Calculus for Engineering Technology II
Fall 2024 CRN: 47533 Credit Hours: 4
Math 2460 Sec. 01 TR 5:45 - 7:35 PM Room: Field House 2910

Instructor:	Dr. David Gajewski
Office:	University Hall 3014
Office Hours:	MW 12:30-2:30, R 4:30-5:45 and also by appointment.
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COURSE DESCRIPTION
Transcendental functions, methods of integration, applications of the integral, polar coordinates, vectors and vector operation, lines and panes, parametric equations.

PREREQUISITES
Minimum grade of C- in Math 2450 or Math 1850 or Math 1920. Students who enroll in Math 2460 but have not the prerequisite course may be administratively dropped from the class. General education curriculum core course meets the skills requirements in mathematics.

TEXTBOOK: *Technical Calculus with Analytic Geometry Fifth Edition*, by Kuhfittig (ISBN:9781133945192), Brooks/Cole Cengage Learning. Students have the option to subscribe to Cengage Unlimited https://www.cengage.com/unlimited to bundle all of their Cengage textbooks at one cost for eBooks. *APEX Calculus III*, by Gregory Hartman. This is a free textbook located at http://www.apexcalculus.com/downloads/

CALCULATOR
A non-programmable, non-graphing calculator is allowed, and no other electronic devices.

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, and 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 September 26, October 24, and November 21, 2024. The final is comprehensive and will be held on **Tuesday December 10, 2024 5:00-7:00pm** in a possibly different room. 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: Monday September 9 2024
Last day to withdraw from this class with a grade of W: Friday November 1 2024

MISSED CLASS POLICY

If circumstances occur in accordance with "The University of Toledo Missed Class Policy" (found at `http://www.utoledo.edu/policies/academic/undergraduate/index.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 <u>semester</u> 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. See 3364-71-30 Religious accommodations policy (`https://www.utoledo.edu/policies/academic/undergraduate/pdfs/3364-71-30%20Religious%20accommodations.pdf`) and 3364-71-30.01 Religious accommodations procedure (`https://www.utoledo.edu/policies/academic/undergraduate/pdfs/3364-71-30%2001%20Procedure%20religious%20accommodations.pdf`)

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`

Suggested Schedule for MATH 2460

Chapter	Section	Topic	Hours	Learning Objectives
Chapter	6	Derivatives of Transcendental Functions	6 hours	
	6.6	Exponential and Logarithmic Functions	1.0	
	6.7	Derivative of the Logarithmic Function	1.0	
	6.8	Derivative of the Exponential Function	1.0	
	6.9	L'Hospital's Rule	1.0	
	6.10	Applications	2.0	
	6.11	Newton's Method (Optional)	1.0	
Chapter	7	Integration Techniques	10.5 hours	
	7.1	The Power Formula Again	1.0	Techniques of Integration
	7.2	The Logarithmic and Exponential Forms	1.0	Techniques of Integration
	7.3	Trigonometric Forms	1.0	Techniques of Integration
	7.4	Further Trigonometric Forms	1.0	Techniques of Integration
	7.5	Inverse Trigonometric Forms	0.5	Techniques of Integration
	7.6	Integration by Trigonometric Substitution	2.0	Techniques of Integration
	7.7	Integration by Parts	2.0	Techniques of Integration
	7.8	Integration of Rational Functions	2.0	Techniques of Integration
Chapter	8	Parametric Equations, Vectors, and Polar Coordinates	6 hours	
	8.1	Vectors and Parametric Equations	1.0	Three-Space
	8.2	Arc Length	1.0	Definite Integrals
	8.3	Polar Coordinates	1.0	Polar Coordinates
	8.4	Curves in Polar Coordinates	1.0	Polar Coordinates
	8.5	Areas in Polar Coordinates; Tangents	2.0	Polar Coordinates
Chapter	9	Three-Dimensional Space; Partial Derivatives; Multiple Integrals	9 hours	
	9.1	Surfaces in Three Dimensions	1.0	Three-Space
	9.2	Partial Derivatives	1.0	Three-Space
	9.3	Applications of Partial Derivatives	2.0	Three-Space
	9.4	Iterated Integrals	2.0	Three-Space
	9.5	Volumes by Double Integration	1.0	Three-Space
	9.6	Mass, Centroids, and Moments of Inertia (Optional)	2.0	Three-Space
Chapter	10	Vectors (APEX Calculus)	7 hours	
	10.2	An Introduction to Vectors	2.0	Vectors
	10.3	The Dot Product	1.5	Vectors
	10.4	The Cross Product	1.5	Vectors
	10.5	Lines	1.0	Vectors
	10.5	Planes	1.0	Vectors
Chapter	11	First Order Differential Equations	5.5 hours	
	11.1	What is a Differential Equation?	1.0	Differential Equations
	11.2	Separation of Variables	2.0	Differential Equations
	11.3	First-Order Linear Differential Equations	1.0	Differential Equations
	11.4	Applications of First-Order Differential Equations	1.5	Differential Equations
		Total Hours	44	

STUDENT LEARNING OUTCOMES

Upon successful completion of this class a student should be able to:

- **Definite Integrals:** Use antiderivatives to evaluate definite integrals and apply definite integrals in a variety of applications including center of mass, moments of inertia, work, fluid pressure, and average value.

- **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. Polar Coordinates: Analyze curves given in polar form and find the areas of regions defined with polar coordinates.

- **Three-Space:** Use partial derivatives to find the tangent lines, critical points, and relative maximum or minimum of a function of two variables. Evaluate double integrals to find the volume of a solid.

- **Vectors:** Perform and apply vector operations, including the dot and cross product of vectors, and use them to derive analytic descriptions of lines and planes.

- **Differential Equations:** Use the method of separation of variables and integrating factor to solve differential equations. Apply differential equations in a variety of engineering applications including radioactive decay, electric circuits, mixtures, and temperature change.