RADFORD UNIVERSITY
Registrar

105 Heth Hall | PO Box 6904 | Radford, VA 24142 | Telephone: 540-831-5271 | Fax: 540-831-6642

Cover Sheet for Proposal to the Undergraduate Curriculum and Catalog Review Committee

Date: January 24, 2014

Proposal Number:
(Assigned by the Registrar)

Department: Mathematics and Statistics

Current Course or Program ID: MATH 152

Contact Person: Juergen Gerlach

Proposal Category: (✓ all that apply). A cover sheet must be submitted for each proposal.

__x__ Course Prerequisite Change

__x__ Course Title Change

_____ Course Deletion

_____ Course Number Change

_____ Program Revision

_____ New Program
(Major, minor, or certificate)

_____ Course Credit Hour Change

_____ New Course

__x___ Change to Official Detailed Course Description (formerly referred to as Official Course Syllabus)

___x__ Change to Catalog Description

_____ Minor Change to Course

Other Proposal Requirements: (✓ as applies and attach form)

____ For New Course Proposals, attach the New Course Proposal with appropriate signatures.

Proposal Description with Rationale: (State current status, proposed change, and why the change is desired. Attach additional sheets if necessary).

The department proposes to list the courses MATH 151:152 as separate entities in the catalog. This separation will clarify the content for each of the courses, and facilitate transfers of courses. This proposal contains the updated MATH 152 description.
Firm knowledge of Calculus I is essential for success in MATH 152. For this reason we propose to mandate a C or better in MATH 151 as a prerequisite for this course.

Effective Date:
Reason for requesting an alternative effective date:

Signature	Title	Date
	Department Curriculum Committee Chair	3/18/14
	Department Chair	3/18/14
	College Curriculum Committee Chair	3-24-14
	College Dean	3/24/2014
If this proposal in any way affects a professional education program, it must be submitted to and approved by the Professional Education Committee and the Faculty Senate:		
	Professional Education Committee Chair	
	General Education Curriculum Advisory Committee Chair	
	Faculty Senate President	
	UG Curriculum & Catalog Review Committee	
	Provost and VP for Academic Affairs	

Proposed Listing for MATH 152

Catalog Entry

MATH 152 Calculus and Analytic Geometry II.
Three hours lecture (3).

Prerequisite: A grade of C or better in MATH 151.

This course deals with the Riemann integral, the fundamental theorem of calculus, methods of integration, and applications. Mathematical software packages and graphing calculators will be used as illustrative and problem-solving devices. This course has been approved for credit in the Mathematical Sciences Area of the Core Curriculum.

Detailed Description of Content of Course

The following topics will be covered:

- Anti-derivatives and the indefinite integral.
- Fundamental properties of the Riemann integral and its relation to area, Riemann sums, properties of definite integrals, the Fundamental Theorem of Calculus.
- Basic techniques of integration including the integration of polynomials, exponential, logarithmic and simple trigonometric functions, integration by substitution, integration by parts, partial fractions and trigonometric substitutions.
- Numerical integration methods and the use of tables and formulas.
- Applications of the definite integral to calculating area, volume, arc length, and applications to the physical science.
- L'Hôpital's rule
- Improper Integrals
- Elementary differential equations, exponential growth and decay, the logistic equation.

Detailed Description of Conduct of Course

Instructors will use a combination of lectures, group work and computer laboratory sessions. Some may require students to present homework problems to the rest of the class on a regular basis. Software packages and graphing utilities will be used in solving problems and as illustrative aids.

Goals and Objectives of the Course

Students are expected to learn the basic principles of Calculus and Analytic Geometry and to demonstrate the use of these principles in problem solving. In addition to paper and pencil problem solving, students will use appropriate graphing calculator and computer algebra system technology to solve integration problems.

Students will be able to use the tools of mathematics and quantitative reasoning to conceptualize and solve problems.

Students will be able to:

- identify and interpret relationships among numeric, symbolic, and graphical information
- generate mathematical models using numeric, symbolic, and graphical information for use in real-world applications
- solve problems using numeric, symbolic, and graphical information

Assessment Measures

Graded tasks may include tests, quizzes, homework exercises, papers, class participation and attendance. Students will be required to demonstrate literacy in the use of mathematical software packages and/or graphing calculators as effective tools in problem-solving.

Other Course Information

This course is primarily intended for freshman and sophomore students, especially those majoring in mathematics, computer science, the sciences, psychology, or economics.

Existing

MATH 151:152
CALCULUS AND ANALYTIC
GEOMETRY

Catalog Entry

MATH 151:152. Calculus and Analytic Geometry I & II. (3:3)
Three hours lecture, one hour lab, three hours credit for each course.

Prerequisite: Students registering for Math 151 must satisfy one of the following criteria:

1. A grade of C or better in an approved college-level precalculus course, including or in addition to some trigonometry at the high school or college level.
2. An SAT math score of 550 or better.
3. A passing score on a placement exam approved by the math department.

The first part of this course covers the concept of functions, limits, and continuity of functions the derivative, rules and applications of differentiation. The second part deals with the Riemann integral, the fundamental theorem of calculus, methods of integration, and applications. Mathematical software packages and graphing calculators will be used as illustrative and problem-solving devices. This course has been approved for credit in the Mathematical Sciences Area of the Core Curriculum.

Proposed

MATH 152 Calculus and Analytic Geometry II.
Three hours lecture (3).

Prerequisite: A grade of C or better in MATH 151.

This course deals with the Riemann integral, the fundamental theorem of calculus, methods of integration, and applications. Mathematical software packages and graphing calculators will be used as illustrative and problem-solving devices. This course has been approved for credit in the Mathematical Sciences Area of the Core Curriculum.

Detailed Description of Content of Course

The following topics will be covered in MATH 151:

- Functions and their graphs, algebra of functions, inverse functions
- Important classes of functions, including exponential, logarithmic and trigonometric functions
- Limits: graphical, numerical and analytic methods, one-sided limits
- Continuity
- Derivatives: Definition, basic rules of differentiation, including the power, product, quotient and chain rule, implicit differentiation, derivatives of inverse functions.
- Curve sketching, extrema and inflection points, optimization problems, related rates, Newton's method and differentials.

The following topics will be covered in MATH 152:

- Anti-derivatives and the indefinite integral.
- Fundamental properties of the Riemann integral and its relation to area, Riemann sums, properties of definite integrals, the Fundamental Theorem of Calculus.
- Basic techniques of integration including the integration of polynomials, exponential, logarithmic and simple trigonometric functions, integration by substitution, integration by parts, partial fractions and trigonometric substitutions.

Detailed Description of Content of Course

The following topics will be covered:

- Anti-derivatives and the indefinite integral.
- Fundamental properties of the Riemann integral and its relation to area, Riemann sums, properties of definite integrals, the Fundamental Theorem of Calculus.
- Basic techniques of integration including the integration of polynomials, exponential, logarithmic and simple trigonometric functions, integration by substitution, integration by parts, partial fractions and trigonometric substitutions.

- Numerical integration methods and the use of tables and formulas.
- Applications of the definite integral to calculating area, volume, arc length, and applications to the physical science.
- L'Hôpital's rule
- Improper Integrals
- Elementary differential equations, exponential growth and decay, the logistic equation.

Detailed Description of Conduct of Course

Instructors will use a combination of lectures, group work and computer laboratory sessions. Some may require students to present homework problems to the rest of the class on a regular basis. Software packages and graphing utilities will be used in solving problems and as illustrative aids.

Goals and Objectives of the Course

Students are expected to learn the basic principles of Calculus and Analytic Geometry and to demonstrate the use of these principles in problem solving. In addition to paper and pencil problem solving, students will use appropriate graphing calculator and computer algebra system technology to solve equations, plot, differentiate and integrate.

Students will be able to use the tools of mathematics and quantitative reasoning to conceptualize and solve problems.

- Numerical integration methods and the use of tables and formulas.
- Applications of the definite integral to calculating area, volume, arc length, and applications to the physical science.
- L'Hôpital's rule
- Improper Integrals
- Elementary differential equations, exponential growth and decay, the logistic equation.

Detailed Description of Conduct of Course

Instructors will use a combination of lectures, group work and computer laboratory sessions. Some may require students to present homework problems to the rest of the class on a regular basis. Software packages and graphing utilities will be used in solving problems and as illustrative aids.

Goals and Objectives of the Course

Students are expected to learn the basic principles of Calculus and Analytic Geometry and to demonstrate the use of these principles in problem solving. In addition to paper and pencil problem solving, students will use appropriate graphing calculator and computer algebra system technology to solve equations, plot and differentiate.

Students will be able to use the tools of mathematics and quantitative reasoning to conceptualize and solve problems.

Students will be able to:

- identify and interpret relationships among numeric, symbolic, and graphical information
- generate mathematical models using numeric, symbolic, and graphical information for use in real-world applications
- solve problems using numeric, symbolic, and graphical information

Assessment Measures

Graded tasks may include tests, quizzes, homework exercises, papers, class participation and attendance. Students will be required to demonstrate literacy in the use of mathematical software packages and/or graphing calculators as effective tools in problem-solving.

Other Course Information

This course is primarily intended for freshman and sophomore students, especially those majoring in mathematics, computer science, the sciences, psychology, or economics.

Review and Approval

11/5/2008

Students will be able to:

- identify and interpret relationships among numeric, symbolic, and graphical information
- generate mathematical models using numeric, symbolic, and graphical information for use in real-world applications
- solve problems using numeric, symbolic, and graphical information

Assessment Measures

Graded tasks may include tests, quizzes, homework exercises, papers, class participation and attendance. Students will be required to demonstrate literacy in the use of mathematical software packages and/or graphing calculators as effective tools in problem-solving.

Other Course Information

This course is primarily intended for freshman and sophomore students, especially those majoring in mathematics, computer science, the sciences, psychology, or economics.