

**HOUSTON COMMUNITY COLLEGE SYSTEM
NW SPRING BRANCH CAMPUS**

ENGR 2304 Programming for Engineers CRN: 44383 UH equiv. -ECE 1331 Spring 2015

Time: 5:30 pm- 9:30 pm: TH (13 weeks Semester course)

Lecture (room B-122) at NW Alief Campus

Instructor: Olatunde (Tunde) Amosu; Phone: 832-359-8414;

email address: olatunde.amosu@hccs.edu

Office Hour: before and after class on Thursday or by appointment

Prerequisite: Math 2413 Calculus 1 --- 4 Credits

Textbooks: **William J. Palm III, Introduction To MATLAB For Engineers-** 3rd edition, McGraw Hill 2005 (ISBN 978-0-07-3534879).

Byron S. Gottfried, SPREADSHEET TOOLS for Engineers using Excel 2007. McGraw Hill 2010 McGraw Hill (ISBN 978-0-07-3385860)

Course Description

Programming for Engineers: This course is intended for those who are planning to major in any branch of engineering or for those planning to have a career in engineering. The materials that will be covered in the course will include problems solving algorithm for advanced topics in engineering/calculus and application of technology for solving them. Emphasis will be on the use of Microsoft Excel- a popular spreadsheet program to solve engineering problems. Excel (and several other competing spreadsheet programs) permits engineers to carry out very lengthy calculations very easily, without getting bogged down in complicated mathematical procedures. The course is generally transferable as a credit for engineering majors to University of Houston. The delivery format will include lectures, presentations, homework assignments, and examinations.

Course Objectives

The objective is to introduce and reinforce the use of problem-solving methodology as practiced by the engineering profession in general and as applied to the use of computers to solve some problems in particular.

After successful completion of the course, the following objectives should be attained:

1. Demonstrate qualitative and quantitative understanding of the use Excel Spreadsheet.
2. Develop a working knowledge of the required mathematical solution procedures for engineering analysis.
3. Demonstrate the use of spreadsheets to solve a variety of engineering problems.
4. Ability to use Excel built in features to solve all engineering problems.
5. Ability to use MATLAB to reinforce the use of problem-solving methodology as practiced by the engineering profession and as applied to the use of computers to solve problems.

Attendance policy

Students are encouraged to attend all classes.

Attendance: HCCS Attendance Policy is stated in the **2007-2008** Student Handbook

page 2 as follows: “You are expected to attend all lecture classes and labs regularly. You are also responsible for materials covered during your absences. Instructors may be willing to consult with you for make-up assignments, but it is your responsibility to contact the instructor. Class attendance is checked daily. Although it is your responsibility to drop a course for nonattendance, the instructor has the authority to drop you for excessive absences. You may be dropped from a course after accumulating absences in excess of 12.5 percent of the total hours of instruction (lecture and lab). For example:

- For a three credit-hour lecture class meeting three hours per week (48 hours of instruction), you can be dropped after six hours of absence.
- For a four credit-hour lecture/lab course meeting six hours per week (96 hours of instruction), you can be dropped after 12 hours of absence.”

If circumstances significantly prevent you from attending classes, please inform the instructor.

http://www.hccs.edu/hcc/System%20Home/Departments/Student_Handbook/academic_info.pdf

If circumstances significantly prevent you from attending classes, please inform me. I realize that sometimes outside circumstances can interfere with school and I will try to be as accommodating as possible, but please be aware of the attendance policy.

Students with Disabilities

HCCS is committed to compliance with the American with Disabilities Act and the Rehabilitation Act of 1973 (section 504). “Any student with a documented disability (e.g. physical, learning, psychiatric, vision, hearing etc.) who needs to arrange reasonable accommodation must contact the appropriate HCC Disability Support Service (DSS) Counselor at the beginning of each semester. Instructors are authorized to provide only the HCC DSSO approved accommodations but must do so in a timely manner. Students who are requesting special testing accommodations must first contact the appropriate (most convenient) DSS office for assistance each semester.

Disability Support Services Offices:

System: 713.718.5165

Central: 713.718.6164 - also for Deaf and Hard of Hearing Services and Students

Outside of the HCC District service areas.

Northwest: 713.718.5422

Northeast: 713.718.8420

Southeast: 713.718.7218

Southwest: 713.718.7909

The student must request an accommodation before the start of each semester (as applicable) and should indicate to the DSS counselor when he/she is enrolled in a class. After student accommodation letters have been approved by the DSS office an email confirmation informing them of the Instructional Support Specialist assigned to their professor and that the accommodation letter has been processed. Upon consultation and documentation, you will be provided with reasonable accommodations and/ or modifications.

Also visit the ADA web site at:

<http://www.hccs.edu/students/disability/index.htm>. Faculty Handbook / faculty Orientation is also available at <http://www.hccs.edu/sudnts/disability/faculty.htm>

Academic Honesty

Students are responsible for conducting themselves with honor and integrity in fulfilling course requirements. Disciplinary proceedings may be initiated by the college system against a student accused of scholastic dishonesty. Penalties can include a grade of 'O' or 'F' on the particular assignment, failure in the course, academic probation or even dismissal from the college. Scholastic dishonesty includes but is not limited to cheating on a test, plagiarism and collusion.

Administrative and Student Withdrawals

For 13 week Spring '15 classes, this date is [March 24th \(4:30pm\)](#). In order to withdraw from a class, students **MUST** request to be withdrawn by notifying the professor. This must be done **PRIOR** to the withdrawal deadline to receive a "W" grade. If a student does not request to withdraw before the deadline, the student must be assigned a letter grade that is earned by the end of the semester (A, B, C, D, and F). I urge any student who is contemplating of withdrawing from the class to see me first. You may be doing better than you think. Either way, I want to be accessible and supportive. I don't believe in "weed out" classes, and I consider you to be much more than just a name or number. If you need assistance, do not hesitate to contact me (my phone number and e-mail address are listed above). I am here to help you.

Course Withdrawals - First Time Freshman Students - Fall 2007 and Later

Under Section 51.907 of the Texas Education Code "an institution of higher education may not permit a student to drop more than six courses, including any course a transfer student has dropped at another institution of higher education." This statute was enacted by the State of Texas in the Spring 2007 and applies to students who enroll in a public institution of higher education as a first - time freshman in fall 2007 or later. Any course that a student drops is counted toward the six - course limit if "(1) the student was able to drop the course without receiving a grade or incurring an academic penalty; (2) the student's transcript indicates or will indicate that the student was enrolled in the course; and (3) the student is not dropping the course in order to withdraw from the institution." Policies and procedures for implementation of this statute are being developed and will be published as soon as they are available.

HCC students affected by this statute that have attended or plan to attend another institution of higher education should become familiar with that institution's policies on dropping courses.

[Web link to this information](#)

Homework

There will be homework/assignments problems assigned after each class. Most of the problems will be of a practical nature and should appeal to all engineering students. They will be primarily designed to illustrate the material presented in the text and to help the students understand

the principles. Students are strongly advised to attempt all these selected problems and other problems from the text. In general, student who fail to do these assigned problems do not do well in the course. All the assignments/home works/ quizzes will be graded for credit. Students are strongly encouraged to attempt all assignments/homework. The effort spent will enable you to perform better in tests and exams. Homework / assignments must be turned in at the beginning of the class. Maximum of **15 points deduction** for each assignment/home work turn in late after the due date. You may be asked to explain your work in the classes. Explaining the problems in your own words helps you to understand course and to copy the answers without understanding of the programming for Engineers is a waste of time

Exams and Make-up Policy

Examinations consist of two regular exams and a compulsory comprehensive final will be administered during the semester. Make-up exams **will not** be given, so make every effort to take the exams on their scheduled dates.

Please note: 1) All students are required to take the final (no student can be exempted).

2) After the withdrawal date, no "W" can be given, and you **must** receive a regular grade (A-F) in the course.

Cell Phones:

Why are there rules about using cell phones?

- They are distracting
- They can be used to cheat.
- They can be used to invade the privacy of others
- They can be lost or stolen

Classroom Cheating

- Do not let students go to the restroom during exams unless medically necessary
- Assure that the student is properly registered for the class
- Do not allow students to use cell phones during exams.

Grading Policy: The final grade is based on the score out of 100% that the student accumulated from the two exams, quizzes/home works and the final exam. Below is the weighting of the categories:

50% (25% for each Exam => 2x 25%)

15% Home works

35% Final exam

100% Total

The *overall score* is based on the following:

Overall score = 0.50 (Average of two regular exams) + 0.15 (Homework) + 0.35 (Final Exams)

The course grade is then obtained from the overall score:

<i>Final Average</i>	90 - 100	80 - 89	70 - 79	60 - 69	< 60
<i>Letter Grade</i>	A	B	C	D	F

Tentative outline for ENGR 2304

NB. This outline is subject to change as the semester progresses

Week / Date	Chapter	Sections
	1. INTRODUCTION TO COMPUTER	1. Computer Basics 2. Operating System 3. Networking
	1.1 Engineering Analysis And Spreadsheets	1. A spreadsheet Overview 2. General Problem- Solving Techniques 3. Applicable Engineering Fundamentals 4. Mathematical Solution Procedures
	2.1 Creating an Excel Worksheet	2.1 Entering & Leaving Excel 2. Entering data 3. Using Formulas 4 Using Functions 5. Saving & Retrieving a Worksheet 6. Printing a Worksheet
	3.1 Editing an Excel Worksheet	3.1. Editing the Worksheet 2. Inserting & Deleting individual cells 3. Formatting Data Items 4. Displaying Cell Formulas
	4.1 Making Logical Decisions (IF-THEN- ELSE)	1 Logical (Boolean) Expressions 2 The IF FUNCTION 3 Nested IF Function

5.1 Graphing Data (Excel)	<ul style="list-style-type: none"> 1 Characteristics of a Good Graph 2 Creating a Graph in Excel 3 X-Y Graphs 4 Semi-Log Graphs 5 log - Log Graphs
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Exam 1 (Suggested)

5.1 Graphing Data (Excel)	<ul style="list-style-type: none"> 8 Bar Graphs (Excel Column Charts) 9. Pie Charts
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6.0 Analyzing Data Statistically	<ul style="list-style-type: none"> 6.1 data Characteristics- Mean, Median, Mode, Min and Max, Variance, Standard Deviation 2. Histograms- Constructing a Histogram 3. Cumulative Distributions
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12.0 Solving Simultaneous Equations	<ul style="list-style-type: none"> 1. Matrix Notation 2. Matrix Operations in Excel 3. Solving Simultaneous Equations in Excel Using Matrix Inversion
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15.0 Comparing Economic Alternatives	<ul style="list-style-type: none"> 1. Compound Interest 2. The time value of money 3. Uniform, multipayemnt cash flows
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Exam 2 (Suggested)

15.0 Comparing Economic Alternatives	<ul style="list-style-type: none"> 4. Irregular Cash flows 5. Comparing Two Investment Opportunities 5. Internal Rate of return 6. Comparing two investment Opportunities using IRR
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1.0 An Overview of MatLab	<ul style="list-style-type: none"> 1. MatLab Interactive sessions 2. Menus and the Toolbar 3. Arrays, files & plots
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4. Script Files & the editor / debugger
5. The MatLab Help System
6. Problem-Solving Methodologies

- 2.0 Numeric, Cell & Structure Arrays
1. One- & Two- Dimensional Numeric Arrays
 2. Multidimensional Numeric Arrays
 3. Element-by-Element Operations
 4. Matrix Operations
 5. Polynomial Operations Using Arrays
 6. Cell Arrays
 7. Structure Arrays

3.0 Functions and Files

1. Elementary Mathematical Functions
2. User-Defined Functions
3. Additional Function Topics
4. Working with data Files

4.0 Programming with Matlab

- 1.0 Program Design and Development
- 2.0 relational Operators & logical Variables
- 3.0 Logical Operators and Functions
- 4.0 Conditional Statements
- 5.0 For loops

**FINAL EXAM -
COMPREHENSIVE**

Success in this course depends solely on the individual student

The following are strongly recommended for each student:

- Read and understand all elements of the Syllabus, Distance Education and Student handbooks.
- Give your professor evening (after 9pm or week-ends) phone calls and e-mail.
- Read and comprehend the required chapters in the textbook prior to the exams.
- Successfully complete all requirements of this course as outlined in this document.
- Contact your professor if you have any questions regarding any element of the course you do not understand.

- HINT: Work hard from the beginning of the semester rather than playing a "catch-up game during the second half of the semester.
- Plan to attend all class review sessions to clarify your concerns about the course content/tests.

Important dates

Jan 19:	Last day for Drop/Add/Swap/Registration Ends (Online only)
Jan 19:	Offices Closed - Martin Luther King Jr Observance
Jan 20:	Regular classes' begin- Drop/Add/Swap
Feb 16:	Offices Closed _ Presidents day Holiday
March 16-22:	Office Closed - Spring Break
March 24:	Last day for student withdrawals- 4:30pm
April 3 - 5:	Offices closed- Spring Holiday
May 10:	Instruction ends
May 11-16:	Final exam begins on HCCS regular class schedule
May 17:	Semester Ends
May 18:	Grades Due by 12:00 noon
May 22:	Grades available to students