CALCULUS FOR THE LIFE SCIENCES WITH APPLICATIONS II
The University of Toledo
College of Natural Sciences and Mathematics
MATH 1760-001 (CRN: 44915)

MWF 10:00 – 10:55, Health and Human Services 2302 SPRING 2017

INSTRUCTOR

Name: Anthony Vasaturo (Final Year Pure Mathematics Ph.D. student)

Office:

- University Hall 2030E
- Carlson Library
- Facebook Messenger

E-Mail: avasatu@rockets.utoledo.edu

OFFICE HOURS (subject to change)
To be announced. Feel free to message me with any time slots you would prefer! Also, my Facebook messenger and e-mail address serve as private office hours whenever you would like to use them. Don't be shy to ask questions! If you want to schedule a longer private office hours with me, use one of those means to do so, and we will work it out!

CREDIT HOURS: 3

CLASS MEETINGS: 3 hours per week

REQUIRED MATERIALS

- MyMathLab access code (for online homework – if purchasing a stand-alone access code, please be sure to get a MyMathLab code, NOT a MyMathLab Plus code). Temporary access (for 14 days) is available at the publisher’s website. Students who used MyMathLab based on the same course materials in an earlier semester can continue to use their access code without paying again.
- The custom package available at the bookstore, ISBN 9781256873778, includes the loose-leaf edition of Neuhauser and a MyMathLab access code.
- Scientific calculator (non-graphing, non-programmable).
- Course ID: vasaturo88202
- Here is a link to get your started enrolling: https://www.pearsonmylabandmastering.com/northamerica/mymathlab/students/get-registered/
PREREQUISITES AND COREQUISITES

You must have a minimum grade of C- in Calculus for the Life Sciences with Applications I (MATH 1750), or equivalent (MATH 1850, MATH 1830, MATH 1920, or transfer credit).

CATALOG DESCRIPTION

Indefinite and definite integrals, probability, functions of several variables, least squares, differential equations. Course is not applicable toward the undergraduate Mathematics major requirements.

STUDENT LEARNING OUTCOMES

The successful MATH 1760 student should understand:

- **Indefinite integrals**: Construct antiderivatives analytically. Find indefinite integrals by using integration formulas and by the methods of substitution and integration by parts.

- **Definite integrals**: Use Riemann sums to estimate and to evaluate definite integrals. Evaluate definite integrals by use of the Fundamental Theorem of Calculus. Identify a definite integral of a function in terms of areas of regions between the graph of the function and the x-axis, and use definite integrals to calculate areas of planar regions.

- **Differential equations**: Determine whether a function is a solution of a differential equation. Solve separable differential equations. Use differential equations to model a variety of real-life situations. Determine the equilibrium solutions of autonomous differential equations and classify their stability.

- **Probability**: Use the Multiplication Principle, permutations, and combinations to determine the number of possible outcomes in a given situation. Describe sample spaces of experiments. Compute probabilities if outcomes are equally likely. Compute the probabilities of complementary events and OR-events, apply the multiplication rule for independent events, and compute conditional probabilities. Use probability distributions, including the binomial distribution and the normal distribution, to compute probabilities.

- **Vectors**: Represent vectors graphically in rectangular coordinates. Perform basic vector operations graphically and algebraically – addition, subtraction, and scalar multiplication. Compute the dot product and the cross product of vectors.

This course is part of our institutional General Education Program (Core Mathematics, Trans Mod mathematics).

GRADING SCALE

<table>
<thead>
<tr>
<th>Letter Grade</th>
<th>A</th>
<th>B+</th>
<th>B</th>
<th>B-</th>
<th>C+</th>
<th>C</th>
<th>C-</th>
<th>D+</th>
<th>D</th>
<th>D-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Percentage Required</td>
<td>90%</td>
<td>87%</td>
<td>83%</td>
<td>80</td>
<td>77%</td>
<td>73%</td>
<td>70%</td>
<td>67%</td>
<td>63%</td>
<td>60%</td>
</tr>
</tbody>
</table>
GRADING POLICY

Attendance:
3% regular credit if no more than 3 classes are missed + 3% Extra Credit if no more than 1 class is missed.

Online Homework (MyMathLab)
http://www.pearsonmylabandmastering.com, course-ID: vasaturo88202

18%

Weekly Quizzes: Only the 6 highest are counted.
There will be no make-ups; in case of an excused absence (see below) the quiz score will be prorated.

2 Tests: 50 minutes each.
Make-ups will be given only in case of an excused absence in accordance with The University of Toledo Missed Class Policy:
(http://www.utoledo.edu/policies/academic/undergraduate/pdfs/3364-71-14%20Missed%20class%20policy.pdf).

You must provide official documentation for the absence and contact me at least 12 hours in advance of the exam date by phone, e-mail or in person to make arrangements for a make-up exam. In particular, in case of a planned absence (such as an athletic competition), contact me well in advance of the scheduled exam.

Final Exam: 120 minutes; comprehensive.

27%

total: 100%

A scientific (non-graphing, non-programmable) calculator may be used on all exams and quizzes.

Quizzes and tests will be returned in class. Quiz and exam scores will be posted on Blackboard. Any errors in posted scores must be brought to the instructor's attention by the next class period after returning the quiz/exam.

<table>
<thead>
<tr>
<th>Quiz 1</th>
<th>Quiz 2</th>
<th>Quiz 3</th>
<th>Quiz 4</th>
<th>Quiz 5</th>
<th>Quiz 6</th>
<th>Test 1</th>
<th>Test 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

There will be NO extra-credit assignments for individual students to boost their grades towards the end of the semester.

Homework: Online homework counts towards the grade. If you get stuck on a particular problem, you have access to an interactive, step-by-step solution. You may then work the problem again (more precisely: a new version of the problem), as many times as you wish, and practice until you have mastered the topic. To obtain full credit for your online assignments, you must submit them
by the due date. After the due date, you will still be able to work on questions that you previously missed, but you will encounter a 30% late submission penalty for those questions.

All online assignments must be submitted by the last day of classes (Friday, December 8\textsuperscript{th}).

Additional homework that I think is valuable for exam preparation and your own benefit will be assigned from the textbook daily for practice but will not be collected.

\textbf{Attendance and Midterm Grades:} Students are expected to attend all classes from beginning to end. Attendance will be tracked.

You can use the overall course percentage posted on Blackboard anytime during the semester for an estimate of where you stand academically in the course. It is recommended that you keep track of your scores using the table above. To further assist you, midterm grades (letter grades) accessible via the myUT portal will be posted in the week of October 16\textsuperscript{th}. Attendance is also recorded during midterm grading to meet state and federal laws regarding financial aid disbursement.

\textbf{Please note:} Not attending class could impact your financial aid.

\textbf{Classroom Etiquette:} To avoid distraction and provide an environment conducive to learning, please do not use cell phones, iPads, or laptop computers in class, and set cell phones to silent. Food and drink are generally not allowed in classrooms.

\textbf{IMPORTANT DATES}

\textbf{Quizzes:} Every Wednesday unless there is an exam that week.

\textbf{Tests:} September 27\textsuperscript{th}, November 1\textsuperscript{st} (Wednesdays).

\textbf{Final Exam:} Monday, December 11\textsuperscript{th}, 10:15 AM -12:15 PM

Dates for quizzes and tests are tentative and subject to change. The final exam is scheduled according to the university exam schedule and cannot be given early or late. The room will be announced once it has been assigned.

The last day to \textbf{ADD/DROP} classes is September 11\textsuperscript{th}, 2017.

The last day to \textbf{WITHDRAW} with a grade of “W” from this class is November 3\textsuperscript{rd}, 2017

Any student who has not withdrawn from class by November 3\textsuperscript{rd}, 2017 will receive a letter grade for this class.

It is the student’s responsibility to withdraw; an instructor cannot withdraw a student.

\textbf{Note:} An \textbf{INCOMPLETE} grade is given only in exceptional circumstances, and only if the student has completed most of the course work with a passing grade. It is the student’s responsibility to notify the instructor and provide documentation.
SOME ADVICE FOR SUCCEEDING IN THIS CLASS

- Attend class regularly. Try to read ahead over the material to be covered. This will allow you to participate actively in the class, ask relevant questions, clear up points that you didn't understand.
- Don't hesitate to ask questions, either in class/recitation or during office hours. If you can't make it during my office hours, make an appointment or contact me by email, text message, or Facebook!
- Don't postpone clarifying a point that you missed. It's the nature of mathematics that something new will soon build on it!
- Work exercises daily. This allows you to absorb concepts and techniques one at a time, and prevents you from falling behind. Regular exercise is just as important for the mind as for the body.
- Don't give up if you don't "get it" after the first try. Everybody struggles at some point when confronted with new material, everybody has to work at understanding new concepts.
- Always strive for understanding, not just memorization. Understanding a concept, and how concepts relate to one another, will make remembering much easier (and more enjoyable).
- Study with fellow students. Take turns explaining the material to each other. Teaching someone else is the best way of learning.
- Schedule sufficient time for studying outside the classroom. The expected out-of-class study time for a 3-credit class is 6-9 hours per week.

HOW TO GET THE MOST OUT OF YOUR ONLINE HOMEWORK

- Before you start working on your homework, review the textbook material/class notes relating to the homework material.
- Get out your paper & pencil before you do homework. Write down the question that you're working on, the question number and homework title. Work out your solution on paper, writing out every step, before entering your answer. This avoids frustrating mistakes. A good record of your work (detailed solutions, kept well-organized by chapter/section) will also be very helpful for reviewing once test time comes around.
- Strive for understanding, not just for a good homework grade. Before you use the online help ("Help me solve this"), ATTEMPT THE PROBLEM ON YOUR OWN and work it as far as you can get. When you use the online help, ask yourself what the purpose of each step is, don't just memorize the steps or guess the pattern how the numbers change.
- Do the homework as soon as possible after the lecture in which the material was introduced. At the latest, do the homework corresponding to quiz material before the quiz, so that it serves as practice for the quiz. It's best if you work the homework at least 2 days ahead of the quiz, that leaves you time to seek help if there's something you don't understand.
STUDENT SUPPORT SERVICES

Tutoring: Free mathematics tutoring on a walk-in basis is available in the Learning Enhancement Center/Math Learning and Resource Center in the lower level of Carlson Library (419.530.2176). Hours: MTWR 10 am - 9 pm, F 9 am - 5 pm, Sun 4 pm - 8 pm.

Study skills: For help with study skills, test taking strategies, and test anxiety, contact Julie Radwanski at the Learning Enhancement Center, Julia.Radwanski@utoledo.edu , 419.530.2449.

UNIVERSITY POLICIES

Policy Statement on Non-Discrimination on the basis of Disability (ADA): The University is an equal opportunity educational institution. Please read The University’s Policy Statement on Nondiscrimination on the Basis of Disability – Americans with Disabilities Act Compliance.

Academic Accommodations: The University of Toledo is committed to providing equal access to education for all students. If you have a documented disability or you believe you have a disability and would like information regarding academic accommodations/adjustments in this course please contact the Student Disability Services Office (Rocket Hall 1820; 419.530.4981; studentdisabilitysvs@utoledo.edu ) as soon as possible for more information. To initiate the process for accessing academic accommodations, see: http://www.utoledo.edu/offices/student-disability-services/registernew.html.

ACADEMIC POLICIES

Student Privacy: Federal law and university policy prohibit instructors from discussing a student’s grades or class performance with anyone outside university faculty/staff without the student’s written and signed consent. This includes patents and spouses. For details, see the “Confidentiality of student records (FERPA) section of the University Policy Page at https://www.utoledo.edu/policies/academic/undergraduate/

Academic Dishonesty: Any act of academic dishonesty as defined by the University of Toledo policy on academic dishonesty (https://www.utoledo.edu/policies/academic/undergraduate/), e.g., turning in work that is not your own or using unauthorized materials during an exam, will result in a score of 0 on the item in question for the first incident, and an F in the course for a repeat. Please note that any use of, or visibility of, a cell phone or smart watch (or any other device capable of connecting to the internet or storing information) during a test, quiz or exam will be considered academic dishonesty. A course grade received due to academic dishonesty cannot be deleted, and may lead to probation, suspension, or dismissal.

Media Use Policy: Media produced by the course instructor are solely for class use by students currently registered for the course, and under no circumstances can they be posted, linked to, or made available for distribution or copying to any persons, institutions, or servers (for example, no
portion of them may be downloaded and posted on YouTube or sent to friends). This includes media that appears on the course site and in VoiceThread. As the author of these teaching materials the instructor or university holds the copyright (though not to the commercial artworks contained within them), and the only authorized use by students is for the purposes of the course. Violating this policy constitutes a serious infraction of UT's computer use policy and may result in consequences up to and including expulsion from the University and legal action (both criminal and civil) from the various rights holders whose copyrights you may have infringed.

For further details on the policies that govern the institution’s academic processes, please refer to the Undergraduate Academic Policies (https://www.utoledo.edu/policies/academic/undergraduate/).
## CLASS SCHEDULE

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Topic</th>
<th>Learning Outcome</th>
<th>Number of Lecture Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter</td>
<td>Review of Differentiation</td>
<td></td>
<td>1.0</td>
</tr>
<tr>
<td>5.8</td>
<td>Antiderivatives</td>
<td><strong>Indefinite integrals</strong></td>
<td>2.0</td>
</tr>
<tr>
<td>Chapter</td>
<td>Integration</td>
<td></td>
<td>(7 hours)</td>
</tr>
<tr>
<td>6</td>
<td>The Definite Integral</td>
<td><strong>Definite integrals</strong></td>
<td>4.0</td>
</tr>
<tr>
<td>6.2</td>
<td>The Fundamental Theorem of Calculus</td>
<td><strong>Definite integrals</strong></td>
<td>1.0</td>
</tr>
<tr>
<td>6.3</td>
<td>Applications of Integration</td>
<td><strong>Definite integrals</strong></td>
<td>2.0</td>
</tr>
<tr>
<td>Chapter</td>
<td>Integration Techniques and Computational Methods</td>
<td></td>
<td>(4 hours)</td>
</tr>
<tr>
<td>7.1</td>
<td>The Substitution Rule</td>
<td><strong>Indefinite integrals</strong></td>
<td>2.0</td>
</tr>
<tr>
<td>7.2</td>
<td>Integration by Parts and Practicing Integration</td>
<td><strong>Indefinite integrals</strong></td>
<td>2.0</td>
</tr>
<tr>
<td>7.3</td>
<td>Rational Functions and Partial Fractions</td>
<td><strong>Indefinite integrals</strong></td>
<td>optional</td>
</tr>
<tr>
<td>7.4.1</td>
<td>Improper Integrals (Unbounded Intervals)</td>
<td><strong>Definite integrals</strong></td>
<td>optional</td>
</tr>
<tr>
<td>Chapter</td>
<td>Differential Equations</td>
<td></td>
<td>(7 hours)</td>
</tr>
<tr>
<td>8</td>
<td>Solving Differential Equations</td>
<td><strong>Differential equations</strong></td>
<td>4.0</td>
</tr>
<tr>
<td>8.2</td>
<td>Equilibria and Their Stability</td>
<td><strong>Differential equations</strong></td>
<td>3.0</td>
</tr>
<tr>
<td>Chapter</td>
<td>Probability and Statistics</td>
<td></td>
<td>(13 hours)</td>
</tr>
<tr>
<td>12.1</td>
<td>Counting</td>
<td><strong>Probability</strong></td>
<td>2.5</td>
</tr>
<tr>
<td>12.2</td>
<td>What Is Probability?</td>
<td><strong>Probability</strong></td>
<td>2.5</td>
</tr>
<tr>
<td>12.3</td>
<td>Conditional Probability and Independence</td>
<td><strong>Probability</strong></td>
<td>2.5</td>
</tr>
<tr>
<td>12.4</td>
<td>Discrete Random Variables and Discrete Distributions</td>
<td><strong>Probability</strong></td>
<td>2.5</td>
</tr>
<tr>
<td>12.5</td>
<td>Continuous Distributions</td>
<td><strong>Probability</strong></td>
<td>3.0</td>
</tr>
<tr>
<td>Chapter</td>
<td>Linear Algebra and Analytic Geometry</td>
<td></td>
<td>(3 hours)</td>
</tr>
<tr>
<td>9.4</td>
<td>Analytic Geometry</td>
<td><strong>Vectors</strong></td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>Total Number of Lecture Hours</td>
<td></td>
<td>37.0</td>
</tr>
</tbody>
</table>

The instructor reserves the right to change the content of the course material if she perceives a need due to postponement of class caused by inclement weather, instructor illness, etc., or due to the pace of the course.

As a matter of fact, your understanding of the material is more important than the amount of material covered. It is possible that the probability and vector sections, in particular, will not be covered in depth.