Syllabus
MATH 355-03: Introduction to Differential Equations with Applications | Spring 2022

CLASS INFORMATION:
Course Number: Math 355 section 03
Class Meeting Time: MWF 9:25 -10:35 am
Class Meeting Location: RVAC 108

INSTRUCTOR INFORMATION:
Name: Dr. Viktoria Savatorova
Office Location: Marcus White 118
Office Phone: 860-832-3679
Email: viktoria.savatorova@ccsu.edu (include your name and Math 355 in the subject line)
Office Hours: MW: 12:10-1:10 pm, F: 4:15-5:30 pm or by appointment

COURSE DESCRIPTION: qualitative, analytical, and numerical methods for first and second order ordinary differential equations and first order linear systems. Laplace transforms and the application to differential equations. Introduction to numerical methods used to analyze and solve differential equations. Additional topics if time permits.

PREREQUISITES for the COURSE: MATH 221 and either MATH 226 or MATH 228 (C- or higher)
COREQUISITE: MATH 226 or MATH 228 can be taken concurrently.

CREDITS: 4

COURSE MATERIALS:

Notes: I may not necessarily teach from the book. Lecture notes will be posted on the Blackboard.

Blackboard: This course uses the Blackboard online system to provide you with course materials including the syllabus, tentative class schedule, class announcements, studying guides, etc. You may also use Blackboard to submit some of the Tests and Quizzes. Your grades will also be posted there.

Calculators and software: The class will be hold in a computer lab and from time to time will use MATLAB as a software (you may also use Mathematica if you want). In case of no previous coding experience, do not worry: we will be doing some basic coding, and templates will be provided to you to modify.

If you will want to use a calculator, choose one of the following: TI-83, TI-83+, TI-84, TI-84+, TI-86. Tests and quizzes may have “do this problem by hand” questions with no calculators or any software allowed.

TOPICAL OUTLINE: I will not necessarily teach from the book. However, the material we will cover can be found in Chapters 1, 2, 3, 4, 6 of the book.

LEARNING OUTCOMES: after completion this course students will be able to
- Solve first and second order ordinary differential equations using qualitative, analytical and some numerical methods;
- Solve first order linear systems of differential equations using qualitative and analytical methods;
- Use Laplace transforms to solve the second order initial value problems;
- Use ordinary differential equations to model mechanical and electrical vibrations
EVALUATION AND GRADE ASSIGNMENT:

<table>
<thead>
<tr>
<th>Weight</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Written assignments (W)</td>
</tr>
<tr>
<td>10%</td>
<td>Quizzes (Q)</td>
</tr>
<tr>
<td>19%</td>
<td>1st Mid Term Exam (T1)</td>
</tr>
<tr>
<td>19%</td>
<td>2nd Mid Term Exam (T2)</td>
</tr>
<tr>
<td>19%</td>
<td>3rd Mid Term Exam (T3)</td>
</tr>
<tr>
<td>23%</td>
<td>Cumulative Final Exam (F)</td>
</tr>
</tbody>
</table>

HOW TO CALCULATE YOUR SCORE FOR THE COURSE:

\[ \text{TOTAL} = 0.19 \times T1 + 0.19 \times T2 + 0.19 \times T3 + 0.10 \times W + 0.10 \times Q + 0.23 \times F \]

Letter grades will be assigned according to the following scale:

A 93-100, A- 90-92.9, B+ 87-89.9, B 83-86.9, B- 80-82.9, C+ 77-79.9, C 73-76.9, C- 70-72.9, D+ 67-69.9, D 63-66.9, D- 60-62.9, F below 60.

COURSE SCHEDULE: The (tentative) weekly schedule is posted on the Blackboard

CLASS POLICIES:

ATTENDANCE: Attendance of our class meetings is an important component of all on-campus classes, and it will be taken regularly. It may not count directly in the computation of your grade. However, it may count via quizzes and other assignments, given during lectures and/or discussions. You are encouraged to (1) study before the meeting, (2) bring your questions about the course material and about the homework to the meeting. Do not be afraid to speak in class. Participation will be appreciated even if your idea is not the greatest or your answers are not always correct. Making mistakes is a part of the learning process.

MAKE-UP POLICY: If you miss a class meeting for any reason, you are responsible for all the topics and announcements made in your absence. Make up work will not be accepted and will result in a recorded grade of zero. Missing an examination is a very serious matter. If you know in advance that you will have to miss an examination, you MUST inform your instructor before the examination. In that case, you will normally be offered an alternate time for the examination. If you miss an examination because of an emergency, you need to contact your instructor by the e-mail within 24 hours of the beginning of the examination. Do not wait until the next class meeting to contact your instructor!

HOMEWORK:

Written homework is assigned for almost all the topics covered in class. This assignment consists of selected problems posted on the Blackboard (see the Homework folder in the Course content). The written homework will not be collected or graded. Nevertheless, I suggest you solve these problems during the semester regularly and especially for mastery of the material before exams and quizzes. If you will have questions on homework, please bring them to the class meetings. You are also encouraged to post your questions on the discussion board on the Blackboard to get help from your classmates or from me. Solutions for selected homework questions will be posted on the Blackboard.

QUIZZES will be given on weeks without an exam. They will cover the material from recent homework assignments. The majority of quizzes will be given during the class time, some of them may be “take home” (it will be announced).

WRITTEN ASSIGNMENTS will consist of 5-6 questions, have an emphasis on applications of differential equations and be assigned to solve outside of the class. Using software (MATLAB) will be required. In case of no previous experience with the software, do not worry. We will use very basic coding, and templates will be provided for you to modify and use. You will be warned in advance about the due date for any assignment. Usually you will be given a week to complete and submit an assignment.
TESTING:

**TEST 1:** Wednesday, February 23  
**TEST 2:** Friday, April 01  
**TEST 3:** Wednesday, April 27  
**Final EXAM:** Monday May 9 (8:00 - 10:00 am)

On exam day, please arrive on time, and minimize the amount of clutter you bring into the classroom. Leave all electronic devices in your home or automobile; if it is necessary to carry them for emergency purposes, they should be turned OFF before the assessment begins. If you create a disturbance with an electronic item (even in vibrate mode) you may receive a zero on that assessment. **You may NOT use notes, formula cards, or textbooks.** Exams may have parts with no calculators allowed.

RESOURCES AVAILABLE:

1. If you need help, take advantage of your instructor’s office hours. Do not wait until just before the first test to do so!
2. Form a study group with other students in your class. Explaining solutions to homework problems to each other is a good way to learn.

GUIDELINES FOR COURTESY AND RESPECT:

I would like to welcome all students into an environment that creates a sense of community pride, courtesy, and respect; we are here to work cooperatively and to learn together. To create a smooth and harmonious learning community, please make every attempt to **come to all the class sessions, to come to class on time, and to stay until the end of the meeting.** There may be a time when you are unavoidably late for class. In that case, please come into the room quietly and choose a seat closest to the entrance. Once the class session has begun, please do not leave the room and then re-enter unless it is an emergency. It is important that we are all able to stay focused on the class lecture/discussion. For this reason, only **one person at a time** in the class should be speaking. Side conversations are distracting for surrounding students and for the professor. At the same time, everyone is encouraged to raise their hand to speak next or to ask a question. When I speak, you can interrupt me at any time if you have a question. You must have instructor permission for use of a cell phone or a laptop, and it is only to be used for instructional purposes. As you can see, simple norms of courtesy should be sufficient to have our class run in the best interests of all. Any student considered to be a distraction to the learning environment may be asked to leave the classroom at any time. Thank you in advance for your cooperation.

Keeping our Classroom Safe:

Over the summer, CCSU developed a plan to keep our campus as safe as possible this semester. Please take the time to read the entire highlights page, as you will be expected to adhere to the guidelines: [https://www.ccsu.edu/blueprint/](https://www.ccsu.edu/blueprint/). As we all know from experience, public health conditions can change over time, so stay tuned for possible updates. Here I just want to emphasize that **masks must be worn over your nose and mouth at all times.** As explained in the Blueprint, both students and faculty have important roles to play. I thank you in advance for doing your part in keeping our classroom a safe and productive learning environment. I am going to do the same on my end.

SOME PIECES OF ADVICE FOR SUCCESS AND MY EXPECTATIONS OF YOU:

1. Be in class on time, take notes and participate actively.  
2. Read the posted class notes and the textbook. Sounds obvious, but I do recommend browsing the section to be covered the night before the class, trying to identify the important points and objectives. Then after class (the same day), look through the covered topics carefully and review/rewrite your class notes.  
3. Keep a separate homework notebook.  
4. Every hour in class should be accompanied by two hours or so of work outside of class. Some students will require more or less time at various points of the semester.  
5. I believe that **communication is a key to success.** Stay connected with your instructor and your classmates.
6. Check your university email daily. Login into the Blackboard daily to see new announcements, uploaded course materials, new posts on the discussion board, your grades, etc. Your emails will be answered promptly: you are encouraged to reach out to me with all your questions and concerns. Be proactive!

UNIVERSITY POLICIES:

1. You must take the final examination at the time specified by CCSU’s final exam schedule: Monday, May 9 (8:00 – 10:00 am)

2. In the event of a weather emergency which requires curtailment or cancellation of classes, listen to WTIC (1080 AM) or call (860) 832-3333 for the “general snow message.”

3. Course Accommodations Policy
   Please contact me privately to discuss your specific needs if you believe you need course accommodations based on the impact of a disability, medical condition, or if you have emergency medical information to share. I will need a copy of the accommodation letter from Student Disability Services in order to arrange your class accommodations. Contact Student Disability Services at (860)-832-1952 if you are not already registered with them. Student Disability Services maintains the confidential documentation of your disability and assist you in coordinating reasonable accommodations with your professors.

4. You are responsible for understanding and abiding by the University’s policy on academic integrity. Information on the policy may be found at http://www.ccsu.edu/AcademicIntegrity/. This policy is rigorously enforced by the Department of Mathematical Sciences.

5. The last day to drop this course without approval is April 19. Before this date, approvals for withdrawal are not required; however, it is strongly recommended that students consult with their academic advisors prior to deciding to withdraw. Cessation of attendance, notice to the instructor, or telephone calls to the Enrollment Center are not considered official notice of a student’s intention to drop the course. After April 19, withdrawals are allowed only under extenuating circumstances and require approval of the course instructor and of the Chair of the Department of Mathematical Sciences.

6. Statement on Discrimination and Harassment
   Central Connecticut State University strives to maintain our campus as a place of work and study for faculty, staff, and students that is free of all forms of prohibited discrimination and harassment based upon age; ancestry, color; gender identity and expression; intellectual disability; learning disability; mental disorder; physical disability; marital status, national origin; race; religious creed; sex, (including pregnancy, transgender status, sexual harassment and sexual assault); sexual orientation; or any other status protected by federal or state laws. Any student who has concerns about should contact the Office of Equity & Inclusion (OEI) at 860-832-1652, Student Affairs at 860-832-1601, or their faculty member. The OEI is located on the main floor of Davidson Hall, room 119.

7. Sexual Misconduct, Intimate Partner Violence and Stalking
   Central Connecticut State University (CCSU) will not tolerate sexual misconduct against students, staff, faculty, or visitors in any form, including but not limited to: sexual assault, sexual exploitation, sexual harassment or stalking, as defined in CCSU policies. For additional information, please consult the CCSU policy at https://www.ccsu.edu/diversity/policies/index.html. All faculty members and staff have a duty to report incidents of sexual harassment including sexual misconduct, intimate partner violence and stalking to Pamela Whitley, Title IX Officer, Office of Equity & Inclusion, Davidson Hall, 119. To file a report, contact: Equity & Inclusion (860-832-1652), Student Conduct (860-832-1667) or Student Affairs (860-832-1601). For criminal complaints, contact the University Police (860-832-2375).
   For support and advocacy, contact: Office of Victim Advocacy at 860-832-3795 or jlanagan@ccsu.edu; Student Wellness Services at 860-832-1945 (confidential); Women’s Center at 860-832-1655; the local YWCA’s Sexual Assault Crisis Services Hotline at 860-223-1787 (confidential) and Prudence Crandall Center for Domestic Violence (confidential) at 888-774-2900 (24-hour hotline).

GOOD LUCK IN YOUR STUDIES!