

# Syllabus for MATH 4163, Intro to Partial Differential Equations, Sec. 001

## Spring 2018

**Lectures:** Tue & Thu 1:30-2:45 p.m. in 116 PHSC

**Class web page:** [http://www2.math.ou.edu/~npetrov/math4163\\_s18.html](http://www2.math.ou.edu/~npetrov/math4163_s18.html)

**Instructor:** Prof. Nikola Petrov, [npetrov@ou.edu](mailto:npetrov@ou.edu), 1101 PHSC, office phone 325-2748

**Office Hours:** Mon 12:30-1:30 p.m., Wed 11:00 a.m. – 12:00 p.m., or by appointment, in 1101 PHSC

**Description from the Course Schedule:** Prerequisite: 2443, 3113 or 3413. Physical models, classification of equations, Fourier series and boundary value problems, integral transforms, the method of characteristics. (F, Sp, Su)

### Main textbook:

DAVID BLEECKER, GEORGE CSORDAS, *Basic Partial Differential Equations*, Intern. Press, Boston, 1997

### Additional resources:

1. STANLEY J. FARLOW, *Partial Differential Equations for Scientists and Engineers*, John Wiley & Sons, 1982; reprinted by Dover in 1993 (a very cheap and readable book)
2. J. DAVID LOGAN, *Applied Partial Differential Equations*, 3rd edition, Springer, 2015 (pdf feely available for OU students from the OU library; OU students can buy a cheap paper copy through the library)
3. PETER J. OLVER, *Introduction to Partial Differential Equations*, Springer, 2014 (pdf feely available for OU students from the OU library; OU students can buy a cheap paper copy through the library)
4. A. C. KING, J. BILLINGHAM, S. R. OTTO, *Differential Equations: Linear, Nonlinear, Ordinary, Partial*, Cambridge University Press, 2003 (pdf feely available for OU students from the OU library)

**Grading:** Your grade will be based on the following:

Homework	20 %
Two midterm exams	25 % each
Final exam	30 %

Course grades will be assigned by calculating the total for each student in the class, listing the totals in rank order, and assigning grades according to a reasonable total needed for each letter. After each in-class examination, I will announce tentative grades, so by the middle of the course you will have a good idea of where you stand, and what is required for a given grade.

### Tentative exam dates:

Midterm Exam 1	Thursday, March 1, in class
Midterm Exam 2	Thursday, April 19, in class
Cumulative Final Exam	Tuesday, May 8, 1:30-3:30 p.m.

No books, notes, or electronic devices of any kind may be used during exams. Do not make travel plans that prevent you from taking any of the tests or the final exam at the scheduled time. If you have a legitimate reason for missing an exam that can be documented independently of your testimony (e.g., via a note or phone call from a doctor or a parent), you must contact me prior to the exam, in order to make an alternative arrangement. I am very fastidious about such matters, so don't expect such arrangements unless you have a compelling excuse that meets the above conditions (especially the "prior notice" part).

**Attendance:** You are expected to attend all lectures, and you are responsible for all information given out during them. You are expected to arrive on time for the lectures, properly prepared and in good physical condition – in particular, adequately rested and up to date on the course material – so that you can maintain full concentration for the entire lecture.

All electronic equipment should be turned off before the start of every lecture, and should remain off until the class is dismissed. Since learning calculus requires your full attention, activities such as *conversing with other students, eating, sleeping, reading a newspaper, listening to headsets, using computers, cell phones, or other electronic devices, are not allowed!*

**Homework:** The homework assignments will be given on the class web site. Your homework solutions must be turned in at the beginning of class on the due date. Giving just an answer to a problem is not worthy any credit – you have to write a complete solution which gives your step-by-step reasoning and is written in grammatically correct English. Although good exposition takes time and effort, writing your thoughts carefully will greatly increase your understanding and retention of the material. Your lowest homework grade will be dropped.

*The problems in your homework should be in the order listed in the assignment, and the sheets should be stapled. No late homework will be accepted!*

You are encouraged to discuss the homework problems with other students, but you should write up the solutions in your own words. Copying solutions from a solutions manual, from someone else's work, or from the Internet is a complete waste of time, as you will not learn the material adequately, and you will pay a heavy price on the exams which constitute 80% of your course grade.

It is absolutely essential to solve problems on a regular basis. After each class, start on the problems for the topic discussed. It is much more efficient to work a few problems at a time in many sessions, rather than all at once, as this will allow your mind to assimilate the ideas better. Please read your notes from the lectures and the textbook, paying special attention to the solved examples.

#### **Some important dates:**

- (1) First day of classes: Tuesday, January 16, 2018.
- (2) Last day to withdraw with an automatic  $W$ : Friday, March 30, 2018 for undergraduate students and Friday, February 23, 2018 for graduate students.
- (3) Petition to the Dean to drop courses (with a grade of  $W$  or  $F$ ): Monday, April 2 – Friday, May 4.
- (4) Spring break (no classes): March 17–25, 2018.
- (5) Last day of classes: Friday, May 4, 2018.

**Policy on  $W/I$  grades:** Through the end of the sixth week of the semester, students can withdraw from the course with an automatic  $W$ . Between the seventh and tenth weeks of the semester, undergraduate students can continue to withdraw with an automatic  $W$ , but graduate students must obtain the instructor's signature on the University's "drop form" to withdraw from the course, and along with the signature the instructor must indicate whether the student is passing or failing at the time of the withdrawal. After the tenth week of the semester, all students can only withdraw via petition to the Dean of their college. The petition process also requires the instructor's signature with a passing-failing indication at the time the petition is filed. Note that a "failing" indication on the petition means that even if the petition is approved the grade in the course will be weighted in the GPA as an  $F$ .

The grade of  $I$  is not intended to serve as a benign substitute for the grade of  $F$ , and is only given if a student has completed the majority of the work in the course at a passing level (for example everything except the final exam), the course work cannot be completed because of compelling and verifiable problem beyond the student's control, and the student expresses a clear intention of making up the missed work as soon as possible. Moreover, current OU policies require that instructors and the affected students execute a written "Incomplete Contract" before a grade of  $I$  can be given. The contract makes clear: (1) what work

is to be made up; (2) when the make-up work must be completed (which cannot be more than one calendar year from the assignment of the *I*); and (3) *what alternative grade will be assigned if the make-up work is not completed*. If the make-up work specified in the contract is not made up within one calendar year, then the alternative grade specified in the contract will be entered on the student's transcript. Thus the *I* grade does not become permanent on the transcript if it is not made up within one year.

**Academic Misconduct:** All cases of suspected academic misconduct will be reported to the Office of Academic Integrity Programs as possible violations of University's Academic Integrity Code. If the violation is confirmed by the Academic Integrity Program's Office, the penalties can be quite severe, so the best advice is **Don't do it!** For more details on the University's policies concerning academic misconduct consult the link

<http://integrity.ou.edu/students.html>

This link also has information about admonitions (essentially warnings about potential misconduct for fairly minor infractions) and your rights to appeal charges of academic misconduct.

Students are also bound by the provisions of the *OU Student Code*, available at

<https://www.ou.edu/content/dam/studentlife/documents/AllCampusStudentCode.pdf>

**Students with disabilities:** The University of Oklahoma is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with the instructor as early in the semester as possible. Students with disabilities must be registered with the Office of Disability Services prior to receiving accommodations in this course. The Office of Disability Services is located in Goddard Health Center, Suite 166: phone 405-325-3852 or TDD (only) 405-325-4173.

Caminante, son tus huellas  
el camino y nada más;  
caminante, no hay camino,  
se hace camino al andar.  
Al andar se hace camino,  
y al volver la vista atrás  
se ve la senda que nunca  
se ha de volver a pisar.  
Caminante, no hay camino,  
sino estellas sobre la mar.

Traveler, your footsteps  
are the road and nothing more;  
traveler, there is no road,  
the road is made by walking.  
By walking the road is made  
and when we turn to look back  
we see the path that  
will never be traveled again.  
Traveler, there is no road,  
only tracks of foam on the sea.

From *Proverbios y Cantares*, Antonio Machado (1875–1939)