



# Advanced Differential Equations

MTH 416/616 || CRNs: 3864, 3881, 3882 || Spring 2025

- Instructor:** Dr. Tom Cuchta  
**Time:** 5:00-6:15 MW  
**Location:** Smith Hall 518  
**E-mail:** [cuchta@marshall.edu](mailto:cuchta@marshall.edu)  
**Office:** Smith Hall 614 (walk into room, turn left – my office is inside!)  
**Open office hours:** See my website <http://tomcuchta.com>. They may change throughout the semester without notice. Alternate office hours may always be scheduled via e-mail.  
**Class webpage:** <https://tomcuchta.com/teach/classes/2025/MTH416.616-Spring2025-Marshall/>  
**Textbook:** “The Theory of Differential Equations: Classical and Qualitative” by Kelley and Peterson  
**Course Description:** Differential equations are studied qualitatively. Topics include the existence and uniqueness of solutions and the behavior of solutions including stability of nonlinear systems, periodic solutions, and approximation using perturbation methods.  
**Prerequisites:** MTH300 and MTH335  
**Weekly Homework:** Weekly homework will be assigned on the course webpage and be submitted via Blackboard. Graduate students may be given extra problems.  
**Quizzes:** Quizzes will be given randomly, will not be announced in advance, and (usually) due by the next day on Blackboard. 20% of the lowest-scored quizzes will be dropped.  
**Exams:** There will be three one-hour exams in this course. All exams for graduate students are more difficult.  
**Final exam:** There will be a cumulative final exam in this course.  
**Make-up exam policy:** If an exam is to be missed due to an excused absence (defined as in this page), then it is the *student’s responsibility* to arrange an alternative time to take the exam at least one week before the exam is given. If the student misses an exam due to an unexcused absence, the exam may be replaced with the percentage earned on the final exam. The unexcused absence policy applies *only once*.  
**University policies:** Various university policies such as Academic Dishonesty, Academic Dismissal, Academic Forgiveness, Academic Probation & Suspension, Affirmative Action, Pre-Finals Week, D/F Repeat Rule, Excused Absence, Inclement Weather, Sexual Harassment, Students with Disabilities, and University Computing Services Acceptable Use can be found at the Marshall University academic affairs webpage here: <https://www.marshall.edu/academic-affairs/policies/>

		Grade	Percentage Range
<b>Grading policy:</b>	Weekly Homework (WH)	25%	$90\% \leq \mathbf{PE} \leq 100\%$
	Quizzes (Q)	15%	
	Hour exams (HE)	35%	
	Final exam (FE)	25%	
		F	

**Campus Carry Policy**  $\mathbf{PE} = 0.25(\mathbf{WH}) + 0.15(\mathbf{Q}) + 0.35(\mathbf{HE}) + 0.25(\mathbf{FE})$   
 University Policy, UPGA-12 (Campus Carry Policy) derives its authority from West Virginia State law, including the Campus Self-defense Act (WV Code §18B-4-5b). It pertains to the exercise of concealed carry on Marshall University’s campus, except in designated areas, by individuals with a valid permit to conceal carry.  
 Individuals who choose to conceal carry are responsible for knowing and understanding all applicable federal, state, and local laws and Marshall University Board of Governors Rules, university policies, and administrative procedures. University Policy, UPGA-12 applies to areas of campus and buildings that are directly under the possession or control of Marshall University.  
 Concealed handguns are not observable to others and must be holstered and concealed on the body of the permit holder or in a personal carrier, such as a backpack, purse, or other bag that remains under the exclusive and uninterrupted control of the permit holder. This includes wearing the personal carrier with a strap, carrying or holding the personal carrier, or setting the personal carrier next to or within your immediate reach at all times. If your participation in class activities impedes your ability to maintain constant control of your handgun, please make alternate arrangements prior to coming to class.

# Advanced Differential Equations Spring 2025

Week #	Dates	Sections
1	13 Jan – 17 Jan	
2	20 Jan – 24 Jan	20 Jan: <b><i>NO CLASS</i></b> – MLK DAY
3	27 Jan – 31 Jan	
4	3 Feb – 7 Feb	
5	10 Feb – 14 Feb	10 Feb: <i>Review half-day</i> 12 Feb: <b><i>EXAM 1</i></b> 14 Feb ♥: <b><i>NO CLASS</i></b> - February break
6	17 Feb – 21 Feb	
7	24 Feb – 28 Feb	
8	3 Mar – 7 Mar	
9	10 Mar – 14 Mar	10 Mar: <i>Review Half-Day</i> 12 Mar: <b><i>EXAM 2</i></b>
—	17 Mar – 21 Mar	<b><i>NO CLASSES</i></b> - SPRING BREAK
10	24 Mar – 28 Mar	
11	31 Mar – 4 Apr	
12	7 Apr – 11 Apr	
13	14 Apr – 18 Apr	14 Apr: <i>Review Half-Day</i> 16 Apr: <b><i>EXAM 3</i></b>
14	21 Apr – 25 Apr	
15	28 Apr – 2 May	
16	5 May – 9 May	Mon 5 May, 5:00PM: <b><i>FINAL EXAM</i></b>