Math 171 Calculus I, Section 2: Autumn '18

Catalog Description for Math 171

M 171 - Calculus I. 4 Credits. Offered autumn and spring. Prereq., M 122 or M 151 or ALEKS placement ¿= 5 or M03-Maplesoft Calculus score ¿= 15. Differential calculus, including limits, continuous functions, Intermediate Value Theorem, tangents, linear approximation, i nverse functions, implicit differentiation, extreme values and the Mean Value Theorem. Integral Calculus including antiderivatives, definite integrals, and the Fundamental Theorem of Calculus. Gen Ed Attributes: Math Competency Course

Learning Outcomes:

Upon completion of this course, a student will be able to:

1. Explain the definition of limit, compute it in elementary cases, and determine the limits of transcendental, rational and piecewise defined functions;

2. Compute infinite limits, limits at infinity, asymptotes, and indeterminate forms (the latter using LHopitals Rule);

3. Explain the limit definition of continuity;

4. Explain the limit definition of the derivative of a function, and use it to compute derivatives;

5. Use derivatives to find tangent lines to curves and velocity for particle motion;

6. Apply the power, sum, product, quotient and chain rules of differentiation;

7. Compute the derivatives of exponential, logarithmic, and trigonometric functions;

8. Use implicit differentiation;

9. Explain the Intermediate and Mean Value Theorems in concrete settings;

10. Analyze the graph of a function, using continuity and differentiation to determine ocal and global extrema, concavity, and inflection points;

11. Use the derivative to solve related rate and optimization word problems;

12. Use Newtons Method to estimate the zeros of a function;

13. Use the Fundamental Theorem of Calculus to calculate Riemann integrals, find the area under a given graph and compute the derivative of a function defined by an integral.

Teacher: Greg St. George

   Office: Math 313 (Third floor, in the elevator wing). Office phone: 243-4146
 e-mail: gregory.stgeorge@umontana.edu

Office hours: To be announced.

Text: Hughes-Hallet, D. et al. (2009). Calculus, Single variable (6th ed.). Danvers, MA: John Wiley and Sons, Inc. We will also make use of other sources; On reserve, I have an older, more rigorous book by Robert Adams, and its Solution manual, available to the class. I also wrote an Applied Calculus book which we may use some parts of; this will be on Moodle, which I will use as a document repository.

Website: Resources will be made available on Moodle.

Evaluation: The plan at this point is to have three tests and a final. The final will *NOT* be the common final that the other 171 sections are taking. It will be a test that I write and will be given according to the University's final schedule. There will be announced quizzes. There may be some turn-in problem sets, depending on the resources available to the instructor. The final grade is based on the numerical average of these scores. The score of the lowest test will be dropped, if this helps your average. However, we may have more or fewer tests based on how things go, and the class's desires.

Note that although attendance (& the daily homework assignments) play no role in your average and hence in your grade, the tests are based on everything that is done in class, and not just what is available in the text. The text will mostly be used for homework assignments. The course as presented in class may and probably will vary considerably from the generic version which is presented in the text. Extraordinary performance on the final may, at the instructor's discretion, be the basis for raising a grade.

Accomodation. The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors and Disability Services for Students (DSS). If you think that you may have a disability adversely affecting you academic performance, and you have not already registered with DSS, please contact DSS in Lommassen 154. I will work with you and DSS to provide an appropriate accommodation.

Software and Calculators: Only particularly stupid calculators will be allowed on tests. If it has more than a single numerical memory location it is probably too smart to be allowed. Most high school sanctioned TI calculators include integral and derivative estimators which (if you know how to use them) confer too much advantage to be allowed.

Grading Scale: The cutoffs for A is 0.9, for B: 0.8, for C 0.65, for D: 0.55. Plusses and minuses will be used, the increment is usually about 3 points. (e.g. to get a B+ the cutoff will be around 0.87.)

Topics. Basically we will cover the material which is included in first six chapters of the text. However, we may not cover them in the order or in the way that the book covers them.

Academic Honesty: All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University.

Student Conduct Code: All students need to be familiar with the Student Conduct Code. You can find it on the "A to Z Index" link on the UM home page.