Course Inventory Change Request

New Course Proposal

Date Submitted: 12/01/14 4:06 pm

Viewing: MATH 1613 : Calculus I

Last edit: 12/03/14 4:30 pm

Changes proposed by: TAMTINY

In Workflow

1. MATH Editor
2. MATH Chair
3. SM Undergraduate Curriculum Committee Chair
4. SM Editor
5. SM Associate Dean
6. Distance Education 1
7. Distance Education 2
8. Coordinator Curriculum Management
9. University Curriculum Committee Chair
10. Coordinator Curriculum Management

Approval Path

1. 12/01/14 4:25 pm
HOLLIGD: Approved for MATH Editor
2. 12/01/14 4:43 pm
TAMTINY: Approved for MATH Chair
3. 12/01/14 4:49 pm
CAMMAVI: Approved for SM Undergraduate Curriculum Committee Chair
4. 12/02/14 9:28 am
YARBREL: Approved for SM Editor
5. 12/02/14 9:33 am
CAMMAVI: Approved for SM Associate Dean
6. 12/03/14 4:30 pm
SZC0024: Approved for Distance Education 1
7. 12/03/14 6:49 pm
ALIASIM: Approved for Distance Education 2
Other Courses referencing this course

Description:

MATH 1610: Calculus I

Submitter:

User ID: TAMTINY  Phone: 4-6572

Proposing College/School:
Coll of Sciences & Mathematics

Department:
Mathematics & Statistics

Effective Term:
Fall 2015

Subject Code:
Mathematics (MATH)

Course Number:
1613

Justification for new course:
MATH 1610 (Calculus I) is a requisite for many programs. Offering it online will provide greater flexibility and easier access for the large number of students that require it. Distance learning is part of the AU 2013-18 strategic planning.

Course Title:
Calculus I

Abbreviated Title:
Calculus I

<table>
<thead>
<tr>
<th>Schedule Type</th>
<th>Contact/Group Hours</th>
<th>Weekly or Per Term?</th>
<th>Credit Hours</th>
<th>Anticipated Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance Learning</td>
<td>4</td>
<td>Weekly</td>
<td>4</td>
<td>40</td>
</tr>
</tbody>
</table>

Can the course be repeated? No  Total Credit Hours: 4

Grading Type:
Standard Grades

Prerequisites:
Pr. Math ACT 26 or Math SAT 600 or above, or grade "C" or better in MATH 1130/1133/1150/1153.

Prerequisite Courses:
MATH 1130 - Pre-Calculus Trigonometry
MATH 1150 - Pre-Calculus Algebra and Trigonometry
MATH 1133 - Precalculus: Trigonometry
MATH 1153 - Precalculus: Algebra and Trigonometry

Corequisites:

Restrictions:
Admin Restrictions:

Course Description: Limits, derivative of algebraic, trigonometric, exponential, logarithmic functions. Applications of derivative, antiderivatives, definite integral, applications to area problems, fundamental theorem of calculus. Students may receive credit for only one of MATH 1610/1613/1617/1710.

May Count Either: MATH 1610 - Calculus I

Affected Program(s):

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Program Title</th>
<th>Requirement or Elective?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major</td>
<td>BS in Math and Applied Math</td>
<td>Requirement</td>
</tr>
</tbody>
</table>

Overlapping or Duplication of Other Units' Offerings: No

Resources

We may need an experienced distance learning lecturer or adjunct faculty to teach the course.

Course Objectives/Outcomes

Apply arithmetic, algebraic, and higher-order thinking to solve application problems in science and engineering that involve the use of calculus (differentiation and integration).

Apply appropriate differentiation techniques to obtain derivatives of various functions, including logarithmic, exponential, and trigonometric functions.

Solve application problems involving implicit differentiation and related rates.

Solve optimization problems with emphasis on science and engineering problems.

Obtain integrals of various functions, including use of integration by substitution.

Solve science and engineering application problems using integration techniques.

Is this course considered University Core? Yes

Which Student Learning Outcomes are achieved? SL04 Mathematical Methods
How would outcomes be assessed?

Questions assessing SLO4 are incorporated in the final exam to measure the SLO4. Data will be collected and analyzed.

Week 1
1.1 Functions and Models
1.3 New Functions from Old Functions
1.5 Exponential Functions

Week 2
2.1 Tangent and Velocity Problems
1.6 Inverse Functions and Logarithms

Week 3
2.2 The Limit of a Function
2.3 Calculating Limits Using the Limit Laws

Week 4
2.5 Continuity
2.6 Limits at Infinity; Horizontal Asymptotes

Week 5
2.7 Derivatives and Rates of Change
2.8 The Derivative as a Function

Week 6
3.1 Derivatives of Polynomial and Exponential Functions
3.2 The Product and Quotient Rules

Week 7
3.3 Derivatives of Trigonometric Functions
3.4 The Chain Rule

Week 8
3.5 Implicit Differentiation
3.6 Derivatives of Logarithmic Functions

Week 9
3.7 Rates of Change in the Natural and Social Sciences
3.8 Exponential Growth and Decay

Week 10
3.9 Related Rates
3.10 Linear Approximations and Differentials

Week 11
4.1 Maximum and Minimum Values
4.3 How Derivatives Affect the Shape of a Graph

Week 12
4.4 Indeterminate Forms and l'Hopital's Rule
4.2 The Mean Value Theorem

Week 13
4.5 Summary of Curve Sketching
4.7 Optimization Problems

Week 14
4.9 Antiderivatives
5.1 Areas and Distances

Week 15
5.3 The Fundamental Theorem of Calculus

5.4 Indefinite Integrals and the Net Change Theorem
5.5 The Substitution Rule
The course will be set up in four components: Homework, quizzes, tests, and final exam.

Modules will be accessed through online instructional tools such as WebAssign, which is available with current textbook. Each module will consist of practice homework, media assignments, and quizzes. Modules will be due at the end of the week.

There will be three tests. Each test will cover multiple modules and will be proctored. The final exam will be a paper–based comprehensive proctored exam. Proctoring will be arranged through Biggio Center.

All communication will be conducted through Canvas, with WebAssign communication as secondary. Students may contact the instructor through either. Grades will be posted on Canvas with a copy in WebAssign.

The final exam will be a paper–based comprehensive exam (40%) proctored on campus and will be the same, and given at the same time, as the MATH 1610 final exam.

All communication will be conducted through Canvas, with WebAssign communication as secondary. Students may contact the instructor through either. Grades will be posted on Canvas with a copy in WebAssign.

Grades will be awarded based on the following:
Homework: 10%
Quizzes: 10%
Tests: 60%
Final Exam: 20%
Total Awarded: 100%
A: 90-100%
B: 80-89%
C: 70-79%
D: 60-69%
F: 0-59%

Supplemental Information For Addition Of Distance Education Course

Justification for DE Delivery
It is an online version of MATH 1610 (Calculus 1) according to the Auburn University 2013-2018 strategic planning.

Links will be provided to the following electronic resources: AU Student Code of Discipline, AU Policies, AU Office of Accessibility, Accessibility syllabus statement, AU Miller Writing Center, AU Libraries, AU Digital Library, AU Online Bookstore,
AU College of Liberal Arts Distance Education, AU Office of Information Technology (IT Help Desk), Online netiquette, as well as other online resources that are specifically relevant to the course.

All communication will be conducted through Canvas, with WebAssign communication as secondary. Students may contact the instructor through either. Grades will be posted on Canvas with a copy in WebAssign.

e-chat such as skype, email.

**Course reviewer comments**

**CAMMAVI (10/30/14 9:28 am):** Rollback: equivalent SAT

**WILLIF2 (12/01/14 1:43 pm):** Rollback: correction

**SZC0024 (12/03/14 4:30 pm):** I modified the 'Resources' section to remove unnecessary verbiage as requested by Office of Academic Affairs. The department may wish to think about addressing how they will recruit/acquire the expertise to teach this course. The 'Course Interaction' area could be expanded with a little more detail in terms of how students will receive help with assignments, but the regular and extensive use of tools in Canvas and WebAssign should address the 'Course Interaction'. If students need tutoring where will they turn?