**Mathematics 1502 (CRN 768)**

Calculus II

Spring Semester 2020

Monday, Wednesday, Friday 11:00-12:10

Instructional Complex 411

Instructor: Dr. Satyajit Karmakar

Office: Instructional Complex 231

Office Hours: 10:00 - 11:00, 12:30 – 1:30 MWF

10:00 – 11:00 TR

And by appointment

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Prerequisite: MATH 1501

Credit Hours: 4 semester credit hours

Calculator: Graphing calculator required. TI-83/84 recommended.

Text: Stewart, James. 2016. *Calculus*. 8th Edition. Cengage Learning. ISBN: 978-1-285-74062-1.

**Course Description**

This course includes the study of additional topics in differential and integral calculus. These topics include, but are not limited to, analyses of the derivatives and integrals of transcendental and inverse trigonometric functions, techniques of integration, l’Hospital’s Rule, improper integrals, infinite sequences, infinite series, power series, numerical methods in calculus, and polar coordinates and calculus.

This course will emphasize student preparation, critical thinking, and problem solving. To do well in the course, you must ***read the assignment ahead of time*** and prepare questions, do problems from the text, and prepare for test by reviewing those problems worked in class and at home. Over the course of the semester, you should devote about two hours of outside work for each hour in class. Calculus demands your time and effort! **First, study the examples worked in class as well as those in the textbook, then practice, practice, practice problems.**

This course, as many other courses, will emphasize the written communication of ideas to others. In this course, you will be communicating mathematical ideas. Just as it is important in an English course to use the proper format in your essays and term papers, it is important to use proper form when communicating mathematical ideas. You will learn how to write mathematics so that it can be understood by others. You should carefully study how mathematics is written in class as well as how it is written in the textbook. You should pattern your writing after these sources.

**Course Objectives**

This objective is directed toward the following general education expected outcome of the college:

**Mathematical Skills:** Students will demonstrate a basic knowledge of the fundamentals of college-level mathematics.

Upon completion of Calculus II, students should have an understanding of:

1. The definition of logarithmic and exponential functions. Differentiation and integration of logarithmic and exponential functions.

2. The definition, differentiation, and integration of the inverse trigonometric functions.

3. Indeterminate limit forms and L’Hospital’s Rule.

4. The techniques of integration including integration by parts, trigonometric substitution, and partial fractions.

5. Approximate integration.

6. Improper integrals.

7. Arc length and area of a surface of revolution.

8. Infinite series of constants, tests for convergence and divergence of series, and approximating the sum of a series.

9. Power series, interval of convergence of power series, differentiation and integration of power series, power series representation of elementary functions, and Taylor polynomials.

10. Polar coordinates and calculus.

**Method of Evaluation**

A. There will be quizzes approximately every Monday. Quizzes will be at the end of class. ***There will be NO make-up quizzes***. However, I will drop your lowest two quiz grades.

B. **There will be four (4) in-class tests given during the semester. If a make-up test is required, there will be 20% penalty unless there is a documented medical excuse or documented death in the immediate family. A make-up test must be taken within 48 hours of your return to class or by the last day of class (whichever comes first), after which you receive a grade of zero. There will be some unannounced in-class quizzes before each test**. ***All test will be taken without references of any description***.

Just having the correct answer to a test question will **NOT** earn you credit for the problem; you must use clear mathematical reasoning and clear mathematical writing to show me how you arrive at your solution.

C: There will also be a **comprehensive Final Examination** **given on Friday, May 8, 2020 at10:15 AM.** Gordon State College policy states the Final Examinations must be taken at the scheduled time with the following exception. Students who have three or more finals on the same day may petition to take the third and/or fourth exam on another day or days. Student Petition forms are available in the Academic Affairs Office (Lambdin Hall 347). Please make your plans accordingly. If a student fails to take the Final Examination, he/she will earn a grade of WF for the course.

D. The student’s final grade will be computed as follows:

Quizzes 15%

Tests 60%

Final Exam 25%

TOTAL 100%

E. If your grade on the Final Exam is higher than your highest test score, the grade on the Final Exam will replace your lowest test score.

F. The following grading scale will be used.

89.5 or above A 59.5 to 69.49 D

79.5 to 89.49 B Below 59.5 F

69.5 to 79.49 C

**Class Procedures**

A. **Attendance:** Attendance at class is important. I will take attendance by passing an Attendance Sheet for you to sign. ***If your signature is not beside your name for a particular day, you are considered absent. It is your responsibility to make sure you sign the Attendance Sheet.*** Students are responsible for every instruction, every change in the syllabus, and all material covered in class whether or not they are present. ***Students who enroll in the course late are responsible for material covered before they enrolled.***

B. **Attire:** As in all professional environments, appropriate dress is required in the classroom. I reserve the right to refuse you admittance to class if I deem your attire to be inappropriate and/or distracting. Please dress appropriately.

C. **Working Problems:** Most students will benefit by working *many, many* problems for practice. On the Tentative Course Outline is a list of suggested problems for each section covered. These are intended to give the student practice in specific concepts that are taught in class. The problems will not be graded. However, I strongly encourage you to work them to better prepare for the tests. I will use approximately the first ten minutes of class to answer any questions about the homework problems. Math is not a spectator sport!

D. **Group Work:** I encourage students to work together on homework.

E. **Academic Honesty:** Each student must do his or her own work on exams without any assistance from any outside source not specifically authorized by me. The student handbook details school policies on academic honesty.

F. **Calculator Policy:** A graphing calculator is required for this course. The TI-83 or TI-84 is recommended. Please bring your calculator for all tests. I will not provide calculators for your use. Also, sharing calculators during a test will be considered cheating. Calculators that can manipulate symbolically, *e.g.* the TI-89 or TI-92, are NOT allowed during tests.

G. **ADA and 504:** If you have a documented disability as described by the Americans with Disabilities Act (ADA) and the Rehabilitation Act of 1973, Section 504, you may be eligible to receive accommodations to assist in programmatic and/or physical accessibility.  The Counseling and Accessibility Services office located in the Student Center, Room 212 can assist you in formulating a reasonable accommodation plan and in providing support in developing appropriate accommodations to ensure equal access to all GSC programs and facilities.  Course requirements will not be waived, but accommodations may assist you in meeting the requirements.  For documentation requirements and for additional information, contact Counseling and Accessibility Services at 678-359-5585.

H. **Title IX:** Gordon State College is committed to providing an environment free of all forms of discrimination and sexual harassment, including sexual assault, domestic violence, dating violence and stalking. If you (or someone you know) has experienced or experiences any of these incidents, know that you are not alone. All faculty members at Gordon State College are mandated reporters. Any student reporting any type of sexual harassment, sexual assault, dating violence, domestic violence or stalking must be made aware that any report made to a faculty member under the provisions of Title IX will be reported to the Title IX Coordinator or a Title IX Deputy Coordinator. If you wish to speak with someone confidentially, you must contact the Counseling and Accessibility Services office, Room 212, Student Life Center. The licensed counselors in the Counseling Office are able to provide confidential support.

Gordon State College does not discriminate against any student on the basis of pregnancy, parenting or related conditions. Students seeking accommodations on the basis of pregnancy, parenting or related conditions should contact Counseling and Accessibility Services regarding the process of documenting pregnancy related issues and being approved for accommodations, including pregnancy related absences as defined under Title IX.

I.. **House Bill 280:** For information regarding House Bill 280, see the University System of Georgia at the following link: http://www.usg.edu/hb280

J**. Religious Holidays:** Gordon State College acknowledges that the academic calendar can sometimes conflict with major holidays from among our diverse religious traditions. If a student must miss class due to the observance of a religious holiday, that absence may be excused. To be excused, the student must inform his/her instructors before the absence and make alternate arrangements for any work due at the time of the absence. An excused absence for the observance of a religious holiday does not excuse student from responsibility for required course work.

K. **Gordon E-mail:** Your Gordon e-mail address is where ***all*** official communication from Gordon College is sent. This includes registration information, etc. Please check your Gordon e-mail account periodically for important information. You should also delete junk e-mail to keep your mailbox from getting full. If your mailbox is full, you may not receive important e-mail notifications. Also, if I need to communicate with you via e-mail, I will send the message to your Gordon e-mail account.

L. **Electronic Devices Policy:** The use of electronic devices (iPhone, iPad, smartphones, tablets, laptops, iPods, etc.) is prohibited during class and testing.

M. **Classroom Etiquette:** Students are expected to treat the instructor and other students with respect. Please refrain from the following during class time:

1. Talking with other students (other than during classroom or group activities).

2. Leaving class early (other than an emergency).

3. Leaving the desk to sharpen a pencil in the middle of a lecture.

4. Consistently late coming to class.

5. Cell phones ringing during class. Placing or receiving cellular phone calls during class.

6. I-pods or other music listening devices should NOT be in use during class time or during tests and quizzes.

**Office Procedures**

When you come to my office for help, please be prepared by doing the following.

1. Bring your textbook, your calculator, and you class notes.

2. Make sure you have read the section in the text, read the class notes, and studied the examples.

3. Be prepared to show me at least two odd-numbered problems, from the section that you have worked.

4. Bring your incomplete or incorrect solution to each problem about which you have a question.

5. Ask for help as early as possible. **Don’t wait until the day of a test!**

**Tentative Course Outline**

MATH 1502

Spring Semester 2020

| **Date** | **Section** | **Homework** |
| --- | --- | --- |
| Mon, Jan 13 | 6.1: Inverse Functions | 1-43 odd |
| Wed, Jan 15 | 6.2\*: The Natural Logarithm Function | 1-51 odd, 61-77 odd |
| Fri, Jan 17 | 6.3\*: The Natural Exponential Function | 1-55 odd, 67-71 odd, 81-95 odd |
| ***Mon, Jan 20*** | ***Martin Luther King, Jr. Holiday – No class*** |  |
| Wed, Jan 22 | 6.4\*: General Logarithmic and Exponential Functions | 3-51 odd |
| Fri, Jan 24 | 6.6: Inverse Trigonometric Functions | 1-73 odd |
| Mon, Jan 27 | 6.8: Indeterminate Forms and L’Hospital’s Rule | 1-67, 73, 74 odd |
| Wed, Jan 29 | 6.8 (concluded) |  |
| Fri, Jan 31 | 7.1: Integration by Parts | 1-41 odd, 47-57 odd, 61, 63 |
| Mon, Feb 3 | 7.1 (concluded), Review |  |
| Wed, Feb 5 | **Test 1** |  |
|  |  |
| Fri, Feb 7 | 7.2: Trigonometric Integrals | 1-63 odd |
| Mon, Feb 10 | 7.3: Trigonometric Substitution | 1-29 odd |
| Wed, Feb 12 | 7.3 (concluded) |  |
| 7.4: Integration of Rational Functions by Partial Fractions |  |
| Fri, Feb 14 | 7.4 (concluded) | 1-53 odd |
| Mon, Feb 17 | 7.5: Strategy for Integration | 1-49 odd, 53-81 odd |
| Wed, Feb 19 | 7.7: Approximate Integration | 1-39 odd |
| Fri, Feb 21 | 7.8: Improper Integrals | 1-41 odd, 49-59 odd |
| Mon, Feb 24 | 7.8 (concluded) |  |
| Wed, Feb 26 | 8.1: Arc Length | 1-21 odd |
| Fri, Feb 28 | 8.2: Area of a Surface of Revolution | 1-17 odd |
| Mon, Mar 2 | Review |  |
| Wed, Mar 4 | **TEST II** |  |
| Fri, Mar 6 | 11.1: Sequences | 1-55 odd, 73-77 odd |
| Mon, Mar 9 | 11.2: Series | 1-55 odd |
| Wed, Mar 11 | Catch-up Day |  |
| Fri, Mar 13  **Mon, Mar 16 -Fri, Mar 20** | 11.3: The Integral Test  ***Spring Break – No Classes*** | 3-31 odd, 38, 39 |
| Mon, Mar 23 | 11.4: The Comparison Tests | 1-31 odd |
| Wed, Mar 25 | 11.5: Alternating Series | 1-19 odd, 23-29 odd |
| Fri, Mar 27 | 11.6: Absolute Convergence and the Ratio and Root Tests | 1-37 odd, 43, 44, 45 |
| Mon, Mar 30 | 11.7: Strategy for Testing Series | 1-37 odd |
| Wed, Apr 1 | Review |  |
| **Fri, Apr 3** | **Test III** |  |
| Mon, Apr 6 | 11.8: Power Series | 1-27 odd, 31 |
| Wed, Apr 8 |  |  |
| Fri, Apr 10 | 11.8 (concluded) |  |
| Mon, Apr 13 | 11.9: Representations of Functions as Power Series | 1-27 odd, 39, 40, 41 |
| Wed, Apr 15 | 11.9 (concluded) |  |
| Fri, Apr 17 | 11:10: Taylor and Maclaurin Series | 1-15 odd, 19-25 odd, 31-55 odd, 61-79 odd |
| Mon, Apr 20 | 11.11: Applications of Taylor Polynomials | 1-25 odd |
| Wed, Apr 22 | Catch-Up Day |  |
| Fri, Apr 24 | 10.3: Polar Coordinates | 1-25 odd, 29-45 odd, 55-65 odd |
| Mon, Apr 27 | 10.4: Areas and Lengths in Polar Coordinates | 1-41 odd, 45, 47 |
| Wed, Apr 29 | Review |  |
| Fri, May 1 | **TEST IV** |  |
| Mon, May 4 | Review |  |
|  |  |  |
| **Friday, May 8**  **10:15 AM** | **FINAL EXAMINATION** |  |