Course Inventory Change Request

Date Submitted: 12/01/14 4:37 pm

Viewing: MATH 1683: Calculus with Business Application I

Last edit: 12/09/14 6:07 pm

Changes proposed by: TAMTINY

Submitter: TAMTINY
Phone: 6572

Change Type
Other Change Type
Pre Requisite
Pre-req only

Proposing
College/School: Coll of Sciences & Mathematics

Department: Mathematics & Statistics

Effective Term: Fall 2015

Subject Code: Mathematics (MATH)

Course Number: 1683

This is an online version of MATH 1680 (Calculus with Business Application I) and is a core level class for the College of Business. Offering it online would provide greater flexibility and easier accessibility to the large number of students who take this course. Offering it 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.

Justification for change:
The proposed pre-requisite change is based on the recommendation by the Math Placement Committee of the Department of Mathematics and Statistics. The committee did a statistical analysis in which students with the proposed prerequisite will have 75% chance of success.

Course Title: Calculus with Business Application I

In Workflow
1. MATH Editor
2. MATH Chair
3. SM Undergraduate Curriculum Committee Chair
4. SM Editor
5. SM Associate Dean
6. Distance Education1
7. Distance Education2
8. Coordinator Curriculum Management
9. University Curriculum Committee Chair
10. Coordinator Curriculum Management

Approval Path
1. 12/02/14 7:24 am
HOLLIGD: Approved for MATH Editor
2. 12/02/14 10:20 am
TAMTINY: Approved for MATH Chair
3. 12/08/14 8:38 am
CAMMAVI: Approved for SM Undergraduate Curriculum Committee Chair
4. 12/08/14 1:29 pm
YARBREL: Approved for SM Editor
5. 12/09/14 9:27 am
CAMMAVI: Approved for SM Associate Dean
6. 12/09/14 1:34 pm
SZC0024: Rollback to SM Associate Dean for Distance Education1
7. 12/09/14 1:41 pm
CAMMAVI: Rollback to MATH Chair for SM Associate Dean
8. 12/09/14 6:08 pm
Abbreviated Title: Calculus with Business Applications I

<table>
<thead>
<tr>
<th>Schedule Type</th>
<th>Weekly or Per Term?</th>
<th>Credit Hours</th>
<th>Anticipated Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSL</td>
<td>No</td>
<td>4</td>
<td>40</td>
</tr>
</tbody>
</table>

Course Credit: Distance Learning

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

Grading Type: Standard Grades

Prerequisites: Pr. Math ACT 25 MPP score of 072 or Math SAT 580 MPA2 score of 072 or above, MATH 1120 or grade "C" in MATH 1130 or better in MATH 1120/1123/1130/1133/1150/1153. MATH 1150.

Prerequisite Courses:
- MATH 1120 - Pre-Calculus Algebra
- MATH 1123 - Pre-Calculus algebra
- MATH 1130 - Pre-Calculus Trigonometry
- MATH 1133 - Precalculus: Trigonometry
- MATH 1150 - Pre-Calculus Algebra and Trigonometry
- MATH 1153 - Precalculus: Algebra and Trigonometry

Corequisites:

Restrictions:

Admin Restrictions:

Course Description: Students in College of Business. Mathematics Core. Differentiation and integration of exponential and logarithmic functions, applications to business. Functions of several variables, partial derivatives, multiple integrals. Students may receive credit for only one of MATH 1680/1683.

May Count Either: MATH 1680 - Calculus with Business Applications 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 Business</td>
<td>Requirement</td>
</tr>
</tbody>
</table>
Overlapping or Duplication of Other Units' Offerings: No

No new resources needed. Links will be provided to the following electronic resources:

- AU Student Code of Discipline: https://sites.auburn.edu/admin/universitypolicies/Policies/CodeofStudent Discipline.pdf
- AU Policies: https://sites.auburn.edu/admin/universitypolicies/default.aspx
- AU Office of Accessibility Link: http://accessibility.auburn.edu/
- Accessibility syllabus statement: https://fp.auburn.edu/disability/syllabus.asp
  (this one will probably change soon as the Frontpage server is going away)

- AU Miller Writing Center: http://wp.auburn.edu/writing/
- AU Libraries: http://www.lib.auburn.edu/
- AU Digital Library: http://diglib.auburn.edu/
- AU Online Bookstore: http://www.aubookstore.com/pretextbooks.asp
- AU College of Liberal Arts Distance Education http://www.cla.auburn.edu/distance
- AU Office of Information Technology (IT Help Desk) http://www.auburn.edu/oit/

Online netiquette: http://www.studygs.net/netiquette.htm

Course Objectives/Outcomes

Apply arithmetic, algebraic, and higher-order thinking skills to solving business and economics application problems that involve calculus (differentiation and integration).
Apply appropriate differentiation techniques to obtain derivatives of various functions, including logarithmic and exponential functions.
Solve application problems involving implicit differentiation and related rates.
Solve optimization problems with emphasis on business applications.
Obtain integrals of various functions, including use of integration by substitution.
Solve economics and business application problems using integration techniques.

Is this course considered University Core? Yes

Which Student Learning Outcomes

SL04 Mathematical Methods
SL05 Problem Solution
Questions assessing SLO4 are incorporated in the final exam to measure the SLO4. Data will be collected and analyzed.

Week 1
2.4 Limits

Week 2
2.5 One-Sided Limits and Continuity
2.6 The Derivative

Week 3
3.1 Basic Rules of Differentiation
3.2 The Product and Quotient Rule
3.3 The Chain Rule

Week 4
3.4 Marginal Functions in Economics
3.5 Higher-Order Derivatives

Week 5
3.6 Implicit Differentiation and Related Rates

Week 6
4.1 Applications of the First Derivative
4.2 Applications of the Second Derivative

Week 7
4.3 Curve Sketching
4.4 Optimization I

Week 8
4.5 Optimization II
5.1 Exponential Functions
5.2 Logarithmic Functions

Week 9
5.3 Compound Interest
5.4 Differentiation of Exponential Functions

Week 10
5.5 Differentiation of Logarithmic Functions
App. B l'Hopital's Rule

Week 11
6.1 Antiderivatives and the Rules of Integration

Week 12
6.2 Integration by Substitution
6.3 Area and the Definite Integral
6.4 The Fundamental Theorem of Calculus

Week 13
6.5 Evaluating Definite Integrals
6.6 Area Between Two Curves

Week 14
8.1 Functions of Several Variables
8.2 Partial Derivatives

Week 15
8.4 Method of Least Squares
8.6 Double Integrals
The course will be set up in 3 components: modules, test, and final exam.

Modules will be accessed through Enhanced WebAssign which is available with the text purchase. Each module will consist of practice homework, media assignments, and quizzes. Modules are due at the end of the week. Module quizzes will be conducted online in a virtual testing environment (timed exam, browser lock-down, IP address lock).

There will be 5 tests. Each test will cover multiple modules and will be proctored. Proctoring will be arranged through Biggio Center.

The final will be a proctored paper-based comprehensive exam. Proctoring will be arranged through Biggio Center. It will be a multiple choice and free response exam consisting of approximately 32 questions. In the Fall this will also include the Core Learning Assessment questions that are included on every 1680 Final to measure the Student Learning Objectives from the University.

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

<table>
<thead>
<tr>
<th>Rubric and Grading Scale</th>
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<tbody>
<tr>
<td>Modules (15 units) 20%</td>
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<tr>
<td>Test (5) 40%</td>
</tr>
<tr>
<td>Final exam 40%</td>
</tr>
<tr>
<td>Total Awarded 100%</td>
</tr>
<tr>
<td>A = 90-100%</td>
</tr>
<tr>
<td>B = 80-89%</td>
</tr>
<tr>
<td>C = 70-79%</td>
</tr>
<tr>
<td>D = 60-69% F=0-59%</td>
</tr>
</tbody>
</table>

The rest of the description of the test seems to indicate that the student does not need to be supervised during the 5 exams. Please clarify this point. The
final "will be a proctored paper-based comprehensive exam" makes it clear what type resource the student will need to complete it. Campus presence or an off-campus proctor will be required, correct?

**SZC0024 (12/09/14 1:34 pm):** Rollback: Please see comment regarding the exams. Easy clarification - then the rest of it is fine.

**CAMMAVI (12/09/14 1:41 pm):** Rollback: TY- there needs to be some clarification about the testing procedures- see Raj's comments.

Vince