POINT 1902 LOMA
NAZARENE UNIVERSITY

MTH333 Differential Equations (3 units)

TTh 4:00-5:15 LA002

Instructor: Ryan Botts, Ph.D.
Office Hours: Posted on Canvas
Office: Science Trailer 1/RS228 after 2/4/19
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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 parakeets and a goldfish

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 **Thursday May 2, 2018 from 4:30-7 pm.**

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.

Class Enrollment

It is the student's responsibility to maintain his/her class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), the student has the responsibility to follow through (provided the drop date meets the stated calendar deadline established by the university), not the instructor. Simply ceasing to attend this course or failing to follow through to arrange for a change of registration (drop/add) may easily result in a grade of F on the official transcript.

Academic Accommodations

While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center. (DRC@pointloma.edu or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 (a) prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will

thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.

If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

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 Thursday May 2, 2018 from 4:30-7 pm

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.

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

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