

UNIVERSITY OF ALABAMA AT BIRMINGHAM

COURSE SYLLABUS FOR MA 461-1B

Spring 2021

Instructor: Professor Yanni Zeng

Contact information:

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Preferred Methods of Contact

Email is the preferred method of contact if you have questions. Please expect a response within 24 hours on weekdays; Emails received on Friday will be returned by Monday. Include MA 461-1B in the subject line of your email for a faster response. I am available to meet with you virtually via Zoom by appointment during my virtual office hours (see below for my scheduled virtual office hours); the details concerning Zoom will be conveyed to you by email after you contact me.

Virtual Office Hours

Monday, Wednesday 2:30–3:30 PM (or by appointment)

Instructional Method

Remote: The class will meet online using Zoom. This course is delivered via the Canvas Learning Management System, where you will interact with your classmates and your instructor. You can access the course through canvas; the Zoom ID is 938 4899 5466 and the password is 3e102f. You should be available on the days and hours listed in the Class Schedule, and attendance on zoom is required.

Teaching Time Zone

Central Time U.S.

UAB Policies and Resources:

Add/Drop and Course Withdrawal

- Drop/Add: Deadlines for adding, dropping, or withdrawing from a course and for paying tuition are published in the Academic Calendar available online. Review the Institutional Refund Policy for information on refunds for dropped courses.

- **Withdrawal:** To avoid academic penalty, a student must withdraw from a course by the withdrawal deadline shown in the academic calendar and receive a grade of W (withdrawn). Failure to attend class does not constitute a formal drop or withdrawal.

UAB United: Safe Entry to Campus

Please go to the UAB United website for guidance and resources related to our safe entry to campus in Fall 2020, including information on:

- Testing
- Academic resources and in-depth information
- Student Affairs resources to support all students (housing, dining, extracurricular activities, parking, etc.)
- Health and safety resources and recommendations for on and off-campus
- Information for graduate students, School of Medicine students, Post-Docs and International Students

All students should use the Student COVID-19 Entry Checklist to see what they have to do in order to enter the campus safely. Non-compliance with the required items will result in students not being able to remain on campus or participate in any in-person classes, meetings, jobs, extracurricular activities, and events.

Misconduct

- Academic Honor Code
<https://www.uab.edu/students/one-stop/policies/academic-honor-code>
- Non-Academic Student Code of Conduct
<https://www.uab.edu/students/conduct/>

DSS Accessibility Statement

Accessible Learning: UAB is committed to providing an accessible learning experience for all students. If you are a student with a disability that qualifies under Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act, and you require accommodations, please contact Disability Support Services for information on accommodations, registration and procedures. Requests for reasonable accommodations involve an interactive process and consist of a collaborative effort among the student, DSS, faculty and staff. If you are registered with Disability Support Services, please contact DSS to discuss accommodations that may be necessary in this course. If you have a disability but have not contacted Disability Support Services, please call (205) 934-4205, visit their website or their office located in Hill Student Center Suite 409. You can also contact them by email at dss@uab.edu,

COVID-19 Adjustments for Students: This course is completely remote. The following policy on adjustments is for your information.

UAB Disability Support Services (DSS) has established a process for UAB students to request temporary adjustments based on the impact of COVID-19. The process is similar to the traditional DSS registration procedures for accommodations based on disability. However, these requests will be referred to as "COVID-19 Related Temporary Adjustments". On the DSS website, there is a section (next to the traditional DSS application process) titled "Request COVID-19 Temporary Adjustments" where students can read the process and click to complete an application.

On the application, the student must complete an attestation and identify which of the following category(s) applies to their situation. Students will be allowed to submit documentation to support their requests.

- I am 65 or older
- My medical provider has determined that I am an individual who is considered high risk according to Centers for Disease Control and Prevention
- I care for or reside with an individual who has been determined to be high risk according to Centers for Disease Control and Prevention
- I have tested positive for COVID-19
- I am requesting adjustments for another reason

Any questions regarding this process should be referred directly to dss@uab.edu. For qualifying students, DSS staff will create a Notification of Temporary Adjustment Letter (PDF format) which will be provided to students. Students will share this letter, as needed, with instructors to request adjustments.

Title IX Statement

The University of Alabama at Birmingham is committed to providing an environment that is free from sexual misconduct, which includes gender-based assault, harassment, exploitation, dating and domestic violence, stalking, as well as discrimination based on sex, sexual orientation, gender identity, and gender expression. If you have experienced any of the aforementioned conduct we encourage you to report the incident. UAB provides several avenues for reporting. For more information about Title IX, policy, reporting, protections, resources and supports, please visit UAB Title IX webpage for UAB's Title IX, UAB's Equal Opportunity, Anti-Harassment, Duty to Report, and Non-Retaliation policies.

Mandatory Masks and Social Distancing Requirements

In accordance with CDC guidelines and for the health and wellbeing of all faculty, staff and students. Students, faculty and staff are required to wear cloth face coverings or face masks at all times and maintain social distancing (6 feet between individuals in traditional classrooms, or, in instructional laboratories and similar settings) while on the UAB campus. Instructors have the right to ask those who are not complying with these requirements to leave class in the interest of everyone's health and safety. In the event that a student refuses to comply with these requirements, the instructor has the right to cancel class.

Additionally, following other simple practices will promote good health in and out of the classroom, such as frequent and thorough hand washing, wiping down desks and seats with

disinfectant wipes whenever possible, not sharing personal items such as pens and cell phones, and avoiding crowded areas and other enclosed spaces.

The UAB Blazer community views the adoption of these mandatory guidelines as a mark of good citizenship and respectful care of fellow classmates, faculty, and staff. Please visit the UAB United website for further information.

Food may not be consumed during class times in classrooms, but bottled water is permissible.

GuideSafe Event Passport Class Requirement

Faculty are required to verify all students who are present for in-person instruction have a current Event Passport.

The COVID-19 pandemic is an extraordinary situation requiring significant measures to create a safe educational community. UAB is using GuideSafeTM Event Passport to facilitate access to classrooms, meetings, events, or facilities having ten or more people. Attendees, including faculty, staff, and students, will complete UAB Healthcheck, a COVID-19 assessment tool, prior to entering their event. An Event Passport is issued based factors from your daily risk level as assigned by the UAB Healthcheck. After you have completed Healthcheck, press the “Passport” button to get your passport. This passport is good for 24 hours. Remember your passport number to access your passport later in the day. Each user is assigned a unique passport number indicating their status for the upcoming event that will show a “Clear” (Green) screen or “Not Clear” (Red) screen. After the 24-hour passport has expired, you will need to complete Healthcheck again. Each passport will have a time and date to ensure validity. Learn more at UAB GuideSafe Event Passport.

Course Information

Course number and title: Modeling With PDE, MA 461-1B; 35439, Spring 2021

Meeting times: MWF, 9:05–9:55 AM

Zoom ID: 938 4899 5466; password: 3e102f

Prerequisite: Grade of C or better in MA 252 or equivalent.

Credits: 3 semester hours

Textbook: Lecture notes and assignments are posted on Canvas.

Zoom office hours: By appointment

Important dates

First day of classes: January 19, 2021

Last day to drop without paying full tuition: January 26, 2021

Last day for fullterm withdrawal and 75% refund: February 1, 2021

Last day for fullterm withdrawal and 50% refund: February 15, 2021

Welness Day: March 16, 2021

Welness Day: April 14, 2021

Last Day to Withdraw with a “W”: April 23, 2021

Last day to elect Pass/Fail grading method: April 23, 2021

Last day of class: April 23, 2021

Grading Policies

- **Course Grade:**

| | |
|---|------|
| weekly quizzes | 25 % |
| (approximately weekly) written assignments/projects | 75 % |

- The two lowest quiz grades will be dropped to account for any missed quizzes due to illness or any other circumstance.
- Overdue assignments turned in before the last day of class receive half credits. No overdue assignments will be accepted after the last day of class.
- Your final grade is determined according to the following table:

| | | | | | |
|---------------------|--------|-------|-------|-------|----------|
| Course performance: | 88-100 | 75-87 | 62-74 | 50-61 | below 50 |
| Final Grade: | A | B | C | D | F |

Syllabus:

- Flocking: the Cucker-Smale model, flocking theorems, a flock of two birds, language evolution
- Synchronization: Peskin's model for pacemaker cells (integrate-and-fire dynamics), the synchrony of two cells, Peskin's conjectures, the Kuramoto model, phase-locked states
- Guitar/Violin Strings – Waves: equation, initial and boundary conditions
- Vibrating Membranes – The 2-D Wave Equation: a wave animation, musical and non-musical sounds
- Heat Flow: heat flow problem, the heat equation, initial and boundary conditions, steady state temperature distributions
- Diffusion: diffusion equation, population dynamics, space structured population dynamics, invasion fronts
- Introduction of Nonlinear Theory: weak solutions and elementary waves
- Traffic Flows: fundamental diagram of traffic flow, green light effect – rarefaction waves, red light effect – shock waves

Software We use MATLAB and COMSOL installed in Math Computational Lab, with access via internet. Please see instructions in the file *using VMware Horizon Web Access*.