# CSE 453
## Hardware/Software Integrated System Design
Spring 2017
4 Credit Hours

**Instructor:** Dr. Kris Schindler

**Instructor E-Mail:** kds@buffalo.edu

**Course E-Mail:** cse-453@buffalo.edu

*All course related concerns and correspondence should be sent to cse-453@buffalo.edu*

**Office:** Davis 346

**Phone:** (716) 645-3185

**Office Hours:**
Monday 10:00 AM - 10:50 AM
Wednesday 10:00 AM - 10:50 AM
Friday 10:00 AM - 10:50 AM

Additional times by appointment

*Any changes to office hours during the semester will be posted to the class website and announced in class.*

**Class Time:**
Monday 11:00 AM - 11:50 AM
Wednesday 11:00 AM - 11:50 AM
Friday 11:00 AM - 11:50 AM

**Class Location:**
Alumni 97

**Labs:**
Arranged
Students will meet with their team regularly (at least once a week). Each team will arrange days and times in which they can meet. Baldy 19 is available for these meetings.

**Lab Location:**
Baldy 19

**Prerequisites**:
CSE 442 or Permission of Instructor

**Description:**
This is a computer engineering capstone design course where students get practical experience using the skills they have learned in previous courses. Students design and implement a project that requires the integration of hardware and software into a complete system. Bringing skills learned from previous software and hardware oriented courses, students form multidisciplinary workgroups and are given tools, parts, goals, and constraints, all of which define the integrated design setting. These workgroups identify, formulate, and solve the hardware and software problems posted by their project, and defend their realization concepts at key intervals during the project build-out. Projects are built, tested, and delivered to the client. Along the way students must author technical documentation to accompany their project. Each group prepares a 'rollout' presentation, which includes a demonstration of their project in operation. This is a required course for CEN majors.

**Objectives:**
The objectives of this course are to provide a culminating design experience to computer engineering students whereby they:
- integrate hardware and software together into a complete system
- become proficient at writing technical documentation
- consider the ethical, legal, safety, and environmental factors as part of the design process, and then ensure that these criteria are addressed in the system they design
- present their work in front of their peers and clients

**Textbook:**
None

**References:**
Various references will be sited throughout the semester.

**Outcomes:**
At the end of this course, each student should be able to:
- design, build, test, and deliver a system that integrates hardware and software seamlessly into a single product that meets the specifications of the client.
- write technical documentation about a project that can be used to troubleshoot the system and serve as a basis for future upgrades.
- maintain an engineering notebook, documenting the entire design process from inception through delivery.
- understand the ethical, legal, safety, and environmental factors that must be considered as part of the design process.

**URL**:
http://www.cse.buffalo.edu/~kds/cse-453/

**Computer Usage:**
All students are required to have an account on the Computer Science and Engineering Department's Unix/Linux timeshare machines and a UBIT account. These accounts will be used for:
- Project design, development, and implementation
- Documentation
- Communication
- Information will be disseminated via *e-mail* & the CSE 453 website. Students are expected to check their *e-mail* and the CSE 453 website regularly

**Class Participation:**
Class participation is strongly encouraged.

**Academic Integrity:**
All work submitted for CSE 453 must be your own and must be done on a team basis. Sharing work between groups is considered to be a violation of the academic integrity policy. Such a violation will result in automatic failure of the course.

**ABET Outcomes:**
This course is intended to meet outcomes C, D, E, F, H, I, and K for computer engineering as prescribed by the Accreditation Board for Engineering Technology (ABET).

**Grading Policy:**

- Evaluation:
  - Requirements Document - 11 %
  - Design Document - 11 %
  - User Manual or Research Paper - 11 %
  - Final Product - 11 %
  - Engineering Notebook - 11 %
  - Presentation - 11 %
  - Debug Exercise - 11 %
  - Client Assessment - 11 %
  - Progress Reports (Biweekly) - 4 %
  - Attendance for Required Lectures - 4 %
  - Group Peer Review - 4 %
- Letter grades are assigned using the following criteria. The average referenced is calculated using the breakdown shown above (*Evaluation*).
  - A: average ≥ 93.333
  - A-: 93.333 > average ≥ 90
  - B+: 90 > average ≥ 86.667
  - B: 86.667 > average ≥ 83.333
  - B-: 83.333 > average ≥ 80
  - C+: 80 > average ≥ 76.667
  - C: 76.667 > average ≥ 73.333
  - C-: 73.333 > average ≥ 70
  - D+: 70 > average ≥ 66.667
  - D: 66.667 > average ≥ 65
  - F: 65 > average
- At the end of the semester, a curve may be applied to help the class, but not hurt the class. The grading breakdown above represents a worst case scenario. Determination of whether a curve will be applied occurs at the END of the semester after ALL graded components have been graded. Individual components are not curved.
- One team will earn an automatic A in the course. During the presentations, all the students in the class will vote for one project that they feel is the best, based on the quality of the presentation and how well the design meets the project requirements. You may NOT vote for your own team. The team with the highest number of votes will receive an automatic A in the course. Note that this opportunity for the automatic A does not apply to a student who violates the academic integrity policy or takes an incomplete in the course.
- Every student must submit a biweekly peer review of every one of his or her group members.
- Any of the graded components may be prorated based on the confidential biweekly assessments from your teammates (group peer review). If a student on a team is not contributing, their grade may be lower than that of the other members of the team for any of the graded components in the course. Hence, it is critical that every member of the group contribute equally.
- 80% of the required lectures MUST be attended by each student. If you cannot make a required lecture, permission must be granted in writing prior to the lecture. When requesting permission, a valid reason, with appropriate documentation must be given for your absence.
- *Late policy*: A late submission will result in a 50% penalty. After one day, the submission will not be accepted and will result in a grade of zero. A day is defined as 24 hours after the day/time the graded component is due (excluding weekends or school holidays). In addition, no help will be available from the TAs or from the instructor for a submission after its scheduled due date.
- Graded components submitted as hardcopies will be returned during lecture. E-mail will also be sent out with the grade, along with details on how the grade was derived. If you don't pick an assignment up during class, it is your responsibility to pick it up from the instructor during office hours.
- Any graded component may be submitted for regrades no later than one (1) week after it is returned. The sole exception is when an assignment is returned within seven days of the last class of the semester. In this case, the regrade request deadline will end at the end of the last class of the semester. If you don't pick up the assignment on the day it is returned, that does NOT extend the regrade request deadline. Regrade requests must be made using an online form on the CSE 453 website. Requests made without using this form will not be accepted. This form allows you to enter a detailed description of why the material is being submitted for regrade. It is only available during the regrade period outlined above. Regrade requests are intended to correct grading errors, NOT for negotiating a higher grade. When work is submitted for regrade, the entire work may be regraded. Work done in pencil may not be considered for regrade.

**Disabilities:**

If you have a diagnosed disability (physical, learning, or psychological) that will make it difficult for you to carry out the course work as outlined, or that requires accommodations such as recruiting note-takers, readers, or extended time on exams or assignments, please advise the instructor during the first two weeks of the course so that we may review possible arrangements for reasonable accommodations. In addition, if you have not yet done so, contact the Office of Accessibility Resources (formerly the Office of Disability Services).

**Incompletes:**

As per departmental and University policy, Incomplete (I) grades are only given in cases where the student has done satisfactory work, but only lacks one or two assignments/exams because of some sort of unexpected emergency or serious illness at the end of the semester. Do not request an "I" grade unless you believe that you actually fall into this category, and you are prepared to present evidence. Incompletes are given only in these very rare circumstances.

**Professionalism:**

- Students are expected to use professional style in all communications, including email, with course administrators. This includes the proper use of salutations/closing, grammar, and identification of oneself as the author of the correspondence.
- Students are expected to refrain from the use of cell phones or other electronic devices in class unless they are clearly linked to class purposes. Cell phones must remain off or muted during lecture and recitation.