Prerequisite: Math 2202 (Calculus II) with a grade of “C” or better

Textbook: No textbook; an inquiry-oriented approach for the study of Ordinary Differential Equations (ODEs) will be used. The topics (divided in units; see Course Description below) to be inquired in class are also posted on D2L.

Some references for the course are:

- Elementary Differential Equations with Boundary Value Problems, William F. Trench (free);

Supplemental Instruction: This class is supported by the Supplemental Instruction (SI) program of KSU. The leader for this course is Mr. Duncan Bohannon (dbohann1@students.kennesaw.edu).

Course Description: An introduction to the theory of ordinary differential equations (ODEs), methods of solving first and higher order linear differential equations and linear systems, some applications in the sciences and engineering, the Laplace transform and its application in solving differential equations and linear systems, stability analysis and Euler’s numerical algorithm.

Tentative Topics to be covered:

Unit 1: Qualitative and Graphical Approaches
Unit 2: A Numerical Approach
Unit 3: An Analytic Approach
Unit 4: Linear Differential Equations
Unit 5: Uniqueness of Solutions
Unit 6: Autonomous Differential Equations
Unit 7: Modeling with Autonomous Differential Equations
Unit 8: The Effect of Varying a Parameter in Autonomous Differential Equations*
Unit 9: Introduction to Systems
Unit 10: Spring Mass System and Linear System
Unit 11: Damped and Undamped Linear Systems
Unit 12: Eigentheory Applied to Linear Systems
Unit 13: Second Order Linear Differential Equations*
Unit 14: Nonlinear Systems*
Unit 15: The Laplace Transform
*optional, but will be covered if time permits.

Technology Statement: A TI-83/84 calculator is permitted to use throughout the course. Please get an approval from the instructor to use other calculator types during tests and final exam. Use of calculators (such as TI-89) with symbolic computation capabilities will not be permitted on tests or final exam.
Learning Outcomes:
Upon completing this course, students will be able to
1. solve first-order separable, linear, and some special differential equations, and use these methods to solve applied problems;
2. solve higher-order constant-coefficient linear differential equations and systems of differential equations, and use these methods to solve applied problems;
3. find Laplace transforms and inverse transforms, and apply these to solve differential equations;
4. find the Fourier series of a function.

Homework: Homework will be assigned and posted on D2L when a unit is completed and will be due one week later. However, when we reach Unit 15 for the Laplace transform, there will be daily and weekly homework assignments.

Homework assignments are due at the start of the class on the due dates. Homework submitted after the due date but before it has been returned to class will be accepted with a penalty of 50% loss of credit. Homework turned in after the graded homework is returned to class will not be accepted under any circumstances.

Requirements of the Course/Method of Evaluation/Makeup Policy:
The student is expected to:
• attend all classes, actively participate in group/class discussion, and complete homework assignments;
• take two tests tentatively scheduled as follows;
  Test 1 (Wednesday, September 27)
  Test 2 (Wednesday, November 15)
  make-up exam will only be allowed for a university approved excuse in writing. Wherever possible, you should inform me prior to missing an exam;
• take comprehensive Final Exam [Wednesday, Dec 6, 2017, 1:00 PM- 3:00 PM].
  All tests and final exam are closed book and closed notes. Everyone must take the final. The final exam percentage will be used to replace your one lowest test score if it helps your average. There will be no extra credit in this course, and therefore please do not ask for one.

Grading System:
  Participation: 20%
  Homework: 20%
  Test 1: 20%
  Test 2: 20%
  Final Exam: 20%

Participation: Your participation grade is composed of the following three components.
1. Note Takers: Two students will be assigned as note takers each class day. The note takers have to meet and combine their notes into one coherent set of notes which must be returned in class next class day. I will then post the notes on D2L. Another student who finds significant errors in the notes may submit their notes in or before next class to claim the credit for the notes, and it will be 8% of the grade. In the latter case, the two note-takers may be given a second chance to take notes.
2. In-class: You are expected to be an active member in class, and 7% of your grade comes from being so. The class will be divided into randomly generated groups (about 6) each class day for group discussion. Each member of a group is expected to contribute to group discussion, and
each group is expected to contribute to class discussion. There will also be times when you will be asked to engage in partner talk for any small areas that need further inquiry.

3. **Evaluation Exam**: As part of a research project involved in this course, you will be asked to take an evaluation exam. Taking the exam will make 5% of your grade.

**Grading Scheme:**
- **A** for [90%, 100%], **B** for [80%, 90%), **C** for [70%, 80%), **D** for [60%, 70%), **F** for [0, 60%]

**Student Disability Services**: Any student with a documented disability needing academic adjustments is requested to notify the instructor as early in the semester as possible. Verification from KSU Student Disability Services is required. All discussions will remain confidential.

**Class Attendance**: Regular attendance is expected and will be recorded. There will be a class roll going around in class every day, and it is your responsibility to sign in. Missing a class can leave you a lot behind in the course and, in this case, you will be responsible for all announcements, class assignments and material presented in class. I will need to report the last day of attendance when submitting grades.

**Classroom Behavior**: All phones and laptops must be put silent for the duration of each class. Phones with QR code readability applications and laptops can be used in class for accessing and learning content materials. Music players cannot be used for the duration of class or tests. You are expected to arrive in class on time, be prepared for interactive learning, and not be disruptive during the class. You may be asked to leave the classroom for any misconduct or inappropriate behavior, and your participation point for the day will result in a zero.

The instructor of the course reserves the right to make changes on pages 1-3 of this syllabus if it is absolutely necessary to account for ineluctable circumstances. In such events, students will be notified of any changes ahead of time by the instructor.
Withdrawal

Students who find that they cannot continue in college for the entire semester after being enrolled, because of illness or any other reason, need to complete an online form. To completely or partially withdraw from classes at KSU, a student must withdraw online at http://www.kennesaw.edu, under Owl Express, Student Services.

The date the withdrawal is submitted online will be considered the official KSU withdrawal date which will be used in the calculation of any tuition refund or refund to Federal student aid and/or HOPE scholarship programs. It is advisable to print the final page of the withdrawal for your records. Withdrawals submitted online prior to midnight on the last day to withdraw without academic penalty will receive a “W” grade. Withdrawals after midnight will receive a “WF”. Failure to complete the online withdrawal process will produce no withdrawal from classes. Call the Registrar’s Office at 470-578-6200 during business hours if assistance is needed.

Students may, by means of the same online withdrawal and with the approval of the university Dean, withdraw from individual courses while retaining other courses on their schedules. This option may be exercised up until October 4, 2017.

This is the date to withdraw without academic penalty for Fall Term, 2017 classes. Failure to withdraw by the date above will mean that the student has elected to receive the final grade(s) earned in the course(s). The only exception to those withdrawal regulations will be for those instances that involve unusual and fully documented circumstances.

Academic Integrity

Every KSU student is responsible for upholding the provisions of the Student Code of Conduct, as published in the Undergraduate and Graduate Catalogs. Section II of the Student Code of Conduct addresses the university’s policy on academic honesty, including provisions regarding plagiarism and cheating, unauthorized access to university materials, misrepresentation/falsification of university records or academic work, malicious removal, retention, or destruction of library materials, malicious/intentional misuse of computer facilities and/or services, and misuse of student identification cards. Incidents of alleged academic misconduct will be handled through the established procedures of the Department of Student Conduct and Academic Integrity (SCAI), which includes either an “informal” resolution by a faculty member, resulting in a grade adjustment, or a formal hearing procedure, which may subject a student to the Code of Conduct’s minimum one semester suspension requirement. See also http://www.kennesaw.edu/scai/content/ksu-student-code-conduct
The course syllabus above (pages 1 - 4) describes the terms and conditions under which the instruction of the abovementioned course will take place in Fall 2017.

With the exception of the changes of coverage of the course units, any other changes to this syllabus will be announced in class and emailed to students at their students.kennesaw.edu address, at least one week prior to the dates for the changes to take effect. All communication regarding the university business and class content will be sent exclusively to students.kennesaw.edu address.

Students are reminded that they attend all classes, actively participate in group/class discussion, and complete homework assignments. The students will be responsible for all announcements and course material of each class meeting, regardless of whether they were in attendance. This includes any changes to the policies of this syllabus as well as to the course coverage.

Consent of Syllabus Terms and Conditions

By signing below, I acknowledge that I have read the syllabus posted on KSU D2L Brightspace Learning Management System for Math 2306 Ordinary Differential Equation, Section 54, Fall Semester 2017, and agree to abide by its terms.

I further agree that I will return this signed signature page to the instructor by the end of the drop/add date, August 21, 2017 (12:00 noon).

Print Name: _____________________

Signature: ______________________                Date:    ______________