# University of North Georgia
## College of Science and Mathematics
## Mathematics Department
### Mathematics 2460, Calculus II CRN 1385

**Meeting Time:**    **15:30 – 17:15 (3:30 – 5:15** pm) **TR**;        **Room:** Oc. Class 316
**Semester:**    Fall 2014 (August 18 – December 12)
**Instructor:**    Berhanu Kidane
**Office Phone**:    (706) 310 – 6363
**E-Mail:**    berhanu.Kidane@ung.edu

**Office Hours:**    MW    **09:00 – 11:30 am**
            TR    **08:30 – 11:00 am**
            Fri    **12:00 – 02:00 pm:**    Room 320 (Math Gym)

**Important Dates:**    1. Course changes and late registration:
            Late registration:  **August 18**
            Drop/Add: **Aug 18 - 22**
        2.  Mid-Semester Drop Date: Full Session withdrawal dead line **Oct. 10**
            Dropping a course after this date means an automatic "WF" unless the
            Dean gives specific approval.  Prior to this date, a "W" will be awarded.
        3. Holiday (No Class): **Sept. 1**
        4. Nov. 24 – 29:  Break (no classes)
        5. Class end: Dec. 5; Final Exams: **Dec. 8 - 12**
        6. **Final Exam: Tuesday Dec. 9 form 3:00 – 5:00 pm**

**Text and Other Materials:**        **Required Text:**  Textbook: <u>Calculus. Early Transcendental Functions</u> by Larson & Edwards; Fifth Edition (Publisher: Brooks/Cole)

1.    **Supplementary Text:**  Student Solutions Manual (Optional)
2.    **Library Resources:**
   * 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.

3.    **Web-based Resources:**
   * Purplemath.com at:  http://www.purplemath.com
   * Khan academy at: http://www.**khanacademy**.org
   * **Google** at:  http://www.google.com Google any topic (**For example**:  Google Square root of 2 or pi or any topic)
   * You tube at:  http://www.youtube.com (**For example**: write "linear equations" in the YouTube.com browser bar)

- 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 Interactive - 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

4. **Technology Resources** (may vary by campus/instructor but include):
- Maple
- Geogebra
- Enhanced WebAssign
- A graphing calculator such as a TI-83 Plus

**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.

**Credit:** 4 hours.

**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 CONTENTS AND COVERAGE**

| Chapter 0.    Review Real Numbers; Graphs and Functions | Weeks | |
|---|---|---|
| o   The Real Number System | 1 | |
| o   Review on Functions | | |
| **Chapter 2.    Limit and Their Properties** | 1 | |
| 2.1   A Preview of Calculus | | |
| 2.2   Finding Limits Graphically and Numerically | | |
| 2.3   Evaluating limits Analytically | | |
| 2.4   Continuity and One Sided limits | | |
| 2.5   Infinite Limits | | |
| **Chapter 3.    Differentiation** | | |
| 3.1   The Derivative and The Tangent Line Problem | | |
| 3.2   Basic Differentiation Rules and Rate of Change | | |
| 3.3   Product and Quotient Rules and Higher Derivatives | | |
| 3.4   The Chain Rule | | |
| 3.5   Implicit Differentiation | | |
| 3.6   Derivatives of inverse functions | | |
| 3.7   Related Rates | | |
| **Chapter 4.    Application of Differentiation** | | |
| 4.1   Extrema On an Interval | | |
| 4.2   Rolle's Theorem and the Mean Value Theorem | | |
| 4.3   Increasing and Decreasing Functions and $1^{st}$ Dei. Test | | |
| 4.4   Concavity and the $2^{nd}$ Derivative Test | | |
| 4.5   Limits at Infinity | | |
| 4.6   A summary of Curve Sketching | | |
| 4.7   Optimization Problems | | |
| 4.8   Differentials | | |
| **Chapter 5.    Integration** | | |
| 5.1   Antiderivatives and Indefinite Integration | | |
| 5.2   Area of a Region (Area between two curves*) | | |
| 5.3   Riemann Sum and Definite Integrals | | |
| 5.4   The Fundamental Theorem of Calculus | | |
| 5.5   Integration by Substitution | | |
| 5.6   Numerical Integrations* | | |

**\*Optional**

**Methods of Instruction**:  The methods of instruction are determined by the instructor; however, the instructor is encouraged to use a variety of methods.  These methods 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:**  Formative assessment will be in the form of written tests and/or short quizzes and summative assessment will be in the form of a final examination.  Special projects and daily grades may be used at the discretion of the instructor.  Final grades are determined by the percentage as follows:  **90 – 100 = A, 80 – 89 = B, 70 – 79 = C, 60 – 69 = D** and **below 60 = F.**

**Course Calendar**:   (Number of 50 minute lessons is approximate)
1. Limits and Continuity-10 Days
2. Differentiation-16 Days
3. Applications of Differentiation-16 Days
4. Integration-9 Days

**Final grades will be determined as follows**:

|  |  |  |
|---|---|---|
| Homework and Quiz: | 30 pts. | |
| Exam One: | 15 pts. | (Sept, 18) |
| Exam Two: | 15 pts. | (Oct. 10) |
| Exam Three: | 15pts. | (Oct. 31) |
| Exam Four: | 15 pts. | (Nov. 21) |
| Final Exam: | 25 pts. | (**Tuesday Dec. 9 form 3:00 – 5:00 pm**) |
| Total: | 100 | |

**Tests and other assignments:** At least 6 quizzes and homework. Four Exams/Tests (of the Four one with the least grade will be dropped)
**Final:** The final is comprehensive, covers everything discussed during the semester

**Make-up Information:** Generally Make-ups are not allowed for missed Tests; however, if a student provides an acceptable authorized documentation for the absence, the student might be allowed to make up for the missed work. No make-up for .homework and no make ups for missed classes.

*Attendance Policy:*  The attendance policy is concurrent with UNG's attendance policy. Attendance will be taken each class.

**SPECIFIC DETAILS OF THIS SYLLABUS MAY BE SUBJECT TO CHANGE**

**Students are expected to refer to the Supplemental Syllabus for the following information:** (**Include the link TBD**) (Last Revised March 2013)

**Supplemental Syllabus (will be posted online) Here is the link for the Supplemental Syllabus:**
http://ung.edu/academic-affairs/policies-and-guidelines/supplemental-syllabus.php
1. **Academic Exchange**
2. **Academic Integrity Policy**
3. **Academic Success Plan Program**
4. **Class Evaluations**
5. **Course Grades and Withdrawal Process**
6. **Disruptive Behavior Policy**
7. **Inclement Weather**
8. **Smoking Policy**
9. **Students with Disabilities**

**ACADEMIC SUCCESS PLAN PROGRAM**
UNG has implemented an Academic Success Plan Program to identify and provide assistance to at-risk students. Refer you to your campus Academic Advising Center for the development of strategies that will enhance your academic success. You will be expected to take advantage of advising and other campus resources to achieve your academic goals.

**STUDENTS WITH DISABILITIES**
University of North Georgia is committed to equal access to its programs, services, and activities, and welcomes otherwise qualified students with disabilities. Students who require accommodations and services must register with Disability Services and submit supporting documentation. Disability Services provides accommodation memos for eligible students to give to their instructors. Students are responsible for making arrangements with instructors, and must give reasonable prior notice of the need for accommodation.

## Contact Information for Disability Services:

- Gainesville Campus:  Carolyn Swindle, Assistant Director, carolyn.swindle@ung.edu, Dunlap-Mathis Building, Room 107, 678-717-3855
- Dahlonega Campus:  Thomas McCoy, Assistant Director, thomas.mccoy@ung.edu, Stewart Student Success Center, Room 313, 706-867-2782.
- Oconee Campus: Erin Williams, Assistant Director, erin.williams@ung.edu, Administration Building, Room 112, 706-310-6202.
- Cumming Instructional Site: Nicola Dovey, Director nicola.dovery@ung.edu  or Beth Bellamy, Test Facilitator, beth.bellamy@ung.edu  678-717-3855. (For on-site assistance, contact Rebecca Rose, Head Librarian, rebecca.rose@ung.edu, Library University Center 400, 470239-3119.

**ACADEMIC INTEGRITY POLICY**
**Student Code of Conduct**: Please review the Student Code of Conduct found here:  **http://ung.edu/student-affairs/student-code-of-conduct.php**

**Plagiarism and Turnitin.com**: Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Turnitin.com for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Terms and Conditions of Use posted on the Turnitin.com site.

**Copyright**:  Both Federal and State laws forbid the unlawful duplication of copyrighted computer software or other reproductions of copyrighted material. In accordance with these policies, University of North Georgia

expressly forbids the copying of such materials supplied by or used in the College. Unlawful duplication of copyrighted materials by a user may result in disciplinary action by the College under the Student Code of Conduct (Non-Academic Infractions--Prohibitions, Theft), and/or possible criminal action by the owner of the copyright.

## DISRUPTIVE BEHAVIOR POLICY

Students who exhibit behaviors that are considered to obstruct or disrupt the class or its learning activities are subject to sanctions under the Board of Regents Policy on Disruptive Behavior. Behaviors which may be considered to be inappropriate in this classroom includes, but is not limited to, sleeping, coming in late, talking out of turn, inappropriate use of laptops or mobile devices, verbal behavior that is disrespectful of other students or the faculty member, or other behaviors that may be disruptive. Students who exhibit such behavior may be temporarily dismissed from the class by the instructor and will be subject to disciplinary procedures outlined in the Student Handbook.

## CLASS EVALUATIONS

Class evaluations at UNG are conducted online. Evaluation of the class is considered a component of the course and students will not be permitted to access their course grade until the evaluation has been completed. The evaluations will be accessible beginning one week prior to Final Exam week.

## ACADEMIC EXCHANGE

Universities welcome diversity, free speech and the free exchange of ideas. Discussion should be held in an environment characterized by openness, tolerance of differences and civility. The values of an intellectual community are trust, honesty, free inquiry, open debate, respect for diversity, and respect for others' convictions. Further, the intellectual community always seeks to foster the virtues and characteristics of intelligence, curiosity, discipline, creativity, integrity, clear expression, and the desire to learn from others. It is these that must guide our work and exchanges in this class. These principles are delineated further in the ACE Statement on Academic Rights and Responsibilities.

If these values and principles are breached, students have the right and responsibility to discuss their concerns with the course instructor and, as needed, the department head. Usually, the concerns are addressed at this level, but sometimes the department head may refer students to another resource.  In the event that either the student or the instructor is not satisfied after discussion with each other, he/she may take his/her concerns in writing to the Associate Provost for Academic Administration.

## INCLEMENT WEATHER

TV and radio stations will announce if the college is closed. Information on closing will also be available on our Web site http://www.ung.edu. Students, faculty and staff who have registered under Blackboard Connect Emergency Notification System will receive information not only about college and individual campus closures but also about the status of college and campus hours, including late openings.

**Blackboard Connect Emergency Notification System**

Emergency situations - from natural disasters to health scares to the threats of violence - require that our campus community be fully prepared and informed. Accordingly, University of North Georgia has implemented the Blackboard Connect service to enhance university communication and emergency preparedness. The Blackboard Connect system is a communication service that enables key administrators and Public Safety personnel to quickly provide all students, faculty, and staff with personalized voice and text messages.

All UNG emails are added into the system automatically. In addition, you may enter a phone number so that emergency announcements can be sent to you via voice and text message. To do this, go to our Banner self-service environment; click on the tab labeled "Personal Information"; then, click on the tab named "Enter Emergency Contacts for Blackboard Connect." Here you can update your information for the Blackboard system.

If you have questions, please contact Public Safety at 706-864-1500 or send an e-mail to emeralert@ung.edu.

**COURSE GRADES AND WITHDRAWAL PROCESS**
Grades: A, B, C, D, F, W, WF, MW – Should this date be listed at the end of this section?

Incomplete grades **(I)** - This grade indicates that a student was doing satisfactory work but, for non-academic reasons beyond her/his control, was unable to meet the full requirements of the course. For undergraduate programs, if an **I** is not satisfactorily removed after one semester (excluding summer), the symbol of I will be changed to the grade of F by the appropriate official. For graduate programs, if an I is not satisfactorily removed after two semester (excluding summer), the symbol of I will be changed to the grade of F by the appropriate official.  Under special circumstances, this period of time can be increased with the approval of the department head and the dean.

**IP** (In Progress) - This grade is appropriate for thesis hours, project courses, Learning Support and English as a Second Language (**ESL**) courses. It is not appropriate for traditional credit courses. If an IP grade isn't satisfactorily removed after 3 semesters, the symbol of IP will be changed to the grade of F by the appropriate official. Under special circumstances, this period of time can be increased with the approval of the dean. However, students who receive a grade of IP in a learning support course or an ESL will retain this grade due to the nature of the course.

**K** – This symbol indicates that a student was given credit for the course via a credit by examination program.
**MW** – Withdrawal for military exigencies.
**CR** – Credit (for Military experience).
**NR –** This symbol indicates that the grade was not reported by the instructor.
**S –** This symbol indicates that a student completed the course with satisfactory work.
**U** – This symbol indicates that a student did not complete the course with satisfactory work.
**V** – This symbol indicates that a student was given permission to audit the course. Students may not transfer from audit to credit status or vice versa. If an audit student withdraws from a course prior to the end of the term, a **"W"** will be assigned as the grade rather than a grade of **"V".** An audit student who is dropped by the instructor for excessive absences will be assigned a grade of "W".
**W or WF** – A W grade indicates that a student was permitted to withdraw from without academic penalty. Students may withdraw from courses prior to the midterm and receive a grade of W. Withdrawals without penalty will not be permitted after the midpoint of the total grading period except in cases of hardship as determined by the appropriate official. If a student withdraws before the deadline, the grade of **W** will be given. The grade of **WF** is for students who withdraw after the deadline for the term or commit academic integrity violations.