Instructor: **Dr. A. Muleshkov**, Associate Professor of Mathematics

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Textbook: ELEMENTARY DIFFERENTIAL EQUATIONS AND BOUNDARY VALUE PROBLEMS, 10th Edition - William E. Boyce & Richard C. DiPrima (Chapters 5, part of 7, 9, 10, 11 and an additional topic, First Order Partial Differential Equations, which is not in the book, are intended to be covered fully or partially.)  
Recommended reading material: PROBLEMS IN DIFFERENTIAL EQUATIONS (Dover Books on Mathematics) - J. L. Brenner (adopted from PROBLEMS IN DIFFERENTIAL EQUATIONS by A. F. Filippov)

Learning Outcomes:

Knowledge of the fundamental notions and important theorems covering differential equations.  
(A) Laplace Transform: Review, use of Laplace Transform for reduction of PDE to ODE.  
(B) Other methods for reducing PDEs to ODEs.  
(C) Autonomous non-linear systems of ODEs; Phase planes and stability theory; Linear Homogeneous PDEs of order 1; linear homogeneous and quasilinear PDEs of order 1.  
(D) Partial Differential Equation and Fourier Series: Fourier Series expansions and Fourier Convergence Theorem; Even/odd/periodic continuations of functions and their Fourier Series expansions; Separation of variables and applications for Heat, Wave, and Laplace PDEs.  
(E) Boundary value problems and Sturm-Liouville theory.

Prerequisite: MATH 427 (min. grade C) or MATH 431 (with the instructor’s permission)

The final grade for the course is obtained from the **total** (max 500) of:  
- homework and/or quizzes - 140 points  
- midsemester test - 130 points  
- final exam (partially comprehensive) - 190 points  
- instructor's discretion - 40 points
There is going to be a recitation/discussion class taught by my graduate student Mr. Tan Nguyen every Friday. During his class, Mr. Tan Nguyen is going to solve problems, answer questions, collect and return homework, and administer quizzes.

There will be a quiz (on the material covered in class during the previous weeks at the end of Friday’s recitation or assigned as take-home) or a test about every other week. No calculators, other electronic devices, notes, or textbooks are allowed to be used during the examinations. The homework for a section is due at the beginning of the recitation class on Friday after the section has been fully covered in class. All work must be shown to receive any credit. A solution that includes only the answer will receive 0 points. On the other hand, the answer always needs to be given.

In this class, the textbook is only a tool rather than a self-study text. Very often, easier and more powerful methods are going to be presented in class. This textbook was chosen by the instructor because of the good choice and order of topics and also because of the quality and relevance of the problems. Further natural continuations of this class are the graduate Ordinary Differential Equations class, as well as the undergraduate and graduate Partial Differential Equations classes. Mastery of integration techniques, especially integration by parts as well as series, especially power series is absolutely necessary for understanding the course from the beginning. Students are encouraged to review these topics and study the distributed handouts extensively from the beginning and to seek the instructor’s and his GA’s assistance if needed. Since Differential Equations (and Complex Analysis) are the first and most important parts of Applied Mathematics, the main goal of this and the other above mentioned classes (at least when I teach them) are going to be analytical, semi-analytical/approximate, and some numerical solutions of differential equations. Issues of existence, uniqueness, stability, convergence, etc. will also be considered, but their formal treatment will be secondary in these classes. Use of Fortran, C++, etc. codes and software packages such as Mathematica, Maple, MATLAB, etc. is encouraged but will not be considered in this and the other above mentioned classes. As it is seen from the previous remarks, this is a very serious and time-consuming class.

Besides coming to class, students need to review past material, work on homework, prepare for quizzes and tests, read the text, and consult the instructor his GA and/or tutors. Accordingly, students should plan to allow sufficient time. Regular attendance, prompt arrival, and taking elaborate class notes are strongly recommended; students who do not maintain these good habits do not usually succeed in this course. Knowledge of a phone number of and keeping in touch with a classmate could be very helpful. Participation in groups, e.g. Dr. Muleshkov’s Students (Facebook group, https://www.facebook.com/groups/700535313307816/) is much better.

Please keep this syllabus for future reference. If you have any questions about the issues raised here or other issues, please come to my office hours.

**Academic Misconduct** – Academic integrity is a legitimate concern for every member of the campus community; all share in upholding the fundamental values of honesty, trust, respect, fairness, responsibility and professionalism. By choosing to join the UNLV community, students accept the expectations of the Student Academic Misconduct Policy and are encouraged when faced with choices to always take the ethical path.
Students enrolling in UNLV assume the obligation to conduct themselves in a manner compatible with UNLV’s function as an educational institution.

An example of academic misconduct is plagiarism. Plagiarism is using the words or ideas of another, from the Internet or any source, without proper citation of the sources. See the Student Academic Misconduct Policy (approved December 9, 2005) located at: http://studentconduct.unlv.edu/misconduct/policy.html.

**Copyright** – The University requires all members of the University Community to familiarize themselves with and to follow copyright and fair use requirements. **You are individually and solely responsible for violations of copyright and fair use laws. The university will neither protect nor defend you nor assume any responsibility for employee or student violations of fair use laws.** Violations of copyright laws could subject you to federal and state civil penalties and criminal liability, as well as disciplinary action under University policies. Additional information can be found at: http://www.unlv.edu/provost/copyright.

**Disability Resource Center (DRC)** – The UNLV Disability Resource Center (SSC-A 143, http://drc.unlv.edu/, 702-895-0866) provides resources for students with disabilities. If you feel that you have a disability, please make an appointment with a Disabilities Specialist at the DRC to discuss what options may be available to you. If you are registered with the UNLV Disability Resource Center, bring your Academic Accommodation Plan from the DRC to the instructor during office hours so that you may work together to develop strategies for implementing the accommodations to meet both your needs and the requirements of the course. Any information you provide is private and will be treated as such. To maintain the confidentiality of your request, please do not approach the instructor in front of others to discuss your accommodation needs.

**Religious Holidays Policy** – Any student missing class quizzes, examinations, or any other class or lab work because of observance of religious holidays shall be given an opportunity during that semester to make up missed work. The make-up will apply to the religious holiday absence only. It shall be the responsibility of the student to notify the instructor no later than the end of the first two weeks of classes, January 29, 2016, of his or her intention to participate in religious holidays which do not fall on state holidays or periods of class recess. For additional information, please visit: http://catalog.unlv.edu/content.php?catoid=6&navoid=531.

**Incomplete Grades** - The grade of I – Incomplete – can be granted when a student has satisfactorily completed three-fourths of course work for that semester/session but for reason(s) beyond the student’s control, and acceptable to the instructor, cannot complete the last part of the course, and the instructor believes that the student can finish the course without repeating it. The incomplete work must be made up before the end of the following regular semester for undergraduate courses. Graduate students receiving “I” grades in 500-, 600-, or 700-level courses have up to one calendar year to complete the work, at the discretion of the instructor. If course requirements are not completed within the time indicated, a grade of F will be recorded and the GPA will be adjusted accordingly. Students who are fulfilling an Incomplete do not register for the course but make individual arrangements with the instructor who assigned the I grade.
**Tutoring** – The Academic Success Center (ASC) provides tutoring and academic assistance for all UNLV students taking UNLV courses. Students are encouraged to stop by the ASC to learn more about subjects offered, tutoring times and other academic resources. The ASC is located across from the Student Services Complex (SSC). Students may learn more about tutoring services by calling 702-895-3177 or visiting the tutoring web site at: [http://academicsuccess.unlv.edu/tutoring/](http://academicsuccess.unlv.edu/tutoring/).

**UNLV Writing Center** – One-on-one or small group assistance with writing is available free of charge to UNLV students at the Writing Center, located in CDC-3-301. Although walk-in consultations are sometimes available, students with appointments will receive priority assistance. Appointments may be made in person or by calling 702-895-3908. The student’s Rebel ID Card, a copy of the assignment (if possible), and two copies of any writing to be reviewed are requested for the consultation. More information can be found at: [http://writingcenter.unlv.edu/](http://writingcenter.unlv.edu/)

**Rebelmail** – By policy, faculty and staff should e-mail students’ Rebelmail accounts only. Rebelmail is UNLV’s official e-mail system for students. It is one of the primary ways students receive official university communication such as information about deadlines, major campus events, and announcements. All UNLV students receive a Rebelmail account after they have been admitted to the university. Students’ e-mail prefixes are listed on class rosters. The suffix is always @unlv.nevada.edu. **Emailing within WebCampus is acceptable.**

**Final Examinations** – The University requires that final exams given at the end of a course occur at the time and on the day specified in the final exam schedule. See the schedule at: [http://www.unlv.edu/registrar/calendars](http://www.unlv.edu/registrar/calendars).