



**Rowan University  
Department of Mathematics**

**Proposal for Minor Change to the Mathematics Requirements for the Bachelor of Science  
in Mathematics**

**1. Details**

**a. Change Requested**

We request the following change in the core courses and restricted electives in the BS in Mathematics degree.

From

HEGIS Number	Core Courses	Semester Hours
1701.130	Calculus I	4
1701.131	Calculus II	4
1701.230	Calculus III	4
1701.210	Linear Algebra	3
1701.231	Ordinary Differential Equations	3
1701.330	Introduction to Real Analysis I	3
1701.331	Introduction to Real Analysis II	3
1701.340	Modern Algebra I	3
1701.341	Modern Algebra II	3
1702.360	Introduction to Probability and Statistics	3
1701.332	Numerical Analysis	3
1701.430	Introduction to Complex Analysis	3
1701.310	College Geometry	4
1701.354	Introduction to Topology	3
1902.300	Modern Physics	4
1701.498	Mathematics Seminar	3
	<b>Total Core</b>	<b>53</b>

Restricted Electives (12 semester hours required)

Any Math Department Course numbered 300 except 1703.305 (Patterns I) or higher **or**

Technological Tools for Discovering Mathematics	2 s.h.
Design and Analysis of Algorithms	3 s.h.
Theory of Computing	3 s.h.
Mathematical Physics	3 s.h.

To

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1701.130	Calculus I	4
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1701.330	Introduction to Real Analysis I	3
1701.340	Modern Algebra I	3
1702.360	Introduction to Probability and Statistics	3
1701.	Introduction to Complex Analysis	3
1701.498	Mathematics Seminar	3
	Total	33

Restricted Electives (27 semester hours required)

Any Math Department Course numbered 300 except 1703.305 (Patterns I) or higher

**or**

1701.205 Technological Tools for Discovering Mathematics 2 s.h.

**or**

A maximum of two courses from the following list

0707.340	Design and Analysis of Algorithms	3 s.h.
0707.422	Theory of Computing	3 s.h.
1902.300	Modern Physics	4 s.h.
1902.315	Analytical Mechanics	4 s.h.
1902.387	Statistical Physics	3 s.h.
1902.401	Quantum Mechanics I	4 s.h.
1902.430	Electricity and Magnetism I	4 s.h.
1908.400	Physical Chemistry I	3 s.h.
1908.401	Physical Chemistry II	3 s.h.

b. Sponsors: Christopher J. Lacke, Christopher S. Simons, and the members of the Mathematics Department Curriculum Committee.

## **2. Rationale**

### a. Need for the Change

The current Bachelor of Science has suffered from low enrollment, despite having many students who are eligible for it. The primary reason for the low enrollment has been the overwhelming number of required courses that are offered only once every two years. Without proper planning, a student who misses one requirement may have to wait an extra two years in order to obtain her/his degree.

### b. Curricular Effect

The reduction of the core course load adds a great deal of flexibility to the Bachelor of Science. We feel that the new structure will increase enrollments. In addition, the increase in the number of restricted electives will allow students to focus on a set of interests that they wish to pursue in graduate school.

The addition of four restricted electives, specifically Statistical Physics, Quantum Physics I, Physical Chemistry I, and Physical Chemistry II, provides flexibility for students who wish to minor in Physics or Chemistry to count a portion of their courses toward their major. Because of the very small number of math majors participating in either of these minors, as well as the fact that these are upper level courses within their own disciplines, we expect a minimal effect on enrollments.

## **3. Letters of Consultation**

Attached are letters of consultation from Dr. Robert Newland, Chair, Department of Chemistry and Biochemistry, and Dr. Jeff Hettinger, Chair, Department of Physics and Astronomy. No letter was requested from Computer Science because the two eligible computer science courses remained in the Restricted Electives bank.

We fully support the addition of Physical Chemistry I & II as optional advanced courses for the BS Mathematics degree. Each of these courses uses high level math skills in examining the foundations of theoretical chemistry.

Robert Newland, Ph.D.  
Chair, Chemistry & Biochemistry  
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*Department of Physics and Astronomy*

**Date:** October 10, 2005  
**To:** Dr. Chris Lacke  
**From:** Jeff Hettinger, Chair, Department of Physics  
and Astronomy  
**Re:** Curriculum Proposal

This memo provides the support of the Department of Physics and Astronomy for the changes to the program leading to a BS in Mathematics.

Your proposed modification removes Modern Physics from the program as a major requirement and includes it as a restricted elective. In addition, you have included Analytical Mechanics, Statistical Physics, and Quantum Mechanics as restricted electives. Since some of our Physics majors are also Math majors, we want to be sure that this combination of majors is still practical. Two courses from the restricted electives can count toward the major requirement whereas only one counted before. Therefore, this group may gain some flexibility but are not strongly impacted by the change. We feel the mathematical rigor of Electricity and Magnetism I is equal to that of the courses listed above and would like to see that included on the list of potential restricted electives.

Removal of the Modern Physics course may impact the number of math students earning a minor in physics which we think would be detrimental to that group. We encourage you to advise your students to take Modern Physics (or more) since it demonstrates an ability to employ many of the concepts and techniques your students learned in math courses to physical situations.

**ROWAN UNIVERSITY SENATE**  
**COLLEGE CURRICULUM COMMITTEE WORKSHEET**

*11/18/05*  
*Lacke*

<b>PART I: INFORMATION</b>								
COLLEGE NAME (circle one)	BUS	COM	ED	ENG	FPA	LAS-HUM	LAS-M/S <b>X</b>	LAS-SBS
Date of Hearing	<b>18 November 2005</b>							
Type of Hearing (circle one)	OPEN <b>X</b>	CLOSED						
SCC Proposal #	05 – 06 - 813							
Proposal Title	<b>Change to Math Requirements for BS in Math</b>							
Sponsor(s) in Attendance	Lacke							

<b>PART II: COMMON PROBLEMS REVIEWED</b>		
	<b>Sponsor's Initials</b>	<b>College Chairperson's Initials</b>
Consultation letters attached		DRK
Library form completed by librarian (not sponsor)		—
Prerequisites consistent (initial page and catalog description)		—
Course title consistent throughout proposal		—
Catalog description – on separate page – complete with HEGIS, credits, and prereqs (with HEGIS)		—
All courses throughout proposal identified with correct title and HEGIS numbers		

**PART III: COMMITTEE DECISION**

- Pass with NO CHANGES
- Passed – Return to Sponsor for MINOR CHANGES
- Tabled w/SUGGESTED MINOR CHANGES
- NOT APPROVED

**HEARING SUMMARY:**

Everywhere a course is mentioned, it must be by full name and HEGIS number. File a new cover sheet with Senate Office since this should be a Process C.

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