

Library Resource Form Required for New Non-Gen-Ed

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

TITLE Minor Changes in Calculus III

Sponsor(s) Dr Abdulkadir Hassen 3888 e-mail:hassen@rowan.edu
e-mail:
e-mail:

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:

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: *Ronald J. Gordon* Date: 2/3/06
Department CURRICULUM Chair: *Abdulkadir Hassen* Date: 2/3/06
Academic DEAN: *J. J. H...* Date: 2-7-06

COLLEGE CURRICULUM COMMITTEE: Open Hearing Date: 3/5/06
Approved: *[Signature]*
Not Approved

Signature: College Curriculum Chair _____

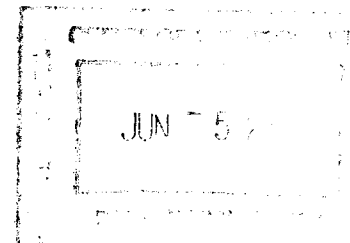
Signature: SENATE CURRICULUM CHAIR *[Signature]*
Date: 3/27/06

Comments: _____

Signature: Executive Vice President/Provost: *[Signature]*
Date: 4/21/06
Approved:
Not Approved:

Signature: REGISTRAR *[Signature]*
Date: 5/30/06 Course Description Received & Approved
Hegis Taxonomy & Course # MATH 01-230

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



THIS FORM MUST BE COMPLETED FOR ALL CURRICULUM PROPOSALS

The purpose of this form is to provide a channel of communication between the Campbell Library staff and faculty when changing and designing new courses/programs. The information will be used to assess the resources available in the library, and to identify resources the library should acquire to support the course/program. The information will also provide the rationale for institutional support for library acquisitions. This form should be completed in a coordinated effort between the course sponsor(s) and the academic department liaison librarian.

Note: Sponsor(s) complete parts A & B

If assistance is required to complete, please notify the librarian liaison.

Forward this form to the librarian who will complete parts C, D & E

When form is completed, attach to the original curriculum proposal before submitting to the Senate office.

A. College: LAS

Department: MATH.

Proposed by: A. HASSEN

Date: 2/3/06

COURSE TITLE: Calculus III

Anticipated Date for Course/Program Offering:

B. List specific resources that should be acquired to support this course.

NONE

C. Describe the resources available in the library to support this course/program, including reference, monographic, electronic databases, audio-visual materials, etc. A summary statement is sufficient.

Calculus reference books.
We mostly use self-contained texts.

D. List key periodicals available in the library to support this course/program.

None

E. Librarian comments & recommendations:

No additional resources are required.

LIBRARIAN LIAISON: Denise Brush

Signature: Denise A. Brush

Minor Curricular Change Changes in Calculus III

I. Details

- a) **Change requested:** Changes to the content of Calculus III(see below)
- b) **Sponsor:** Dr. Abdulkadir Hassen, Department of Mathematics

II. Rationale

a) **Statement of need for changes:**

This proposal addresses the need to add some topics from vector calculus (currently covered as “optional” or as “if time permits”). Vector Calculus contains some of the most important and applicable topics of higher mathematics. Calculus III is the most appropriate place for covering these topics in detail. In a separate proposal, we have proposed that topics of Analytic Geometry be covered in Calculus II. This will allow us to cover vector calculus in detail as proposed.

b) **Statement of curricular effect:**

The proposed changes will have the effect that Calculus III will now have more applicable materials and helps students to see some of the most applicable and fascinating topics of higher mathematics.

c) **Changes in topics:**

From:

CATALOG DESCRIPTION:

1701.230 Calculus III 4 s.h.
(Prerequisite: 1701.131 Calculus II)

This course includes: polar coordinates and parametric equations, vectors, vector functions, velocity, acceleration, partial differentiation, directional derivatives, and multiple integration. The student is expected to use a computer software system, such as Mathematica, in addition to a graphing calculator.

OBJECTIVES:

Students will demonstrate the ability to: (i) graph and find areas in polar coordinates; (ii) calculate dot and cross products; (iii) identify and find equations for lines, planes and quadric surfaces, (iv) compute partial derivatives; and (v) evaluate double and triple

integrals and find area and volumes with them.

CONTENTS:

1: Analytic Geometry

Polar coordinates are introduced and used for graphing and to find areas. Also, conic sections are studied.

2: Three-Dimensional Space; Vectors

The definition of a vector is introduced, then dot and cross products are defined. Other topics covered are lines and planes in space, quadric surfaces, cylindrical and spherical coordinates.

3: Vector Valued Functions

An introduction to and calculus of vector valued functions.

4: Partial Derivatives

Functions of several variables are defined. Other topics covered include partial derivatives and consideration of conditions for differentiability, the chain rule, extreme, directional derivatives and gradients, and Lagrange multipliers.

5: Multiple Integrals

Topics covered include double and triple integrals, surface area and volumes, and centers of mass.

6: Topics in vector calculus (if time permits)

Line integrals, Green's Theorem, and Stokes Theorem.

REMARKS: We will continue our study of the history of calculus through the study of biographies of the great mathematicians who helped create this subject. Also, we continue our work with Mathematica as a tool in solving problems.

To:

CATALOG DESCRIPTION:

1701.230 Calculus III
(Prerequisite: 1701.131 Calculus II)

4 s.h.

This course includes: vectors, vector functions, velocity, acceleration, partial differentiation, directional derivatives, multiple integration, and vector calculus. The student is expected to use a computer algebra system, such as Mathematica, in addition to a graphing calculator.

OBJECTIVES:

Students will demonstrate the ability to: (i) graph and find areas in polar coordinates; (ii) calculate dot and cross products; (iii) identify and find equations for lines, planes and quadric surfaces, (iv) compute partial derivatives; (v) evaluate double and triple integrals and find area and volumes with them, and (vi) compute and apply line integrals, Green's Theorem, and Stokes Theorem.

CONTENTS:

1: Three-Dimensional Space; Vectors

The definition of a vector is introduced, then dot and cross products are defined. Other topics covered are lines and planes in space, quadric surfaces, cylindrical and spherical coordinates.

2: Vector Valued Functions

An introduction to and calculus of vector valued functions.

3: Partial Derivatives

Functions of several variables are defined. Other topics covered include partial derivatives and consideration of conditions for differentiability, the chain rule, extreme, directional derivatives and gradients, and Lagrange multipliers.

4: Multiple Integrals

Topics covered include double and triple integrals, surface area and volumes, and centers of mass.

5: Topics in Vector Calculus

Line integrals, Green's Theorem, and Stokes Theorem.

REMARKS: We will continue our study of the history of calculus through the study of biographies of the great mathematicians who helped create this subject. Also, we continue our work with Mathematica as a tool in solving problems.

III. Letters of consultation:

Letters were requested from all departments that require Calculus III.

- a) Physics & Astronomy
- b) Chemistry & Biochemistry

CATALOG DESCRIPTION:

1701.230 Calculus III
(Prerequisite: 1701.131 Calculus II)

4 s.h.

This course includes: vectors, vector functions, velocity, acceleration, partial differentiation, directional derivatives, multiple integration, and vector calculus. The student is expected to use a computer algebra system, such as Mathematica, in addition to a graphing calculator.

Hassen, Abdulkadir

From: Newland, Robert
Sent: Thursday, January 19, 2006 10:30 AM
To: Hassen, Abdulkadir
Subject: Re: Letter of Consultation for Minor Changes in Calculus III

We fully support the changes to calculus III.

Robert Newland, Ph.D.
Chair, Chemistry & Biochemistry
Rowan University
201 Mullica Hill Rd.
Glassboro, NJ 08028
(856) 256-4502
FAX (856) 256-4478
newland@rowan.edu

From: "Hassen, Abdulkadir" <Hassen@rowan.edu>
Date: Wed, 18 Jan 2006 12:23:15 -0500
To: "Newland, Robert" <Newland@rowan.edu>, "Hettinger, Jeffrey D." <Hettinger@rowan.edu>
Conversation: Letter of Consultation for Minor Changes in Calculus III
Subject: Letter of Consultation for Minor Changes in Calculus III

Hi Again

I sent you a request for letter of consultation for minor change in Calculus II a short time ago. Now I am requesting another one. (It is the beginning of a semester and rumor has it that department chairs need more work!)

The attached file contains the minor change we are proposing for Calculus III. We are removing the parametric and polar equation (moved to Calculus II) and cover vector analysis (line integral, Green's and Divergence Theorems, divergence and curl of vector fields, etc), which is currently list as "if time permits". I believe that these changes are beneficial to your students as well as ours.

Hoping to hear from you at your earliest, I wish you the best and smooth semester.

Abdul Hassen



Department of Physics and Astronomy

Date: January 23, 2006
To: Dr. Abdulkadir Hassen, Department of Mathematics
From: Jeff Hettinger, Chair, Department of Physics and Astronomy
Re: Curriculum Proposals-Changes to Calculus II and III

The Department of Physics and Astronomy strongly supports the changes to Calculus II and III proposed by the Department of Mathematics.

The proposed modification is to cover two additional topics--Parametric Equations and Polar Coordinates--in Calculus II instead of Calculus III. Calculus III will cover more vector analysis including line integrals. Exponential and logarithmic functions have already been moved to Calculus I. Overall, these modifications do not represent a substantial increase in content but a reorganization which allows covering applications benefiting our Physics majors. We feel this is a very positive change for our students.

Regarding Physics courses, these changes will not impact the sequence of topics in our introductory courses but will likely simplify the teaching of applications in these classes.

ROWAN UNIVERSITY SENATE
COLLEGE CURRICULUM COMMITTEE WORKSHEET

PART I: INFORMATION								
COLLEGE NAME (circle one)	BUS	COM	ED	ENG	FPA	LAS-HUM	LAS-M/S X	LAS-SBS
Date of Hearing	3 March 2006							
Type of Hearing (circle one)	OPEN X	CLOSED						
SCC Proposal #	05 – 06 – 835							
Proposal Title	Minor Changes in Calculus III							
Sponsor(s) in Attendance	Hassen							

PART II: COMMON PROBLEMS REVIEWED	Sponsor's Initials	College Chairperson's Initials
Consultation letters attached		DRK
Library form completed by librarian (not sponsor)		DRK
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)		DRK
All courses throughout proposal identified with correct title and HEGIS numbers		DRK

PART III: COMMITTEE DECISION

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

HEARING SUMMARY:
