POINT LOMA NAZARENE UNIVERSITY

MTH333 Differential Equations (3 units)

TTh 4:15-5:30 LA001

Instructor: Ryan Botts, Ph.D.
Office Hours: Posted on Canvas
Office: Rohr Science 228
Phone: 619.849.2968
Email: ryanbotts@pointloma.edu

Course Description
Ordinary differential equations, solutions by analytical and numerical methods in the context of real world applications. A brief introduction to partial differential equations and Fourier series.

Prerequisites: MTH274 Calculus III

Required Materials
Textbook: Nagle, Saff and Snider, *Fundamental of Differential Equations 9th ed.*
ISBN: 978-0321977069

Computational tools: Throughout this course there will be places where we use technology to solve problems, thus you should have access to software such as MATLAB, FreeMat, Octave, R, etc.
Recommended: 3 iguanas and a parakeet

Course Goals
Students should gain the ability to properly identify types of differential equations and apply a wide range of analytical methods for solving differential equations. Students should be able to apply the basic numerical methods for solving differential equations.

Learning Outcomes
Students will be able to apply their mathematical knowledge to solve problems.
Students will be able to use technology to solve problems.

Examinations
There will be two midterms and a final exam. The final is comprehensive and will be held on **Tuesday May 1, 2018 from 4:30-7 pm.** All or some portion of the exams may be take-home, in which case they will be due on the date of the scheduled exam.

Projects
There will be several projects throughout the semester. These are designed to improve your ability to communicate technical ideas and to give you a chance to apply differential equations to real world problems.

Grading Policies
Grades will be weighted in the following manner:
Projects(10%), Homework (20%), Midterms (40%), Final (30%)

Approximate minimal percentages required to obtain a given grade are:

Grading Scale in percentages	A	B	C	D
+		(87.5, 90)	(77.5, 80)	(67.5, 70)
	[92.5, 100]	[82.5, 87.5)	[72.5, 77.5)	[62.5, 67.5)
-	[90, 92.5)	[80, 82.5)	[70, 72.5)	[60, 62.5)

- **Late work**. A written assignment or computer assignment is late if it is not received at the beginning of class on the due date. Late work will not be accepted. Make-up tests (or the exam) will be given by prior arrangements with the instructor or for a documented emergency. All late work (exams, homework or projects) will receive no credit.

- **Format for Projects**. Assignments collected must be prepared in a style suitable for grading. The projects will be graded on clarity and writing quality.
    - the organization must be easy to follow
    - the work must be typed
    - complete solutions must be written for problems (not just answers); solutions must be clearly marked
    - use complete sentences to answer questions

University Mission

Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Department Mission

The Mathematical, Information, and Computer Sciences department at Point Loma Nazarene University is committed to maintaining a curriculum that provides its students with the tools to be productive, the passion to continue learning, and Christian perspectives to provide a basis for making sound value judgments.

Attendance

Attendance is expected at each class session. In the event of an absence you are responsible for the material covered in class and the assignments given that day.

Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See Academic Policies in the Undergraduate Academic Catalog.

Academic Accommodations

If you have a diagnosed disability, please contact PLNU's Disability Resource Center (DRC) within the first two weeks of class to demonstrate need and to register for accommodation by phone at 619-849-2486 or by e-mail at DRC@pointloma.edu. See Disability Resource Center for additional information. For more details see the PLNU catalog under Academic Accommodations. Students with learning disabilities who may need accommodations should discuss options with the instructor during the first two weeks of class.

Academic Honesty

Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See Academic Policies for definitions of kinds of academic dishonesty and for further policy information.

Final Exam

The final exam date and time is set by the university at the beginning of the semester and may not be changed by the instructor. This schedule can be found on the university website and in the course calendar. No requests for early examinations will be approved. Only in the case that a student is required to take three exams during the same day of finals week, is an instructor authorized to consider changing the exam date and time for that particular student.

Copyright Protected Materials

Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

Credit Hour

In the interest of providing sufficient time to accomplish the stated course learning outcomes, this class meets the PLNU credit hour policy for a 3 unit class delivered over 15 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

MTH333 SP2018

POINT LOMA NAZARENE UNIVERSITY

M	T	W	Th	F
1/8/18	1/9/18	1/10/18	1/11/18	1/12/18
	No Class		1.1-1.3 IVP's and Dir Fields	
1/15/18	1/16/18	1/17/18	1/18/18	1/19/18
MLK Day	1.4 & 2.2 Sep. of Variables		2.3-2.4 Linear and Exact Eqns	
1/22/18	1/23/18	1/24/18	1/25/18	1/26/18
	2.5 Int. Factors		2.6 & 3.2 Transf and Modeling	
1/29/18	1/30/18	1/31/18	2/1/18	2/2/18
	4.1-4.2 Hom. Linear Eqn		4.3-4.4 More 2nd Order Eqns	
2/5/18	2/6/18	2/7/18	2/8/18	2/9/18
	Review		**Exam I**	
2/12/18	2/13/18	2/14/18	2/15/18	2/16/18
	4.5 Superposition Princ.		4.6 & 4.9 More 2nd Order Eqns	
2/19/18	2/20/18	2/21/18	2/22/18	2/23/18
	4.10 Mechanical Vibrations		5.1-5.2 Solving Systems	
2/26/18	2/27/18	2/28/18	3/1/18	3/2/18
	7.2-7.3 Laplace Trans.		7.4-7.5 Inv. Laplace	
3/5/18	3/6/18	3/7/18	3/8/18	3/9/18
Spring Break				
3/12/18	3/13/18	3/14/18	3/15/18	3/16/18
	7.6 Disc. Functions		7.7 & 7.8 Per. Functions	
3/19/18	3/20/18	3/21/18	3/22/18	3/23/18
	7.9 & 7.10 Other Lap. Transf.		Review	
3/26/18	3/27/18	3/28/18	3/29/18	3/30/18
	Exam II		Easter Break	Easter Break
4/2/18	4/3/18	4/4/18	4/5/18	4/6/18
Easter Break	8.1-8.2 Power Series		8.3 Pow. Ser. Solns.	
4/9/18	4/10/18	4/11/18	4/12/18	4/13/18
	8.4 & 8.5 Analytiv Coeff.		8.6 Frobenius Meth.	
4/16/18	4/17/18	4/18/18	4/19/18	4/20/18
	10.1 & 10.2 Partial DE.		10.3 Fourier Ser.	
4/23/18	4/24/18	4/25/18	4/26/18	4/27/18
	10.4 & 10.5 Heat Eqn.		Review	
4/30/18	5/1/18	5/2/18	5/3/18	5/4/18
	FINAL 4:30-7:00 pm			

*Note that all homework is due the class session after in-class activities on the material.