# Information Sheet for Math 430 Fall 2020

**Class meets:** MTRF 2:00 - 2:50 pm (please look for the Zoom link in your class Canvas page)

**Instructor:** Branko Ćurgus **Office Hours:** BH 178 MTRF **Email:** curgus@wwu.edu

**Course website:** http://faculty.wwu.edu/curgus/Courses/430_201240/430.html

**Text:** *(Elementary) Applied Partial Differential Equations With Fourier Series and Boundary Value Problems* (3rd or 4th or 5th Edition) by Richard Haberman

**Material covered.** We plan to cover a selection of topics from Chapters 1, 2, 3, 4, 5, 7, 8, 12 of the textbook.

**Student Learning Outcomes:** The successful student will demonstrate: (1) a geometric understanding of the method of characteristics, how to use it to solve quasi-linear first order PDEs and how to apply it to the one-dimensional wave equation to derive d'Alembert's formula; (2) a knowledge of the physical laws and mathematical facts used in derivation of the diffusion, heat and wave equation and an ability to use those laws and facts to derive those equations; (3) an understanding of the physical meaning and the role of boundary conditions for PDE, in particular Dirichlet, Neumann and mixed boundary conditions; (4) an ability to solve the wave, heat and Laplace equations in the one-dimensional setting via separation of variables for a variety of boundary conditions; (5) an ability to expand a (piece-wise smooth) function in its Fourier (sine, cosine, full, complex) series on a finite interval; (6) an understanding of the statements of convergence of Fourier series including when such series can be differentiated or integrated term by term to yield a convergent series; (7) an ability to use differentiation to apply the method of eigenfunction expansion to solve the heat and wave equations; (8) an ability to apply the method of separation of variables to the wave, heat and Laplace equations in higher dimensional settings, for example on a rectangle or a disk in the plane (in particular, an ability to derive these equations in polar coordinate system);

**Homework.** Your daily homework should consist of studying the material covered in class. Sometimes my presentation in class will differ significantly from the presentation in the textbook. Study both: your class notes and the book. Analyze the similarities and the differences. This will help you to internalize the concepts and the methods that are being studied. Exercises in the book are there to enhance and challenge the learning process. Almost every day I will post something on the website. In particular, I will post the pdf file of the notes that I create during an online class.

**Assignments:** There will be two assignments during the class and the final assignment. The assignments during the class will be due one week after they have been posted. I will post the final assignment before Thanksgiving Holiday and it will be due on the day of the final exam Thursday, December 10, 2020. You will be expected to make a good scan of your work and submit it to me as a single legible pdf file. More details of the submission will be posted later.

**Grading:** Each assignment will be graded by an integer between 0 and 100. Your final grade will be determined using the following formula

$$\texttt{FG} = \max\Big\{\big\lceil(\texttt{A1}+\texttt{A2}+\texttt{A3})/3\big\rceil, \big\lceil(\texttt{A1}+\texttt{A2}+2*\texttt{A3})/4\big\rceil\Big\},$$

where A1, A2, A3 are the grades for the assignments. Notice that the above formula is designed to reward impovement during the class. Your letter grade will be assigned according to the following table.

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| F : 0 - 39 | D−: 40 - 44 | D : 45 - 49 | D+: 50 - 54 | C−: 55 - 59 | C : 60 - 64 |
| C+: 65 - 69 | B−: 70 - 74 | B : 75 - 79 | B+: 80 - 84 | A−: 85 - 89 | A : 90 - 100 |

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**How to succeed:** Attend online classes regularly and do all the suggested homework problems. Read the book before online classes and ask questions if there is anything that is not clear. Keep organized notes of all your work. Make sure that you *fully understand* how to do each assigned problem. Do not hesitate to ask a question whenever something does not make sense.

**Diversity, Equity, Inclusion:** Welcome to my class. I would love to have a face-to-face class with you, but until that is possible, we will make the best out of this mode of learning. We can make it better than a regular class since we can meet outside of class more often. I promise to keep my mind open for the mathematical experiences that you bring to this class. I want to help each of you use those personal experiences in creative ways to build your own understanding of the material studied in this class. I will bring diverse approaches to most concepts. I do understand that each one of you comes to this class with a diverse background. If you are not happy with your background understanding of a particular topic that is expected as a prerequisite for this class, please let me know. We can meet outside of class and discuss that topic, or I can find some study material for you, or I can create some study material, especially for you. The goal is to create an environment where each one of you can succeed in this class and be proud of one's individual achievement.

**Remarks.** This is a fast-paced course. It is essential that you keep up with the material presented every day. Do the exercises at that I will assign on the class web-page. Look for help if you encounter difficulties.

**Flexibility Statement:** This syllabus is subject to change. Changes, if any, will be announced in class or online. Students will be held responsible for all changes.

**Sylabii@WWU:** Please go to `https://syllabi.wwu.edu/` where you will find Syllabi Policies for Students and Campus Resources for Students