

Library Resource Form Required for New Non-Gen-Ed

Submission Deadlines: Fall - October 11, 2005 Spring - February 14, 2006

**TITLE** Minor Change-Course Name, Hegis Number, Content, and Catalog description:  
**Patterns in Nature II: Projects in Calculus and Physics, 4902-315**

Sponsor(s) Dr. Paul J. Laumakis e-mail: laumakis@rowan.edu  
Dr. Marlena Herman e-mail: herman@rowan.edu

**DEPARTMENT** Mathematics  
**College** LAS

If **LAS**-check:  History/Humanities  Social/Behavioral Sciences

Math/Science

UNDERGRADUATE  GRADUATE

New non gen-ed  Major

Short-Term non gen-ed

Minor curricular changes (fewer than three) to: 4902-315

Existing non gen-ed course

Non gen-ed degree requirements

Major

Minor, specialization, concentration, track, certificate program

**Signatures Required: representing approval before submission to Office of the Senate**

Department Chair: Donald J. Galvin Date: 2/19/06  
Department CURRICULUM Chair: Abdul Herman Date: 2/19/06  
Academic DEAN: Joy Har Date: 2-13-06

COLLEGE CURRICULUM COMMITTEE: Open Hearing Date: 3/3/06  
Approved \_\_\_\_\_  
Not Approved \_\_\_\_\_

Signature: College Curriculum Chair \_\_\_\_\_

Signature: SENATE CURRICULUM CHAIR \_\_\_\_\_  
Date: \_\_\_\_\_

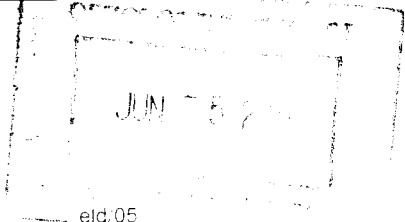
Comments: \_\_\_\_\_  
\_\_\_\_\_

Signature: Executive Vice President/Provost: C. J. [Signature]  
Date: 3/17/06

Approved:   
Not Approved: \_\_\_\_\_

Signature: REGISTRAR [Signature]  
Date: 5/30/06 Course Description Received & Approved  
Hegis Taxonomy & Course # MATH 03.315

Notification Forward:  
 SCC CHAIR  Academic Dean  
 IR  Department Chair  
 CAP  VP/Student Affairs  
 Registrar  Other-



## Minor Change

### 1. Details:

(a) **Change:** Change the **Course Name, Hegis Number, Content, and Catalog Description** of Patterns in Nature II: Projects in Calculus and Physics, 4902-315

#### Former Name and Catalog Description

Patterns in Nature II: Projects in Calculus and Physics (~~4902~~-315)

*Prerequisites: Patterns in Nature I: Visual Geometry (1703-305)*

This laboratory course for students in the math/science specialization track of Liberal Studies provides an introduction through physics projects to techniques of mathematical modeling and quantitative reasoning, including the use of vectors, parametric equations, and calculus. Problem situations provide opportunities to investigate motion and spectra concretely. Graphing calculators and computers will be used.

#### Former Content

- Mathematical Modeling
- Functions
- Derivatives and Applications
- Integration and Applications
- Force
- Projectile and Circular Motion
- Rigid Bodies
- Work and Energy
- Scalar Products
- Potential Energy
- Harmonic Motion
- Waves
- Photoelectric Effect
- Quantum Mechanics

#### New Name and Catalog Description

Patterns in Nature II: Projects in Calculus (MATH 03-315)

*Prerequisites: Patterns in Nature I: Visual Geometry (1703-305)*

This project-oriented course for students in the Liberal Studies Math/Science program provides an introduction to the mathematics of change. Topical coverage includes a review of functions, limits, continuity, the notion of the derivative and its applications, and the notion of integration and its applications. The use of numerical methods will be

the college of LAS. Implementing this suggested minor change would, at the same time, reduce the required contact time for both the students and the faculty.

### **3. Results of Consultations**

This change will not impact any other major or program at the university.

included in the context of mathematical modeling and various types of technologies, including graphing calculators, spreadsheets, and mathematical software packages will be utilized.

### **New Content**

- Review of Functions
- Mathematical Modeling
- Notions of Limits and Continuity
- Notion of Derivative and Applications
- Numerical Methods involving the Derivative
- Notion of the Antiderivative
- Fundamental Theorem of Calculus
- Notion of Integration and Applications
- Numerical Methods involving Integration
- Uses of various types of technological tools

- (b) Sponsors:** Drs. Paul J. Laumakis and Marlena Herman  
Mathematics Department
- (c) Credit Hours:** 4 semester hours (no change)
- (d) Course Level:** Undergraduate (no change)
- (e) Curricular Effect:** Requirement for Liberal Studies Math/Science students  
(no change)
- (f) Suggested Time:** Spring 2007
- (g) Implementation:** 1 section (no change)
- (h) Resources:** Fewer resources will be needed for this minor change  
(See Rationale section below)

### **2. Rationale:**

There are two motivating reasons for this suggested minor change. First, most students majoring in Liberal Studies Math/Science do so in anticipation of teaching math and science subjects in K-8 upon graduation. Currently, the state of New Jersey requires 15 credits of undergraduate mathematics courses for an individual to be certified to teach mathematics at the K-8 level, and the current program has only 12 credits of mathematics courses. This change would result in 16 credits of mathematics courses in the program. Moreover, when the Liberal Studies Math/Science major was initially offered, the intent was to give the students a broad exposure to both mathematics and science courses at the undergraduate level. The current program has more than enough science courses, so this minor change to the mathematics course offerings is warranted. Second, the current Patterns in Nature II course is team-taught by a faculty member in the mathematics department and a faculty member in the physics and astronomy department. The current course meets for the equivalent of 6 contact hours per week, for which the students receive 4 credits. Also, each of the two faculty members teaching the course receive 5 credits of teaching load, totaling 10 credits of allocated faculty teaching time charged to


## Patterns in Nature II: Projects in Calculus (MATH 03-315)

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**TO:** Drs. Paul J. Laumakis and Marlena Herman

**FROM:** Ronald J. Czochor, Chairman  
Mathematics Dept. 

**DATE:** February 13, 2006

**RE:** Consultation on the proposal to change *Patterns in Nature II*

The members of the Mathematics Department have reviewed this proposal and are in agreement in their support of the change. As the course currently stands it includes both physics and mathematics and requires a team teaching approach. The suggested changes would make it purely a mathematics course with an emphasis on modeling using the calculus. This would reduce the total number of credit hours the mathematics department would need to devote to this course and would make it easier to staff. It would also provide the added benefit that students taking the Liberal Studies: Math/Science major would meet the requirements for certification to teach math at the K-8 level.

This course would not be acceptable as a restricted elective for the mathematics major.



**Date:** February 10, 2006  
**To:** Paul J. Laumakis and Marlena Herman, Mathematics Dept.  
**From:** Jeff Hettinger, Chair, Department of Physics and Astronomy  
**Re:** Minor Changes to Patterns in Nature II

A handwritten signature in cursive, appearing to read "Jeff Hettinger", written in black ink.

The Department of Physics and Astronomy supports the modifications to the course *Patterns in Nature II*. We recognize that this is an essential change to provide graduating students with certification to teach mathematics in middle schools. The applications used in the class will remain physics applications so much of the important introductory physics content will transition to the modified course. More in-depth physics content will be moved to the *Seminar* Course.

**ROWAN UNIVERSITY SENATE**  
COLLEGE CURRICULUM COMMITTEE WORKSHEET

<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>3 March 2006</b>							
Type of Hearing (circle one)	OPEN <b>X</b>	CLOSED						
SCC Proposal #	05 – 06 – 837							
Proposal Title	<b>Minor Changes for Patterns in Nature II: Projects in Calc and Physics</b>							
Sponsor(s) in Attendance	Grove (for Laumakis, Herman)							
<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)							N/A	
Prerequisites consistent (initial page and catalog description)							DRK	
Course title consistent throughout proposal							DRK	
Catalog description – on separate page – complete with HEGIS, credits, and prereqs (with HEGIS)								
All courses throughout proposal identified with correct title and HEGIS numbers							DRK	

**PART III: COMMITTEE DECISION**

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

**HEARING SUMMARY:**

Needs catalog page.

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**Mosto, Patricia**

**From:** Sharp, Carol  
**Sent:** Tuesday, May 16, 2006 3:48 PM  
**To:** Mosto, Patricia  
**Subject:** curriculum proposal

Dear Pat,  
A hard copy will follow as well.

May 16, 2006

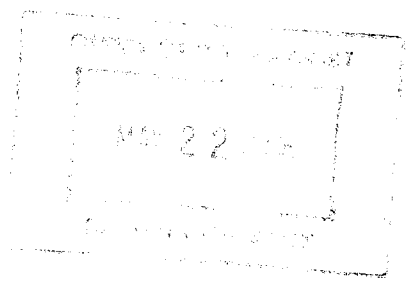
Dr. Paul Laumakis  
Mathematics Department  
College of Liberal Arts and Sciences  
Rowan University

Dear Dr. Laumakis:

I support your proposal for a minor curriculum change from the course Patterns in Nature II: Projects in Calculus and Physics to Patterns in Nature II: Projects in Calculus in the math/science specialization track of Liberal Studies. This curricular endeavor will enable graduates to be certified to teach mathematics at the middle school level. This proposal is an example of the type of work that is needed to ensure that Rowan University's programs meet state mandates as delineated in the New Jersey Administrative Code. I also note that you have not requested additional resources for the implementation of this revision (from the College of Education). I appreciate your efforts to better serve students seeking teacher certification.

Sincerely,

Carol A. Sharp, Ph.D.  
Dean



May 16, 2006

Dr. Paul Laumakis  
Mathematics Department  
College of Liberal Arts and Sciences  
Rowan University

Dear Dr. Laumakis:

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Sincerely,

Carol A. Sharp, Ph.D.  
Dean