CBEE 102 (3 Cr.) – Engineering Problem Solving and Computations
Winter Quarter 2014
School of Chemical, Biological, and Environmental Engineering
Oregon State University
2014.02.08
COURSE SYLLABUS

Instructors:

Dr. Karl Schilke
Email: karl.schilke@oregonstate.edu
Phone: 541.737.7283
Office: Merryfield South 100A
Office Hours: Wednesdays from 1500-1600 and by appointment

Dr. Travis Walker
Email: travis.walker@oregonstate.edu
Phone: 541.737.7244
Office: Gleeson Hall 211
Office Hours: Mondays from 1400-1500 and by appointment

Teaching Assistant:
Adam Lambert
Email: lamberta@onid.orst.edu
Office: Merryfield 106
Office Hours: Wednesdays from 1300-1400 and by appointment

Dates: 2014.01.06-03.14
Lectures: CRN 36319: M 1700-1750
Classroom: GLFN AUD
Laboratories: either Tuesday & Thursday (TR) or Wednesday & Friday (WF)
See section schedule below for your appropriate section information.
Classroom: GRAF 210

CRN	Sec	Date	Time	Instructor	UTA			
#	#				HR1	HR2	HR3	HR4
36324	1	TR	0900-1050	Schilke	ACFH	ACFH	ACH	ACH
36320	2	TR	1100-1250	Schilke	ABCH	ABCH	ABCH	ABCH
36322	3	TR	1400-1550	Schilke	DGLM	DEGLM	DGLM	DEGLM
37196	4	TR	1600-1750	Lambert	EGIL	EFIL	BEGIL	BEFIL
36321	5	WF	0900-1050	Walker	DE	DFJM	DE	DFJM
36323	6	WF	1100-1250	Walker	BFGK	BGK	BFGK	BGK
38026	7H	WF	1400-1550	Walker	GJKM	GJKM	GJKM	GJKM
40423	8H	WF	1600-1750	Schilke	GFHK	FHK	BFGHK	BFHK

UTA: (A) Haller, (B) Hobson, (C) Schneider-Coppolino, (D) Denton, (E) Offer, (F) Robinson, (G) Marsh, (H) Reynolds, (I) Koeltzow, (J) Duff, (K) Beaty, (L) Yenduru, (M) Swann

Course Description: (CRN: 36219) CBEE 102. ENGINEERING PROBLEM SOLVING AND COMPUTATIONS (3). Elementary programming and problem-solving concepts implemented using MATLAB and Excel software; emphasis on problem analysis and development of algorithms in engineering. Lec/lab. **PREREQS:** MTH 112 or MTH 251 or MTH 251H

Website: `http://my.oregonstate.edu`
(Please make sure you have access to the My Oregon State website, since all course materials and announcements will be available there.)

Prerequisites: MTH 251 or MTH 251H

Textbook: Musto, Joseph C., William E. Howard, & Richard R. Williams. *Engineering Computations: An Introduction Using MATLAB and Excel*. McGraw Hill. 2009.

Course Grading:

Laboratory Exercises	20%
Laboratory Quizzes	10%
Group Project	20%
Midterm Examination	20%
Final Examination	30%

If you determine that a regrade is necessary, the entire assignment will be regraded.

Grade Policy: Work received up to 24 hours late will receive 50% credit. Work received beyond 24 hours late will receive 0% credit. Group work on homework is permitted, but each student must turn in his or her own individual assignment with a list of contributors.

Final performance percentage will be assigned a minimum letter grade by the following scale (implying that the percentage requirements for a particular grade may be decreased at the instructors' sole discretion but will not be increased):

94-100	A	74-76	C
90-93	A-	70-73	C-
87-89	B+	67-69	D+
84-86	B	64-66	D
80-83	B-	60-63	D-
77-79	C+	0-60	F

Course Overview & Objectives: By the end of the course, a student will be able to do the following:

- use MATLAB and Excel to perform simple calculations and analyze data;
- use MATLAB and Excel to develop appropriate plots of data from a variety of input data methods. Include relevant components such as text comments, arrows, legends, etc.;
- write programs in MATLAB and Excel following good programming practice, using scalar and array operations, control structures and built in math functions, and incorporates one or more user written functions; and

- make meaningful contributions to team efforts to design a software solution to a problem.

Course Structure:

Communication:

The Blackboard announcement tab and email to ONID addresses will be used for course communication. We will only use the lecture Blackboard (CRN 36319; not individual labs). All scores will be posted in the Blackboard grade center.

Lectures:

Monday lectures will be used for the following:

- Excel and MATLAB content instruction,
- Laboratory overview,
- One midterm exam, and
- Exam feedback and questions.

Attendance in class is expected. You are expected to be punctual and to minimize disruptions. Cell-phones need to be off during class. Also, no use of laptops or other electronic devices for activity outside of its use in this class will be tolerated. If you miss a class, you are responsible for obtaining lecture notes from other students.

Laboratories:

Each student should be enrolled in a laboratory section. Two laboratory periods exist each week for each section. During each laboratory a lab-based activity will be completed. You must bring a laptop with the ability to access Microsoft Excel and MATLAB. Help with access can be found at the end of this syllabus. Note that the Oregon State University College of Engineering has mandated the possession of a usable laptop: `http://engineering.oregonstate.edu/laptop-requirements`.

Students will be graded on this activity during laboratory. To achieve full credit, students must be engaged in course activities for the entire period. Student who successfully complete the task before the end of the period and have had their completion approved by the instructor will be allow to leave early if they desire. The assignment will be multi-part and increase in complexity. The grade for the laboratory exercises will be based on the following:

- the student was in attendance;
- the student was prepared with an Excel and MATLAB enabled laptop;
- the student remained productive the entire lab period;
- the student understands the concepts of the activity; and
- the student achieved a minimum level of competency on the activity.

We encourage discussion and peer-to-peer consultation and guidance during the laboratory. We do not allow cell phone or internet (email, web surfing, etc.) use while in the laboratories. If the lab instructor observes these activities, the grade will be lowered. Also, if file sharing between students within one lab, or between students in different labs, is observed or suspected, the instructor will file academic dishonesty claims immediately. If you are over

10 minutes late, the instructor will lower your grade by 4% or more, depending on how late you are to the class. Habitual lateness (even less than 10 minutes) will also be penalized with a reduction in score.

The lowest two laboratory scores will be dropped; therefore, no make-up laboratories will exist regardless of the reason – no exceptions. The purpose of this policy is to reduce logistics for emergencies in a large class. We advise students to save these "drop" opportunities for true emergencies.

Two or three times during the term, students will complete an practical quiz during the laboratory section. These quizzes will consist of the class receiving a programming problem, and students will be required to complete the problem without help from peers or instructors. The instructors will score the problem in the laboratory.

Group Project:

A course project will be completed by groups of three (3) students. The project will be used as an overall assessment of the students' understanding of key concepts described throughout the course. The project will consist of a MATLAB based code (60% of the project grade), a project report (30% of the project grade), and some additional Administrative Activities including various checkpoints and evaluations (10% of the project grade). Please refer to the additional Group Project description for details beyond the information listed below.

- Lec. 1: during the first lecture of the course (2014.01.06), a brief overview of the project will be given during the introduction of the course.
- Lab. 1: during the first week of laboratory exercises, you will be required to complete a homework assignment surveying your interests and skills. This survey will help the instructors organize the students into teams.
- Lab. 2: during the second week of laboratory exercises, you will be organized into teams based on the results of the survey.
- Lec. 4: during the fourth lecture of the course (2014.01.27), a theoretical background of the Monte Carlo method and a theoretical background of Buffon's needle problem will be given.
- Lab. 4: during the fourth week of laboratory exercises, you will complete a brief experiment with your team to collect brute force data.
- Lec. 5: at 1700 on 2014.02.03, the minutes of your required meeting with acknowledgement of the assigned tasks will be due.
- Lec. 6: at 1700 on 2014.02.10, a penultimate flow chart of your project code will be due.
- Lec. 9: at 1700 on 2014.03.03, your team project will be due.

Exams:

Two exams will exist in this class: one midterm during the Monday lecture period and one final during finals week. The dates of the exams are the following:

- Week 6, Monday, 2014.02.10 from 1700-1750 in class
- Finals Week, Monday, 2014.03.17 from 2000-2150

The midterm exam and the final exam will be delivered in two different rooms according to lab sections (subject to change):

- Tuesday and Thursday Lab sections will take exams in Gilbert 224.
- Wednesday and Friday Lab sections will take exams in GLFN AUD.

Please sit with an open chair between you and another student during the exam (i.e., occupy every other seat). During exams you may only use your copy of the required textbook. You cannot "share" a textbook during an exam or use copies of pages from the book. Note that you may run out of time if you try to "look up" every question. You may write notes in your textbook about topics covered in class but not included in the textbook. Laptops, calculators or phones are not allowed during exams.

If you must miss one of the exams for an emergency situation, please let us know as soon as possible (karl.schilke@oregonstate.edu and travis.walker@oregonstate.edu). You will not have an opportunity to make up the exam without an approved reason.

Tentative Course Outline (2014.02.08):

Week	Monday	Tuesday/Wednesday	Thursday/Friday
1	Introduction, Syllabus	Survey, MATLAB	MATLAB
2	Methodology	MATLAB	MATLAB
3	No Lecture, MLKJ Day	Quiz	MATLAB
4	Buffon's Needle	Experiment	MATLAB
5	Trouble Shooting, Debugging	MATLAB	MATLAB
6	Midterm Exam	MATLAB	MATLAB
7	Spreadsheets	Excel	Excel
8	Solvers	Excel	Quiz
9	Project Due, Solution	Excel	Excel
10	Student Driven Review	Excel	Excel
11	Final Exam	–	–

OSU STATEMENTS:

From the Office of the Dean of Students (1995.12.13): Behaviors which are disruptive to the learning environment will not be tolerated, and will be referred to the Office of the Dean of Students for disciplinary action. Behaviors which create a hostile, offensive or intimidating environment based on gender, race, ethnicity, color, religion, age, disability, marital status or sexual orientation will be referred to the Affirmative Action Office.

Web link : `http://oregonstate.edu/admin/stucon/index.htm`

Statement Regarding Students with Disabilities Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

Web link: `http://ds.oregonstate.edu/prospective/`

Academic Honesty Any instances of dishonesty in academic work will be treated according to OSU Academic Regulations. The Statement of Expectations for Student Conduct is given in the OUS OAR #576-015-0020, accessible at the following link:

Web link: `http://oregonstate.edu/studentconduct/home/`.

The policy is stated below:

> Academic or Scholarly Dishonesty is defined as an act of deception in which a Student seeks to claim credit for the work or effort of another person, or uses unauthorized materials or fabricated information in any academic work or research, either through the Student's own efforts or the efforts of another.
>
> b) It includes:
>
> (i) CHEATING - use or attempted use of unauthorized materials, information or study aids, or an act of deceit by which a Student attempts to misrepresent mastery of academic effort or information. This includes but is not limited to unauthorized copying or collaboration on a test or assignment, using prohibited materials and texts, any misuse of an electronic device, or using any deceptive means to gain academic credit.
>
> (ii) FABRICATION - falsification or invention of any information including but not limited to falsifying research, inventing or exaggerating data, or listing incorrect or fictitious references.
>
> (iii) ASSISTING - helping another commit an act of academic dishonesty. This includes but is not limited to paying or bribing someone to acquire a test or assignment, changing someone's grades or academic records, taking a test/doing an assignment for someone else by any means, including misuse of an electronic device. It is a violation of Oregon state law to create and offer to sell part or all of an educational assignment to another person (ORS 165.114).
>
> (iv) TAMPERING - altering or interfering with evaluation instruments or documents.
>
> (v) PLAGIARISM - representing the words or ideas of another person or presenting someone else's words, ideas, artistry or data as one's own, or using one's own previously submitted work. Plagiarism includes but is not limited to copying another person's work (including unpublished material) without appropriate referencing, presenting someone else's opinions and theories as one's own, or working jointly on a project and then submitting it as one's own.

Important Dates:

Add/Drop Deadline	2014.01.17
Midterm Exam	2014.02.10 1700-1750
Withdraw Deadline	2014.02.21
Project Deadline	2014.03.03 1700
Final Exam	2014.03.17 2000-2150

Accessing COE Programs and Documents
CBEE 102

Important: Please read and follow these instructions before coming to your CBEE 102 laboratory section. You may wish to keep a copy of these directions for future reference. You must complete the following tasks prior to the first day of lab (Wednesday 11/8) for full credit.

1. **Verify that you have a valid OSU ONID and ENGR computing account.** More information on getting access to and using ENGR computing resources is available here: `http://engineering.oregonstate.edu/computing/gettingstarted/224`
   To create an ENGR computing account (if you have not done so already),

   (a) go to `https://secure.engr.oregonstate.edu:8000/teach.php`

   (b) select "Create a new account" at the bottom of the screen.

   (c) follow the prompts to create your ENGR account.

   It is strongly suggested that you immediately log in and verify that you can access the Web, printers, etc. from your ENGR account.
   If you are working from off-campus, you will need to access COE systems through the secure Virtual Private Network (VPN).
   For more information and to download software to set up the VPN, please visit `http://oregonstate.edu/helpdocs/network/vpn-campus-access`

2. **You must have a laptop computer with access to wireless networks and which is capable of running Microsoft Excel and MATLAB.** You will lose points for any lab section that you do not have a laptop with access to Excel and MATLAB.
   Access to a laptop computer is a requirement for students in the OSU College of Engineering (c.f., `http://engineering.oregonstate.edu/laptop-requirements`).
   For general information about OSU COE computing resources, visit `http://engineering.oregonstate.edu/computing/personal`.
   If you need help with your ENGR account, setting up your laptop, installing software, or access to the ENGR wireless network, please contact the COE Wireless Helpdesk. The Helpdesk is located in Dearborn 120A and is open from 9AM ? 11PM, 7 days a week. `http://engineering.oregonstate.edu/computing/personal/155`

3. **MATLAB may be downloaded and installed on your personal laptop free of charge from the ENGR website.** Carefully follow the directions given at the College of Engineering website: `http://engineering.oregonstate.edu/computing/personal/149` (Note that the 64-bit installer is larger and will run only on 64-bit PCs. The 32-bit version should run on any PC running Windows).
   If you install MATLAB locally, you will need to have access to the OSU VPN each time you run the program in order to obtain a license key. More information on VPN is available here: `http://oregonstate.edu/helpdocs/network/vpn-campus-access`

4. **Microsoft Office may be purchased from the campus book store for $99 with valid student ID.** Purchasing a copy of Microsoft Office to use throughout the several years that you work towards your degree is highly recommended.
   Although they perform similar functions and have similar interfaces, we will not use OpenOffice or other spreadsheet programs in this course. Microsoft Office is ubiquitous throughout

the engineering workplace, and we hope to keep confusion to a minimum by using only one software package for this course. All files which are handed in must be fully compliant with Microsoft Office; incompatible files will be returned ungraded to the student.

5. **Accessing MATLAB and MS Office through Citrix/XenApp Web (no need to purchase Microsoft Office)**
   Both MATLAB and MS Office (including Excel) can be accessed remotely, at no cost, from COE servers using the Citrix or XenApp Web mechanisms. You will need to be on-campus, or have access to the COE VPN (see above), to access the OSU Citrix servers.
   Citrix and XenApp allow you to run a wide variety of software applications on your PC or Mac system, as well as some iOS, Android and Chrome-based devices. A convenient Web-based interface makes access to the applications simple, and can be accessed at `https://apps.engr.oregonstate.edu/Citrix/EngineeringWeb/`.
   You will need to install the Citrix Receiver software to use applications on the Citrix servers. Follow the directions at the site below to get started with Citrix: `http://engineering.oregonstate.edu/computing/citrix/`

If you need help with any of these steps, please contact the OSU College of Engineering Helpdesk: `http://engineering.oregonstate.edu/computing/policies/155` or `https://secure.engr.oregonstate.edu/forms/contact.php?to=support`

Please note: CBEE 102 instructors and lab TA?s will make every possible effort to assist with simple wireless/software issues during lab (if time allows and this activity is not disruptive to the class). However, it is the student?s responsibility to be prepared for class by bringing a working laptop with wireless network and access to MATLAB and Excel to every lab section.