ENGG*2560 Environmental Engineering System
Winter 2014

School of Engineering
(v2014 01 06c – posted 2014 01 12
CORRECTION to Test #2 DATE)

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1 INSTRUCTIONAL SUPPORT

1.0 Instructor

Instructor: Warren Stiver, Professor
Office: THRN 1343, ext. 54862
Email: wstiver@
Office hours: By appointment

1.1 Lab Technician

Joanne Ryks	Ryan Smith
THRN1114	THRN1114
jryks@	Rsmyth17@

1.2 Teaching Assistants

GTA	Email	Office Hours
Arun Moorthy	amoorthy@	NONE … use labs well
Sondus Jamal	sjamal@	NONE … use labs well

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2 LEARNING RESOURCES

2.0 Course Contact Hours (Lectures, Labs, & Tutorials)

The lectures, labs and tutorials are the primary means used to support your learning in this course. Lectures will be the primary means for course news and announcements in addition to provision of course materials. Lecture attendance is expected. Tutorials will be the primary means for the instructional team to coach you. Tutorial attendance is expected. Labs will be the primary means for some hands-on experience. Lab attendance is required.

2.1 Course Website

ENGG*2560 Courelink site will provide copies of lecture slides, project descriptions, assignments, sample problems and links to additional resources.

2.2 Required Resources

1. None

2.3 Recommended Resources

Some additional suggestions will be posted on courselink site.

2.4 Additional Resources

Lecture Information: All the lecture slides will be posted on the courselink site.

Lab Information: Posted on courselink.

Assignments: Posted on courselink.

Exams: Old tests and finals are posted as samples.

Miscellaneous Information: See courselink.

2.5 Communication & Email Policy

Communication associated with course material is delivered by a combination of the lectures, lab/tutorials and the courselink site. It is your responsibility to receive communication from ALL of these sources – there will be some mutual reinforcement between these sources but they are not completely redundant sources. As per university regulations, all students are required to check their <uoguelph.ca> e-mail account regularly: e-mail is the official route of communication between the University and its students.

3 ASSESSMENT

3.0 Dates and Distribution

FINAL EXAM	35%	Monday, April 7th, 8:30 a.m.
TESTS (In Lecture)	10% 10%	Friday, January 31st Friday, March 14th **(NOTE CORRECTION … originally posted as Friday March 15th which doesn't exist!)**
LABS	10% 20% 15%	Batch Reactor Lab – Due Sunday Feb 2nd, 5:00 pm Reactor Systems Lab – Due Sunday March 9th, 5:00 pm Noise Lab – Due Sunday March 30th, 5:00 pm

3.1 Course Grading Policies

Missed Assessments: If you are unable to meet an in-course requirement due to medical, psychological, or compassionate reasons, please email the course instructor. See the undergraduate calendar for information on regulations and procedures for Academic Consideration: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

Accommodation of Religious Obligations: If you are unable to meet an in-course requirement due to religious obligations, please email the course instructor **within two weeks of the start** of the semester to make alternate arrangements. See the undergraduate calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml

Passing grade: Students must obtain a grade of 50% or higher on the combination of the tests and final exam portion of the course in order for the laboratory portion of the course to count towards the final grade.

Missed tests: If you miss a test due to grounds for granting academic consideration or religious accommodation, the weight of the missed test will be added to the final exam. There will be no makeup tests.

Lab Work: You must pass the laboratory safety quiz to be permitted to complete the hands on laboratories. You must attend and complete the hands on laboratory in order to be eligible to complete the required written laboratory report.

Late Lab Reports: Late submissions (without instructor permission based on suitable grounds and documentation) will be penalized. The penalty will depend on how late: 10% for 1-12 hours; 25% for 12-48 hours; 50% for 48-96 hours and 100% after 96 hours.

Previous Year's Lab Work: If this is your second attempt at this course then you have the option to not repeat the experimental labs. You must exercise this option by Friday January 10th (4:00pm) via an email to the instructor (wstiver@). If you exercise this option then your grade from the previous attempt's labs will be used for this attempt. You are still responsible for test and exam related assessment. You may choose this option as the "Reactor Labs" and/or "Noise Lab" (that is you cannot choose this option for just the Batch or just the Reactor System lab – they are a combination in terms of this option).

4 AIMS, OBJECTIVES & GRADUATE ATTRIBUTES

4.0 Calendar Description

Analysis techniques for natural and engineered systems including chemical, physical and biological processes. Mass balance analysis for steady state and unsteady state situations. Analysis under both equilibrium and non-equilibrium conditions. Reactor types including batch, plug-flow, CSTR. Noise pollution, control and prevention.

Prerequisite(s): CHEM*1050, MATH*2270

4.1 Course Aims

This course aims to establish fundamental chemical engineering skills necessary to address environmental engineering systems. The course also aims to introduce basic noise modelling and control approaches.

4.2 Learning Objectives

At the successful completion of this course, the student will have demonstrated the ability to:

1. **Apply (3)** chemical mass balances to a range of environmental engineering components.

2. **Develop (5)** mathematical models of a range of environmental engineering systems.

3. **Develop (5)** computer models (Matlab/Simulink) of environmental engineering systems.

4. **Explain (2)** basic noise control approaches.

5. **Apply (3)** basic noise modelling equations.

6. **Develop (5)** computer models of noise equations.

7. **Demonstrate (3)** safe laboratory practices based on guidance provided.

8. **Produce (4)** experimental results in an interpretable form (effective tables and figures).

9. **Discriminate (4)** between good and not-so-good experimental results and between model and experiment.

10. **Formulate (5)** a credible set of conclusions and recommendations based on experimental objectives.

11. **Prepare (3)** a well-structured laboratory report.

4.3 Graduate Attributes

Successfully completing this course will contribute to the following CEAB Graduate Attributes:

Graduate Attribute	Learning Objectives	Assessment
1. Knowledge Base for Engineering	1, 2, 4, 5	Tests, Exams, Labs
2. Problem Analysis	1, 2, 4, 5	Tests, Exams, Labs
3. Investigation	7, 8, 9, 10, 11	Labs
4. Design	-	
5. Use of Engineering Tools	3, 6, 7	Labs
6. Communication	11	Labs
7. Individual and Teamwork	-	Labs
8. Professionalism	-	
9. Impact of Engineering on Society and the Environment	1-10	Tests, Exams, Labs
10. Ethics and Equity	-	
11. Business & Project Management	-	
12. Life-Long Learning	3, 6	Labs

4.4 Instructor's Role and Responsibility to Students

The instructor's role is to develop and deliver course material in ways that facilitate learning for a variety of students. Selected lecture notes will be made available to students on Courselink/D2L but these are not intended to be stand-alone course notes. During lectures, the instructor will expand and explain the content of notes and provide example problems that supplement posted notes. Scheduled classes will be the principal venue to provide information and feedback for tests and project.

4.5 Students' Learning Responsibilities

Students are expected to take advantage of the learning opportunities provided during lectures and tutorials. Students, especially those having difficulty with the course content, should also make use of other resources recommended by the instructor. Students who do (or may) fall behind due to illness, work, or extra-curricular activities are advised to keep the instructor informed. This will allow the instructor to recommend extra resources in a timely manner and/or provide consideration if appropriate.

4.6 Relationships with other Courses & Labs

Previous Courses:

CHEM*1040/1050: Chemicals are generally pollutants. Chemical

CIS*1500: Programming logic.

ENGG*1500: Manipulating variables and equations is an essential skill.

MATH*2270: Simple differential equations are used throughout the course.

Follow-on Courses:

ENGG*3180: Air quality

ENGG*3590: Water quality

ENGG*3470: Mass transfer operations

ENGG*4330: Air Pollution Control

ENGG*4340: Solid & Hazardous Waste Management

ENGG*4260: Water & Wastewater Treatment Design

5 TEACHING AND LEARNING ACTIVITIES

5.0 Timetable

Lectures:
M, W, F		12:30 – 13:20	THRN 1307

Tutorials & Labs
Monday	Sec 01	13:30 – 15:20	THRN 1002 / 2336 / 1116
Wednesday	Sec 02	13:30 – 15:20	THRN 1002 / 2336 / 1116
Monday	Sec 04	15:30 – 17:20	THRN 1002 / 2336 / 1116
Tuesday	Sec 05	13:30 – 15:20	THRN 1002 / 2336 / 1116

5.1 Lecture Schedule

Lectures

(Approx)	Lecture Topics	Learning Objectives
1	Introduction	ALL
2-5	Mass & Energy Balance Principles	1, 2
6-18	Reactors & Chemical Kinetics	1, 2
19-23	Noise	4, 5
24-29	Equilibrium	1, 2
30-33	Biochemical Reactors	1, 2
34-35	Life Cycle Introduction (time permitted)	1, 2
36	Wrap-up, Course Evaluation	ALL

5.2 Tutorial & Lab Schedule

Week of	Tutorial		Lab
	THRN 1002	**THRN 2336**	**THRN 1116**
Jan 6	Problem Set		
Jan 13	Problem Sets		
Jan 20	Problem Sets Spreadsheet		Batch Reactors (half time)
Jan 27	Problem Sets		
Feb 3		Simulink	Reactor Systems (half students)
Feb 10		Simulink	Reactor Systems (other half)
READING WEEK			
Feb 24	Problem Sets		
Mar 3		Programming	Noise (half)
Mar 10		Programming	Noise (other half)
Mar 17	Problem Sets		
Mar 24	Problem Sets		
Mar 31	Problem Sets		

5.3 Lab Schedule

See Section 5.2

5.4 Other Important Dates

Monday, January 6 2014: First day of class
Monday, February 17 – Friday, February 21 2014: Winter Break
Friday, March 7: last drop date – 40th class
Friday, April 4 2014: last day of class

6 LAB SAFETY

6.0   School of Engineering Policy

Safety is critically important to the School and is the responsibility of all members of the School: faculty, staff and students. As a student in a lab course you are responsible for taking all reasonable safety precautions and following the lab safety rules specific to the lab you are working in. In addition, you are responsible for reporting all safety issues to the laboratory supervisor, GTA or faculty responsible.

If the laboratory rules are not followed, consequences will include removing student's access to the lab. If this results in lab work not being completed, the student will receive a grade of 0.

6.1   ENGG*2560 Specific

Pre-Lab Safety Quiz must be passed prior to starting the lab. You will not be permitted to conduct your lab until all team members have individually passed the quiz (on-line courselink). You may be asked equivalent safety questions in the lab and poor responses may lead to you being asked to leave the lab.

7 ACADEMIC MISCONDUCT

The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

Please note: Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it. Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member.

7.0   Resources

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

A tutorial on Academic Misconduct produced by the Learning Commons can be found at:
http://www.academicintegrity.uoguelph.ca/

Please also review the section on Academic Misconduct in your Engineering Program Guide.

The School of Engineering has adopted a Code of Ethics that can be found at:
http://www.uoguelph.ca/engineering/undergrad-counselling-ethics

8 ACCESSIBILITY

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty and administrators. This relationship is based on respect of individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability for a short-term disability should contact the Centre for Students with Disabilities as soon as possible

For more information, contact CSD at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website: http://www.uoguelph.ca/csd/

9 RECORDING OF MATERIALS

Presentations which are made in relation to course work—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

10 RESOURCES

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs: http://www.uoguelph.ca/registrar/calendars/index.cfm?index