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Single Variable Calculus II
Spring 2024   CRN: 26856   Credit Hours: 4
Math 1860 Sec. 007   MTRF 2:30 - 3:25 PM   Room: Memorial Field House 2920

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Instructor:	Dr. David Gajewski
Office:	University Hall 3014
Office Hours:	Tues 11-1, Wed 2-4, Thurs 12-1, Fri 12-1, and also by appointment.
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CATALOG DESCRIPTION
Techniques of integration, polar coordinates and calculus or plane curves, infinite series and Taylor series. Of interest to students requiring a conceptual understanding of calculus.

PREREQUISITES
Minimum grade of C- in MATH 1830 or Math 1850 or equivalent (Calculus I). Students who enroll in Math 1860 but have not passed either prerequisite may be administratively dropped from the class.

TEXTBOOK: *Calculus – Volume II*, OpenStax (Print ISBN-13: 978-1-938168-06-2; Digital ISBN-13: 978-1-947172-14-2), Senior Contributing Authors: Edwin "Jed" Herman and Gilbert Strang. The ebook is available for free at https://openstax.org/details/books/calculus-volume-2.

GRADING AND EVALUATION

% Score	Grade
90-100	A range
80-89.99	B range
70-79.99	C range
60-69.99	D range
< 60	F

Note that minus and plus grades will be awarded for grades within 2.5% of the lower and upper ends of the given ranges respectively, e.g. B- for 80-82.49, B for 82.50-87.49, B+ for 87.5-89.99. Also note that there are not A+ grades at The University of Toledo.

Component	points
Homework	15%
Quizzes	15%
Three (3) Exams	45%
Final Exam	25%

ONLINE HOMEWORK
Homework for this course is online and is located at http://www.webassign.net and is also linked from Blackboard. Late homework will have a 40% penalty. Students must purchase a WebAssign Access Code.

QUIZZES
There will be weekly quizzes. The lowest two quiz scores will be dropped.

TESTS AND FINAL EXAM
There will be 3 tests one after each 4 weeks. Tentatively they will be held on February 16, March 22, and April 19. The final is comprehensive and will be held on **Friday May 3 2024, 10:15-12:15pm** in possibly a different classroom. Please note that the final exam may not be taken early under any circumstances in accordance with department policy.

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

Last day to add/drop this class: Tuesday January 30, 2024
Last day to withdraw from this class with a grade of W: Friday March 22, 2024

MISSED CLASS POLICY

If circumstances occur in accordance with "The University of Toledo Missed Class Policy" (found at `http://www.utoledo.edu/facsenate/missed_class_policy.html`) result in a student missing a quiz, test, exam or other graded item, the student must contact the instructor in advance by phone, e-mail or in person, provide official documentation to back up his or her absence, and arrange to make up the missed item as soon as possible.

INSTITUTIONAL CLASSROOM ATTENDANCE POLICY

Please be aware that the university has implemented an attendance policy, which requires faculty to verify student participation in every class a student is registered at the start of each new semester/course. For this course, if you have not attended/participated in class (completed any course activities or assignments) within the first 14 days, I am required by federal law to report you as not attended. Unfortunately, not attending/participating in class impacts your eligibility to receive financial aid, so it is VERY important that you attend class and complete course work in these first two weeks. Please contact me as soon as possible to discuss options and/or possible accommodations if you have any difficulty completing assignments within the first two weeks.

ACADEMIC DISHONESTY

Any act of academic dishonesty as defined by the University of Toledo policy on academic dishonesty (found at `http://www.utoledo.edu/dl/students/dishonesty.html`) will result in an F in the course or an F on the item in question, subject to the determination of the instructor. In particular, tests, quizzes and exams must be entirely the student's own work and any use of outside websites, apps, technology or persons to assist with completing these items will be considered academic dishonestly.

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 Disability Act Compliance. Students can find this policy along with other university policies listed by audience on the University Policy webpage (`http://www.utoledo.edu/policies/audience.html/#students`).

ACADEMIC ACCOMMODATIONS

The University of Toledo embraces the inclusion of students with disabilities. We are committed to ensuring equal opportunity and seamless access for full participation in all courses. For students who have an Accommodations Memo from the Office of Accessibility and Disability Resources, I invite you to correspond with me as soon as possible so that we can communicate confidentially about implementing accommodations in this course.

For students who have not established accommodations with the Office of Accessibility and Disability Resources and are experiencing disability access barriers or are interested in a referral to health care resources for a potential disability, please connect with the office by calling 419.530.4981 or sending an email to `StudentDisability@utoledo.edu`.

RELIGIOUS ACCOMODATIONS

A student is permitted to be absent, *without penalty*, for up to three days each academic semester to take holidays for reasons of faith or religious or spiritual belief system or to participate in organized activities conducted under the auspices of a religious denomination church, or other religious or spiritual organization.

Alternative accommodations will be provided to students who miss exams and/or other academic requirements because of such absences under the following circumstances:
  i. The student's sincerely held religious belief or practice severely affects the student's ability to take an exam or meet an academic requirement; and
  ii. the student submits a form through `https://forms.office.com/r/gBBCQkQj3H` (which includes a link to the non-exhaustive list of religious holidays/holy days) within 14 days after the first day of instruction; and
  iii. the Office of the Provost will send notification to each instructor indicating the specific dates for which the student will be absent; and
  iv. the student and faculty member agree on how and when the missed coursework and/or exam will be completed, which may be prior to or after the missed class, but must be completed before the end of the term.

GRIEVANCE PROCEDURE

A student may notify the institution of any grievance regarding the policy's implementation using the 3364-71-05.1 Academic grievance procedure (`https://www.utoledo.edu/policies/academic/undergraduate/pdfs/3364-71-05-1_AcademicGrievanceProcedure.pdf`).

ACADEMIC AND SUPPORT SERVICES

Please follow this link to view a comprehensive list of Student Academic and Support Services (`http://www.utoledo.edu/studentaffairs/departments.html`) available to you as a student.

SAFETY AND HEALTH SERVICES FOR UT STUDENTS

Please use the following link to view a comprehensive list Campus Health and Safety Services (`http://www.utoledo.edu/offices/provost/utc/docs/CampusHealthSafetyContacts.pdf`) available to you as a student.

STUDENT PRIVACY

Federal law and university policy prohibits instructors from discussing a student's grades or class performance with anyone outside of university faculty/staff without the student's written and signed consent. This includes parents and spouses. For details, see the "Confidentiality of Student Records (FERPA)" section of the University Policy Page at `http://www.utoledo.edu/policies/academic/undergraduate/index.html`

OTHER UNIVERSITY POLICIES

Refer to the student handbook at `http://www.utoledo.edu/studentaffairs/pdfs/handbook.pdf`

RESOURCES

Free math tutoring on a walk-in basis is available in the Math Learning and Resources Center located in Rm B0200 in the lower level of Carlson Library (phone ext 2176). The Center operates on a walk-in basis. MLRC hours can be found at `http://www.math.utoledo.edu/mlrc/MLRC.pdf`

CLASS SCHEDULE

Chapter	2	**Applications of Integrals**	(total 6 hr)
	2.1	**(Op.)** Areas between Curves; *Definite Integration*	
	2.2	Determining Volumes by Slicing; *Definite Integration*	2
	2.3	Volumes of Revolution: Cylindrical Shells; *Definite Integration*	2
	2.4	Arc Length of a Curve and Surface Area	1
	2.5	Physical Applications	1
	2.6	**(Op.)** Moments and Centers of Mass	
	2.7	**(Op.)** Integrals, Exponential Functions, and Logarithms	
	2.8	**(Op.)** Exponential Growth and Decay	
	2.9	**(Op.)** Calculus of the Hyperbolic Functions	
Chapter	3	**Techniques of Integration**	(total 10 hr)
	3.1	Integration by Parts; *Techniques of Integration*	2
	3.2	Trigonometric Integrals; *Techniques of Integration*	1
	3.3	Trigonometric Substitution; *Techniques of Integration*	2
	3.4	Partial Fractions; *Techniques of Integration*	2
	3.5	**(Op.)** Other Strategies for Integration	
	3.6	**(Op.)** Numerical Integration	
	3.7	Improper Integrals; *Improper Integrals*	3
Chapter	5	**Sequences and Series**	(total 10 hr)
	5.1	Sequences; *Sequences and Series*	2
	5.2	Infinite Series; *Sequences and Series*	2
	5.3	The Divergence and Integral Tests; *Sequences and Series*	2
	5.4	Comparison Tests; *Sequences and Series*	1
	5.5	Alternating Series; *Sequences and Series*	1
	5.6	Ratio and Root Tests; *Sequences and Series*	2
Chapter	6	**Power Series**	(total 7 hr)
	6.1	Power Series and Functions; *Power Series*	2
	6.2	Properties of Power Series; *Power Series*	2
	6.3	Taylor and Maclaurin Series; *Power Series*	2
	6.4	Working with Taylor Series; *Power Series*	1
Chapter	7	**Parametric Equations and Polar Coordinates**	(total 6 hr)
	7.1	Parametric Equations; *Parametric Curves*	1
	7.2	Calculus of Parametric Curves; *Parametric Curves*	2
	7.3	Polar Coordinates; *Parametric Curves*	2
	7.5	Area and Arc Length in Polar Coordinates; *Parametric Curves*	1
	7.6	**(Op.)** Conic Sections	

Total Hours	39

LEARNING OBJECTIVES

A more detailed list of learning objectives is given below. At least 70% of the course time will be devoted to these essential outcomes. These objectives are listed again in the chronological list of topics at the end of this syllabus. The successful Calculus II student should be able to:

- **Definite Integrals:** Use antiderivatives to evaluate definite integrals and apply definite integrals in a variety of applications to model physical, biological or economic situations. Whatever applications (e.g. determining area, volume of solids of revolution, arc-length, area of surfaces of revolution, centroids, work, and uid forces) are chosen, the emphasis should be on setting up an approximating Riemann sum and representing its limit as a definite integral.

- **Techniques of Integration:** Employ a variety of integration techniques to evaluate special types of integrals, including substitution, integration by parts, trigonometric substitution, and partial fraction decomposition.

- **Improper Integrals:** Evaluate improper integrals, including integrals over infinite intervals, as well as integrals in which the integrand becomes infinite on the interval of integration.

- **Sequences and Series:** Determine the existence of and find algebraically the limits of sequences. Determine whether a series converges by using appropriate tests, including the comparison, ratio, root, and integral.

- **Power Series:** Find the nth Taylor polynomial at a specified center for a function and estimate the error term. Use appropriate techniques to differentiate, integrate and find the radius of convergence for the power series of various functions.

- **Parametric Curves:** Analyze curves given parametrically and in polar form and find the areas of regions defined by such curves.

- **Lines and Planes:** Perform and apply vector operations, including the dot and cross product of vectors, in the plane and space.