CALCULUS 2   2-2:50PM   SPRING 2016   SH306

Instructor:	Jonathan White
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Office:	Stuart 316
Office Hours:	10:00-10:50am MWF and by appointment
Office Phone:	399-8280
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Text:	*Calculus, Early Transcendentals*, 3rd Edition, by Rogawski & Adams, Freeman Publishing
Problem Sets, Quizzes, WW:	There will be several problem sets and quizzes during the semester, as well as online WeBWorK assignments. Combined these will be worth 200 points.
Math Culture: (optional)	Each student has the option of including Math Culture Points in his or her grade, as detailed on page 3 of this syllabus. If included, this component will be worth 50 points
Exams:	There will be four in-class exams administered during class time. The dates of these are indicated in the schedule on the back side of this sheet. These exams will be worth 100 points each. The final exam will be held during finals week at the date and time indicated on the back side of this sheet. The final will be worth 200 points
Grading:	Grading will approximately follow a $[92.0\%,+\infty) \rightarrow$ A, $[90\%, 92\%) \rightarrow$ A–, $[87\%, 90\%) \rightarrow$ B+, $[82\%,87\%) \rightarrow$ B, $[80\%, 82\%) \rightarrow$ B–, $[77\%, 80\%) \rightarrow$ C+, $[72\%, 77\%) \rightarrow$ C, $[70\%, 72\%) \rightarrow$ C–, $[67\%, 70\%) \rightarrow$ D+, $[62\%, 67\%) \rightarrow$ D, $[60\%, 62\%) \rightarrow$ D–, $(-\infty, 60\%) \rightarrow$ F scale.
Makeups:	For fairness to those who follow the schedule, makeups for exams and quizzes will be allowed only in extenuating circumstances, with documentation and advance notice when possible. Late problem sets will be penalized 20% of points possible for each day late, and only accepted until others are returned. Late WeBWorK will generally not be accepted.

The "Big Idea" of Calculus is using mathematics to deal with changing quantities. Calculus 1 deals primarily with rates of change, and Calculus 2 addresses accumulations – the totals toward which changing quantities tend. These ideas cut across all quantitative disciplines – whether it's a falling stone, a falling stock, a declining population, or an endothermic reaction, there are mathematical commonalities, and those are what Calculus deals with.

Calculus 2 is a continuation of topics introduced in Calculus 1, but with a greater depth and sophistication. The problems get bigger, and the ideas get bigger as well. Some truly interesting questions become answerable, and more aspects of the world come within reach, but the techniques involved become substantially more difficult.

To enter this class, each student must pass (score 80% or more) a computer-administered Derivatives Gateway. You may attempt this exam as often as desired, provided that you demonstrate understanding of mistakes before a retake. Success by 10pm Sunday 1/17 counts as 10 out of 10 points toward a student's WeBWorK score, by 10pm Tuesday 1/19 counts 7 out of 10, and by 10pm 1/25 counts 4 out of 10. Course grades will be lowered 5% for each week or portion of a week beyond 1/27 without passing this exam.

The use of technology, particularly the software package Mathematica, will be an important component of the course. Ability to compute with pencil and paper will also be important, as will conceptual understanding of the topics treated. This combination of approaches and topics is likely to be challenging, partly because few will find that all of these aspects play to their strengths. Don't let that be overwhelming, though – remember that I'm around to help.

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Tentative Schedule

1/11 §5.3 Antiderivatives	1/12 §5.4 & 5.5 F.T.C.	1/13 §5.7 *u*-Substitution	1/15 §6.1 Areas btwn. Curves
1/18 No Class – MLK Day	1/19 §6.2 Average Value, etc.	1/20 §6.3 Discs & Washers	1/22 §6.4 Cylindrical Shells
1/25 §6.5 Work	1/26 §6.5 Work	1/27 Review	1/29 **Exam 1**
2/1 §7.1 Integration by Parts	2/2 §7.1 Integration by Parts	2/3 §7.2 Trig. Integrals	2/5 §7.3 Trig. Substitution
2/8 §7.4 Hyperbolic Func.	2/9 §7.5 Partial Fractions	2/10 §7.6 Integration Strat.	2/12 §7.7 Improper Integrals
2/15 Monte Carlo Methods	2/16 §7.9 Num. Integration	2/17 Review	2/19 **Exam 2**
2/22 §8.1 Arc Length, etc.	2/23 §8.2 Fluid Pressure	2/24 §8.3 Center of Mass	2/26 Applications to Econ.
2/29 Applications to Econ.	3/1 §8.4 Taylor Polynomials	3/2 Applications to Prob.	3/4 Applications to Prob.
No Class – Spring break			
3/14 §10.1 Sequences	3/15 §10.2 Summing Series	3/16 §10.3 Convergence Tests	3/18 §10.3 Comparison Tests
3/21 §10.3 Convergence Tests	3/22 §10.4 Absolute Convergence	3/23 §10.5 Ratio Test	3/25 §10.5 Root Test
3/28 §10.6 Power Series	3/29 §10.7 Taylor Series	3/30 Review	4/1 **Exam 3**
4/4 §9.1 Differential Eq.	4/5 §9.2 Modeling w/ Df. Eq.	4/6 §9.3 Df. Eq. Graphically	4/8 §11.1 Parametric Eq.
4/11 §11.2 Arc Length	4/12 §11.3 Polar Coordinates	4/13 §11.3 Polar Coordinates	4/15 §11.4 Area in Polar
4/18 §11.5 Conic Sections	4/19 §11.5 Conic Sections	4/20 Review	4/22 **Exam 4**
4/25 §9.3 Df. Eq. Numerically	4/26 §9.4 Logistic Growth	4/27 Review	
Final Exam – 2pm on Monday 5/2			

Any students with disabilities which might affect their performance in this class should contact me as soon as possible to arrange accommodations.

Coe's faculty has adopted an academic integrity policy. It is your responsibility to understand and follow it.

FERPA information can be found on page 42 of the 2015-2016 catalog.

Diversity, in all its forms, is valuable.

Math Culture Points

A portion of the grade for this course may take the form of Math Culture Points, at each student's individual discretion. These will be earned through activities outside of class including, but not necessarily limited to, those listed below. Note that none of these are mandatory – there are far more opportunities than necessary to earn full credit. You should be able to select activities that are particularly relevant to you.

Activity	Points	Max #
Colloquium Attendance	5	–
Colloquium Presentation	5-15	2
Meeting Attendance		2
Nebraska Conference for Undergraduate Women in Mathematics (January 29 - 31)	15	
SIGCSE Technical Symposium (March 2 - 5)	15	
University of Iowa Computing Conference (February or March?)	15	
Midwest Undergraduate Mathematics Symposium (April?)	15	
Mathematics Competition Participation		2
Mathematical Contest in Modeling (February 5 – February 9)	15	
Iowa Collegiate Mathematics Competition (February 21)	15	
Hack-a-thon (February 19-21, register by February 9)	15	
Math Culture Reading		
Some weeks specific readings will be posted on the course web page	5	–
Articles from Math Horizons	5	3
With approval, articles from *Math. Magazine*, *The College Math. Journal*, etc.	5	3
Math Club Activities (when appropriate)	5-10	5
Winter Break Book, Movies, Pi Day celebration, Speakers, Workshops, etc.		
Other Appropriate Coe or Outreach Activities		
Contemporary Issues Forum (February 3)	5	–
Chess Club	5	3
Attending a Quantitative Research Symposium Presentation	5	3
Job Shadowing in any relevant field	10	1
Other Outreach (see page 4)	5	5

You should plan to spread your participation throughout the semester. In each case above, credit assumes both full participation and posting a brief summary/response on Moodle **in a timely manner**. These reflections should generally be between 100 and 300 words, and include both a brief summary and your personal thoughts on the event, and **must be submitted within one week of the event**, or within the specified time window for other activities. Up to three units of credit may be submitted after normal deadlines in the "Math Culture – Late" category on Moodle, but otherwise exceptions will not be made without serious extenuating circumstances.

Volunteer Math Outreach

Below is a preliminary list of organizations that have need for help with math tutoring and related activities. To learn more, contact Kayla Lyftogt (klyftogt@coe.edu). This list is not meant to be exhaustive, but gives you at least some idea of possibilities. If you have other ideas, talk to Jon.

McKinley Middle School
Volunteer Opportunity: Help an 8th Grade Pre-Algebra teacher by working individually with kids that are struggling/behind
Various Times Throughout Day

Garfield Elementary
Volunteer Opportunity: Assist Teachers by working individually with students that are struggling/behind
Various Times Throughout Day

Boys and Girls Club
Volunteer Opportunity: Assist with Math Homework on a case-by case basis (wider range of age groups)
After School Program

Kids on Course
Work Opportunity: Commit to tutoring two days a week at a local elementary. T/R 3:45-5:15. Some experience with youth preferred. Up to two hours of prep time paid in addition to hours spent tutoring.
Payment: $33/hour.