Graduation Composition and Communication Requirement (GCCR)
GCCR PROPOSAL AND CHANGE UNDERGRADUATE PROGRAM FORM

I. General Information:

College:	Engineering	Department (Full name):	Electrical and Computer Engineering
Major Name (full name please):	Computer Engineering	Degree Title:	BSCOE
Formal Option(s), if any:	———	Specialty Field w/in Formal Options, if any:	———
Requested Effective Date:	FALL 2014, ***IF*** RECEIVED BY SENATE COUNCIL BY MONDAY, APRIL 7.		
Contact Person:	Regina Hannemann	Phone: 7-5156	Email: regina.hannemann@uky.edu

II. Parameters of the Graduation Composition and Communication Requirement (GCCR):

The new GCCR replaces the old Graduation Writing Requirement. It is fulfilled by a course or courses specified within a B.A./B.S. degree program. As outlined in draft Senate Rule 5.4.3.1, the GCCR stipulates that students must successfully complete this requirement after achieving sophomore status and prior to graduation. To satisfy the GCCR, students must earn an average grade of C or better on the designated Composition and Communication (C&C) intensive assignments produced in any given course designated as fulfilling some or all of the GCCR. The requirements for GCCR courses include:

- at least 4500 words of English composition (approximately 15 pages total);
- a formal oral assignment *or* a visual assignment;
- an assignment demonstrating information literacy in the discipline;
- a draft/feedback/revision process on GCCR assignments.

The program requirements for the GCCR include:

- at least one specific Program Student Learning Outcome for C&C outcomes;
- a plan for assessing both the writing and oral *or* visual components of the GCCR;
- clear goals, rubrics, and revision plans for GCCR implementation.

Upon GCCR approval, each program will have a version of the following specification listed with its Program Description in the University Bulletin:

> *"**Graduation Composition and Communication Requirement.** Students must complete the Graduation Composition and Communication Requirement as designated for this program. Please consult a college advisor or program advisor for details. See also 'Graduation Composition and Communication Requirement' on p. XX of this Bulletin."*

III. GCCR Information for this Program (by requirement):

A. *List the courses currently used to fulfill the old Graduation Writing Requirement:*

EE 490

B. *GCCR Program Outcomes and brief description:*

1. Please specify the Major/Program Student Learning Outcomes (SLOs) pertaining to Composition & Communication and the GCCR requirement. These are *program* outcomes, not *course* outcomes. Please specify the program-level SLOs for C&C in your program:

An ability to communicate effectively.

2. Please provide a short GCCR description for your majors (limit 1000 characters): Please explain the GCCR requirement in language appropriate for undergraduate majors to understand the specific parameters and justification of your program's GCCR implementation plan:

The outcome will be evaluated in our senior design course EE 490. The students make a series of presentations, write reports (both team and individual), and present posters. The reports/presentations/posters are reviewed by a faculty team. In addition, individual

reports are peer reviewed. The poster presentations are open to all faculty, staff and students. Please also see Section C1

C. *Delivery and Content:*

1. Delivery specification: for your major/program, how will the GCCR be delivered? Please put an X next to the appropriate option. *(Note: it is strongly recommended that GCCR courses be housed within the degree program.)*

- ☐ a. Single required course within program
- ☐ b. multiple required or optional courses within program
- ☐ c. course or courses outside program (i.e., in another program)
- ☐ d. combination of courses inside and outside program
- ☒ e. other (please specify): _

2. Basic Course Information: Please provide the following information for course(s) used to satisfy the GCCR, either in whole or in part:

Course #1: Dept. prefix, number, and course title: EE 490 Electrical Engineering Capstone Design I

- new or existing course? existing (*new courses should be accompanied by a New Course Proposal*)
  - ☐ *if a new course, check here that a New Course Proposal has been submitted for review via eCATS*
- required or optional? required for a certain track
- shared or cross-listed course? no
- projected enrollment per semester: 50-75 students (mix of electrical and computer engineering students)

Course #2 (if applicable): Dept. prefix, number, and course title: CS 499 Computer Science Senior Design. NOTE: CS application attached for this course.

- new or existing course? _____ (*new courses should be accompanied by a New Course Proposal*)
  - ☐ *if a new course, check here that a New Course Proposal has been submitted for review via eCATS*
- required or optional? required for a certain track
- shared or cross-listed course? _____
- projected enrollment per semester: 25 - 55 students (mix of computer science and computer engineering students)

Course #3 (if applicable): Dept. prefix, number, and course title: _____

- new or existing course? _____ (*new courses should be accompanied by a New Course Proposal*)
  - ☐ *if a new course, check here that a New Course Proposal has been submitted for review via eCATS*
- required or optional? _____
- shared or cross-listed course? _____
- projected enrollment per semester: _____

3. Shared courses: If the GCCR course(s) is/are shared from *outside* the program, please specify the related department or program that will be delivering the course(s). Please provide the following:

- **Contact information of providing program:**

  _____

- **Resources:** what are the resource implications for the proposed GCCR course(s), including any projected budget or staffing needs? If multiple units/programs will collaborate in offering the GCCR course(s), please specify the resource contribution of each participating program.

  _____

- **Memorandum of Understanding/Letter of Agreement**: Attach formal documentation of agreement between the providing and receiving programs, specifying the delivery mechanisms and resources allocated for the specified GCCR course(s) in the respective programs (include with attachments).

  Date of agreement: _____

4. Syllabi: Please provide a sample syllabus for each course that will be designated to fulfill the GCCR. Make sure the following things are clearly indicated on the syllabi for ease of review and approval (check off each):

- the GCCR assignments are highlighted in the syllabus and course calendar;
- the GCCR assignments meet the minimum workload requirements as specified by the Senate Rules for GCCR courses (see the draft Senate GCCR rule linked here);
- the elements are specified in the syllabus that fulfill the GCCR requirement for a clear draft/feedback/revision process;
- the grade level requirements for the GCCR are specified on the syllabus (i.e., an average of C or better is required on GCCR

assignments for credit);
- the course or sequence of courses are specified to be completed after the first year (i.e. to be completed after completing 30 credit hours) for GCCR credit;
- the course syllabus specifies "This course provides full/partial GCCR credit for the XXX major/program"
  - if the course provides partial GCCR credit, the fulfilled portion of the GCCR must be specified and the other components of the GCCR for the program must be specified: e.g. "This course provides partial credit for the written component of the GCCR for the XXX major/program in conjunction with Course 2"

5. Instructional plan: Summarize the instructional plan for teaching the C&C skills specified in the program SLOs and delivered in the course(s). Include the following information in **brief** statements (200 words or less). Information can be cut-and-pasted from the relevant sample syllabus with indications **where** on the syllabus it is found:

- overview of delivery model: summarize how the GCCR will be delivered for **all** program majors: explain how the delivery model is appropriate for the major/program and how it is offered at an appropriate level (e.g. required course(s), capstone course, skills practicum sequence of courses, etc.):

see extra file

- assignments: overview or list of the assignments to be required for the GCCR (e.g. papers, reports, presentations, videos, etc.), with a summary of how these GCCR assignments appropriately meet the disciplinary and professional expectations of the major/program:

see extra file

- revision: description of the draft/feedback/revision plan for the GCCR assignments (e.g. peer review with instructor grading & feedback; essay drafting with mandatory revision; peer presentations; etc.):

see extra file

- other information helpful for reviewing the proposal:

see extra file

D. Assessment:

In addition to providing the relevant program-level SLOs under III.B, please specify the assessment plan at the program level for the proposed course(s) and content. Provide the following:

- specify the assessment schedule (e.g., every 3 semesters; biennially):

annual prior to start of fall semester (EE490 is taught in fall)

- identify the internal assessment authority (e.g. curriculum committee, Undergraduate Studies Committee):

Instructor Team and Directors of Undergraduate Studies for Electrical Engineering and Computer Engineering

- if the GCCR course(s) is/are shared, specify the assessment relationship between the providing and receiving programs: explain how the assessment standards of the receiving program will be implemented for the provided course(s):

N/A

Signature Routing Log

General Information:

GCCR Proposal Name (course prefix & number, program major & degree):	EE 490, Electrcial Engineering, BSE
Contact Person Name:	Regina Hannemann
Phone:	7-5156
Email:	regina.hannemann@uky.edu

Instructions:

Identify the groups or individuals reviewing the proposal; record the date of review; provide a contact person for each entry. On the approval process, please note:

- Proposals approved by Programs and Colleges will proceed to the GCCR Advisory Committee for expedited review and approval, and then they will be sent directly to the Senate Council Office. Program Changes will then be posted on a web transmittal for final Senate approval in time for inclusion in the Fall 2014 Course Bulletin.
- New Course Proposals for the GCCR will still require review and approval by the Undergraduate Council. This review will run parallel to GCCR Program Change review.
- In cases where new GCCR courses will be under review for implementation after Fall 2014, related GCCR Program Changes can still be approved for Fall 2014 as noted "*pending approval of appropriate GCCR courses.*"

Internal College Reviews and Course Sharing and Cross-listing Reviews:

Reviewing Group	Date Reviewed	Contact Person (name/phone/email)
Home Program *review by Chair or DUS, etc.*	2-14-14	Bob Heath / 7-3124 / heath@engr.uky.edu
Providing Program *(if different from Home Program)*		/ /
Cross-listing Program *(if applicable)*		/ /
College Dean	3/24/14	Kimberly Anderson, Assoc Dean / 7-1864 / kimberly.anderson@uky.edu
		/ /

Administrative Reviews:

Reviewing Group	Date Approved	Approval of Revision/ Pending Approval[1]
GCCR Advisory Committee	4/2/2014	

Comments:

[1] *Use this space to indicate approval of revisions made subsequent to that group's review, if deemed necessary by the revising group; and/or any Program Change approvals with GCCR course approvals pending.*

Section C1

Computer Engineering Students can choose between two Capstone options: The Electrical Engineering Capstone Design or the Computer Science Capstone Design. Students choosing the EE490/491 sequence (electrical engineering capstone) will fulfill their GCCR with the EE490 course. Students choosing the CS499 senior design course will need to take the GCCR course required by the CS program to fulfill their GCCR requirement.

Section C5

Bullet 1 Overview

This course is the first of a two-semester Capstone Sequence which can be chosen as the capstone option for Computer Engineering students. All students in this option will also gain GCCR credit. Students choosing the CS senior design option, must take the CS option for GCCR credit.

Bullet 2 Assignments

1) Each student needs to keep a labbook to note all research, thoughts, ideas etc for the project. Labbooks are common in industry for this purpose and often will also be used for prove of Intellectual Property. (Written, Individual)

2) Each Student needs to write a research report related to their project of at least 1000 words and must include pictures, graphs and tables to explain their findings. (Written, Individual)

3) Teams need to submit two written project proposals (Written, Team)and also present their proposals in a formal presentation. (Oral, digital slides, Team)

4) Teams need to submit a written requirement report (Written, Team) and make a formal presentation on their project requirements. (Oral, digital slides, Team)

5) Teams need to submit a written Preliminary Design Report (PDR) (Written, Team) and make a formal presentation on their preliminary design. (Oral, digital slides, Team)

6) Teams need to present their design (with a poster) at the end of the semester. (Oral, Poster, Display of Project, Team)

Bullet 3 Revision

For 1) above: The labbook is a "living" document. Students need to improve after each grading session.

For 2) above: The individual research reports go through a formal draft, peer review, final report sequence. Each individual report is peer reviewed by at least 2 other students. The instructors do final grading. Each individual report is reviewed by one instructor.

For 4) above: Presentation: each individual student must submit review notes for about half of all projects in that semester (total number between 8-15). These reviews are "bundled" together by the TA and sent to the teams.

For 3), 4), 5) above: (Reports) These documents build on each other. Most parts of the (selected) proposal will be included in the requirements report; the requirements report is part of the PDR (and that will feed into a report in the second semester). Therefore there is, with each grading, an "automated" review for the next report built in. Two instructors review each report.

For 4) above: The PDR includes a draft version submitted to the instructors. Instructors review and return the PDR draft to the teams for final changes.

For 3), 4), 5) above: (Presentations) Students will get immediate feedback on their project during these presentations. This includes technical feedback as well as presentation feedback.

Bullet 4 Other Information

In engineering, reports are inherently multimodal. Reports with charts, tables and graphs are everyday communication tools. Block diagrams, flowcharts, decision tables, circuit graphs, etc. are needed to relay much of the information in a short and concise way to the audience.

Info for GCCR reviewers:

This syllabus will be submitted to the eCAT system in the next few days to incorporate a change in the Course Description. In this syllabus the old pre-req is canceled out and the new pre-req is inserted in magenta. We also added in the note that this course now covers the GCCR requirements (also in magenta.)

GCCR assignments and related topics are highlighted in yellow in this syllabus and in the accompanying schedule.

This syllabus has been submitted twice to the GCCR committee, once for the Electrical Engineering degree and once for the Computer Engineering degree. Each submission has been accompanied by the GCCR proposal form which took the differences in the degrees into account.

EE490 – Fall 2014
Electrical Engineering Capstone Design I
Syllabus

Instructor

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Office Hours:
T 9:30am - 11:00am
W 9:30am - 11:00am
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Co–Instructor

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T 1:30-2:30
W 1:30-2:30
R 9:00-10:00
or by appointment

TA

Minghao Wang Office (for office hours, otherwise, contact him by email): TBD
E-Mail:
wmh199014@uky.edu
Office Hours:
TBD

Website and Mailing List

Blackboard will be used in this class. Blackboard is accessible through the "link blue" on the UK website.

Blackboard will be used as a mailinglist. All students are responsible to check their UK mail account on a regular basis (Once a day is recommended).

Text

1. Ralph M. Ford and Chris S. Coulston; "Design for Electrical and Computer Engineers"; McGraw-Hill; 2008; ISBN 978–0–07–338035–3

Lectures

TR (3:30–4:45 PM) Whitehall Classroom Bldg 238-CB

Course Description

The first semester of a two–semester capstone design sequence for senior students in electrical engineering with an emphasis on the engineering design processes. Topics important in product design and manufacturing are included, including considerations of economics, safety, and communication. Students are expected to formally propose a design project that includes a problem definition that incorporates engineering standards and realistic constraints. Students work in teams to develop and complete the designs. Lecture, two hours, laboratory, three hours per week.

This course provides full GCCR credit for BSEE and BSCOE.

old Pre-req~~Pre-req: Engineering standing and completion of all other required 400-level EE courses, excluding EE491.~~

suggested new Pre-req Pre-req for Electrical Engineers: Engineering standing and completion of at least 3 of the following classes: EE380, EE415, EE421, EE461, and EE468.

Pre-req for Computer Engineers: Engineering standing and completion of at least 3 of the following classes: EE/CS380, EE383, EE421, EE461, and EE/CS480.

Topics

Product Specifications
Project Planning and Management
Team Building
Engineering Economic Analysis
Concept Development and Selection for Product Design
Technical Communication, Written and Verbal
Design for Manufacturing
Product LifeCycle Design
Safety and Ergonomics
Product Liability
Patents and Intellectual Property
Computational Tools
Reliability and Statistics in Design

Outcome

1. Demonstrate good engineering judgement in the design process.
2. Develop project specifications and work plans for completing the design as a team.
3. Apply varied subject knowledge in electrical engineering to the solution of engineering problems requiring interdisciplinary efforts.
4. Identify and describe aspects of environment, safety, quality, cost, and contemporary issues in design.
5. Articulate the principles of teamwork.
6. Solve openended engineering problems, such as those where information is under–specified or over–specified, and where methodologies are not specified.

Class Content and Objective:

The content of Senior Design has two aspects (1) Engineering Design Theory and (2) Design Experience. A lecture series, coupled with sub-tasks and class discussion, covering Design Theory will be provided twice a week for most of the semester. The theory will detail the individual processes involved in going from a problem to be solved to a final Solution. Examples will be given and the design theory will be relevant to the project tasks. Another aspect of the design theory will cover group dynamics, which include brainstorming and mind mapping techniques. The Design Experience will be the goal of the students to implement their ideas into an operational system. System performance and its impact on society will also be part of the students experience.

Students enrolled in EE 490 will be grouped in teams of 4-6 students each. Each team will submit and present 1) two project proposals (one of these two will be the selected project for the team), 2) a Specifications and Requirements Report, 3) Preliminary Design Report (PDR), and 4) a Critical Design Report (CDR). The group will need to present to the class and the faculty advisors and should prove understanding of their project. **Some of the presentations will be conducted outside of lecture time. Failing to show deep understanding of project scope, specificatio**

Group Responsibilities: The class will be subdivided teams. Each group will submit a specification report for approval. The groups will define the test protocol that their projects will be tested with. The groups will define performance measures on which the projects will be graded. Each group will submit a preliminary design review report and present the status of the project. Projects will be graded on creativity, innovation, quality of construction and performance. The group size must be 4 to 6 members.

Individual Responsibilities: Each individual is responsible for designing, building and debugging their component of the project and for preparing a section of the team reports. Each individual is responsible for his/her own notebook. Each individual must prepare an individual research report.

Presentation: Each student will present, test and demonstrate their contribution to the design. As part of the subtasks, they will also present and demonstrate the design at an organized competition or conference. All designs will be entered into the ECE Senior Design Day competition which is held the Friday before Finals Week, every semester.

Design Journal or Lab Notebook*

A design journal is the "diary" of intellectual contributions to your project. The journal can be used for legal purposes (described below), but is also an great resource for writing reports, having back–up solutions and simply help you keep track of work.The purpose of the Journal is to follow the required practices of industrial or academic research and development laboratories, where complete and accurate records of laboratory work are vital. The lab journal is a legally recognized paper that is essential in documenting project progress, discoveries, billable work time, and patent disclosures. Some companies require lab notebooks to be officially notarized and filed so that any legal questions later on can refer directly to the original, unaltered notebook entries. Even if you end up working for a company that does not require a notebook or journal, it is worth getting in the habit as a way to document your own work and to organize your development activities.

Required form: The pages of the Journal must be bound (not loose leaf or spiral) and should be numbered consecutively. The notebook entries must be in ink, and no pages should be left blank between entries. Begin the entries for each work day on a new page, giving the date and time, your name, the topic, and in the case of a meeting, the names of all of the people present. The entries themselves can be full of written comments, calculations, sketches, data tables, speculative ideas, brainstorms, design alternatives, contact information (email, phone, URLs, etc.), references to electronic files, schematic diagrams, and so forth.

In case some of the data or calculations written in the Journal turn out to be in error, do not tear out the page or completely obliterate the entries: a single line through the error is preferred. This way there is no question regarding the legitimacy and completeness of the notebook material. Furthermore, you will not be penalized in this course for having lined-out errors and corrections in your notebook.

Each student's Journal will be collected at least two times during the semester (unannounced). Students are required to work in the notebook whenever they work on their projects. Students should be able to show their work in the journal at any time. The journals will be evaluated on the following criteria:

- Overall Form: Notebook bound, pages numbered, entries in ink, no blank pages between entries, entries for a new date start on a new page; writing legible; dates, times, topics, and names indicated clearly.

- Thoroughness: Cogent sequence of activities and meetings; presence of design ideas, data collection, data analysis, and schedule planning; examples of design results and conclusions.

- Creativity and Insight: Journal entries show a connection between initial ideas, preliminary activities and the resulting design and implementation decisions.

Self/Peer Reviews*

Personnel reviews are a part of project management responsibilities. You will be having regular reviews with your boss and will need to provide reviews of those you supervise. This is often a difficult — but necessary — thing to do. To give you some practice we are asking you to complete an evaluation form for yourself and your project partners. The grades you give to yourself and your project partners will be confidential and used solely by the course instructor. There will be three evaluations performed during the semester.

Report Format

The format of the reports and proposals will be discussed in class. The final form will be an amendment to this syllabus and handed out to the students in class and will be published on the class' webpage.

Assignments

There will be different assignments throughout the semester. These will help the students to train some of the skills they need to finish their projects with all deliverables. Assignments will be announced in class and/or via the class website. Assignments will be marked as team or individual work. No student is allowed to submit an individual work for a team assignment. All team members are responsible for team assignments.

Attendance

Attendance of all class lectures is required. Failing to attend lecture will result in a reduced attendance grade for the student.

Grade

	Team grade	individual grade
Project Specifications and Requirements	30%	
Preliminary Design	30%	
Assignments, Self/Peer Evaluations, Feedback from faculty advisor, attendance, individual presentations, Exam, Lab Notebook		35%
ECE Senior Design Day	5%	
Total	65% Team	35% Individual

For each student, if there is any curve in the final grade, none of the above individual parts of the final grade can be a failing grade without grade penalty. For a failing grade in any one of the individual parts, the final curved grade will be reduced by one letter grade. A failing grade in attendance and a failing grade in the lab book grade will reduce the final curved grade will be reduced by two letter grades.

To pass the course, students must earn an average grade of C or higher on Composition and Communication assignments (Labbook, individual research report, Project Proposals, Project Proposal Presentation, Requirements Report, Requirements Presentation, Preliminary Design Report, Preliminary Design Presentation, Poster Presentation at ECE Senior Design Day).

The final letter grade will be:

A: 90%–100%
B: 80%–89%
C: 70%–79%
D: 60%–69%
E: 59% or below

Classroom Behavior, Decorum and Civility

Students and faculty are expected to treat everyone present in the classroom with respect and civility. Disparate treatment will not be tolerated. Disparate treatment occurs when one or more persons treat an individual less favorably on the basis of their actual or perceived race, sex, age, color, national origin, religion, disability, veteran status, and/or sexual orientation. All interactions should be characterized

by respect for, and consideration of, others present in the classroom.

Cheating and Plagiarism

Cheating — claiming another individual's work as your own or permitting another person to claim your work. **Plagiarism** — claiming another person's work, writing or ideas as your own. This includes material from the Internet or other digital media.

Cheating and plagiarism will not be tolerated at this university. Please check out the new (effective since Fall 2006) Academic Offenses Policy at
http://www.chem.uky.edu/research/grossman/acadoffenses/index.htm .

Classroom and Learning Accomodations

If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a Letter of Accommodation from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, jkarnes@uky.edu) for coordination of campus disability services available to students with disabilities.

Announcements

Announcements such as homework assignments, required attendance, class cancellations, etc. will be made in class and/or via the Blackboard and /or via email. Check regularly for updates (recommended: email twice daily, Blackboard once a day).

EE490 – Fall
Electrical Engineering Design
Tentative Schedule

General/*F2013*

date	Topic	Deliverable
1 week before	*Homework (I):* Student Profiles *Homework (I):* Personality Type	
R *8 - 29* day 1	Introduction, Syllabus, Lect 1 *Book:* Chapter 1 "The Engineering Design Process" TA: take student pictures	HW due (I): Student Profiles HW due (I): Personality Type
F *8 - 30*	Publish Student Profiles	
T *9 - 3* day 2 day 2	Lect 2 *Activity:* Teams and Design Processes "Marshmallow Challenge" *Homework (I/T):* Team Selection	
R *9 - 5* day 3	Lect 3 *Book:* Chapter 9 "Teams and Teamwork" *Homework (I):* Re-read Chapter 9 *Homework (I):* Read Chapter Appendix B	HW due (I/T): Team Selection Forms (on paper during class time)
F *9 - 6*	Announce teams *Homework (T):* Develop Team Process Guidelines (chapter 9.4, 1st bullet can be ignored for now)	
T *9 - 10* day 4	Lect 4 example AHPs *Book:* Appendix B *Activity:* (Vacation Plan AHP) See Homework *Homework (T):* Project Selection Process (AHP) Select first and second choice project for team	HW due (T): Team Process Guidelines
R *9 - 12* day 5	Lect 5 *Book:* Chapter 2 *Homework (I):* Read Chapter 2 *Homework (I):* Read Chapter 3 *Homework (T):* Project Proposal time slots *Homework (T):* Project Proposal for 1st and 2nd choice projects	HW due (T): Project Selection Process (AHP)

[T]: Team Effort; [I]: Individual Effort

date	Topic	Deliverable
T *9 - 17* day 6	Q and A Session on Project Proposals	
R *9 - 19* day 7	Work in Teams (WIT)	
F *9 - 20*		*HW due (T):* Project Proposal
M *9 - 23*	Team Proposal Presentations 1.5 hours for three teams	
T *9 - 24* day 8	Team Proposal Presentations 1.5 hours for three teams *Homework (I):* Read IEEE Std 1233 *Homework (I):* Take Quiz on IEEE Std 1233	
W *9 - 25*	Announce Projects	
R *9 - 26* day 9	Lect 6 *Book:* Chapter 3 *Homework (T):* Team Logo and Name *Homework (T):* Fine Tune Problem Statement (chap. 2.7)	HW due (I): Quiz on Std 1233
T *10 - 1* day 10	Lect 7 *Book:* Chapter 3 *Homework (T):* Engineering Requirements	HW due (T): Team Logo and Name HW due (T): Problem Statement
R *10 - 3* day 11	Lect 8 *Book:* Chapter 4 *Activity:* Brainstorm *Homework (T):* Submit Brainstorming Notes *Homework (T):* PDR *Homework (I):* Self/Peer Review 1	HW due (T): Engineering Requirements
F *10 - 4*		HW due (T): Results of Brainstorming Activity
T *10 - 8* day 12	WIT *Homework (I):* Read Chapter 5	HW due (I): Self/Peer Review 1

[T]: Team Effort; [I]: Individual Effort

Date	Topic	Deliverable
R *10 - 10* day 13	WIT *Homework (I):* Individual Research Paper Request *Homework (I):* Read Chapter 12	
M *10 - 14*	*Homework (I):* Presentation Feedback	
T *10 - 15* day 14	Requirements Presentations Tuesday Group (Thursday Group: WIT)	HW due (T): Requirements Report HW due (T): Requirements Slides
W *10 - 16*		HW due (I): Individual Research Request
R *10 - 17* day 15	Requirements Presentations Thursday Group (Tuesday Group: WIT)	
T *10 - 22* day 16	Requirements Presentations Tuesday Group (Thursday Group: WIT)	
R *10 - 24* day 17	Requirements Presentations Thursday Group (Tuesday Group: WIT) *Homework (I):* Read Chapter 6	
F *10 - 25*		HW due (I): Presentation Feedback
T *10 - 29* day 18	WIT	HW due (I): Individual Research Paper draft version
R *10 - 31* day 19	WIT *Homework (T):* PDR *Homework (I):* Read Chapter 10	HW due (I): Individual Research Paper final version
T *11 - 5* day 20	WIT *Homework (I):* Self/Peer Review 2 *Homework (I):* Read Chapter 7	
R *11 - 7* day 21	Q and A PDR and Individual Research	HW due (I): Self/Peer Review 2

[T]: Team Effort; [I]: Individual Effort

Date	Topic	Deliverable
T *11 - 12* day 22	WIT	
R *11 - 14* day 23	WIT	HW due (T): PDR draft version
T *11 - 19* day 24	WIT	
W *11 - 20*	Return PDR draft to students	
R *11 - 21* day 25	WIT	
T *11 - 26* day 26	WIT	HW due (T): PDR final version
R *11-28*		*Thanksgiving*
M *12 - 2*	Team PDR Presentations (1/2 hour per team)	HW due (T): PDR Presentation Slides
T *12 - 3* day 27	Team PDR Presentations (1/2 hour per team) (non-presenters: WIT)	
W *12 - 4*	Team PDR Presentations (1/2 hour per team)	
R *12 - 5* day 28	Lect "Poster Presentations" *Homework (T):* Poster for Senior Design Day	
T *12 - 10* day 29	WIT *Homework (I):* Self/Peer Review 3	
W *12 - 11*		HW due (T): Poster
R *12 - 13* day 30	WIT	HW due (I): Self/Peer Review 3
F *12 - 14*	Senior Design Day (8am – 12pm)	Show parts of your design First Studies, Tests etc
11 – 16 Dec		Finals Week

Note: The CS application is attached since Computer Engineering will also be using this course for some of their students

Graduation Composition and Communication Requirement (GCCR)
GCCR PROPOSAL AND CHANGE UNDERGRADUATE PROGRAM FORM

I. General Information:

College:	Engineering	Department (Full name):	Computer Science
Major Name (full name please):	Computer Science	Degree Title:	BSCS
Formal Option(s), if any:	———	Specialty Field w/in Formal Options, if any:	———
Requested Effective Date:	FALL 2014, ***IF*** RECEIVED BY SENATE COUNCIL BY MONDAY, APRIL 7.		
Contact Person:	Jerzy W Jaromczyk	Phone: 7-1186	Email: jurek@cs.uky.edu

II. Parameters of the Graduation Composition and Communication Requirement (GCCR):

The new GCCR replaces the old Graduation Writing Requirement. It is fulfilled by a course or courses specified within a B.A./B.S. degree program. As outlined in draft Senate Rule 5.4.3.1, the GCCR stipulates that students must successfully complete this requirement after achieving sophomore status and prior to graduation. To satisfy the GCCR, students must earn an average grade of C or better on the designated Composition and Communication (C&C) intensive assignments produced in any given course designated as fulfilling some or all of the GCCR. The requirements for GCCR courses include:

- at least 4500 words of English composition (approximately 15 pages total);
- a formal oral assignment *or* a visual assignment;
- an assignment demonstrating information literacy in the discipline;
- a draft/feedback/revision process on GCCR assignments.

The program requirements for the GCCR include:

- at least one specific Program Student Learning Outcome for C&C outcomes;
- a plan for assessing both the writing and oral *or* visual components of the GCCR;
- clear goals, rubrics, and revision plans for GCCR implementation.

Upon GCCR approval, each program will have a version of the following specification listed with its Program Description in the University Bulletin:

> *"**Graduation Composition and Communication Requirement.** Students must complete the Graduation Composition and Communication Requirement as designated for this program. Please consult a college advisor or program advisor for details. See also 'Graduation Composition and Communication Requirement' on p. XX of this Bulletin."*

III. GCCR Information for this Program (by requirement):

A. *List the courses currently used to fulfill the old Graduation Writing Requirement:*

UK courses approved for GWR

B. *GCCR Program Outcomes and brief description:*

1. Please specify the Major/Program Student Learning Outcomes (SLOs) pertaining to Composition & Communication and the GCCR requirement. These are *program* outcomes, not *course* outcomes. Please specify the program-level SLOs for C&C in your program:

An ability to communicate effectively with a range of audiences

2. Please provide a short GCCR description for your majors (limit 1000 characters): Please explain the GCCR requirement in language appropriate for undergraduate majors to understand the specific parameters and justification of your program's GCCR implementation plan:

The GCCR requirement for Computer Science majors is satisfied by successful completion of CS 499 Senior Design. This capstone course integrates communication instruction and communication activities in ways that enhance learning of technical content. Multimodal communication is stressed including (1) technical writing, and (2) oral and visual presentation to peers and general audiences. The students will work on assignments with substantial communication components and requirements, will prepare and deliver presentations, and write reports (both team and individual) relevant to their major-specific projects. The

reports/presentations will be reviewed by the Instructor Team and assessed based on rubrics.

C. *Delivery and Content:*

1. Delivery specification: for your major/program, how will the GCCR be delivered? Please put an X next to the appropriate option. *(Note: it is strongly recommended that GCCR courses be housed within the degree program.)*	☒ a. Single required course within program
	☐ b. multiple required or optional courses within program
	☐ c. course or courses outside program (i.e., in another program)
	☐ d. combination of courses inside and outside program
	☐ e. other (please specify): _

2. Basic Course Information: Please provide the following information for course(s) used to satisfy the GCCR, either in whole or in part:

Course #1: Dept. prefix, number, and course title: CS 499 Senior Design

- new or existing course? existing (*new courses should be accompanied by a New Course Proposal*)
  - ☐ *if a new course, check here that a New Course Proposal has been submitted for review via eCATS*
- required or optional? required
- shared or cross-listed course? no
- projected enrollment per semester: 25-55 students (primarily computer science, some computer engineering students)

Course #2 (if applicable): Dept. prefix, number, and course title: _____

- new or existing course? _____ (*new courses should be accompanied by a New Course Proposal*)
  - ☐ *if a new course, check here that a New Course Proposal has been submitted for review via eCATS*
- required or optional? _____
- shared or cross-listed course? _____
- projected enrollment per semester: _____

Course #3 (if applicable): Dept. prefix, number, and course title: _____

- new or existing course? _____ (*new courses should be accompanied by a New Course Proposal*)
  - ☐ *if a new course, check here that a New Course Proposal has been submitted for review via eCATS*
- required or optional? _____
- shared or cross-listed course? _____
- projected enrollment per semester: _____

3. Shared courses: If the GCCR course(s) is/are shared from *outside* the program, please specify the related department or program that will be delivering the course(s). Please provide the following:

- **Contact information of providing program:**

_____

- **Resources:** what are the resource implications for the proposed GCCR course(s), including any projected budget or staffing needs? If multiple units/programs will collaborate in offering the GCCR course(s), please specify the resource contribution of each participating program.

_____

- **Memorandum of Understanding/Letter of Agreement**: Attach formal documentation of agreement between the providing and receiving programs, specifying the delivery mechanisms and resources allocated for the specified GCCR course(s) in the respective programs (include with attachments).

Date of agreement: _____

4. Syllabi: Please provide a sample syllabus for each course that will be designated to fulfill the GCCR. Make sure the following things are clearly indicated on the syllabi for ease of review and approval (check off each):

- the GCCR assignments are highlighted in the syllabus and course calendar;
- the GCCR assignments meet the minimum workload requirements as specified by the Senate Rules for GCCR courses (see the draft Senate GCCR rule linked here);
- the elements are specified in the syllabus that fulfill the GCCR requirement for a clear draft/feedback/revision process;
- the grade level requirements for the GCCR are specified on the syllabus (i.e., an average of C or better is required on GCCR assignments for credit);

- the course or sequence of courses are specified to be completed after the first year (i.e. to be completed after completing 30 credit hours) for GCCR credit;
- the course syllabus specifies "This course provides full/partial GCCR credit for the XXX major/program"
  - if the course provides partial GCCR credit, the fulfilled portion of the GCCR must be specified and the other components of the GCCR for the program must be specified: e.g. "This course provides partial credit for the written component of the GCCR for the XXX major/program in conjunction with Course 2"

5. Instructional plan: Summarize the instructional plan for teaching the C&C skills specified in the program SLOs and delivered in the course(s). Include the following information in **brief** statements (200 words or less). Information can be cut-and-pasted from the relevant sample syllabus with indications **where** on the syllabus it is found:

- overview of delivery model: summarize how the GCCR will be delivered for **all** program majors: explain how the delivery model is appropriate for the major/program and how it is offered at an appropriate level (e.g. required course(s), capstone course, skills practicum sequence of courses, etc.):

see the attached file

- assignments: overview or list of the assignments to be required for the GCCR (e.g. papers, reports, presentations, videos, etc.), with a summary of how these GCCR assignments appropriately meet the disciplinary and professional expectations of the major/program:

see the attached file

- revision: description of the draft/feedback/revision plan for the GCCR assignments (e.g. peer review with instructor grading & feedback; essay drafting with mandatory revision; peer presentations; etc.):

see the attached file

- other information helpful for reviewing the proposal:

see the attached file

D. Assessment:

In addition to providing the relevant program-level SLOs under III.B, please specify the assessment plan at the program level for the proposed course(s) and content. Provide the following:

- specify the assessment schedule (e.g., every 3 semesters; biennially):

annually (CS 499 will be offered at least once a year)

- identify the internal assessment authority (e.g. curriculum committee, Undergraduate Studies Committee):

Instructor Team (including a representative of the Computer Engineering when requested)

- if the GCCR course(s) is/are shared, specify the assessment relationship between the providing and receiving programs: explain how the assessment standards of the receiving program will be implemented for the provided course(s):

N/A

Signature Routing Log

General Information:

GCCR Proposal Name (course prefix & number, program major & degree):	CS 499, Computer Science, BSCS
Contact Person Name:	Jerzy W Jaromczyk
Phone:	7-1186
Email:	jurek@cs.uky.edu

Instructions:

Identify the groups or individuals reviewing the proposal; record the date of review; provide a contact person for each entry. On the approval process, please note:

- Proposals approved by Programs and Colleges will proceed to the GCCR Advisory Committee for expedited review and approval, and then they will be sent directly to the Senate Council Office. Program Changes will then be posted on a web transmittal for final Senate approval in time for inclusion in the Fall 2014 Course Bulletin.
- New Course Proposals for the GCCR will still require review and approval by the Undergraduate Council. This review will run parallel to GCCR Program Change review.
- In cases where new GCCR courses will be under review for implementation after Fall 2014, related GCCR Program Changes can still be approved for Fall 2014 as noted "*pending approval of appropriate GCCR courses.*"

Internal College Reviews and Course Sharing and Cross-listing Reviews:

Reviewing Group	Date Reviewed	Contact Person (name/phone/email)
Home Program *review by Chair or DUS, etc.*	3-16-2014	Jerzy W Jaromczyk / 7-1186 / jurek@cs.uky.edu
Providing Program *(if different from Home Program)*		/ /
Cross-listing Program *(if applicable)*		/ /
College Dean	March 23, 2014	Kimberly Anderson, Assoc Dean / 7-1864 / kimberly.anderson@uky.edu
		/ /

Administrative Reviews:

Reviewing Group	Date Approved	Approval of Revision/ Pending Approval[1]
GCCR Advisory Committee		

Comments:

_____

[1] *Use this space to indicate approval of revisions made subsequent to that group's review, if deemed necessary by the revising group; and/or any Program Change approvals with GCCR course approvals pending.*

CS 499 Senior Design Project
Sample syllabus

Instructor

Paul Piwowarski (www.cs.uky.edu/~paulp).
Office: 773B FPAT (Anderson Tower)
Office hours: see my web page

Course information

Course homepage http://www.cs.uky.edu/~paulp/CS499/index.html

Course: CS 499 Senior Design Project
Section: 001
Meets: MWF 12:00-12:50
Location: 207 RGAN (Ralph G Anderson)
Section: 002
Meets: MWF 1:00-1:50
Location: 207 RGAN (Ralph G Anderson)

Bulletin Description: Projects to design and implement complex systems of current interest to computer scientists. Students will work in small groups. 3 credits.

Prerequisites: CS 315 and engineering standing

Course Description: This is a capstone course with a large software and substantial technical, communication and composition components. Students will work in small groups to design and implement projects of interest to industry and computer scientists. The course will also provide a high-level overview of the software engineering discipline. Presenters and guest speakers will provide background on the industry and computer science profession. CS 499 is a required course for all CS majors --typically taken at the last semester of their study-- and it integrates technical aspects of computer science with communication and composition assignments and activities relevant to the computer science discipline. This course provides full GCCR credit for the Computer Science major and for Computer Engineering students who opt to take this capstone course.

Expectations: CS 315 and engineering standing. Students are assumed to be Computer Science majors in their senior year. Knowledge of program development techniques in an object-oriented language and knowledge of data structures and algorithms at the CS-315 level is assumed.

Learning Outcomes: Students will gain experience in the design and implementation process using material from throughout their undergraduate career. They will gain experience working in groups. Specifically, students will improve their abilities, knowledge, understanding and skills to:

1. Design, implement and evaluate a computer-based system, process, component, or program to meet desired needs
2. Professional, ethical, legal, security, and social issues and responsibilities
3. Use the standard project development steps (specification, design, etc.) in implementing a project
4. Implement a large project
5. Communicate effectively with a range of audiences;
6. Develop and present a talk on the status of a project
7. Develop a written report on a large project
8. Function effectively on teams to accomplish a common goal

Course Materials: Notes and slides on software engineering topics will be presented in class and provided online. Course materials will be available on the course web page. The course web page and e-mail will be important methods of distributing information for the course. There is no textbook for the course, but a good textbook on software engineering (topics from them will be discussed in class):

Shari Lawrence Pfleeger and Joanne M. Atlee, Software Engineering: Theory and Practice , Prentice Hall ISBN: 0-13-909674-3

A very interesting book to read (highly recommended): Frederick Brooks, Jr., The Mythical Man-Month, Addison-Wesley ISBN: 0-201-83595-9

Grading

Your grade in CS 499 will be determined according to these weights:

Project	50%
Project documentation/deliverables	20%
Assignments	10%
Class participation	10%
Attendance	10%

There is no final exam.

Final Grade: A = 90-100%, B = 80-89%, C= 70 -79%, D= 60 - 69%, F = 59 and below

Note on GCCR: To satisfy the CCCR requirements the student has to attain at least an equivalent of a C grade for the communication and composition components of the required work. Specific requirements related to the GCCR are described in section "Overview of CS 499 as a GCCR course" of this document.

Mid-term grades will be posted in myUK by the deadline established in the Academic Calendar (**http://www.uky.edu/Registrar/AcademicCalendar.htm**)

Project Grade Criteria (50% of grade)

100 points

1. Good teamwork and approach to the project, kept to a schedule
2. Communicated well with customer
3. Kept up a professional looking web page
4. Used software engineering procedures that would discover problems as soon as possible, used all resources available to solve problems
5. Instructor has no substantial criticism of the project
6. Appropriate, understandable documentation
7. Went beyond the project specifications in some way

96 Same as 100, except for point 7

92 Same as 96, but with one or two minor negative comments from instructor

86 More than two negative minor comments, or a major problem

82 Partial project failure due to problems that could have been corrected by the team by following the points above

75 Project failed in some way due to problems that could have been corrected by the team by following the points above

70 Project failed, poor teamwork, poor procedures, many of the above points not followed

65 Project failed, most points not followed, lack of effort

Project grades are based on the judgment of the instructor on how well the projects met the above criteria. Note that the use of a version control system (CVS and SVN are examples) for the project will be required.

Project Documentation/Deliverables (20% of grade)

Good documentation is essential for a successful project. These are the items that will be graded:

Final documentation	6%
Team web page	6%
Code documentation	6%
CD of deliverable	2%

Standards for the final project documentation will be provided on the class web site. An example of a team web page will be provided. The instructor will warn teams that have inadequate web pages, or do not keep them current. If the deficiencies continue, points will be deducted. Your source code must follow product documentation standards. Your CD of deliverables must be well organized, and include a table of contents in a "readme" file. Proper language usage is required for all written material.

Note that all students on a project may not receive the same project grade (including documentation grade). At midterm and at the end of the semester, each team member submits a report on what each team member did on the project, how much they cooperated on the project tasks, attended meetings, etc. The instructor will also make a judgment on the each student's team participation based on:

- Class attendance
- Team meeting attendance
- Participation in team class presentations
- Participation in team meetings with the instructor
- Project knowledge as shown in presentations and meetings

If (in the judgment of the instructor based on the input from the team members and the observation of the instructor) it is clear that a team member has made insufficient contribution to the project, that student's grade (for the project and project documentation/deliverables) will be adjusted.

Assignments (10% of grade)

There will be a few written assignments during the semester to be done individually. Most of these assignments are submitted electronically from the class web page.

Class Participation/Web page (10% of grade)

Students are expected to participate in their team's class presentations, and keep a log of the student's project activities updated on the project web page. Each team presents its project to the class at midterm, and at the end of the class. During the semester, the teams present the project status to the instructor. All team members are expected to participate in these presentations. "Participation" means not only being present, but also understanding the project, and being able to answer questions about it. The instructor will

judge, and can lower the participation grade of students who, in the judgment of the instructor, do not understand the project.

The grading for class participation:

Participated in team project midterm presentation	2%
Participated in team project final presentation	2%
Participated in meetings with the instructor	2%
Kept project web page log of student's activities up to date on a weekly basis	2%
Made presentation to the class or other audience	4%

Note that the total is 12%. There is a 2% bonus for doing a class presentation.

Besides the team presentations, students can present topics of interest to the class. A student can do a presentation individually, or as a group of up to four or five students. These are short presentations. Individual presentations will be about 15 minutes (longer with the consent of the instructor). Group presentations may be 30 minutes. See the class web page for example topics. With the approval of the instructor, presentations to other groups (for example a high school science class) can be counted. Note that after midterm, there likely will be no opportunity to do a presentation to the CS 499 class.

Attendance (10% of grade)

Students are expected to attend and participate in all scheduled classes. An attendance sheet will be used. **Attendance for presentations from guest speakers from outside the university will count as two attendances.** The dates of the invited guest speakers' presentations will be announced in class and put on the class web page. Each student is allowed three unexcused absences. After that, each unexcused absence subtracts one percent (two percent if a class with a guest speaker) from the 10 percent attendance grade. For example, if a student has five unexcused absences, but the third one occurred for a class with a guest speaker, the student's attendance grade is seven percent instead of 10 percent. Note that classes start on the hour. A student will not get attendance credit if the student does not arrive within 10 minutes of the start of the class.

Students can be excused for University accepted 1) serious illness; 2) illness or death of family member; 3) University-related trips (S.R. 5.2.4.2.C); 4) major religious holidays; 5) other circumstances that the instructor finds to be "reasonable cause for nonattendance." It is the student's responsibility to contact the instructor regarding the nature of the absence (within 10 days of the absence), and the instructor retains the right to ask for proof.

Students anticipating an absence for a major religious holiday are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day in the semester to add a class. Information regarding dates of major religious holidays may be obtained through the religious liaison, Mr. Jake Karnes (859-257-2754).

Students are expected to withdraw from the class if more than 20% of the classes scheduled for the semester are missed (excused or unexcused) per university policy.

Incomplete grade: Because of the team project nature of the class, the grade of incomplete (I) will be given only in cases of extreme hardship in accordance with the University policy.

Late Policy: Project dates (see the online schedule) must be met or points will be deducted from the grade of all team members. Assignments will have due dates with penalties for late submission.

Academic Honor Code: Group projects allow the sharing of ideas and computer code within the group. The University of Kentucky's guidelines regarding academic dishonesty will be strictly enforced. Note that the penalty for plagiarism can result in a failing grade in the course. You must credit sources for any code, algorithms, ideas, etc., in your project documentation. If you are in doubt whether you are violating plagiarism guidelines, check with the instructor.

Computer Facilities: You will be assigned an account for this course in Multilab. For information regarding Multilab, see links under "facilities" from the Computer Science homepage (www.cs.uky.edu). You may use any computer systems for developing and testing your work provided that your submitted work will run under the proper software environment as specified in the project documentation and agreed to by the customer.

Accommodation: If you have a documented disability that requires academic accommodations, please contact the instructor as soon as possible. In order to receive accommodations in this course, you must provide a Letter of Accommodation from the Disability Resource Center.

Group Projects: The group project for the course will require you to work together with other students in the class. You will be evaluated on your contribution to the group project and presentations of the project results. The instructor will make group assignments, however you are allowed to suggest a project that you would like to do, and mention others in the class who would also like to do the same project. Typically there are three to five students in each group. As discussed above, group members are not guaranteed to receive the same project grade.

Each project will have a web page to be maintained by the project team. The contents of the web page will be discussed in class and the class web site.

Schedule: There will be class lectures on software engineering and presentations from guest speakers that you are expected to attend. The class web site will have the schedule. You are expected to meet with your project team on a regular basis, and to post you meeting times and accomplishments on your web page. The teams are required to meet with the instructor on a regular basis so that the instructor can judge your progress. All students are expected to attend the class project presentations. There will be a midterm presentation to the class, and a final presentation to the class and your customer during finals week.

Overview of CS 499 as a GCCR course

CS 499 Senior Design provides full GCCR credit for the Computer Science major, and for Computer Engineering students who opt to take this capstone course instead of its EE counterpart. Check with your advisor and course instructor for more information.

There are three major components of the GCCR part of the CS 499 course. They constitute about 40% of the final grade of the course:

(a) Multiple written assignments (reports, documentation, user manuals, etc.) that total to at least 4,500 words of text (see details below) for the total of 150 points for the communication and composition.
Deliverables: written notes, reports, technical documents.

(b) Oral assignments in English, in which teams of students give a formal presentation with at least 10 minutes long presentation by each student. Additionally, students put together a web site related to their software project. There is one midterm and one final presentation. The total score for the communication aspects of the assignment is 75 points.
Deliverables: Web page, two PowerPoint oral presentations.

(c) *Software requirements specification* document for the software project, which requires the student to demonstrate information literacy in the discipline. The total score for this project is 75 points.
Deliverables: a formal document following the domain-specific technical writing and format.

Grading for the GCCR requirement: A: 265 – 300 point; B: 225 – 264 points, C: 185 – 224 point; D: 140 – 184 points; E otherwise.

Important: To satisfy the CCCR requirements the student has to attain at least an equivalent of a C grade for the communication and composition components of the required work.

Students are expected to meet with their project team on a regular basis, and to post the meeting times and updates on accomplishments on their project web page. The teams are required to meet with the instructor on a regular basis so that the instructor can review the work, provide feedback on written assignments and judge students' progress. There will be a midterm presentation to the class, and a final presentation to the class and the project customer during finals week. All students are expected to attend the class project presentations and participate in project presentations and peer review sessions. The assignments are graded using clear criteria and rubrics. In particular, rubrics developed on the college level will be used to grade and assess oral presentations.

CS 499 -- grading criteria; excerpts from syllabus:

Project	50% (substantial GCCR components)
Project documentation/deliverables	20% (substantial GCCR components)
Assignments	10% (substantial GCCR components)
Class participation	10%(substantial GCCR components)
Attendance	10%

Project Grade Criteria (50% of grade)

Communication/documentation criteria in bold, points 2, 3, 6:

1. Good teamwork and approach to the project, kept to a schedule
2. **Communicated well with customer**
3. **Kept up a professional looking web page**
4. Used software engineering procedures that would discover problems as soon as possible, used all resources available to solve problems
5. Instructor has no substantial criticism of the project
6. **Appropriate, understandable documentation**
7. Went beyond the project specifications in some way

Project Documentation (20% of grade)

Good documentation is essential for a successful project. These are the items that will be graded:

Final documentation	6%
Team web page	6%
Code documentation	6%
CD of deliverable (including description)	2%

Standards for the final project documentation are provided on the class web site. An example of a team web page will be provided. The instructor will warn teams that have inadequate web pages, or do not keep them current. If the deficiencies continue, points will be deducted. Your source code must follow product documentation standards. Your CD of deliverables must be well organized, and include a table of contents in a "readme" file. Proper language usage is required for all written material. The grading will follow the following cycle: draft/feedback/revisions.

Note that all students on a project may not receive the same project grade (including documentation grade). At midterm and at the end of the semester, each team member submits a report on what each team member did on the project, how much they

cooperated on the project tasks, attended meetings, etc. The instructor will also make a judgment on the each student's team participation based on:

- Class attendance
- Team meeting attendance
- Participation in team class presentations
- Participation in team meetings with the instructor
- Project knowledge as shown in presentations and meetings

If (in the judgment of the instructor based on the input from the team members and the observation of the instructor) it is clear that a team member has made insufficient contribution to the project, that student's grade (for the project and project documentation/deliverables) will be adjusted.

Assignments (10% of grade)

There will be a few written assignments during the semester to be done individually. Most of these assignments are submitted electronically from the class web page. Example individual assignments (all include a written documentation/component):

1. List your favorite/least favorite CS classes, and explain your reasons. List projects that you want to do and explain why
2. Write your resume
3. Write midterm status, what you have done, and teammates have done, discuss problems
4. Write your final project status
5. Write an essay on the social impacts of software failures

Class Participation/Web page (10% of grade)

Students are expected to participate in their team's class presentations, and keep a log of the student's project activities updated on the project web page. Each team presents its project to the class at midterm, and at the end of the class. During the semester, the teams present the project status to the instructor. All team members are expected to participate in these presentations. "Participation" means not only being present, but understanding the project, and being able to answer questions about it. The instructor will judge, and can lower the participation grade of students who, in the judgment of the instructor, do not understand the project. Besides the required team presentations (midterm and final), students can present topics of interest to the class. A student can do a presentation individually, or as a group of up to four or five students. These are short presentations. Individual presentations will be about 15 minutes (longer with the consent of the instructor). Group presentations may be 30 minutes. See the class web page for example topics. With the approval of the instructor, presentations to other groups (for example a high school science class) can be counted. Note that after midterm, there likely will be no opportunity to do a presentation to the CS 499 class.

The grading for class participation:

Participated in team project midterm presentation	2%
Participated in team project final presentation	2%
Participated in meetings with the instructor	2%
Kept project web page log of student's activities up to date on a weekly basis	2%
Made presentation to the class or other audience	4%

Note that the total is 12%. There is a 2% bonus for doing a class presentation.

Summary of the GCCR percentage of grade in CS 499 assignments:

Project Documentation/Project Specifications [part of project deliverables] (20% of course grade) (150 points for the GCCR)

Assignments (10% of course grade) (75 points for the GCCR)

Web page/Presentations [part of Class participation] (10% of course grade) (75 points for the GCCR)

Total: 40% (total 300 points for the GCCR)

Not included in this total: Communicated well with customer

Estimates of documentation sizes

Individual Assignments (10% of grade)

Individual assignments Spring 2013 (all needed written documentation):
1. List your favorite/least favorite CS classes, and explain their impact on your education and future career. List projects that you want to do and explain why (estimated average word count: 400)
2. Write your resume (estimated average word count: 400)
3. Write midterm status, what you have done, and teammates have done, discuss problems (estimated average word count: 600)
4. Write your final project status (estimated average word count: 1200)
Estimate of word count for Individual Assignments: 2600 per student

Web page contents (done by team)
Software Requirements
Project Design
Test cases
Development Schedule
Meeting notes

The total word count for Web pages is difficult to estimate and will vary per project. These also include many diagrams, screen shots, etc., the time and efforts to produce are not reflected in a word count. Estimate of word count for Web page: 2100 (assuming 3 member teams: 700 words/student)

Individual weekly activity estimate 30 words for 12 weeks = 360

Final project documentation (done by team)
The documentation also includes many diagrams, screen shots.
Estimate of word count: 3000 (assuming 3 member teams: 1000 words/student)

Total semester word count of written assignments per student (this breakdown may change but the total word count will be at least 4500):

Individual assignments	2600
Web page contents	700
Notes on weekly activity	360
Project documentation	1000
Total	4660

See class schedule for deadlines with respect to specific assignments/deliverables.

CS 499 Sample course schedule (description of activities and GCCR components)

Week	Activity	Deliverables for CS 499 and GCCR
Week 1 and 2	Presentation by customers (IT, departments, organizations) of projects proposed for students. Team meeting, Web page framework.	Initial Web page for the team. Notes on customer presentations. Written assignments. [GCCR]
Week 3 and 4	Team meetings. Selection and discussions of projects. Development of Software Requirements.	Document: Software Design Requirements – draft. Continual development of the Web page activity log, progress report. [GCCR]
Week 5 and 6	Group meetings, finalizing the design. Peer review of the Software Design Requirements document. Architecture and Implementation decisions. Development of software framework. Initial testing.	Document: Software Design Requirements – revised versions based on feedback [GCCR]
Week 7 and 8	Group meetings. Initial implementation of the projects based on the Software Requirement Specifications. Testing. Preparing progress report.	Software framework. Design of testing units. Progress notes, log of activities. Written assignments. [GCCR]
Week 9 and 10	Group meetings. Implementation of the main components of the projects. Code review (peer review) and testing. Drafting progress report and initial documentation. Meeting with customer representatives.	Project prototype. Sample tests. Initial documentation, PowerPoint presentations on progress [GCCR]
Week 11 and 12	Status meeting with instructor during class period (with each team). Review of the project and feedback. Continuation of coding and testing.	Test units. Revised code. Revisions to the initial documentation. Written assignments (see sample assignments). [GCCR]
Week 13 and 14	Continuation of coding and testing. Final testing. Finalizing project documentation. Meeting with the customers.	Finalized development of the Web site. Finalized Web page contents. Activity log, final progress report. Written assignments (see sample assignments). [GCCR]
Week 15	Final presentations and project delivery.	All of the software components. Oral presentations for customers and general public. Complete final project, documentation, Web page. [GCCR]