



**Instructor:** *Jaffar Ali Shahul-Hameed, Ph.D. Associate Professor.*  
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**Webpage:** [FGCU CANVAS \(fgcu.instructure.com\)](http://fgcu.instructure.com) and/or [www.jaffar.org](http://www.jaffar.org)  
**Extra Help Sessions:** *Tue & Thu 3:00-4:00pm or by appointment.*  
**Class Hours:** *TR 1:30pm - 2:45pm in Merwin 125, credit: 3 hours.*

**Course Description and Prerequisite:** An introduction to differential equations and their applications, based upon knowledge of calculus. Topics to include: initial value problems of the first- order, numerical solutions, systems of differential equations, linear differential equations, Laplace transforms, series solutions.

**Prerequisite:** MAC 2312 with a minimum grade of C.

This course meets the College-Level Mathematics Skills requirements.

**Course Objectives and Learning Outcomes:** This course is designed to provide students with fundamental understanding of ordinary differential equations and some of the applications in engineering and applied sciences, differential equations can be used to model and understand the behavior of a system. This course will be an introductory course on how differential equations can play such a role in science. Overall, general goals are: 1. understand the modelling aspect of differential equations; 2. identify the class of ode; 3. identify the solution

strategy; 4. interpret the result and compare with physical intuition; 5. understand the qualitative analysis of a differential equation and interpret the result.

More specifically, learning objectives are

- ✓ Learn to solve first-order differential equations
- ✓ Learn to solve linear differential equations of higher-order
- ✓ Learn to solve application problems modeled by a second-order differential equation
- ✓ Learn to solve differential equations with variable coefficients
- ✓ Learn to use Laplace transform methods to solve differential equations
- ✓ Learn to solve systems of equations of differential equations.

**Text:** **A First Course in Differential Equations**, 9<sup>th</sup> edition, by Dennis G. Zill; Brooks/Cole Publishing Company.

**Material to be covered:** Selected Sections from *Chapters 1, 2, 3, 4, 5, 6 and 7*.

### Professor's Philosophy

- *This course is challenging and I am not an "easy" professor. Homework is meant to provide practice in preparing for exams, not just as a grade booster.*
- *I will not give you a grade you wish, you have to work hard to earn the grade that you want. You will get a grade that you deserve.*
- *The textbook prescribed are meant to read regularly not just to buy. I will cover most, but not all, material in the text. Students are expected to be able to read the text and learn material not explicitly covered in the class lectures.*
- *A good educator presents material to imbue knowledge on the learners and does not simply teach to an exam. Timed exams can only test some of the knowledge/skills, not all.*
- *At the college level, the student is responsible for his/her own education. I do my best to present the material as simple as possible, but I cannot ensure that the student:*
  - *does his/her homework and actually works out the problems*
  - *studies appropriately.*
- *Lack of attendance, poor study habits, and last-minute" studying are sure ways of failing my class.*
- *If you put the effort into learning the material, I am certain that would not only help pass my class, but leave with a more educated and savvy perspective about the world and the subject.*
- *At the college level, the student is responsible to manage his/her own time according to the subject to excel in the class. If he/she just attends the class and expects to excel the course, then that is a fallacy. The student has to spend time outside the class to learn, revise, review and understand the material discussed in the class to excel in the subject.*

### Grading Policy:

Assignments	Points %
Two In-class Exams (20% each)	40%
Quizzes, Homeworks and Projects	25%
Attendance	5%
Final Exam	30%

## Percentage Ranges for Letter Grades:

%	91-100	89-91	86-89	82-86	78-82	76-78	70-76	60-70	0-60
Grade	A	A-	B+	B	B-	C+	C	D	F

**Exams:** There will be **TWO in-class Exams** (*each exam worth 20%* of the course grade) and a **Final Exam** (*30% of the course grade*).

**Quizzes, Home/Group-work and Projects:** **There will be group works and/or quizzes on randomly selected days (may be every day)**. It is absolutely essential to work a large number of problems on a regular basis. Problem assignments are given in the class website. I cannot accept assignments via email. Hardcopies of homework/group-work must be turned in during class or in my office unless otherwise mentioned. **LATE ASSIGNMENTS WILL NOT BE ACCEPTED\*\***.

Homework/group-work is collected solely as a learning device to help you master the ideas and techniques. As a university level student, it is essential for you to allocate your time so as to learn the most with the least effort. The homework assignments are the bare minimum for most students to gain basic familiarity with the material. As manager of your own education, it is up to you to work whatever additional problems may be necessary for you to achieve a good understanding of the subject.

You may consult with other students about the homework problems; indeed I encourage you to do so. However, you will need to write up the solutions in your own words. It is a complete waste of time to just copy from a solutions manual or from someone else's work. If you decide to turn in work that is not your own, I cannot stop you, but you will not learn the material adequately and you will pay a heavy price on the exams which constitute 70 percent of your course grade. For help, you should come to my office hours, or make an appointment with me to come at another time. Email is the best way to contact me. But it is the worst method to explain an answer for a math problem.

**Attendance:** You are expected to attend every class and are responsible for all information given out during them. This course requires your full effort, so it is expected that you will give your complete attention to the instructor for the full class period. Activities such as sleeping, reading, listening to headsets, operating unapproved electronics (e.g. cell phones, computers, PDA, etc.), conversing with other students, and so on do not constitute class participation and will be noted as an absent. Please **turn off** all unapproved electronics during class periods. Students engaging in such behavior during the lecture may be asked to leave the room.

If you are absent and miss an announcement, assignment, a lesson plan change, or some handout you are responsible to seek out that information from a classmate. Office hours will not be used to re-teach a lesson missed due to student absence.

An **authorized absence** is an absence due to participation in a sponsored activity that has been approved in advance by the program director and the appropriate student affairs officer. Such an absence permits the student to make up the work missed when practical or to be given special allowance so that he/she is not penalized for the absence. An **excused absence** is an absence due to other causes, such as illness, family emergency, death in the family, or religious holiday. A student seeking an excused absence should obtain documentation such as a physician's statement, accident report, or obituary and contact all instructors or the Office of the Dean of Student Affairs. Valid

documentation does NOT include notes from your parents, roommate, etc. If you are seen at Student Health Services, be sure to obtain a walkout statement to be used as valid documentation.

Although students are graded on intellectual effort and performance rather than attendance, absences from several meetings of the course, excused or otherwise, may result in a lower grade. Only students registered for this course and this section may attend class meetings without advance permission of the instructor.

If you miss an assignment due solely to authorized or excused absences, you must bring documentation to your lecture instructor during office hours. In the event a make-up is allowed (except for the final exam) it should be completed within a week from the end of excused time period or by the last day of classes, whichever is earlier; otherwise, zero will be given as a credit for that assignment. If you miss a lot of class or assignments, whether as a result of authorized, excused, or unexcused absences, you may need to withdraw from the course.

If you miss an in-class exam with a 'legitimate' reason, final comprehensive exam percentage will replace that exam. Attendance will be taken on random days (may be every day). There will be 5% points for the attendance. **A percentage will be deducted for each recorded missing class.** University authorized/approved excuses will be exempted. For more information, read the catalog (<http://www.fgcu.edu/catalog/08-09/FullFGCUCatalog08-09.pdf>).

## TECHNOLOGY USE

Students need basic computers skills in Operating Learning Management systems and creating YouTube videos.

## LECTURE CAPTURE TECHNOLOGY/FGCU CAPTURE - CLASSROOM RECORDING

This course may employ technology that will allow for audio and/or video recording of live classroom sessions. This lecture capture technology is utilized for the sole purpose of enhancing student learning. It may provide for supplemental student instruction via secure links to recorded session(s), the live stream of courses, presentations of off-site guest speakers and/or the delivery of course instruction utilizing "flipped classroom" methodologies. Student questions and/or comments may be included as a part of any session being recorded. See FGCU-CAPTURE for additional details and training <http://aets.fgcu.edu/fgcucapture.asp>

**Grade Disputes:** If you have a dispute with a grade recorded by the instructor, you must present the graded assignment to the instructor in order to obtain a change-of-score. It will be your responsibility to keep all of your returned assignments. Scores will NOT be changed without the original assignment being presented to the instructor.

**Important Days:** Check Gulfline ([gulfline.fgcu.edu](http://gulfline.fgcu.edu)) for the latest update on the Final Exam, Drop Dates, etc., and those dates are final.

**Email Communication:** Email communication will be done through the FGCU system to your FGCU email account (.....@eagle.fgcu.edu) or FGCU Angel account. It is your responsibility to check your accounts often. In order to improve the communication and to assist the instructor in replying to emails in a timely manner, this email policy will be strictly enforced.

When sending emails to your instructor, the following rules must be adhered to:

1. The subject line of the email must contain the course name
2. The email must be signed with your first and last name.

3. The email must be written in Standard English.

If your email does not meet the above criteria, you must resubmit your email in the proper format in order to receive a reply. I usually reply to emails within two business days. If you do not receive a reply within that time frame, check that your email was sent in the proper format and resubmit if necessary. I thank you in advance for sending your emails as requested.

**Academic Behavior Standards and Academic Dishonesty:** All students are expected to demonstrate honesty in their academic pursuits. The university policies regarding issues of honesty can be found in the FGCU Student Guidebook under the **Student Code of Conduct** and **Policies and Procedures** sections at <http://studentservices.fgcu.edu/judicialaffairs/new.html>. All students are expected to study this document which outlines their responsibilities and consequences for violations of the policy.

In all course work, assignments and examinations, students are expected to adhere to the following Code of Honor: "As a Florida Gulf Coast University student I will conduct myself with honor and integrity at all times. I will not lie, cheat, or steal, nor will I accept the actions of those who do."

This policy applies in particular to our homework assignments. Discussing assignments with other members of the class is permitted, even encouraged, but the work that you turn in should be your own. If you don't understand an argument, don't take credit for it. Verbatim copying is not acceptable. Academic dishonesty will be dealt with according to the FGCU policy. For More information, read the booklet "Student Code of Conduct".

**University Nondiscrimination Statement:** Florida Gulf Coast University is committed to ensuring equity and fairness for all University employees, students, visitors, vendors, contractors and other third parties. As such, the University prohibits discrimination on the bases of race, color, national origin, ethnicity, religion, age, disability, sex (including sexual harassment/assault), gender identity/expression, marital status, sexual orientation, veteran status or genetic predisposition with regard to admissions, employment, programs or other activities operated by the University. This prohibition extends to enforcement of Title IX of the Education Amendments of 1972. Questions or complaints should be directed to the Office of Institutional Equity and Compliance (OIEC). The OIEC's phone number is (239)745-4366; the OIEC email address is [OIEC@fgcu.edu](mailto:OIEC@fgcu.edu).

**Disability Accommodations Services:** Florida Gulf Coast University, in accordance with the Americans with Disabilities Act and the university's guiding principles, will provide classroom and academic accommodations to students with documented disabilities. If you need to request an accommodation in this class due to a disability, or you suspect that your academic performance is affected by a disability, please see me or contact the Office of Adaptive Services. The Office of Adaptive Services is located in the Wellness Building. The phone number is 239-590-7956 or Video Phone (VP) 239-243-9453. In addition to classroom and campus accommodations, individuals with disabilities are encouraged to create their personal emergency evacuation plan and FGCU is committed to providing information on emergency notification procedures. You can find information on the emergency exits and Areas of Rescue Assistance for each building, as well as other emergency preparedness materials on the Environmental Health and Safety and University Police Department websites. If you will need assistance in the event of an emergency due to a disability, please contact Adaptive Services for available services and information.

**Student Observance of Religious Holidays:** Kindly visit the following webpage for full university policy at the General Counsel Policies: <http://www.fgcu.edu/generalcounsel/policies-view.asp>

**Electronic Devices:** All pagers, cell phones and other electronic equipment should be turned off during class. This includes text messaging. Checking email or browsing during the class is considered as inappropriate and disruptive behavior. Violators will be asked to leave the class or directed to appropriate authorities/offices.

This syllabus is subject to change at the instructor's discretion.

I read the syllabus; I understand the syllabus and I will follow the syllabus.

Name (PRINT): \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

### Tentative Lesson Plan (Subject to Change):

Week			Assignments
1	Aug 21 – 25	Syllabus & Intro, Intro to DE	
2	Aug 28 – Sep 1	Initial Value Problems, Variable Separable	Quiz 1
3	Sep 4 – 8	Variable Separable, First Order Linear ODE – Homogeneous and non-homogeneous	Quiz 2.
4	Sep 11 - 15	Bernoulli and Substitution Method	Quiz 3
5	Sep 18 – 22	Exact DE, Non-exact made Exact	Quiz 4
6	Sep 26	Homogeneous D.E, Catch up/Review/Critical Thinking Activity	
	<b>Sep 28</b>	<b>Exam 1</b>	
7	Oct 2 – 6	Higher Order Linear DE with Constant Coefficients (HOLDECC) – Hom., Operators, Annihilators	
8	Oct 9 – 13	Operators, Annihilators and linear dependence, HOLDECC: Non-homogeneous and Review, Applications of HOLDEC	Quiz 5
9	Oct 16 - 20	Reduction of Order: Homogeneous and Non-homogeneous	Quiz 6
10	Oct 24	Variation of Parameters (Wronskian), Catch up/Review/Critical thinking Activity	Quiz 7
	<b>Oct 26</b>	<b>Exam 2</b>	
11	Oct 30 – Nov 3	Cauchy-Euler: Homogeneous	
12	Nov 6 – 10	Cauchy-Euler: non-Homogeneous	Quiz 8
13	Nov 13 – 17	ODE Systems and Applications	Quiz 9
14	Nov 20 – 24	Laplace Transforms	<b>Quiz 10</b>
		<b>Nov 24 NO CLASS (Thanksgiving)</b>	
15	Nov 27 – Dec 1	Laplace Transforms,	Quiz 11*
16	Dec 5	Laplace Transform: Catch up/Review/Critical Thinking Activity	Quiz 12*
		<b>Final Exam: December 12, Tuesday 12:30 PM – 2:45 PM. (Check Gulfline)</b>	