4

CRITICAL: "C" or better in MATH 1550.

CHE 2176 Mathematical Modeling of Chemical Engineering Systems (3)
CHEM 2262 Organic Chemistry (3)
CHEM 2364 Organic Chemistry Laboratory (2)
ECON 2030 Economic Principles (3)
ENGL 2000 English Composition (3)
Total Semester Hours: 14

Semester 5

CRITICAL: "C" or better in PHYS 2110.

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)
General Education course - Social Sciences (3)
Total Semester Hours: 18

Semester 6

CHE 3102 Transport Sciences: Heat and Mass Transfer (4)
CHE 3104 Engineering Measurements Laboratory (3)
CHE 3171 Process Economics and Optimization (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)
Total Semester Hours: 13

128 Total Sem. Hrs.
2017-2018 General Catalog Louisiana State University
Chemical Engineering, B.S.Ch.E.

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.

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, CHE 2162, and CHE 2171.

✔ Semester 1

CRITICAL: MATH 1022 or 1023.

Chem 1201 General Chemistry I (3)
Engrl 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)
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)
Total Semester Hours: 15

Semester 4

CRITICAL: 2.00 GPA in CHE courses.

CHE 2176 Mathematical Modeling of Chemical Engineering Systems (4)
CHEM 2262 Organic Chemistry (3)
CHEM 2364 Organic Chemistry Laboratory (2)
ECON 2030 Economic Principles (3)
ENGL 2000 English Composition (3)
General Education course - Social Sciences (3)
Total Semester Hours: 15

Semester 5

CRITICAL: 2.00 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 Process Economics and Optimization (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 1

CRITICAL: MATH 1022 or 1023.

CHEM 1201 General Chemistry I (3)
ENGL 1001 English Composition (3)
MATH 1550 Analytic Geometry and Calculus I (5)
General Education course - Arts (3)
General Education course - Humanities (3)
Total Semester Hours: 17

/ Semester 2

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

BIOL 1201 Biology for Science Majors I (3)
CHEM 1202 General Chemistry (3)
CHEM 1212 General Chemistry Laboratory (2)
MATH 1552 Analytic Geometry and Calculus II (4)
CHE 1100 Introduction to Chemical Engineering (1)
PHYS 2110 Particle Mechanics (3)
Total Semester Hours: 16

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)
General Education course - Humanities (3)
Total Semester Hours: 18

Semester 4

CRITICAL: 2.00 GPA in CHE courses.

CHE 2176 Mathematical Modeling of Chemical Engineering Systems (4)
CHEM 2262 Organic Chemistry (3)
CHEM 2364 Organic Chemistry Laboratory (2)
ECON 2030 Economic Principles (3)
ENGL 2000 English Composition (3)
Total Semester Hours: 15

Semester 5

CRITICAL: 2.00 GPA in CHE courses.

CHE 3101 Transport Sciences: Momentum Transfer (4.5)
CHE 3172 Chemical Engineering Thermodynamics (3)
CHEM 3491 Physical Chemistry I (3)
ME 2733 Materials of Engineering (3)
General Education course - Humanities (3)
General Education course - Social Sciences (3)
Total Semester Hours: 18

Semester 6

CHE 3102 Transport Sciences: Heat and Mass Transfer (4)
CHE 3104 Engineering Measurements Laboratory (3)
CHE 3171 Process Economics and Optimization (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)
Total Semester Hours: 13

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 1**

CRITICAL: 1022 or 1023.

CHEM 1201 General Chemistry I (3)
ENGL 1001 English Composition (3)
MATH 1550 Analytic Geometry and Calculus I (5)
General Education course - Arts (3)
General Education course - Humanities (3)
Total Semester Hours: 17

**Semester 2**

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

BIOL 1201 Biology for Science Majors I (3)
CHEM 1202 General Chemistry (3)
CHEM 1212 General Chemistry Laboratory (2)
MATH 1552 Analytic Geometry and Calculus II (4)
CHE 1100 Introduction to Chemical Engineering (1)
PHYS 2110 Particle Mechanics (3)
Total Semester Hours: 16

**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)
General Education course - Humanities (3)
Total Semester Hours: 17

Semester 4

CRITICAL: 2.00 GPA in CHE courses.

CHE 2176 Mathematical Modeling of Chemical Engineering Systems (4)
CHEM 2262 Organic Chemistry (3)
CHEM 2364 Organic Chemistry Laboratory (2)
ECON 2030 Economic Principles (3)
ENGL 2000 English Composition (3)
Total Semester Hours: 15

Semester 5

CRITICAL: 2.00 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)
General Education course - Social Sciences (3)
Total Semester Hours: 18

Semester 6

CHE 3102 Transport Sciences: Heat and Mass Transfer (4)
CHE 3104 Engineering Measurements Laboratory (3)
CHE 3171 Process Economics and Optimization (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)
Total Semester Hours: 13

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 1

CRITICAL: 1022 or 1023.

CHEM 1201 General Chemistry I (3)
ENGL 1001 English Composition (3)
MATH 1550 Analytic Geometry and Calculus I (5)
General Education course - Arts (3)
General Education course - Humanities (3)
Total Semester Hours: 17

/Semester 2

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

BIOL 1201 Biology for Science Majors I (3)
CHEM 1202 General Chemistry (3)
CHEM 1212 General Chemistry Laboratory (2)
MATH 1552 Analytic Geometry and Calculus II (4)
CHE 1100 Introduction to Chemical Engineering (1)
PHYS 2110 Particle Mechanics (3)
Total Semester Hours: 16

/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)
General Education course - Humanities (3)
Total Semester Hours: 18

Semester 4
CRITICAL: 2.00 GPA in CHE courses.

CHE 2176 Mathematical Modeling of Chemical Engineering Systems (4)
CHEM 2262 Organic Chemistry (3)
CHEM 2364 Organic Chemistry Laboratory (2)
ECON 2030 Economic Principles (3)
ENGL 2000 English Composition (3)
Total Semester Hours: 14

Semester 5

CRITICAL: 2.00 GPA in CHE courses.

CHE 3101 Transport Sciences: Momentum Transfer (3)
CHEF 3172 Chemical Engineering Thermodynamics (3)
CHEM 3491 Physical Chemistry I (3)
ME 2733 Materials of Engineering (3)
General Education course - Humanities (3)
General Education course - Social Sciences (3)
Total Semester hours: 18

Semester 6

CHE 3102 Transport Sciences: Heat and Mass Transfer (4)
CHE 3104 Engineering Measurements Laboratory (3)
CHE 3171 Process Economics and Optimization (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)
Total Semester Hours: 13

128 Total Sem. Hrs.
REQUEST FOR **ADDITION** OF NEW COURSE

**PROPOSED COURSE DESCRIPTION**

<table>
<thead>
<tr>
<th>Rubric &amp; No.</th>
<th>CE 7200</th>
<th>Title</th>
<th>Tides, Surges and Relative Sea-levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short Title</td>
<td>T i d e s a n d s u r g e s</td>
<td></td>
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</tr>
<tr>
<td>Semester Hours of Credit</td>
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<td>If combination course type, # hrs. of credit</td>
<td>Lecture:</td>
<td>Lab/Sem/Rec:</td>
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<tr>
<td>Repeat Credit Max. (if repeatable):</td>
<td>_____ credit hours</td>
<td>Graduate Credit?</td>
<td>Yes</td>
</tr>
<tr>
<td>Credit will not be given for this course and:</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Course Type (Indicate hours in the appropriate course type.)</td>
<td>Lecture:</td>
<td>Lab</td>
<td>Seminar</td>
</tr>
<tr>
<td>Maximum enrollment per section: (use integer, e.g. 25 not 20-30)</td>
<td>20</td>
<td></td>
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</tr>
<tr>
<td>Grading System:</td>
<td>Letter Grade</td>
<td>Pass/Fail</td>
<td>Final Exam:</td>
</tr>
<tr>
<td><em><strong>(Attach Justification if the proposed course will not hold a final exam during examination week.)</strong></em></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Course Description:**

(Concise catalog statement exactly as you wish it to appear in the General Catalog)

The development and implementation of ocean and coastal numerical models has led to specialized applications in fields of science and engineering. However, it is important to first provide in-depth focus on tidal theory. This course will explore theoretical concepts and provide a basis upon which the student can build in order to better understand tides, surges and relative sea levels.

**BUDGET IMPACT (IF ANSWER TO ANY QUESTION IS "YES", ATTACH EXPLANATION.)**

| If this course is approved, will additional staff be needed? | Yes | No |
| Will additional space, equipment, special library materials or other major expense be involved? | Yes | No |

Academic Affairs Approval: (Date)

**ATTACHMENTS (ATTACH THE FOLLOWING TO YOUR PROPOSAL)**

JUSTIFICATION: Justification must explain why this course is needed and how it fits into the curriculum. Will the course duplicate other courses? SYLLABUS: Including 14 week outline of the subject matter; titles of text, lab manual, and/or required readings; grading scale and criteria (For 4000-level, specify graduate student grading criteria if requirements differ for graduate and undergraduate students).

**APPROVALS**

<table>
<thead>
<tr>
<th>Department Faculty Approval Date</th>
<th>College Faculty Approval Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/28/16</td>
<td>11/29/16</td>
</tr>
</tbody>
</table>

Department Chair Signature (date)

Graduate Dean Signature (date)

College Dean Signature (date)

Academic Affairs Approval (date)
November 20, 2016

RE: Justification for CE 7200: Tides, surges and relative sea-levels

To whom it may concern,

I am writing this letter to justify the addition of CE 7200 (Tides, surges and relative sea-levels) into the LSU catalogue. I began my tenure at LSU on January 8, 2015 and taught this as a special topics course in Fall 2015 and Fall 2016 with 12 students. The evaluations for Fall 2015 were strong and it is clear that our engineering and natural science graduate students yearn for such a course.

Adding CE 7200 will not infringe on any existing courses. There is no other course that teaches the theory of tides, surges and relative sea-levels; however, there are many courses that can benefit from this in-depth instruction. All of our Louisiana coastal engineering and scientific studies are based on water flows. While courses abound involving the flow of rivers from small tributaries to the Mississippi River, there is no course with this particular focus on tides. There are multiple numerical modeling classes, yet no singular course that provides a perspective on tidal flow that spans the historical perception, to the modern day science, with focus on astronomic and radiational tides.

CE 7200 serves as an interdisciplinary bridge between the engineering and natural sciences. Our young engineers and scientists will form a basis for communication through this course.

If you have any questions or require any additional information, please contact me at your convenience.

Sincerely,

Scott C Hagen, PhD, PE, F.ASCE
Professor, Civil & Environmental Engineering
Louisiana Sea Grant Laborde Chair
Andrea Abad,

See below for an update from Department of Oceanography and Coastal Sciences on the proposed CE7200 course.

Regards,
Suresh Moorthy

---------- Original Message ----------
Subject: URGENT: Tides, Surges and Relative Sea-Levels (CE 7200)
Date: 2017-01-19 14:25
From: Scott C Hagen <shagen@lsu.edu>
To: Ayman M Okeil <aokelil@lsu.edu>, Suresh Moorthy <moorthy@lsu.edu>

See below.

Sent from my BlackBerry 10 smartphone on the Sprint network.

FROM: Kam-Biu Liu <kliu1@lsu.edu>
SENT: Thursday, January 19, 2017 2:22 PM
TO: Scott C Hagen
CC: Haosheng Huang; Chunyan Li; Christopher F D'Elia
SUBJECT: Tides, Surges and Relative Sea-Levels (CE 7200)

Dear Scott,

The faculty of the Department of Oceanography and Coastal Sciences have examined a tentative syllabus of your proposed graduate course on TIDES, SURGES AND RELATIVE SEA LEVEL RISE. Our department does not currently offer a similar course that focuses on these subjects. Even though some areas of potential overlap may occur between your proposed course and ours, we determine that such overlap is not uncommon among courses offered by cognate departments, and we do not see that as a major problem. We support adding your course to the LSU course catalog.

Best wishes,

Kam-biu

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Kam-biu Liu, Ph.D.
George W. Barlineau III Professor
Chair
Department of Oceanography and Coastal Sciences
Tides, Surges and Relative Sea-Levels
CE 7200 - Fall 2017
Professor Scott C. Hagen, PhD, PE, F.ASCE

Course Description: The development and implementation of ocean and coastal numerical models has led to specialized applications in fields of science and engineering. However, it is important to first provide in-depth focus on tidal theory. This course will explore theoretical concepts and provide a basis upon which the student can build in order to better understand tides, surges and relative sea levels.

Office: 124C, Sea Grant Bldg.
E-mail: shagen@lsu.edu
Office hours: T.B.D.


Supplemental reading: Various articles / book chapters will be distributed throughout the semester.

Required software: To be provided as necessary.

Procedure: Reading assignments should be read before and after class. Not all material will be covered by lectures; it is the student's responsibility to remediate if needed. Further, all students are strongly encouraged to read relevant books, journal articles and conference proceedings to broaden and deepen your understanding of the subject matter.

15-week course outline:

Week 1  Chapter 1  Introduction to historical perspectives, astronomic vs. meteorological tides
Week 2  Chapter 2  Sea-level measurements
Week 3  Chapter 3  Tidal forces
Week 4  Chapter 4  Tidal analysis, including harmonics and response
Week 5  Chapter 4  Tidal analysis, including predictions
Week 6  Chapter 5  Tidal dynamics of the oceans
Week 7  Chapter 5  Tidal dynamics on the shelf
Week 8  Midterm  Cumulative review and exam
Week 9  Chapter 6  Shallow-water and coastal tides
Week 10 Chapter 7  Storm surges and meteorological effects on sea-level
Week 11 Chapter 8  Tsunamis
Week 12 Chapter 9  Spatial variations in sea-level
Week 13 Chapter 10 Mean sea-level changes in time
Week 14 Chapter 11 Sea-level changes in time to do with the solid Earth
Week 15 Chapter 12 Sea-level applications
   REVIEW  Cumulative
Final grades will be computed from the following activities: While you are encouraged to work together, all submitted work must be your own. A grade of "F" will be assigned for any work which is clearly not your own or cheating of any type.

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<thead>
<tr>
<th>Activity</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework</td>
<td>20%</td>
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<tr>
<td>Mid-term exam</td>
<td>20%</td>
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<tr>
<td>Final exam (cumulative)</td>
<td>30%</td>
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<tr>
<td>Project Report</td>
<td>15%</td>
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<tr>
<td>Project Presentation</td>
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**Homework assignments:** All assignments should be done neatly and in a professional manner. I encourage you to use word-processing software to prepare your solutions. The problem should be defined, diagrammed (if appropriate), and the solution should be developed in a step-by-step procedure. The final solution(s) should be reported to two or three significant figures, as appropriate, and should be **underlined**. You are encouraged to work together in study groups; however, identical (copied) homework will be awarded a grade of zero (0). Students should e-mail an electronic version of their homework and will be required to follow due dates for all. Late homework will be graded from a basis of 75% of full credit, unless prior arrangements are made with the instructor.

**Project:** Each student will be responsible for conducting a research project on tidal data analysis directly related to course material. The final results will be written up in a 3-5 page report and shared with the entire class in a 10 minute oral presentation. More details will follow after the mid-term examination.

**Attendance:** Please arrive on time for class. Late arrivals are distracting to your classmates and to me. While there is no attendance policy for this class, I strongly encourage you to attend and participate.

**Grading scheme:** The plus/minus system will be used and grades will be assigned as follows. Your end of semester numerical grades are rounded to whole numbers (for example, 94.49 = 94, 94.50 = 95)

<table>
<thead>
<tr>
<th>Grade</th>
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<tbody>
<tr>
<td>A+</td>
<td>98-100</td>
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<tr>
<td>A</td>
<td>94-97</td>
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<tr>
<td>A-</td>
<td>90-93</td>
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<tr>
<td>B+</td>
<td>87-89</td>
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<td>B</td>
<td>84-86</td>
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<tr>
<td>B-</td>
<td>80-83</td>
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<tr>
<td>C+</td>
<td>77-79</td>
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<tr>
<td>C</td>
<td>71-76</td>
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<tr>
<td>C-</td>
<td>68-70</td>
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<tr>
<td>D+</td>
<td>65-67</td>
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<tr>
<td>D</td>
<td>62-64</td>
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<td>D-</td>
<td>58-61</td>
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<tr>
<td>F</td>
<td>57 and below</td>
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**Expectations:** LSU's general policy states that for each credit hour, you (the student) should plan to spend at least two hours working on course related activities outside of class. Since this course is for three credit hours, you should expect to spend a minimum of six hours outside of class each week working on assignments for this course.

For more information see: [http://catalog.lsu.edu/content.php?catojd=12&navoid=822](http://catalog.lsu.edu/content.php?catojd=12&navoid=822).
LSU student code of conduct: The LSU student code of conduct explains student rights, excused absences, and what is expected of student behavior. Students are expected to understand this code as described here: http://students.lsu.edu/saa/students/code. Any violations of the LSU student code will be duly reported to the Dean of Students.

Disability access: Students with documented disabilities who need accommodations in this course must contact the instructor at the beginning of the semester to discuss their requirements. No accommodations will be provided until the student has met with the instructor to request accommodations. Students who need accommodations must contact the LSU Office of Disability Services before requesting accommodations from the instructor.

Respect for diversity: The diversity that students bring to this class is considered a strength and resource and it is the intent of the instructor to create a respectful, supportive, and inclusive learning atmosphere where everyone should feel comfortable sharing ideas and expressing opinions and concerns. Course content will be considered from multiple perspectives. Suggestions on how to improve the value of diversity in this course are welcome and appreciated.

Moodle and email correspondence policy: The instructor may use email and/or Moodle as a means of communication with students. Students are expected to check both email and Moodle regularly.

Academic success: The primary ingredients of your academic success are attending class, managing your time efficiently, taking good notes, and developing good critical thinking and communication abilities. LSU has a number of excellent resources that will assist you in developing these skills. The place to begin is the Center for Academic Success (http://students.lsu.edu/academicsuccess). The CAS offers guidance on what learning strategies are best suited to your talents, tutoring in the basic subjects, and workshops on a variety of topics, from note taking to time management. The main key to succeeding in this or any other course is to not get behind. Good luck!

Disclaimer: Any part of this syllabus is subject to revision at the discretion of the instructor at any time during the semester. Please bring this syllabus to class on a regular basis. Any changes will be announced in class and/or communicated via email and/or Moodle.