

EGR 1101-110: INTRODUCTORY MATHEMATICS FOR ENGINEERING APPLICATIONS
Sinclair Community College, Fall Semester 2013
Mondays, Wednesdays, Fridays 2:00-3:50, Room 1-230

INSTRUCTOR: Nick Reeder **Office:** Room 1-118 **Phone:** (937) 512-2303
e-mail: nick.reeder@sinclair.edu **Course Website:** <http://my.sinclair.edu>
Office Hours: Mon. 4:30–5:30, Tues. 5:00–6:00, Wed. 4:30–5:30, Thurs. 5:00–6:00, Fri. 1:00–2:00.
TEACHING ASSISTANT: John Thompson **e-mail:** thompson.359@wright.edu

COURSE DESCRIPTION: An overview of math topics used in engineering courses: algebra, trigonometry, vectors, complex numbers, sinusoids, systems of equations, matrices, differentiation, integration, differential equations. All math topics are presented within the context of engineering applications, reinforced through examples from engineering courses. Also introduces the engineering analysis software MATLAB.

Credit hours: 4 credit hours (= 3 classroom hours and 2 lab hours per week)

Prerequisite: MAT 1570 or MAT 1290

TEXTS & SUPPLIES: • K. S. Rattan and N. W. Klingbeil, *Introductory Mathematics for Engineering Applications*, Revised Preliminary edition.

- A. Gilat, *MATLAB: An Introduction with Applications*, 4th edition.
- Scientific calculator
- Flash drive

HOW TO SUCCEED IN THIS COURSE:

- * Attend all scheduled hours of class.
- * Read the scheduled textbook sections before class.
- * If you are having any difficulties with the course, see me during my office hours, or contact me by phone or e-mail. If you get sick or have personal problems, contact me as soon as possible so that we can plan a strategy to keep you from falling too far behind.

GRADING COMPONENTS:

Attendance: 5%
Homework (Written & MATLAB): 10%
Labs & MATLAB Projects: 20%
Exam #1: 20%
Exam #2: 20%
Final exam: 20%
MATLAB exam: 5%

GRADING SCALE:

A	90% – 100%
B	80% – 89.9%
C	70% – 79.9%
D	60% – 69.9%
F	less than 60%

COURSE POLICIES:

- * Attendance at all class meetings is required, and is worth 5% of your total course grade. Each unexcused absence will result in a deduction of 1/5 of the total attendance grade. While an attendance grade of 0% (exactly 5 unexcused absences) is possible, any subsequent unexcused absence will result in a grade of "F" for the course. Excused absences for illness, personal/family emergency or academic/professional commitments may be granted at the instructor's discretion.
- * Labs and homework assignments are **due at the beginning of class** on the due date. Since homework solutions will be posted on the course web page, no late homework will be accepted without prior instructor approval.
- * Laboratory assignments will be accepted up to one week late with a penalty of 20%. Laboratory assignments more than one week late must still be completed, but will receive a grade of zero. Since the laboratory is a mandatory component of this course, **the completion of all laboratory assignments is required for a passing course grade.** Students who miss a laboratory assignment may schedule a maximum of **one** separate make-up laboratory session with the teaching assistant.
- * If you miss an exam, contact me (either in person, by phone, or by e-mail) as soon as possible to arrange a make-up. **If you take an exam late, I will deduct 30 percent from your grade for that exam.**
- * Make sure that all assignments are complete when you hand them in. If you skip part of an assignment, I will take off points for the missing part, and I won't let you hand the assignment in a second time to regain the lost points.
- * Turn off cell phones, and do not use them during class. Do not use the computers for non-academic work.
- * No food or soft drinks in the classroom. Stow water bottles at floor level, never on the computer desk or lab bench.
- * While you may discuss assignments with other students, anything that you turn in must be your own work, not work that you have copied from another student. Cheating includes copying someone else's work, obtaining or distributing an advance copy of a quiz or exam, and allowing someone else to copy your work. Depending on the severity of the incident, the penalty for cheating ranges from a zero on that assignment to an 'F' in the course. Conduct yourself in accordance with Sinclair's honor code and academic integrity policy at <http://www.sinclair.edu/about/learning/gened/hc/>

COLLEGE POLICIES:

Sinclair Academic Policies. To view policies on topics such as dropping a course, late registrations, administrative withdrawal, grades, student behavior guidelines, and so on, go to <http://www.sinclair.edu/catalog/pub/policiesandprocedures.pdf>. Understanding these policies is your responsibility.

USEFUL CONTACT INFORMATION:

Dept. Chair: Paul Lawrence, Room 3-134, Phone (937) 512-2570,
paul.lawrence@sinclair.edu

Counselors: Room 11-346, Phone (937) 512-3700, karen.blake@sinclair.edu

Co-op Coordinator: Shep Anderson, Room 3-134, (937) 512-2508,
shep.anderson@sinclair.edu

QUALITY STANDARDS FOR WRITTEN HOMEWORK ASSIGNMENTS:

1. Use lined white paper, letter-size (roughly 8 by 10 inches), with no ragged edges.
2. Write on only one side of each sheet, with roughly one-inch margins all around.
3. **Use pencil.**
4. Include this information at the top of the first page:
 - a. your first and last name
 - b. course number and section number
 - c. assignment type and number (for example, "Homework 1")
 - d. the due date
5. Organize your work:
 - Write horizontally from the top of the page to the bottom. No zigzagging across the page. No tiny equations running up and down the edge of the page.
 - Use a single column. If a short answer, leave any remaining space to the right empty. Do not try to fill in every empty area of the sheet.
 - Leave at least one blank line between problems.
6. Answer all assigned parts of all assigned problems.
7. Start each solution by listing the problem number. For multi-part problems, include the correct a, b, c, etc. designator.
8. You don't need to copy the problem wording to your homework paper. But if the question involves an electrical schematic or other diagram, neatly copy the diagram to the homework paper with all the given quantities and labels. Use a straightedge if neat straight lines do not come naturally to you.
9. Show ALL calculations, steps, and explanations needed to arrive at an answer. If an equation is solved, show that equation in symbolic form (*example: $V = IR$*) and the numbers you substituted in (*example: $V = 2A \times 470 \text{ ohms}$*). For operations on your calculator, show the equations you use and the numbers you entered into your calculator, and write "by calculator" next to the result.
10. Make your work neat and readable. No coffee stains, pizza sauce, etc.
11. To make corrections, either use a good eraser OR cross out the error with a single horizontal line. Do not use X's to cross out the mistake, and do not black out the mistake with a solid "blob."
12. Use proper engineering units.
13. Draw a box around final answers on problems that require manual solution steps.
14. For multi-page assignments, staple pages using **one staple** in the upper left corner.
15. Submit each assignment separately. Do not staple homeworks to lab reports, etc.

TENTATIVE SCHEDULE

WEEK	DATE	CLASS ACTIVITY	DUE
1	Aug. 19	Course Intro & Review of Engineering Notation, Units, Calculator Usage	
	Aug. 21	<i>Teaching Assistant Intro & MATLAB Intro</i>	
	Aug. 23	Linear Equations	
2	Aug. 26	Quadratic Equations	
	Aug. 28	<i>Lab #1: Application of Algebra: The One-Loop Circuit</i>	HW1, ML1
	Aug. 30	Trigonometry – One-Link Planar Robot	
3	Sept. 2	No class; Labor Day	
	Sept. 4	<i>Lab #2: Trig Relationships in One- and Two-Link Planar Robots</i>	HW2, ML2, Lab1
	Sept. 6	Trigonometry – Two-Link Planar Robot	
4	Sept. 9	2-D Vectors	
	Sept. 11	<i>MATLAB Project #1</i>	HW3, ML3, Lab2
	Sept. 13	2-D Vectors & Complex Numbers	
5	Sept. 16	Complex Numbers	
	Sept. 18	Sinusoids	
	Sept. 20	<i>Lab #3: Measurement and Analysis of Harmonic Signals</i>	HW4, ML4, MLProj1
6	Sept. 23	Adding and Subtracting Sinusoids	
	Sept. 25	<i>Exam Review</i>	HW5, ML5
	Sept. 27	Exam #1	
7	Sept. 30	Systems of Equations and Matrices	
	Oct. 2	Systems of Equations and Matrices	
	Oct. 4	<i>Lab #4: Systems of Equations: The Two-Loop Circuit</i>	HW6, ML6, Lab3
8	Oct. 7	Introduction to Derivatives	
	Oct. 9	<i>MATLAB Project #2</i>	HW7, ML7, Lab4
	Oct. 11	Application of Derivatives - Velocity and Acceleration	
9	Oct. 14	Application of Derivatives - Electric Circuits	
	Oct. 16	<i>Lab #5: Derivatives: Velocity and Acceleration in Free-Fall</i>	HW8, ML8, MLProj2
	Oct. 18	Application of Derivatives - Deflection of Beams	
10	Oct. 21	Introduction to Integrals	
	Oct. 23	<i>MATLAB Project #3</i>	HW9, ML9, Lab5
	Oct. 25	Application of Integrals in Statics	
11	Oct. 28	Application of Integrals in Statics	
	Oct. 30	<i>Exam Review</i>	ML10, MLProj3
	Nov. 1	Exam #2	
12	Nov. 4	Application of Integrals in Dynamics	
	Nov. 6	<i>Lab #6: Integrals: Work and Stored Energy in a Spring</i>	HW10
	Nov. 8	Application of Integrals in Electric Circuits	
13	Nov. 11	No class; Veterans Day	
	Nov. 13	<i>MATLAB Project #4</i>	HW11, ML11, Lab6
	Nov. 15	Introduction to Differential Equations - The Leaking Bucket	
14	Nov. 18	Application of Differential Equations - Mechanical Systems	
	Nov. 20	<i>Lab #7: Differential Equations: The Leaking Bucket</i>	HW12, ML12, MLProj4
	Nov. 22	Application of Differential Equations – Electrical Systems	
15	Nov. 25	Application of Differential Equations	

	Nov. 27	No class; Department Planning Day	
	Nov. 29	No class; Thanksgiving	
	Dec. 2	Application of Differential Equations	
16	Dec. 4	<i>Lab #8: Differential Equations: Spring-Mass Vibration</i>	HW13, ML13, Lab7
	Dec. 6	Review & Exam Prep	
	Dec. 9	Final Exam	Lab8
17	Dec. 11	MATLAB Exam	
	Dec. 13		