

**University of North Georgia  
College of Science and Mathematics  
Mathematics Department  
Mathematics 2460, Calculus II**

Semester: Spring 2016

Instructor: Dr. Bikash C Das

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**Office Hours:**

Mon: 11:00 am – 12:00 pm

Tue: 9:00 am -10:00 am, 12:00 pm – 3:00 pm

Wed: 11:00 am – 12:00 pm

Thu: 9:00 am -10:00 am, 12:00 pm – 3:00 pm

Fri: 11:00 am – 12:00 pm

**Important Dates:**

1. Course changes and late registration: Friday, January 15, 11:59 pm.
2. Mid-Semester Withdrawal without a 'WF' grade: Monday, March 7, 11:59 pm
3. Final Exam: Monday, May 2, 3:00 pm – 5:00 pm

**Text and Other Materials:**

- APEX Calculus

**Library Resources:**

- ✚ *Calculus. Early Transcendental Functions* 6th edition by Larson & Edwards (Publisher: Brooks/Cole), for **Gainesville, Oconee and Cumming campuses**.
- ✚ Supplementary Text: Student Solutions Manual (Optional)
- ✚ Calculator: *The calculator policy is left to the discretion of the instructor.*
- ✚ Apostol, *Calculus, Volume I*, Blaisdell, Waltham, MA, 1967.
- ✚ Dudley, *Readings for Calculus*, MAA, 1993.
- ✚ Dunham, *The Mathematical Universe: An Alphabetical Journey Through the Great Proofs, Problems, and Personalities*, Wiley & Sons, New York, 1994.

- ✦ Halmos, *Problems for Mathematicians, Young and Old*, MAA, Washington, D.C., 1991.
- ✦ Hight, *A Concept of Limits*, Prentice-Hall, Englewood Cliffs, N.J., 1966.
- ✦ Nolan, *Women in mathematics: scaling the heights*, MAA, 1997.
- ✦ Parker, *She Does Math!*, MAA, 1995.
- ✦ Sawyer, *What is Calculus About?*, Random House, 1961.
- ✦ Sterrett, *101 careers in mathematics*, MAA, 1996.
- ✦ *Women, Minorities and Persons with Disabilities in Science and Engineering*, National Science Foundation, 1999 (NS 1.49).
- ✦ Weaver, *Conquering calculus: the easy road to understanding mathematics*, Plenum, 1998.
- ✦ Young, *Excursions in calculus: an interplay of the continuous and the discrete*, MAA, 1992.
- ✦ Yount, *A to Z of women in science and math*, Facts on File, 1999.

### Web-based Resources:

- Association for Women in Mathematics - <http://www.awm-math.org>
- The Math Forum – <http://www.mathforum.org>
- Waterloo Maple's Student Center - <http://www.maplesoft.com/academic/students/index.aspx>
- Texas Instruments - <http://education.ti.com/educationportal/>
- Key Curriculum Press <http://www.keypress.com>
- Eric Weisstein's World of Mathematics (Encyclopedia of Mathematics) - <http://mathworld.wolfram.com>
- Math Nerds -<http://www.mathnerds.com>
- SOS Mathematics <http://www.sosmath.com>
- Project Interactivate - <http://www.shodor.org/interactivate>
- Multicultural Pavilion – <http://www.edchange.org/multicultural>
- Women in Mathematics – <http://www.agnesscott.edu/lriddle/women/women.htm>
- Careers in mathematics - <http://www.ams.org/early-careers/>
- Calculus Applets- <http://www.calculusapplets.com>
- Related Rates Applets - [http://www.usna.edu/MathDept/website/courses/calc\\_labs/index.html](http://www.usna.edu/MathDept/website/courses/calc_labs/index.html)

### Technology Resources:

Access to computer and web based learning software WeBWork. Follow instructor's separate email instructions for WeBWork.

### Course Description:

A continuation of Calculus I. Topics include application of definite integrals, derivatives and integrals with inverse trigonometric functions, indeterminate forms and L'Hospital's rule, techniques of integration, polar coordinates, and infinite sequences and series.

**Prerequisite:**

Grade of C or above in MATH 1450 or approval of the department head.

**Course Objectives:**

After completion of the course the student will be able to:

- Find the area of planar region, the volume of a solid of revolution, and the length of a curve in the plane by means of definite integration.
- Determine the derivative of a function involving inverse trigonometric functions.
- Determine an antiderivative of a function by applying properties of inverse functions, including inverse trigonometric functions.
- Solve rate or optimization problems that involve inverse trigonometric functions.
- Select an appropriate method, l'Hospital's Rule or algebraic simplification, for evaluating indeterminate forms.
- Evaluate the limit of an indeterminate form by using L'Hospital's Rule or algebraic simplification.
- Find the antiderivative of a function by using a combination of the following techniques: trigonometric substitution, integration by parts, trigonometric identities, and partial fraction decomposition.
- Approximate areas by using the midpoint rule, trapezoidal rule, and Simpson's rule.
- Determine the convergence or divergence of an improper integral.
- Evaluate improper integrals that converge.
- Find the area of a region bounded by polar curves.
- Choose the representation, rectangular or polar, that facilitates the solution of a given problem in two dimensions.
- Determine the convergence or divergence of a sequence.
- Determine the convergence or divergence of infinite series by using each of the following: geometric series, the sequence of partial sums, the integral test, the direct comparison test, the limit comparison test, the alternating series test, the ratio test, and the root test.
- Determine whether a convergent alternating series is conditionally convergent or absolutely convergent.
- Approximate non-polynomial functions using power series.
- Determine when power series approximations are not valid.

**Course Calendar:**

M	W	M	W
01/11 Orientation and Review Basic Integration Techniques and Integration by Substitution	01/13 Lecture Fundamental Theorem of Calculus, Natural Logarithms	01/18 MLK DAY	01/20 Lecture on Integration by Substitution, Inverse Trigonometric Functions
01/25 Lecture on Numerical Integration	01/27 Lecture on Area of region bounded by curves	02/01 Lecture on Volume Disk Method	02/03 Lecture on Volume Shell method
02/08 Lecture on Arc length, Surface of Revolution and work done	02/10 Test 1	02/15 Lecture on Integration by parts	02/17 Lecture on Trigonometric Integrations
02/22 Lecture on Integration by Trigonometric substitutions	02/24 Lecture on Integration of Rational Functions	02/29 Lecture on Indeterminate form and L'Hopital Rule	03/02 Test 2
03/07 Lecture on Indefinite Integration	03/09 Lecture on Sequences, Series and Convergence	03/14 Spring Break	03/16 Spring Break
03/21 Lecture on Integral Test and P-Series	03/23 Lecture on Comparison Test and Alternating Series	03/28 Lecture on Alternating Series, Ratio Test and Root Tests	03/30 Test 3
04/04 Lecture on Taylor Polynomials and Approximations	04/06 Lecture on Power Series	04/11 Lecture on Representation of Functions by Power Series	04/13 Lecture on Taylor and Maclaurin Series
04/18 Lecture on Calculus of Parametric Equations	04/20 Test 4	04/25 Lecture on Calculus and Polar Coordinates and basic Polar curves	04/27 Final Review
		(M) 05/02 Final 3:00 pm -5:00 pm	

**Methods of Instruction:** The methods of instruction may include, but are not limited to lecture; problem-solving sessions with informal assessment by the student or instructor; discussion; group projects; timely feedback from test, quiz, or project results (formative assessment); question and answer; computer or calculator based explorations; and student presentations. Students will be encouraged to assess and monitor their own problem-solving process to determine when an error has been made or a new strategy should be used.

**Evaluation Methods:** Formal assessments will be in the form of written tests and/or short quizzes and summative assessment will be in the form of a final examination. There will be **three** regular exams and a cumulative final exam. HWs are assigned on WeBWork, the **students are expected to do all homework assignments. Recitation Quizzes will assigned almost every week, on WeBWork.** Problems on quizzes and tests will be similar to those of homework assignments.

HWs: 100 (20%)

10 Quizzes: 50 (10%)

4 in class Tests:  $4 * 50 = 200$  (40%)

Final exam: 150 (30%)

A 10% scale will be used: A: 450 – 500 | B: 400 – 449| C: 350 – 399  
D: 300 – 349 | F: below 300

Any student who is not satisfied with his/her grades during this course should discuss this with the instructor.

***Make-up Information:*** There will be **no makeup tests**. If you anticipate missing a test, please let me know and we will arrange a time to take the test early. You may NOT start a test or take a test and then ask me not to count it.

There will be **no makeup Tests**. Tests may be taken early. If you miss a Test or do not take it early, you will receive a zero for that Test score. Your lowest Test grade will be replaced by a better Final grade.

***Attendance Policy:*** Attendance is mandatory and will be taken daily. **If you do miss a class, you are responsible for any material covered in class during your absence.** If you miss a day, please get the notes from another student in the class. **All unexcused absences from tests are counted as 0 points towards the final grade and will not be replaced or dropped.** The instructor reserves the sole administrative right to assign a student “W” grade at any point of the semester for more than four consecutive and (or) more than 6 total absences and (or) missing subsequent portion of the online work. **Students are expected to refer to the Supplemental Syllabus for the following information:** (<http://ung.edu/academic-affairs/policies-and-guidelines/supplemental-syllabus.php>)