SCUPI - Math0290 Differential Equations sections 1 & 2
Fall Semester, 2020

INSTRUCTOR: Zheng Yang **OFFICE:** Room 3-324A **EMAIL:** zhengyang2018@scu.edu.cn
OFFICE HOURS: Monday through Friday: 2:00pm – 5:00pm at Room 3-324A, or by appointment. Weekends by appointment.
TA QQ group (section 1): Clancy Fan (2017141521014@stu.scu.edu.cn) QQ: 897087391
TA QQ group (section 2): Christopher King (windbirdman@stu.scu.edu.cn) QQ: 1135643302
TA Recitation Hours: TBA
CREDITS: 3 credit hours

LECTURES: **Section 1**-Wednesday 1:50pm-2:35pm, 2:45pm-3:30pm, 3:40pm-4:25pm, Room 3-106
Section 2-Friday 8:15am-9:00am, 9:10am-9:55am, 10:15am-11:00am, Room 3-106

TEXTBOOK: Polking, Boggess and Arnold, *Differential Equations with Boundary Value Problems*, second edition, Pearson Prentice-Hall
Reference: Dennis G. Zill and Michael R. Cullen, *Differential Equations with Boundary Value Problems*, seven edition

DESCRIPTION: Differential equations are an important branch of mathematics. They have a rich mathematical formalization, as well as a very successful history of being applied to important problems in physics, chemistry, engineering, and biology. This course will introduce primarily linear, first and second order of ordinary differential equations. Solution techniques for separable equations, homogeneous and inhomogeneous equations, as well as an intuition for modeling-based applications will be presented. The application of Laplace transforms will be introduced. Fourier series and their application to simple partial differential equations will be treated. Roughly, we will cover systematically most of Chapters 2, 4, 5, 12 and 13. Materials in Chapters 3 and 9 will be assigned as readings and sometimes are also embedded in the lectures. Some materials of Chapters 6 through 11 could be used for the projects as well.

General Student Learning Outcomes: In this course, you will be expected to:
- Explore and learn the core concepts associated with the main topics.
- Develop effective written and oral communication skills.
- Begin to think abstractly about certain key notions.
- Understand how these ideas can be used to solve problems and compute things.
- Identify key concepts in the arts, sciences and humanities to provide a broad perspective.

Course Student Learning Outcomes: The course is designed to provide a basic foundation and overview of differential equations. At the conclusion of the course, the student will be able to, for example:
- Exposed to analytical methods for solving first-order ordinary differential equations.
- Solve linear second-order ordinary differential equations with nonhomogeneous terms.
- Use the concept of mathematical modeling of simple physical, chemical and biological phenomena.
- Choose the right technique that most likely to solve the differential equations.
- Use Laplace transforms and series methods to solve the differential equations.

GRADE: The final grade will be based on the **score** which is a number between 0 and 100 determined by

Homework: 15% Quiz: 20% Projects: 10%
2 Exams: 30% (15% each) Final Exam: 25%

A: 90 – 100	A−: 85 – 90	B+: 80 – 84	B: 76 – 80	B−: 73 – 76	
C+: 70 – 73	C: 66 – 70	C−: 63 – 66	D+: 61 – 62	D: 60	F: < 60

ASSIGNMENTS: Homework assignments and their due dates will be given in the lectures. Homework must be ***written in a neat form***. **NO LATE homework** (no matter what excuses you may have) will be accepted. Using computer software (such as MATLAB) to do some of your homework is fine, but you should always explain your steps in sufficient details. Please talk with me if you are not clear about anything.

QUIZ: There will be many short quizzes given in classes and recitations. I may or may not drop your lowest quiz score.

PROJECTS: Generally, you will work as a group of 4 or 5, and the project will require an oral presentation (10 to 15 minutes, with 5 minutes for Q&A) with PPT slides show. The project should focus on applications of differential equations. You are strongly encouraged to find one connected with your current major studies. Please refer to the *project instructions* for more details. The due dates of the project will be forthcoming.

EXAMS: There are two major tests and a final exam. Each major test will emphasize material since the previous exam, but may include anything covered previously. The final exam will be comprehensive. In general, there is **NO Make up for all exams**.

ATTENDANCE: You are expected to attend all the classes and recitations when quizzes are given. I will check the attendance but will not be used toward your grade. A student who misses a class is responsible for finding out what was covered in the class and very likely misses quizzes.

ACADEMIC MISCONDUCT: All students in attendance at the Sichuan University are expected to be honorable and to observe standards of conduct appropriate to a community of scholars. The University expects from its students a higher standard of conduct than the minimum required to avoid discipline. Academic misconduct includes all acts of dishonesty in any academically related matter and any knowing or intentional help or attempt to help, or conspiracy to help, another student. These include, but are not limited to, cheating, plagiarism, fabrication of information, misrepresentation, and abetting any of the above. The Academic Misconduct Disciplinary Policy will be followed in the event that academic misconduct occurs. Students should refer to the Student Handbook.

NON-ACADEMIC MISCONDUCT: All cell phones and other electronic devices are to be turned off and out of sight while you are in the classroom. All newspapers and other materials not related to the class are to be put away once class begins. Operating these devices and reading unrelated materials while in class is disrespectful of your instructor and fellow classmates. If you fail to abide by this rule, the instructor has the right to confiscate the device or materials. If you have an emergency and need to have your phone turned on during class, ask your instructor for permission.

Tentative Progress		
WK	**Topic Sections**	**Week of**
1	2.1 - 2.2	9/9, 9/11
2	2.4 , 2.6	9/16, 9/18
3	2.7 - 2.9	9/23, 9/25
4	Review	
5	4.1 - 4.3	
6	4.5 - 4.6	
7	5.1 – 5.3	
8	5.4 – 5.5	
	Exam 1	
9	5.6 – 5.7	
10	Linear systems I	
11	Linear systems II Project assigned	
12	Fourier series I	
13	Fourier series II	
14	PDE	

	Exam 2	
15	Presentations	
16	Presentations	
	Final Exam	

Project dates and assignments

Dates	**Assignments**
May 26, Sunday	***Project abstract*** (title, group members, short descriptions) submit on Blackboard
June 1 - 9	***PPT slides discussion (15-20 minutes)*** sign up a time with TA on QQ
June 9, Sunday	***PPT slides*** submit on Blackboard
June 16, Sunday	***Written report*** submit on Blackboard
Section 1 - June 11, 18 **Section 2** – June 13, 20	***Oral Presentations*** in class **Peer reviews** in class, **TA and instructor reviews**

Suggested Format of Homework:

1. **First line (bold) must be the assignment number and due date**
2. **Second line (bold) must be your class section, your name (in English and Chinese) and student ID number**
3. **You must state clearly every homework question.**

Differential Equations **Homework #1**
9/9/2020
Section: 1 (2018 ME/MSE/IE) **Name: David Hilbert**（希尔伯特）
ID#201831012345

1. Find the general solution of …