Ma 180 ~ Applied Calculus

Spring Semester, 2019-2020

Instructor:	Dr. Laurel Carpenter
Office:	AL 46
Office Hours:	10:00 a.m. MTWF; others by appointment
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Textbooks:	*Calculus, An Applied Approach*, 8th edition by Larson
	ISBN # 978-0-618-95825-2 or 0-618-95825-8
	Recommended: *The Elements of Technical Writing* by Blake and Bly
	ISBN # 0-02-013085-6
Calculator:	TI 83 Plus or 84 Plus – Find calculator lessons at
	https://education.ti.com/html/t3_free_courses/calculus84_online/index.html

Catalog Description

A calculator based applied Calculus course in one variable. Derivatives, integrals and their applications will be studied.

Course Context

The faculty of the Division of Mathematical Sciences has developed five broad goals and has aligned these goals with the Bob Jones University Institutional Goals (IG) and the goals of the Bible and Liberal Arts Core (BLA). We believe these goals support the IG/BLA of the University. This can be seen in the following link: https://protect.bju.edu/wiki/display/md/Goals+and+Objectives

The Division Goals (DG) are to

1. Mature the student in the theory and applications of mathematics and computer science.
2. Provide the student the required mathematical and computing background to function and contribute effectively in today's technological society.
3. Provide the student a platform for continued learning and development of his/her God-given abilities.
4. Instill in the student a desire to use his abilities in service to Christ.
5. Provide an appropriate liberal-arts complement to a wide variety of majors.

Course Goals (CG)

1. Develop the basic mathematical and technical skills necessary to solve calculus-based problems. (DG 1, 2)
2. Gain an appreciation and understanding of the power of calculus as a tool to understand and deal with the world of change. (DG 1, 2)
3. Develop an understanding of the use and application of calculus to models developed for practical problems to enable the prediction of results and to allow for informed decision-making. (DG 1, 2, 4)

Course Objectives

The student will be able to

1. Establish limits of functions and develop the definition of the derivative as a limit that describes rates of change and behavior of functional relationships. CG1, CG2 (Assessed by Ch 1,2 tests)
2. Determine the derivatives and integrals of functions in both theoretical and applied contexts. CG1, CG2, CG3 (Assessed by Ch 2,3,4,5 tests)
3. Incorporate the appropriate use of technology to analyze problems connected to real-life applications. CG3 (Assessed by each test and both written projects)
4. Communicate both the stated problem and its solution in a clear and efficient manner. CG2, CG3 (Assessed by written projects)

COURSE EXPECTATIONS

Homework

Because homework is one of the primary means by which students develop good mathematical habits, it is crucial to success in this course.

- Homework must be neat and well organized. Section numbers and page numbers should appear at the beginning of each new section.
- Homework should be worked out in detail. Answers alone are not acceptable and will receive no credit.
- Exercises should be worked down the page, never across.
- The student is responsible for checking the answers to all homework before turning in the assignment. Answers to odd-numbered exercises are in the back of the book. Answers to even-numbers will be accessible in Canvas.
- Homework questions will be addressed at the discretion of the teacher, so be prepared to ask questions each class day. Homework will be collected as indicated in the assignment schedule. One of the keys to success in this course is to stay on schedule and to always be prepared.

Evaluation and Grading

The course grade will include at least the following…

- Unit Tests: five tests worth 100 points each
- Announced and unannounced quizzes worth 5 to 10 points each
- Homework: six assignments worth 10 points each
- Two or three written projects ~ worth a total of approximately 100 points
- Final Exam: cumulative, worth 150 points

Final grades will be assigned according to the standard 10 percentage point scale calculated out of the total points available during the semester. Percentages will not be rounded up when determining final grades.

Late or Missing Assignments

- Students are expected to turn in assignments on time and take quizzes and tests as scheduled for the class. Missing work will be given a grade of 0.
- Homework: Late homework may be turned in for 60% of its value.
- Quizzes: Missed quizzes may be made up only by instructor approval. Except in extenuating circumstances, late quizzes will lose value by 10 percent per day.
- Chapter Tests: Missed chapter tests may be made up only in extreme circumstances with instructor approval.
- Students who are absent are personally responsible to obtain notes from fellow classmates.

Extra Credit

- There will be opportunity for extra credit during the semester. Once these opportunities have passed no other extra credit work will be granted.

Classroom Decorum

The classroom is a professional environment. Students are expected to be respectful to their instructor and peers in behavior, attitude, attire, and use of technology. The instructor has the right to require students who are participating in distracting behavior to leave the class.

Other Policies

BJU **attendance** policy is in effect (see https://home.bju.edu/bju-policies/ for details).

Academic Honesty and Integrity Policy

BJU **academic honesty and integrity** policy is in effect (see https://home.bju.edu/bju-policies/ for details).

Changes to this syllabus may be made during the semester at the discretion of the instructor. Changes will be announced in class and/or posted on Canvas.

Ma 180 HOMEWORK & TENTATIVE COURSE SCHEDULE

The following homework assignments are due when you come to take the corresponding test. **"Mod" represents Calculator Module found at https://education.ti.com/html/t3_free_courses/calculus84_online/index.html**

0.1 # 19, 23, 27 **Mod 0**
0.2 # 42, 45
0.3 # 4, 7, 14, 15, 19 – 21, 30, 33, 36, 37, 42, 43, 45, 47, 49
0.4 # 6, 8, 10, 15, 17, 19, 24, 27, 33, 35, 46, 53, 59
0.5 # 5, 6, 11, 15, 16, 18, 23, 25, 30, 35, 38, 41
1.3 # 9, 13, 17, 85, 86 **Mod 2**
1.4 # 1, 3, 5, 7, 22, 23, 25, 31 – 34 (also do the Horizontal line test for 31 – 34), 35, 37, 41, 43, 63, 74 **Mod 1**
1.5 # 3, 11, 29, 33, 37, 40, 42, 46, 47, 50, 57, 59 **Mod 6**
1.6 # 16 – 19, 45, 47, 49 **Mod 8**

2.1 # 3, 9, 16, 20, 30, 38, 41, 43, 50, 52, 57 **Mod 10**
2.2 # 13, 15, 17, 19 – 21, 24, 25, 27, 31, 36, 41, 45, 47, 64b (copy the F < $10k, M < $10k and sketch the graphs of their derivatives, also follow the directions given in part b) **Mod 12**
2.3 # 6, 7, 9, 10, 12, 13, 14, 16, 17, 34, 35, 45, 46 **Mod 9**
2.4 # 1–9 odds, 13, 18, 21, 22, 25, 26, 29, 34, 35, 37, 41, 43, 47, 58, 59
2.5 # 1-13 odds, 27, 29, 35, 37, 39, 51, 53, 55, 59, 63, 75, 76
2.6 # 5, 9, 17, 21, 36, 39, 42, 46
2.8 # 7, 9, 13, 14, 18, 23 **Mod 16**

3.1 # 1–10, 13, 17, 21, 25, 26, 40, 41 **Mod 13**
3.2 # 1, 3, 5, 6, 9, 13, 17, 19, 23, 25, 29, 37, 50, 51 **Mod 11**
3.3 # 1, 3, 5, 7, 11, 17, 20, 23, 31, 33, 65, 75, 78
3.4 # 1–7 odds, 9, 11, 16, 27, 38, 41 **Mod 14**
3.6 # 4, 7, 10, 11, 13, 19, 21, 31, 34, 35, 55, 57, 65, 66 **Mod 7**
3.7 # 7, 15, 17, 19, 37, 40, 52

4.1 # 1, 3, 5, 7, 9, 11, 13-18, 31, 33, 34
4.2 # 1, 4, 5-10, 16, 17, 19, 23, 41, 43, 47, 49
4.3 # 1–4, 7, 9, 13, 15, 19, 20, 29, 32, 33, 43, 45, 48
4.4 # 1–7 odds, 9-12, 19, 21, 23, 25, 27, 29, 37, 39, 57, 61, 63, 71
4.5 # 7, 9, 11, 19, 23, 25, 39, 41, 43, 45, 47
4.6 # 7, 8, 13, 15, 19, 20, 23, 45, 46

5.1 # 1, 3, 5, 9, 11, 13, 15, 19, 21, 23, 24, 31, 37, 49, 51, 53, 59, 61, 76, 78, 79
5.2 # 1, 3, 5, 7, 9, 11, 13, 15, 19, 23, 25, 37, 39, 41
5.3 # 1, 3, 5, 9, 11, 13, 15, 19, 24, 25, 27, 39, 41, 47, 55, 57, 58, 61
5.4 # 3, 5, 9, 11, 15, 19, 21, 27, 33, 41, 43, 45, 47, 49, 61, 63, 64, 97, 98 **Mod 17 and 18**
5.5 # 2, 3, 5, 15, 15, 19, 21, 23, 27, 29, 50

8.3 # 1, 5, 8, 27, 31, 35, 61, 64, 69, 70, 72
8.4 # 1, 3, 7, 10, 15, 25, 39, 41, 44, 49, 51, 59, 65, 66, 70
8.5 # 1, 7, 9, 11, 13, 26, 29, 31, 47, 49, 51, 57, 60, 61

Very Tentative Test Schedule:

Chapter 0-1 Test:	01/27/2020	Chapter 4 + 8.3-8.4 Test:	04/06/2020
Chapter 2 Test:	02/12/2020	Chapter 5 + 8.5 Test	04/22/2020
Chapter 3 Test:	03/11/2020	Final Exam	