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

COLLEGE: Science

REQUEST IS FOR CHANGE IN COURSE: C H M 1 1 0 1
Prefix Number

General Chemistry 1
Course Title

TO BE INCLUDED IN 2014-2015 CATALOG AND EFFECTIVE IN THE BANNER SYSTEM FOR Fall 2014 TERM

Effective term must be a future term for which registration has not begun. Catalog year will be the next printed edition. Earlier terms/yrs will not be processed.

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

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

Add □ Remove □ Prerequisite □ Corequisite M T H 1 0 1 1
Prefix Number

M T H 1 0 1 1
Prefix Number

M T H 1 0 1 1
Prefix Number

Add □ Remove □ Prerequisite □ Corequisite
Prefix Number

Add □ Remove □ Prerequisite □ Corequisite
Prefix Number

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

*Other restrictions may include changing the grades applied to the course (P/F, S/U, A/F, CEU), majors or class levels restricted from registration, or other restrictions.

Please see attached sheets for explanation.

APPROVALS: Once appropriate department approvals are completed, submit form to Chair, Graduate Council, or Chair, Undergraduate Curriculum Committee for signatures below and forward to Catalog Director.

1) ___________________________ 3-18-14 ____________
Originator Date

2) ___________________________ Date
Department Head/Program Chair

3) ___________________________ 3/21/14
Dean or Associate Dean

4) ___________________________ Date
Chair, Graduate Council

OR

Chair, Undergraduate Curriculum Committee

CATALOG DIRECTOR’S USE ONLY

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SCABASE ____________ SCAABS ____________ Operator Initials ____________ Date ____________

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Summary

The Chemistry Department has found that students enrolled in algebra while also taking General Chemistry 1 do very poorly in General Chemistry 1. Their rate of D/F/withdrawal is 82% (59% F or withdrawal) during the fall semesters since 2009. For this reason, the Chemistry Department wishes to require Precalculus A (MTH 1011) as a pre-requisite for General Chemistry 1.

Explanation

A strong foundation in high school mathematics is a necessary requirement for students entering General Chemistry 1. Students must be fluent in algebraic equations, exponential and logarithmic functions and complex fractions. If a student has difficulty with rearranging a formula to solve for an unknown variable, then that student will be unable to learn the underlying chemical principle. Currently, we are allowing students to take General Chemistry 1 even if they lack the math skills necessary to succeed in the class. We are setting them up to fail.

Students who are placed in a lower level math class struggle more with General Chemistry 1. The situation for students in algebra courses is especially dire. The following table shows the grade distributions for students in General Chemistry 1 (CHM 1101) while enrolled in various math courses for Fall semesters, 2009 - 2013.

<table>
<thead>
<tr>
<th>Math Class</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>F</th>
<th>1100</th>
<th>% (D, F, 1100)</th>
<th>% (F, 1100)</th>
<th># Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algebra</td>
<td>0</td>
<td>5</td>
<td>22</td>
<td>34</td>
<td>21</td>
<td>67</td>
<td>82%</td>
<td>59%</td>
<td>149</td>
</tr>
<tr>
<td>Precalculus</td>
<td>11</td>
<td>80</td>
<td>193</td>
<td>114</td>
<td>44</td>
<td>141</td>
<td>51%</td>
<td>32%</td>
<td>583</td>
</tr>
<tr>
<td>Calculus 1 w/ trig</td>
<td>3</td>
<td>17</td>
<td>30</td>
<td>14</td>
<td>7</td>
<td>12</td>
<td>40%</td>
<td>23%</td>
<td>83</td>
</tr>
<tr>
<td>Calculus 1</td>
<td>91</td>
<td>202</td>
<td>238</td>
<td>94</td>
<td>46</td>
<td>82</td>
<td>29%</td>
<td>17%</td>
<td>753</td>
</tr>
</tbody>
</table>

The column "1100" indicates the numbers of students who withdrew from General Chemistry 1 at midterm (with a low F) and entered the remedial chemistry class (CHM 1100). These students had to retake General Chemistry in the future. Over half of the students in algebra had to retake General Chemistry 1. Another 23% earned a D and no algebra student earned an A in General Chemistry 1. Students in different colleges showed similar results.

This is becoming a bigger problem each year. In 2012, 35 students took an algebra course and General Chemistry 1. In 2013, 54 students did this. Their poor grades are consistent year to year.

Other schools in Florida address this problem by requiring college algebra as a pre-requisite for general chemistry also. This list of schools includes the UF, FSU, UCF, USF, Miami and Florida Gulf Coast University. Even Eastern Florida State University (formerly Brevard Community College) requires some algebra as a pre-requisite for general chemistry.

Students who have not completed algebra lack the mathematical skills and experience required to solve calculations in General Chemistry 1. Therefore, the Chemistry Department recommends that Precalculus A (MTH 1011) serve as a pre-requisite for General Chemistry 1.
Delaying General Chemistry 1 for these students will not jeopardize their graduation date. As the table above shows, most of these students will have to retake General Chemistry 1 anyway. Engineering and science majors who enroll in Precalculus A are already a year behind in their mathematics requirements so they are not graduating in four years. In fact, by taking another class, such as a Humanities elective, these students can make progress towards their degree when they delay enrollment in General Chemistry 1.

Dr. Robert Taylor, Head of the School of Arts and Communication, supports this recommendation and will provide extra class sections for these students. The Freshmen Advisors also support this recommendation. They have found ways to schedule students’ classes so that they can maintain full-time status while taking Precalculus A and postponing General Chemistry 1.