MATH 141

Welcome Math 141 students!
Click here for Math 141 class sections, dates, times, locations, and Instructors.
Check here often for 141 information.

Supplemental Instruction (SI)

<table>
<thead>
<tr>
<th>Day/Time</th>
<th>Location</th>
<th>Instructor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuesday 7:30pm - 8:30pm</td>
<td>Bliss 205</td>
<td>Chris Staniszewski</td>
</tr>
<tr>
<td>Wednesday 6pm - 7:30pm</td>
<td>Past 234</td>
<td>Yanina Kubic</td>
</tr>
<tr>
<td>Thursday 6pm - 7:30pm</td>
<td>Wash 219</td>
<td>Chris Staniszewski and Yanina Kubic</td>
</tr>
</tbody>
</table>

Calendar and Syllabus
Handout Section 1.1
Handout Section 1.2
Handout Section 1.3

Course Materials
The Language of Mathematics
Exams and Grade Evaluation
Mathematica
Students with Disabilities

Graphing Calculators
Sakai
WileyPlus
Mathlets
PreCalc Skills Exam

Students with Disabilities
Course Material


And an access code to WileyPlus, online homework system

Graphing Calculators

A graphing calculator is NOT required for class. For this course, CALCULATORS WILL NOT BE ALLOWED FOR EXAMS!!

WileyPlus Online Homework System

We will be using WileyPlus online homework system in this course. To sign up for the WileyPlus system, you will need a WileyPlus registration code. Every student must register for his or her own section of WileyPlus:

<table>
<thead>
<tr>
<th>Section</th>
<th>Instructor</th>
<th>Web address</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>Daniel Richmond</td>
<td><a href="http://edugen.wiley.com/edugen/class/cls181908/">http://edugen.wiley.com/edugen/class/cls181908/</a></td>
</tr>
<tr>
<td>002</td>
<td>Caitlin Pfifer</td>
<td><a href="http://edugen.wiley.com/edugen/class/cls238281/">http://edugen.wiley.com/edugen/class/cls238281/</a></td>
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<tr>
<td>003</td>
<td>James Baglama</td>
<td><a href="http://edugen.wiley.com/edugen/class/cls238283/">http://edugen.wiley.com/edugen/class/cls238283/</a></td>
</tr>
<tr>
<td>004</td>
<td>Raymond Beauregard</td>
<td><a href="http://edugen.wiley.com/edugen/class/cls238284/">http://edugen.wiley.com/edugen/class/cls238284/</a></td>
</tr>
<tr>
<td>005</td>
<td>Mark Comerford</td>
<td><a href="http://edugen.wiley.com/edugen/class/cls238285/">http://edugen.wiley.com/edugen/class/cls238285/</a></td>
</tr>
<tr>
<td>006</td>
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<td><a href="http://edugen.wiley.com/edugen/class/cls238287/">http://edugen.wiley.com/edugen/class/cls238287/</a></td>
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<tr>
<td>007</td>
<td>Mark Comerford</td>
<td><a href="http://edugen.wiley.com/edugen/class/cls238291/">http://edugen.wiley.com/edugen/class/cls238291/</a></td>
</tr>
<tr>
<td>008</td>
<td>Matthew Pilling</td>
<td><a href="http://edugen.wiley.com/edugen/class/cls238293/">http://edugen.wiley.com/edugen/class/cls238293/</a></td>
</tr>
<tr>
<td>200</td>
<td>Jason Stockford</td>
<td><a href="http://edugen.wiley.com/edugen/class/cls238297/">http://edugen.wiley.com/edugen/class/cls238297/</a></td>
</tr>
</tbody>
</table>

If you buy a new copy of the textbook at the URI Bookstore, a registration code for WileyPlus will be included with the book at no additional cost. If you have a used copy, you will need to purchase a WileyPlus code separately. The cost of a registration code at the Wiley site: WileyPlus is about $75. If you buy a new copy of the book from some other source, make sure it includes the WileyPlus registration code.

WileyPlus Handout

WileyPlus assignments will start on week 3, September 19. There will be a WileyPlus assignment every week over the homework problems given that week. The WileyPlus problems are the same as the homework problems given on the course calendar. The assignments will open at 12am on Monday of that week and will be due by 11pm Sunday, e.g. WileyPlus assignment 1 will open at 12am Monday September 19 and will be due by 11pm Sunday September 25. No extension allowed and late assignments will
not be accepted. After the due date, the answers will be made available. You have an unlimited time (and access) during the week to work on the problems. There will only be two attempts per problem. Your WileyPlus final grade is computed by \((\text{number of correct WileyPlus problems})/\text{(total number of WileyPlus problems)}\) times 50 points.

**Exams and Grade Evaluation**

There will be three evening exams this semester.

<table>
<thead>
<tr>
<th>Exam</th>
<th>Time</th>
<th>Date</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>7:00pm - 8:30pm</td>
<td>Thurs. Oct. 13</td>
<td>Chafee 271</td>
</tr>
<tr>
<td>Exam 2</td>
<td>7:00pm - 8:30pm</td>
<td>Tues. Nov. 8</td>
<td>Chafee 271</td>
</tr>
<tr>
<td>Exam 3</td>
<td>7:00pm - 8:30pm</td>
<td>Thurs. Dec. 1</td>
<td>Edwards Aud.</td>
</tr>
</tbody>
</table>

There will be two in class skills exams this semester.

<table>
<thead>
<tr>
<th>Exam</th>
<th>Date</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>PreCalc Skills Exam</td>
<td>2(^{nd}) week. See course instructor for exact date. No make-ups allowed.</td>
<td></td>
</tr>
<tr>
<td>Mathematica Skills Exam</td>
<td>Last week. See course instructor for exact date. No make-ups allowed.</td>
<td></td>
</tr>
</tbody>
</table>

There will be a comprehensive final exam.

| Final Exam | Date and time to be announced later |

- 3 Exams - 300 pts, 100 pts each
- Final Exam - 200 pts
- 2 Mathematica projects - 50 pts, 25 pts each
- WileyPlus - 50 pts
- The Language of Mathematics Assignments - 50 pts
- Class work, Quizzes, and Homework - 50 pts
- Mathematica Skills Exam - 25 pts
- PreCalc Skills Exam - 25 pts
- Total - 750 pts

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>(92% - 100%)</td>
</tr>
<tr>
<td>A-</td>
<td>(90% - 91%)</td>
</tr>
<tr>
<td>B+</td>
<td>(87% - 89%)</td>
</tr>
<tr>
<td>B</td>
<td>(82% - 86%)</td>
</tr>
<tr>
<td>B-</td>
<td>(80% - 81%)</td>
</tr>
<tr>
<td>C+</td>
<td>(77% - 79%)</td>
</tr>
<tr>
<td>C</td>
<td>(72% - 76%)</td>
</tr>
<tr>
<td>C-</td>
<td>(70% - 71%)</td>
</tr>
<tr>
<td>D+</td>
<td>(67% - 69%)</td>
</tr>
<tr>
<td>D</td>
<td>(60% - 66%)</td>
</tr>
<tr>
<td>F</td>
<td>(0% - 59%)</td>
</tr>
</tbody>
</table>
Compute Grade -> (your total points)/750 * 100 = your percentage

**REMARKS**

- Make-ups for the exams will be given after the exam during a specified date and time. Make-up exams will only be given with prior and approved notification.
- Final exam date and time cannot be changed. You may only request a date change if you have three final exams in one day.
- Incompletes can only be given if you are passing the course.
- CALCULATORS WILL NOT BE ALLOWED FOR EXAMS!!
- No across the board curves allowed.
- No extra credit allowed.
- The particular breakdown of the Class work, Quizzes, and Homework (Not WileyPlus), points will be given by your instructor. All other points, Exams, Final Exam, Mathematica, Language of Mathematics Assignments, WilyPlus, PreCalc Skills Exam, and Mathematica Skills exam will be as stated above for ALL sections.

**PreCalc Skills Exam**

The examination consists of 25 multiple choice questions and has a 50-minute time limit. The PreCalc Skills Exam will be given in class during the second week of classes. Your instructor will announce the exact date of the skills exam. Each question is worth 1 point. If you score 0 - 14 correct out of 25, we HIGHLY recommend you drop the class and take a precalculus class to better prepare yourself for calculus. NO retakes on the exam allowed. NO calculators allowed. The exam will test basic algebra skills and precalculus knowledge that is required to earn a passing grade in Calculus 141. NOTE: Passing the PreCalc Skills Exam does not guarantee a passing grade for the course.

**Mathematica**

*Mathematica* is a powerful Computer Algebra System (CAS) that can perform the most complicated calculations and draw spectacular graphics at the touch of the button. Knowledge of software like *Mathematica* will help you in your future professional career as well as in understanding material in calculus and calculating solutions to computationally complex problems.

Dr. Lew Pakula's website for Mathematica has links to introductory videos and basic command worksheets.

Your instructor will introduce Mathematica to you during lectures and provide in class tutorials. There will be two Mathematica assignments for the semester, dates are given...
below. There will be a Mathematica skills exam given during the last week of classes. Your course instructor will announce in class the exact date of the skills exam. All Mathematica assignments MUST be submitted through Sakai using Assignment tool. Computers in the Library and the Memorial Union computer labs will have Mathematica installed on them. Laptops in Lippitt Hall 205 also have Mathematica installed on them. Furthermore, you can get a student version online from Wolfram if you prefer to work on your own computer. You may work in groups on the projects, no more than 3 students per group.

Mathematica Assignment #1 Due: 11:55pm Friday October 21

Mathematica Assignment #2 Due: 11:55pm Friday November 18

The projects must be submitted electronically through Sakai.

Mathematica Skills Exam Last week of classes.

The Language of Mathematics There will 5 writing projects on the The Language of Mathematics. You will be required to use a word processor and submit the writing projects electronically within your Sakai course shell. Each writing project is designed to test your understanding of the concepts presented in Calculus. See the Course Calendar for due dates and your instructor for details on the assignments.

Language of Mathematics Assignment #1 Due: Friday September 23

Course Content

MTH 141 is a demanding course for students in the STEM disciplines. In order to succeed in this course, you will have to work systematically and hard. In this course we will cover the following.

- Computation of limits by graphical, numerical, and algebraic methods, and the use limits and theorems on continuity to determine continuity properties of functions.
- Computation of derivatives using difference quotients by graphical, numerical and algebraic methods, interpretation of derivatives as rates of change and as slopes of tangent lines, and the use theorems on differentiation (both for computation of derivatives or for properties of differentiable functions).
- Determination of critical and inflection points of functions by graphical and algebraic methods, the use first or second derivatives to analyze monotonicity and concavity of functions, determination of local and global optima of functions.
- Application of derivatives to the computation of limits computation of derivatives of functions defined implicitly.
- Computation of Left-Sums and Right-Sums of functions given algebraically, in tabular form or graphically, and their use to approximate areas and integrals.
Interpretation of integrals of rates of change as total change, the use theorems on integration to compute simple integrals, and to determine properties of functions given algebraically or graphically.

Goals

The primary aim of MTH 141 is to prepare students for further study in mathematics, basic sciences, or engineering by providing an introduction to differential and integral calculus, and by helping students develop new problem solving and critical reasoning skills. The objectives of MTH 141 are

• To provide a thorough introduction to differential calculus concepts and methods.
• To provide an introduction to integration as a limit of sums, and to the Fundamental Theorem of calculus.
• To provide an introduction to mathematical modeling and numerical issues through the use of technology.

Learning Outcomes

At the end of the course the student should be able to:

• LIMITS
  Evaluate the limit of a function at a point or at infinity analytically, graphically, and numerically. Evaluate two-sided limits analytically, graphically, and numerically. Compute limits that result in infinity, and use this to support statements about the nature of the function. Use limits to determine vertical and horizontal asymptotes of a function. Use limits to determine if a function is continuous at a point. For a function given in algebraic or graphical form and defined on an interval or union of intervals, establish if it is continuous in its domain. Use theorems on continuity of addition, product, quotient, and composition of continuous functions to determine if a function is continuous at a point or on an interval.
• DERIVATIVES
  For a given function, calculate the average rate of change over a given interval. For a given function, approximate the instantaneous rate of change over a given interval. Approximate numerically or graphically the slope of a tangent line to a curve at a point. Define and evaluate the derivative at a point as a limit. Compute algebraically the derivative function using limits. Approximate numerically or graphically the derivative of a function at a point. Given the plot of a function, plot the derivative function. Use graphical, numerical, or algebraic arguments to study differentiability at a point.
• COMPUTING DERIVATIVES ALGEBRAICALLY
  Recall and use the derivative of the functions: constant, power, logarithmic, exponential, trigonometric, inverse trigonometric, hyperbolic. Use theorems of derivatives: linearity, product rule, quotient rule, chain rule. Compute the
derivative of a function given implicitly, and determine slopes to curves defined implicitly. Compute higher order derivatives.

**USING DERIVATIVES**
Use derivatives to compute velocity and acceleration of bodies when the displacement function is given. Use derivatives to solve related rates problems. Determine critical points and inflection points of a function given algebraically or graphically. Use derivatives to determine intervals where a given function is increasing or decreasing, and where a function is concave up or concave down. Find local optima by finding critical points and then using the first or second derivative tests. Determine global optima of a function defined on a bounded or unbounded interval. Use derivatives to determine intervals where a function is increasing, decreasing, concave up, concave down. Find the linear approximation to a function at a given point. Use L'Hopital's rule to compute limits of the indeterminate forms "zero over zero" and "infinity over infinity". Use derivatives to compute slopes and tangent lines to curves in the plane given parametrically. Compute the derivative of functions given in terms of one or more parameters, and interpret derivatives and the function in relation to parameter values. State theorems about continuous and differentiable functions, and be able to use them in simple, direct applications. (Extreme Value Theorem, Mean Value Theorem, Rolle's theorem, the Racetrack Principle.)

**INTEGRATION**
Write down Riemann sums for functions given algebraically. Represent Riemann sums graphically (left sum, right sum, other). Use Riemann sums to obtain approximations to areas under a curve or to a definite integral. Given the graph of a function, approximate the value of an integral by using Riemann sums. Given a table of values, obtain a Riemann sum and approximate a definite integral. Compute areas between curves using integrals. Interpret total change in a function as an integral of rate of change. State and use the (first form of the ) Fundamental Theorem of Calculus to compute integrals. State and use the (Second form of the ) Fundamental Theorem of Calculus to compute integrals. Use linearity and additive properties to compute integrals.

**MODELING**
Express, in natural language, model characteristics that are given mathematically through equations or graphs. Develop a mathematical model from natural language specification, graphs, geometric figures. Reason symbolically with parameters to determine properties of a model. Recognize applicability of a model to a situation and limitations imposed by assumptions.

**LOGIC, REASONING**
Recognize patterns, trends, symmetries, and use these to formulate conjectures or draw conclusions Formulate valid arguments to support or refute a conjecture or hypothesis Determine validity in an argument or identify the flaw in an invalid argument. Use problem solving strategies such as considering particular cases, drawing figures, establishing similarities with other problems, etc.

**ESTIMATION AND APPROXIMATION**
Determine if an approximation is accurate to a number of digits. Recognize
reasonableness of a result through the use of approximations or by checking order of magnitude, correct units, appropriate signs, etc.

Students with Disabilities

Any student with a documented disability should contact your instructor early in the semester so that he or she may work out reasonable accommodations with you to support your success in this course. Students should also contact Disability Services for Students: Office of Student Life, 330 Memorial Union, 874-2098. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Sakai

Sakai is being used in part to teach this course. ALL math 141 instructors have a Sakai site for their math 141 section. The Sakai site will contain your grades and have a link to Assignment tool for submission of your Mathematica assignments. That means you should become familiar with using Sakai. Your instructor might place other important course material in the Sakai course shell. Check with your instructor. You can access Sakai at the following web address: https://sakai.uri.edu/portal/ Use your e-campus id and your URI Webmail password.