IE 332: Computing in Industrial Engineering

Syllabus for Spring 2016

Course Overview

Computing is fundamental to all engineering endeavors. This course introduces fundamental computing concepts and real-world applications of importance to IE. Students will continue to develop critical thinking, problem solving and engineering skills. Upon completing the course students will have acquired key computing skills that are also applicable to other IE courses, in addition to an understanding of information systems technologies and their roles in business and society. **Prereqs.:** One of CS 156/158/159/180/220 and IE 330.

Instructor	Mario Ventresca E-mail: `mventresca@purdue.edu` Office hours: Tuesdays 1-5pm by appointment Office location: Grissom 292
Lectures	MWF 3:30-4:20pm, PHYS 223
Lab Instructors	• Bryan Chong (`chongb@purdue.edu`) • Dali Guo (`guo364@purdue.edu`) • Mrunal Shah (`shah123@purdue.edu`) Office hours: T 9-10am in GRIS 157C
Labs	All labs are held in Stanley Coulter Hall (SC) 179. • R 9:30-11:20 (Mrunal) • R 11:30-1:20 (Bryan) • R 1:30-3:20 (Bryan) • R 3:30-5:20 (Dali)
Textbook	*Introduction to Information Systems* 5^{th} Ed. (2013), R. Kelly Rainer, Brad Prince, Casey G. Cegielski.
Website	`https://mycourses.purdue.edu/`

***Contacting instructors via email:** Emails must be sent to ALL instructors or you are unlikely to receive any response. To prevent delay or loss by spam blockers, use the subject line (without quotes and appropriate course component): "IE332: lecture/lab/exam/quiz/other"

Learning Outcomes

Upon completing this course students will be able to:

1. Characterize the structure, design, and value of modern computing, information and telecommunication systems.
2. Design basic models using Computer Aided Design software (using AutoCAD).
3. Describe the importance of algorithms and information organization on the performance of IT systems.
4. Create simple dynamic web pages (using HTML, Javascript, CSS and PHP).
5. Characterize and design Entity Relation Diagrams to express database models, as well as implement the design (in MySQL).
6. Compute and interpret database queries (using SQL).
7. Perform basic statistical/machine learning analyses and plots (using R).
8. Build simple discrete event simulation models (with Arena).
9. Understand the potential impact(s) of Enterprise Resource Planning (ERP), Customer Relationship Management (CRM) and Supply Chain Management (SCM) systems.

Grading

This course has five grading components, as shown below. Refer to the tentative course schedule for approximate due dates (to be confirmed during the term).

Learning Item	Item Value	Percentage of Final Grade
Homeworks (3)	8%	24%
Labs (8)	2% each	16%
Group project	30%	30%**
Exam 1	15%	15%
Exam 2	15%	15%

** potential maximum 5% course bonus for exceptional work.

Grade assignment: Your letter grade will be determined as follows, where X is your final percent grade:

Letter Grade	Percentage	Description
A, A+	$90 \leq X$	Excellent. Comprehensive knowledge and understanding of the subject matter.
B, B+	$80 \leq X < 90$	Very Good. Strong knowledge and understanding of the subject matter.
C, C+	$70 \leq X < 80$	Good. Reasonable knowledge and understanding of the subject matter.
D, D+	$60 \leq X < 70$	Marginal. Minimum knowledge and understanding of the subject matter.
F	$X < 60$	Failing. Unacceptable knowledge and understanding of the subject matter.

Within each letter grade your mark will be indicated by a '+' if your numerical grade is in the upper half of the interval. For example, if your final percentage $X \in [85, 89)$ then you will receive a 'B+'. No '-' grades will be given. No grade curving will be conducted.

Class Policies

Attendance: The university class attendance policy is available at

`http://www.purdue.edu/studentregulations/regulations_procedures/classes.html`

- Lecture attendance is expected and is your responsibility. Reading lecture slides alone is typically insufficient to attain a high grade in this class. Many topics are elaborated and discussed in lecture, and the information of these discussions is not posted online. Moreover, some topics are not covered in the textbook and lectures notes and class discussion will be invaluable.
- 100% attendance of labs is mandatory. Each missed lab will result in -2% of your course grade. If a special circumstance arises (e.g., a job interview) then you *may* be able to attend a different lab for that week. To do so, FIRST contact the TAs responsible for the labs and determine if a reschedule is possible. DO NOT attend a different lab without first contacting the TA. You must contact the TA in a timely manner (at least a 3 days in advance) as space is limited - do not assume you will be able to switch labs.
- Be on time for lectures and labs. Late attendance (more than 10 minutes) will be considered as absence. If you are late for class please enter and seat yourself in a fashion that does not disturb the class.

Reading assignments: Students are expected to complete the assigned reading before coming to class. Reading assignments are listed in the syllabus.

Homework: Three homework assignments.

- Homework will NOT be accepted past the due date.
- MUST be done individually, and include ALL references (not including course notes or the textbook), including web pages.
- You are encouraged to discuss with other students, but handing in highly similar work is plagiarism (see below) and will be punished accordingly.
- ALL assignments will be examined by SafeAssign, a plagiarism detection service available in Blackboard. Do **NOT** rewrite the assignment question.
- ALL assignments must be in a SINGLE file of pdf or doc format, ONLY the most recently submitted assignment will be graded. NO scanned documents or pictures will be permitted (at a non-negotiable penalty of zero on the assignment). The only exception is if an assignment question requires an embedded plot/figure.
- **MUST** (otherwise a grade of zero) include as the first page, a cover sheet indicating (in order) the course title, assignment number, date, your name, PUID, and a brief statement indicating:

  "I am aware of, and understand, the Purdue Academic Misconduct Policies and attest that this submitted work is solely my own. I accept any repercussions if found in violation."

Lab quizzes: During lab times.

- Lab quizzes will be posted on Blackboard the week before the lab is due. The quiz must be uploaded to Blackboard before you can start the lab itself and before the indicated due date. Failure to do so will result in an ungraded lab and you will be considered as being absent.
- Background material (e.g., external tutorials) will often be posted well in advance of the lab (esp. for web development and R). You will be notified of these circumstances through Blackboard.

Examinations: There will be two comprehensive exams.

- Both will be held during the indicated lecture time.
- Closed book and no notes or electronic aides of any kind will be permitted.
- Your student ID must be shown during the examination or it will not be graded.
- Examinations written with pencils or other erasable methods will not be permitted for regrade under any circumstance. Please use blue or black ink.
- Make-up examinations are permitted only for documented severe medical reasons. No make-up will be allowed for other reasons, including job interviews.

Group project: The group project will be done in teams of 6 students. Your team members must be indicated by the indicated due date, as shown in the group project description and syllabus schedule. After each phase of the project is completed, each student will submit a confidential survey indicating workload distribution that will be used when deciding individual grades.

Re-grading: Request for regrading an examination or assignment will be considered only with a clearly written explanation, submitted in class only to the instructor and only AFTER at least 24 hours self-evaluation and within SEVEN days from the time the graded work is returned to the class. The group project is not subject to regrading. A regrade request form is available on Blackboard, and must be submitted with a hard-copy of your assignment/exam.

Class conduct: In order to ensure the best learning environment for all, please:

- be courteous to your fellow students and instructors.
- turn off or put your cellular phones on silent mode. If you must answer the phone, please quietly leave the classroom.
- do not use laptops or tablets during class if you intend to play movies, video games, etc. This disrupts nearby students and negatively affects their learning experience and thus is not permitted. Failure to adhere to this request may result in loss of the privilege.
- raise your hand if you have any questions or comments during the lecture and wait until the instructor calls on you.
- do not chatter with friends or purposely disturb other students.
- leave and re-enter the classroom quietly if you must use the restroom. You do not need to ask permission to leave unless during an examination.

Misconduct: Any type of misconduct as defined in Student Conduct (Part 5) of the University Regulations will not be tolerated: `http://www.purdue.edu/studentregulations/`. The instructors will follow the regulations strictly. These are a few examples:

- substituting on a course or exam for another student
- using someone else to write a paper or assignment and submitting it as one's own work, with or without monetary exchange
- giving or receiving answers by use of signals during an exam
- copying with or without the other person's knowledge during an exam
- collaborating with other students on assignments when it is not allowed
- obtaining a test from the exam site, completing and submitting it later
- altering answers on a scored test and submitting it for a regrade
- stealing class assignments from other students and submitting them as one's own
- fabricating data
- destroying or stealing the work of other students
- using the exact language of someone else without the use of quotation marks and without giving proper credit to the author

- plagiarizing published material, class assignments, or lab reports
  - presenting the sequence of ideas or arranging someone else's material (even if expressed in one's own words) without giving appropriate acknowledgment
  - submitting work (in whole or part) written by someone else but representing it as your own

Emergency Procedures

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. Changes about the course will be announced through the Blackboard and/or class mailing list.

In case of emergency:

- To report an emergency, call 911.
- To obtain updates regarding an ongoing emergency, and to sign up for Purdue Alert text messages, view `http://www.purdue.edu/emergency/`
- There are nearly 300 Emergency Telephones outdoors across campus and in parking garages that connect directly to the Purdue Police Department (PUPD). If you feel threatened or need help, push the button and you will be connected immediately.
- If we hear a **fire alarm**, we will immediately suspend class, **evacuate the building**, and proceed outdoors, and away from the building. **Do not use the elevator.**
- If we are notified of a Shelter in Place requirement for a tornado warning, we will suspend class and shelter in the lowest level of this building away from windows and doors.
- If we are notified of a Shelter in Place requirement for a hazardous materials release, or a civil disturbance, including a shooting or other use of weapons, we will suspend class and shelter in our classroom, shutting any open doors or windows, locking or securing the door, and turning off the lights.
- Your course syllabus includes additional preparedness information as it might impact this class, including classroom suspension for severe weather or other emergencies. Please review the syllabus and the Emergency Preparedness website for additional information. `http://www.purdue.edu/ehps/emergency_preparedness/index.html`

Tentative Schedule

Week/ Lab?	Date	Topic	Remark	Reading
	Jan 11	Course Introduction		Ch 1
1	Jan 13	Computing Machines		Ch 2
	Jan 15	Hardware: CPU		TG 1
	Jan 18	Martin Luther King Jr. Day (no class)		
2	Jan 20	Hardware: Storage		TG 1
	Jan 22	Operating Systems	HW 1 Posted	TG 2
	Jan 25	Programming Languages	Submit Group	TG 2
3 ✓	Jan 27	Programming Languages and Software	Project Posted	TG 2
	Jan 29	Computer Science Concepts: Algorithm Correctness		
	Feb 1	Computer Science Concepts: Complexity		
4	Feb 3	Computer Science Concepts: Heuristics and Approximation		
	Feb 5	Simulation		
	Feb 8	Simulation: Monte-Carlo Estimation		
5 ✓	Feb 10	Networks		Ch 6,9
	Feb 12	Networks		Ch 6,9
	Feb 15	Networks	HW 1 Due	Ch 6,9
6 ✓	Feb 17	Networks: Wireless	HW 2 Posted	Ch 8
	Feb 19	Networks: WWW		
	Feb 22	Databases		Ch 5
7	Feb 24	Databases		Ch 5
	Feb 26	Exam 1		
	Feb 29	Databases	Phase I Due	Ch 5
8	Mar 2	Databases		Ch 5
	Mar 4	Databases		Ch 5
	Mar 7	Databases		Ch 5
9 ✓	Mar 9	Analytics		Ch 12, TG 4
	Mar 11	Analytics	HW 2 Due	Ch 12, TG 4
	Mar 14	Spring break (no class)		
10	Mar 16	Spring break (no class)		
	Mar 18	Spring break (no class)		
	Mar 21	Analytics	HW 3 Posted	Ch 12, TG 4
11 ✓	Mar 23	Analytics		Ch 12, TG 4
	Mar 25	Analytics		Ch 12, TG 4
	Mar 28	Computer Aided Design and 3D Printing		
12 ✓	Mar 30	Cloud Computing		TG 3
	Apr 1	Cloud Computing	Phase II Due	TG 3
	Apr 4	ERP/CRM		Ch 10, 11
13	Apr 6	SCM		Ch 10, 11
	Apr 8	SCM		Ch 10, 11
	Apr 11	Security, Privacy and Ethics		Ch 3, 4
14 ✓	Apr 13	Security, Privacy and Ethics		Ch 3, 4
	Apr 15	Security, Privacy and Ethics	HW 3 Due	Ch 3, 4
	Apr 18	Security, Privacy and Ethics		Ch 3, 4
15 ✓	Apr 20	Exam 2		
	Apr 22	Nanotechnology		
	Apr 25	Quantum Computing		
16	Apr 27	Group Presentations		
	Apr 29	Group Presentations	Project Due	