Office of the Registrar
FORM 40 REV. 5/11

PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION, OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

Print Form

EFD 3/12
(20140)

DEPARTMENT Engineering Education

EFFECTIVE SESSION Fall 2012 2013

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- [X] 1. New course with supporting documents
- [ ] 2. Add existing course offered at another campus
- [ ] 3. Expiration of a course
- [ ] 4. Change in course number
- [ ] 5. Change in course title
- [ ] 6. Change in course credit/type
- [ ] 7. Change in course attributes (department head signature only)
- [ ] 8. Change in instructional hours
- [ ] 9. Change in course description
- [ ] 10. Change in course requisites
- [ ] 11. Change in semesters offered (department head signature only)
- [ ] 12. Transfer from one department to another

PROPOSED:		EXISTING:	
Subject Abbreviation	ENGR	Subject Abbreviation	
Course Number	14100	Course Number	
Long Title	Honors Creativity & Innovation in Engineering Design I		
Short Title	Honors Engineering Design I		

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

TERMS OFFERED
Check All That Apply:
[X] Fall [X] Spring [ ] Summer

CAMPUS(ES) INVOLVED
[ ] Calumet [ ] N. Central
[ ] Cont Ed [ ] Tech Statewide
[ ] Ft. Wayne [X] W. Lafayette
[ ] Indianapolis

CREDIT TYPE
1. Fixed Credit: Cr. Hrs. 3.5
2. Variable Credit Range: Minimum Cr. Hrs
(Check One) To [ ] Or [ ]
Maximum Cr. Hrs.
3. Equivalent Credit: Yes [ ] No [ ]

COURSE ATTRIBUTES: Check All That Apply
1. Pass/Not Pass Only [ ]
2. Satisfactory/Unsatisfactory Only [ ]
3. Repeatable [ ]
Maximum Repeatable Credit: [ ]
4. Credit by Examination [ ]
5. Fees: [ ] Coop [ ] Lab [ ] Rate Request
Include comment to explain fee
6. Registration Approval Type
Department [ ] Instructor [ ]
7. Variable Title [ ]
8. Honors [X]
9. Full Time Privilege [ ]
10. Off Campus Experience [ ]

ScheduleType	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture				
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio	110	3	15	100
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

RECEIVED
OFFICE OF THE REGISTRAR
2012 NOV 30 PM 2:27

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):
This course introduces students to the engineering professions using multidisciplinary, societally relevant content. Students develop engineering approaches to systems, generate and explore creative and innovative ideas, and use of computational methods to support design decisions. Design challenges and projects engage students in innovative thinking across the engineering disciplines at Purdue. Students experience the process of design and analysis in engineering including how to work effectively in teams, develop skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, and modern engineering tools (e.g., Excel, LabView, MATLAB, and Python). Enrollment in this course requires prior admission to the College of Engineering Honors Program and must be enrolled in one of the

*COURSE LEARNING OUTCOMES:
1. Describe the engineering disciplines at Purdue and the interrelationships among them as well as know what graduates of at least three disciplines of engineering do.
2. Understand and apply engineering fundamentals and basic engineering science concepts to model, analyze, predict build, and evaluate an object of engineering interest using a design process;
3. Develop the ability to evaluate complex systems;
4. Develop strategies to facilitate generating creative ideas for complex design challenges

	Date		Date
Calumet Department Head		Calumet School Dean	
Fort Wayne Department Head		Fort Wayne School Dean	
Indianapolis Department Head		Indianapolis School Dean	
North Central Faculty Senate Chair		Vice Chancellor for Academic Affairs	
West Lafayette Department Head	11/27/12	West Lafayette College/School Dean	11/26/12

West Lafayette Registrar — Date 1/29/13

OFFICE OF THE REGISTRAR

LD 1/28/13

TO: The Faculty of the College of Engineering
FROM: The School Engineering Education
RE: New Undergraduate Course, ENGR 14100 – Honors Creativity and Innovation in Engineering Design I and ENGR 14200 – Honors Creativity and Innovation in Engineering Design II

The School of Engineering Education and the First-Year Curriculum Committee have approved the new courses listed below. This action is now submitted to the Engineering Faculty with a recommendation for approval.

ENGR 14100 – Honors Creativity and Innovation in Engineering Design I
Sem. 1, Studio 6, Cr. 3.5.
Prerequisite: Honors Standing

This course introduces students to the engineering professions using multidisciplinary, societally relevant content. Students develop engineering approaches to systems, generate and explore creative and innovative ideas, and use of computational methods to support design decisions. Design challenges and projects engage students in innovative thinking across the engineering disciplines at Purdue. Students experience the process of design and analysis in engineering including how to work effectively in teams. Students also develop skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, and modern engineering tools (e.g., Excel®, LabView®, MATLAB®, and Python).

ENGR 14200 – Honors Creativity and Innovation in Engineering Design II
Sem. 1, Studio 6, Cr. 3.5.
Prerequisite: ENGR 14100

This course continues building on the foundation developed in ENGR 14100.Students take a more in depth and holistic approach to integrating multiple disciplines perspectives while constructing innovative engineering solutions to open-ended problems. The students extend and continue to develop skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, team work, and modern engineering tools (e.g., C, Excel®, LabView®, MATLAB®, and Python).

Rationale: The new first year experience is a strategic response to the numerous calls to action for engineering education published in recent years. Industry has concluded that business as usual will not enable it to meet the challenges and opportunities presented by globalization in an uncertain world. Equally, education as usual will not deliver the graduates that this nation needs if we are to meet these challenges. This proposal and the approach taken align with many of the Key Priorities/Investment Areas around "Student Success" described in the Purdue Strategic Plan (2008-14): New Synergies.

These two courses are proposed as 3.5 studio credit hours each. The courses use discussions and activities to introduce students to fundamental engineering concepts, design challenges, use of various computer tools and extended exercises that will not fit into the more traditional "lecture" and "laboratory" time patterns. Therefore, we use the "studio hours" concept where the focus is on student learning (i.e., student time on task) not hours spent teaching (i.e., faculty time on delivery). This requires a change in perspective and thinking that is student-centric/learning rather than teacher-centric/metric. The "studio" credit hour designation provides more flexibility for delivery of content via "lecture" that is highly interweaved with time for putting lectured content into "practice," "team activities," "design challenges," "presentations," and other similar "hands-on" activities, all of which take an extended period of time. Our goal is for students to leave class having experienced learning rather than simply knowing what to learn. The "studio" hours are not just more "lecture time."

Students successfully completing the two courses, from a knowledge perspective, have a combined exposure to concepts presented in ENGR 131/132 (4 credit hours) and CS 159 (3 credit hours). The modeling emphasis of the two courses, along with the expanded development of computer tools (Excel®, LabView®, MATLAB®, Python and C) provides a excellent foundation for students entering their second year. Therefore, the 3.5 credit hours for each course provides students with the equivalent of 7 credit hours after successfully completing ENGR 142.

The proposed courses have been piloted during the Fall '08 as ENGR 19500 (5 sections having a combined enrollment of 289 students)/Spring '09 as ENGR 19500 (5 sections with a combined enrollment of 280 students); during the Fall '09 (3 sections having a combined enrollment of 180 students)/Spring '10 as ENGR 19500 (3 sections with a combined enrollment of 170 students); during the Fall '10 (3 sections having a combined enrollment of 183 students)/ Spring '11 as ENGR 19500 (3 sections with a combined enrollment of 181 students); and during the Fall '11 (3 sections having a combined enrollment 207).

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE ENGINEERING
CURRICULUM COMMITTEE

ECC Minutes 9/10/12

Date 11-26-12

Chairman ECC

David Radcliffe
Kamyar Haghighi Head of the School of Engineering Education
Epistemology Professor of Engineering Education

ENGR 19500H – FALL 2011
CREATIVITY AND INNOVATION IN ENGINEERING DESIGN I

COURSE OBJECTIVES:

This course introduces you to the engineering professions through multidisciplinary, societally relevant content. You will learn how to develop approaches for comprehending engineering systems and generating and exploring creative ideas and alternatives. You will be introduced to concepts in creativity, innovation, engineering fundamentals, and problem solving methodologies. You will learn to enhance creativity with tools and strategies that amplify alternative perspectives. You will gain knowledge, through experience, the process of design and analysis in engineering including how to work effectively on a team. Finally, you will develop skills in project management, sustainability, oral and graphical communication, logical thinking, and modern engineering tools (e.g., Excel, LabVIEW, MATLAB, Python, CAD/CAM, rapid-prototyping). Successful completion of this course will enable you to:

1. Describe the engineering disciplines at Purdue and the interrelationships among them as well as know what graduates of at least three disciplines of engineering do.
2. Understand and apply engineering fundamentals and basic engineering science concepts to model, analyze, predict build, and evaluate an object of engineering interest using a design process;
3. Develop the ability to evaluate complex systems;
4. Develop strategies to facilitate generating creative ideas for complex design challenges.
5. Show how the engineering problem solving is related to the design process;
6. Use the engineering problem solving process to translate written problem statement into a mathematical model that is suitable for algorithmic development;
7. Communicate technical information to justify decision made during a problem solving situations (e.g. design, troubleshoot, or product selection)
8. Develop a logical and systematic problem solving process and use that process for software development, which includes sequential structures, conditional structures, and repetition structures;
9. Implement simple algorithmic forms of engineering models/problems using the most appropriate computer tool (LabVIEW, MATLAB, and Python);
10. Perform basic file management tasks using an appropriate computer tool;
11. Demonstrate appropriate knowledge and behaviors for effective and ethical membership on a technical team (i.e., teaming skills);
12. Develop skills for cross-cultural communication; and
13. Exhibit a work ethic appropriate for the engineering profession.

COURSE EXPECTATIONS:

You are expected to:

- Be an active problem solver, contributor, and discussant in class;

- Be prepared and accountable for class by reading the assigned material ahead of time and be able to answer simple questions over said material;
- Be held accountable for the material that is, or is not, explicitly discussed in class;
- Have a public presence in the class;
- Attend class because of a community expectation;
- Be cooperative with your team and work with them, not compete against them;
- Learn interdependently with your team and your peers;
- Learn to be accountable to your team and have your team accountable to you;
- Be prepared to meet with your team outside of class to complete assignments; and
- Rely on your peers, as well as the faculty and staff to learn the course material.

COURSE PREREQUISITES:

Enrollment in this course requires prior admission to the First-Year Engineering Honors Program.

college: E cohort: Honors

COURSE GRADE COMPUTATION:

Exam 1	10%
Exam 2	15%
Final Comprehensive Exam	20%
Ready Assessment Trials (RAT's)	2%
Activity Check for Understanding's (CFU's)	15%
Homework	15%
Projects:	
Project 1 (team building, design-build)	2%
Project 2 (computational modeling)	6%
Project 3 (modeling, design-build)	15%
Cross-Cultural Communication and Diversity Assignment*	S/U
Attend three (3) "Engineering Your Major" Seminars and one (1) Industrial Social Seminar+	S/U
	100%

* The "Cross-Cultural Communication and Diversity Assignment" (CCCD) has two (2) components: Registering for and attending one of the scheduled "Diversity Awareness in Engineering" events AND satisfactory (as determined by the instructor) completion of CCCD homework assignment. Completing both of these is a requirement for passing the course regardless of your current grade. See the section "CROSS-CULTURAL COMMUNICATION AND DIVERSITY ASSIGNMENT" below for more details.

+ The "Engineering Your Major" seminars and the "Industrial Social Seminars" are Purdue Engineering Student Council (PESC) sponsored weekly informational events featuring different engineering majors (EYMs) and companies that hire engineering graduates (ISSs). You are **REQUIRED** to attend three (3) "Engineering Your Major" Seminars and one (1) Industrial Social Seminar. Advanced registration for a seminar is required for attendance to count. Failure to attend a seminar for which you are registered will jeopardize your ability to complete this requirement. Attending only three (3) of the EYMs/ISSs for which you have registered will result in you dropping by one course letter grade, attending less than three (3) EYMs/ISSs for which you have registered will result in you failing the course regardless of your current grade. Space is limited; failure to attend 3 EYMs and 1 ISSs because of space limitations will not be

considered a valid excuse. See the section "ENGINEERING YOUR MAJOR SEMINARS AND INDUSTRIAL AWARENESS SEMINARS" below for more details.

This course will make extensive use of student teams. As such, homework, activities, ready assessment transitions (RAT's), activity check for understanding's (CFU's), and project grades may reflect some combination, in part or as a whole, your individual effort and teamwork. Exam grades will, in their entirety, represent your individual understanding of the course material. In general, your final course grade will consist of no less than 70% of your own individual contributions. You are reminded that learning team accountability (your accountability to the team and the team's accountability to you) is an essential element of this course. As such, the course instructor reserves the right to use: materials submitted by your team to reflect your individual effort (in the form of a grade); materials submitted by individuals to reflect your team's effort (in the form of a grade); materials randomly collected by individuals to reflect your team's effort (in the form of a grade); the weakest material submitted by individuals to reflect your team's effort (in the form of a grade); or materials submitted by pairs of team members to reflect your individual or team effort (in the form of a grade).

The following grading scale will be used to determine your semester course grade:

$$90\% \leq A < 100\%,\ 80\% \leq B < 90\%,\ 70\% \leq C < 80\%,\ 60\% \leq D < 70\%, \text{ and } F < 60\%$$

You are, in the minimum, guaranteed a letter grade for the course that corresponds to your course grade percentage as determined by the course grade computation (see above). However, the course instructor reserves the right to review a borderline student on a case-by-case basis. Factors that may be used to evaluate such cases include: class attendance, participation, teaming, grade improvement, and the like. **Consistent with the policy described in the *Course Grade Computation* footnotes, please be reminded that failure to complete the required assignments (Cross-Cultural Communication and Diversity Assignment and attending three (3) "Engineering Your Major" Seminars and one (1) "Industrial Social Seminar", as described above, will result in your course letter grade being lowered or you receiving a letter grade of F regardless of your current numeric score.**

COURSE REQUIRED TEXT BOOKS:

The course has two required text books:

1. Engineering Fundamentals and Problem Solving, 6th Edition
   Authors: Eide, Jenison, Northup and Michelson
   Publisher: McGraw-Hill Higher Education
   ISBN 978-0-07-319158-4
2. Programming in Python 3, 2nd Edition
   Author: Summerfield
   Publisher: Addison Wesley
   ISBN 978—0-321-68056-3
3. Teamwork and Project Management, 3rd Edition
   Author: Smith and Imbrie
   Publisher: McGraw-Hill Higher Education

ISBN: 0-07-310367-5

OTHER REFERENCE MATERIALS:

1. Introduction to MATLAB 7 for Engineers – *Available at the bookstores*
   Authors: Palm
   Publisher: McGraw-Hill Higher Education
   ISBN: 0-07-254818-5
2. Engineering Design: A Project Based Introduction, 3rd Edition
   Authors: Dym and Little
   Publisher: Wiley Higher Education
   ISBN: 978-0-470-22596-7
3. National Academy of Engineering, "Grand Challenges for Engineering", available at http://www.engineeringchallenges.org/, last accessed 11/2008.

COURSE OFFICE HOURS:

Daytime Office Hours:

TBA in ARMS B098 Demonstration Studio
TBA in ARMS B098 Demonstration Studio

Evening Office Hours

Monday, 6:30 p.m.-8:30 p.m. in ARMS B098 Design Studio
Wednesday, 6:30 p.m.-8:30 p.m. in ARMS B098 Design Studio

IMPORTANT DATES: (EXAM AND PROJECT DATES ARE TENTATIVE)

August 26 – Last day change from ENGR 195H to ENGR 131
September 5 – Last day to drop a course without it appearing on your record
September 5 – Labor Day, no class
September 14 – Project 1 Demonstration
September 16 – Project 1 Executive Summary to be submitted electronically
September 5 – Last day to drop a course without it appearing on your record
October 6 – Exam 1 – *Tentative Date*
October 10-11 – Fall Break, no class
October 19 – Project 2– *Tentative Date*
October 21 – Project 2 report to be submitted electronically– *Tentative Date*
October 28 – Last day a course assignment may be cancelled (with passing or failing grade)
November 90 – Exam 2 – *Tentative Date*
November 23-25 – Thanksgiving Break, no class
December 5 – Project 3 demonstrations – *Tentative Date*
December 9 – Project 3 report to be submitted electronically– *Tentative Date*
December 10 – Last day of all Fall classes
December 12-17 – Final Exam week

CROSS-CULTURAL COMMUNICATION AND DIVERSITY ASSIGNMENT:

This assignment has two (2) components:

1. Register/attend the "Diversity Awareness in Engineering" event:

a. Go to https://engineering.purdue.edu/ECN/Resources/Tools/EGO/ and click on the "Diversity Awareness in Engineering – Fall 2011" event to register. Registration will open on August 30st at 5:00 p.m.
b. For your convenience, the event is scheduled for September 28th at 6:00 p.m. and then repeated on October 4th at 6:00 p.m. You are only required to attend one of these events, as such you will only be able to sign up for one.
c. Registering to attend the event on a specific date will remain open until 5:00 p.m. the day before the event (approximately 26 hours). At that time the signup will be frozen (i.e., you will not be able to add or remove your name from the registration list).
d. Prior to the event registration freeze date, you can add/remove your name from a list as many times as you desire within the constraint of available space.
e. **Space is limited for each of the event dates; failure to attend one of these days because of space limitations will not be considered a valid excuse for not being able to fulfill this course requirement.**
f. To satisfy the Register/Attend criteria, your instructor will compare the event date for which you where registered with your attendance at the event.
g. As with anything electronic, it is always a good practice to: a) check to make sure your name appears on the list after you believe you have registered; and b) print a copy of the list for your records.

2. Satisfactory (as determined by the instructors) completion of CCCD homework assignment.

Completing both of these is a requirement for passing the course regardless of your current grade.

ENGINEERING YOUR MAJOR SEMINARS AND INDUSTRIAL AWARENESS SEMINARS:
You are required to attend three (3) EYMs and one (1) ISS. You must pre-register for the seminars you plan to attend. Attending only three (3) of the EYMs/ISSs for which you have registered will result in you dropping by one course letter grade, attending less than three (3) EYMs/ISSs for which you have registered will result in you failing the course regardless of your current grade. Space is limited; failure to attend 3 EYMs and 1 ISS because of space limitations will not be considered a valid excuse.

Registering to attend the 3 EYM Seminars and 1 ISS:

1. Go to https://engineering.purdue.edu/ECN/Resources/Tools/EGO/ and click on the "Engineering Your Major – Fall 2011" event.
2. To provide an equal opportunity for you to register for the Schools of your choice, there will be three registration periods.
    a. On August 26th at 6:00 p.m., registration will open for you to select at most one (1) EYM to attend;

   b. On August 30th at 6:00 p.m., registration will open for you to select at most two (2) EYMs to attend; and
   c. On September 2nd at 6:00 p.m., registration will open for you to select three (3) EYMs to attend.
3. Go to https://engineering.purdue.edu/ECN/Resources/Tools/EGO/ and click on the "Industrial Social Seminars – Fall 2011" event.
4. To provide an equal opportunity for you to register for the ISSs of your choice, there will be two registration periods.
   a. On August 26th at 6:00 p.m., registration will open for you to select an ISS to attend. At this time approximately half of the available space will be made available; and
   b. On August 30th at 6:00 p.m., all remaining space will be made available for you to select an ISS to attend.
5. Registering to attend a specific EYM/ISS will remain open until 6:00 p.m. the day before the seminar (approximately 25 hours). At that time the signup will be frozen (i.e., you will not be able to add or remove your name from the registration list).
6. Prior to the registration freeze date for a specific EYM/ISS, you can add/remove your name from a list as many times as you desire within the constraint of available space and the number of seminars for which you are allowed to signup.
7. **Space is limited for each of these events; failure to attend 3 EYMs and 1 ISS because of space limitations will not be considered a valid excuse for not being able to fulfill this course requirement.**
8. To satisfy the Register/Attend criteria, your instructor will compare the seminars for which you where registered with your attendance at those specific EYM events.
9. As with anything electronic, it is always a good practice to: a) check to make sure your name appears on the list after you believe you have registered; and b) print a copy of the list for your records.

ATTENDANCE:

You are expected to attend ALL classes. In keeping with the Purdue University Class Attendance and Absence Reporting Policy (see http://www.purdue.edu/odos/services/classabsence.php), only the instructor can excuse a student from classes or course responsibilities. For this course excused absences are limited to: documented illness; extended absences noted by the Office of the Dean of Students; or Purdue sanctioned field trips that do not conflict with an exam. If you miss class for one of the aforementioned excuses, you will need to bring documentation to your course instructor in a timely fashion (prior to a class is considered timely, after the fact is generally not) that corroborates your excuse. Once approved, you will have one week to arrange with your TA, through your course instructor, a means for making up any material you missed.

Please note, students having an excessive number of unexcused absences (i.e. more than 10% of the regularly scheduled class meetings) will automatically be dropped one letter grade regardless of his/her class standing.

ACADEMIC DISHONESTY:

You are expected to abide by the Purdue University Student Code of Conduct (see http://www.purdue.edu/usp/acad_policies/student_code.shtml). Turning in work that is not your own or any other form of scholastic dishonesty will result in a grade of zero (0) on an assignment/exam or may result in a grade of F for the entire course. Should the circumstances warrant a grade of F in the course, your name will automatically be forwarded to the Office of the Dean of Students. In addition, knowingly to aid and abet, directly or indirectly, other parties in committing dishonest acts is in itself dishonest. In such cases, all parties involved will receive a zero (0) on the assignment/exam or may result in a grade of F for the entire course. Should the later be necessary, the names of all those involved will be forwarded to the Office of the Dean of Students.

Please pay special attention to the following paragraph regarding teamwork (or working collaboratively with others). During this course, you will be working in teams and as such you are expected, and will be encouraged to, work in teams and help each other. This is done because it has been shown that students learn more effectively while working together. Since course grades are not curved, there is no penalty for helping someone else. However, there is, at times, confusion over when it is ok to "collaborate with a teammate (or someone in the course)" and when collaborating with someone else turns into academic dishonesty.

When an assignment specifies that it is:

1. an **ALL-CLASS Assignment** – you should feel comfortable talking to anyone in the course (and working side-by-side with them) about any aspect of an assignment from gaining conceptual insight to developing an appropriate model to specifying assumptions to writing out a solution. If the assignment was to develop some kind of computer tool model/solution, working side-by-side with other members of the course to gain conceptual insight, develop logic, outline syntax, and implement/debug said logic and syntax would be considered acceptable behavior. In such cases all individuals involved in the assignment should be appropriately acknowledged in the materials submitted.
2. a **TEAM Assignment** – you should feel comfortable talking to anyone on your team (and working side-by-side with them) about any aspect of an assignment from gaining conceptual insight to developing an appropriate model to specifying assumptions to writing out a solution. If the assignment was to develop some kind of computer tool model/solution, working side-by-side with other members of your team to gain conceptual insight, develop logic, outline syntax, and implement/debug said logic and syntax would be considered acceptable behavior. In such cases all individuals involved in the assignment should be appropriately acknowledged in the materials submitted.

3. an **INDIVIDUAL Assignment** – you should feel comfortable talking to anyone in the course about an assignment to gain conceptual insight only. Any act other than having a "conceptual conversation," even if mutually agreed upon, would be considered academic dishonesty. If the assignment was to develop some kind of computer tool model/solution, working with others to gain conceptual insight would be considered acceptable behavior. Any act other than having a "conceptual conversation" or "providing debugging insight," even if mutually agreed upon, would be considered academic dishonesty.

OTHER EXPECTATIONS, RULES, OR COMMENTS:

1. Hand-written work:
   - All hand-written homework will be submitted on Engineering Paper.
   - All hand-written work will be submitted with your name, your team number and section ID printed in the upper right hand corner of your paper. In addition, you must sign your work below your name. Your signature indicates that *"this is your work and that you have a general understanding of all the information that is being submitted."*
   - When submitting a team hand-written homework, you should follow the same rules as stated above, except making sure to include the names of all the team members that participated. In the case of a team assignment, the signature of each individual below his/her name implies that *"you were an active participant in preparing the document and that you have a general understanding of all the information that is being submitted."*
   - Please be aware when submitting a team homework, only one copy may be submitted. Submitting multiple copies of the same team assignment will result in a penalty of 5% times the number of works submitted. Also please let this serve as notice: A late penalty will be awarded to a team assignment if submitted late because a team member fails to act responsibly, even if it was completed on time.
   - Any homework submitted after the due date and time will be deemed late and will automatically be awarded a late penalty of 30%. Late homework will be accepted until a solution is posted or the assignment is returned, whichever occurs first.
2. Computer Tool Assignments:
   - You need to follow the Code Standard associated with the particular computer tool to receive maximum credit.
   - Computer tool assignments will always be submitted using the appropriate header file that includes your name, your team number and section ID.
   - You will always provide an electronic signature (signature: your full name). The electronic signature indicates that *"this is your work, or in the case of a team assignment that you were an active participant in preparing the document, and that you have a general understanding of all the information that is being submitted."*

- Please be aware when submitting team computer tool assignments, only one copy may be submitted. Submitting multiple copies of the same team assignment will result in a penalty of 5% times the number of works submitted. Also please let this serve as notice: A late penalty will be awarded to a team assignment submitted late because a team member fails to act responsibly, even if it was completed on time.
- Any computer tool assignment submitted after the due date and time will be deemed late and will automatically be awarded a late penalty of 30%. Late computer tool assignment will be accepted until a solution is posted or the assignment is returned, whichever occurs first.

3. You will be assigned to a team and will remain on that team until teams are reformed or the semester ends, whichever comes first.

Semester 1 – Overview

Week	Discussion and Activity Topics
1	Introduction and Design Challenge 1 Defining Engineering and Ethics Developing Flowcharts
2	Introduction to Teaming Introduce PROJECT 1 Labview – Introduction
3	Introduction to Design; Introduction of tools to facilitate creative thinking Diagramming Logic Labview – Looping structures and arrays Demonstration of PROJECT 1 PROJECT 3: Introduction
4	Reflection on Project 1 Design processes Labview – SubVI and File I/O Introduce PROJECT 2
5	Teaming strategies Design Process: Evaluating design processes Problem presentation method Unix and computer tools – Introduction
6	Design: Project management tools Using the House of Quality as a design process Modeling (Systems) – Functional Block Diagrams
7	Computer Architecture/programming Design Challenge 2 Python – Introduction
8	Design Requirements: Defining customer needs Representing Data PROJECT 2 : Presentations
9	Modeling Methods Python – Data structure, Loop constructs and arithmetic functions
10	Methods of least squares Python – File I/O
11	Estimation, precision and accuracy PROJECT 3: Design Review Python – Simple string methods
12	Dimensions and Units MATLAB – Introduction
13	STATS: Modeling systems to make decisions MATLAB – array(matrix) operations
14	STATS: Basic descriptive statistics
15	STATS with MATLAB and Regression MATLAB – Computational problem solving
16	Design Challenge 3 PROJECT 3: Demonstrations and Presentation Review

Office of the Registrar
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Print Form

EFD 31-12
(201410)

DEPARTMENT Engineering Education

EFFECTIVE SESSION Fall 2012 2013

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Subject Abbreviation	ENGR	Subject Abbreviation	
Course Number	14200	Course Number	
Long Title	Honors Creativity & Innovation in Engineering Design II		
Short Title	Honors Engineering Design II		

Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)

TERMS OFFERED
Check All That Apply:
[X] Fall [X] Spring [ ] Summer

CAMPUS(ES) INVOLVED
[ ] Calumet [ ] N. Central
[ ] Cont Ed [ ] Tech Statewide
[ ] Ft. Wayne [X] W. Lafayette
[ ] Indianapolis

CREDIT TYPE
1. Fixed Credit: Cr. Hrs. 3.5
2. Variable Credit Range:
Minimum Cr. Hrs
(Check One) To [ ] Or [ ]
Maximum Cr. Hrs.
3. Equivalent Credit: Yes [ ] No [ ]

COURSE ATTRIBUTES: Check All That Apply
1. Pass/Not Pass Only [ ]
2. Satisfactory/Unsatisfactory Only [ ]
3. Repeatable [ ]
Maximum Repeatable Credit: [ ]
4. Credit by Examination [ ]
5. Fees: [ ] Coop [ ] Lab [ ] Rate Request
Include comment to explain fee
6. Registration Approval Type
Department [ ] Instructor [ ]
7. Variable Title [ ]
8. Honors [X]
9. Full Time Privilege [ ]
10. Off Campus Experience [ ]

ScheduleType	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture				
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio	110	3	15	100
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses

RECEIVED
OFFICE OF THE REGISTRAR
2012 NOV 27 P 2:

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):
This course continues building on the foundation developed in ENGR 14100.Students take a more in depth and holistic approach to integrating multiple disciplines perspectives while constructing innovative engineering solutions to open-ended problems. The students extend and continue to develop skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, team work, and modern engineering tools (e.g., C, Excel, LabView, MATLAB, and Python). Enrollment in this course requires prior admission to the College of Engineering Honors Program and a student must at the undergraduate level ENGR 14100 Minimum Grade of C-

*COURSE LEARNING OUTCOMES:
1. Describe, in greater depth, the engineering disciplines at Purdue and the interrelationships among them as well as know what graduates of at least three disciplines of engineering do.
2. Apply engineering fundamentals and basic engineering science concepts to create feasible engineering solutions that are justifiable;
3. Use a problem identification process to create written engineering criteria to satisfy a problem;
4. Use an engineering formulation and solving process to translate an engineering scenario into a mathematical model;

	Date		Date
Calumet Department Head		Calumet School Dean	
Fort Wayne Department Head		Fort Wayne School Dean	
Indianapolis Department Head		Indianapolis School Dean	
North Central Faculty Senate Chair		Vice Chancellor for Academic Affairs	
West Lafayette Department Head	11/27/12	West Lafayette College/School Dean	11/28/12
		West Lafayette Registrar	1/29/13

OFFICE OF THE REGISTRAR

1/28/13

TO: The Faculty of the College of Engineering
FROM: The School Engineering Education
RE: New Undergraduate Course, ENGR 14100 – Honors Creativity and Innovation in Engineering Design I and ENGR 14200 – Honors Creativity and Innovation in Engineering Design II

The School of Engineering Education and the First-Year Curriculum Committee have approved the new courses listed below. This action is now submitted to the Engineering Faculty with a recommendation for approval.

ENGR 14100 – Honors Creativity and Innovation in Engineering Design I
Sem. 1, Studio 6, Cr. 3.5.
Prerequisite: Honors Standing

This course introduces students to the engineering professions using multidisciplinary, societally relevant content. Students develop engineering approaches to systems, generate and explore creative and innovative ideas, and use of computational methods to support design decisions. Design challenges and projects engage students in innovative thinking across the engineering disciplines at Purdue. Students experience the process of design and analysis in engineering including how to work effectively in teams. Students also develop skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, and modern engineering tools (e.g., Excel®, LabView®, MATLAB®, and Python).

ENGR 14200 – Honors Creativity and Innovation in Engineering Design II
Sem. 1, Studio 6, Cr. 3.5.
Prerequisite: ENGR 14100

This course continues building on the foundation developed in ENGR 14100.Students take a more in depth and holistic approach to integrating multiple disciplines perspectives while constructing innovative engineering solutions to open-ended problems. The students extend and continue to develop skills in project management, engineering fundamentals, oral and graphical communication, logical thinking, team work, and modern engineering tools (e.g., C, Excel®, LabView®, MATLAB®, and Python).

Rationale: The new first year experience is a strategic response to the numerous calls to action for engineering education published in recent years. Industry has concluded that business as usual will not enable it to meet the challenges and opportunities presented by globalization in an uncertain world. Equally, education as usual will not deliver the graduates that this nation needs if we are to meet these challenges. This proposal and the approach taken align with many of the Key Priorities/Investment Areas around "Student Success" described in the Purdue Strategic Plan (2008-14): New Synergies.

These two courses are proposed as 3.5 studio credit hours each. The courses use discussions and activities to introduce students to fundamental engineering concepts, design challenges, use of various computer tools and extended exercises that will not fit into the more traditional "lecture" and "laboratory" time patterns. Therefore, we use the "studio hours" concept where the focus is on student learning (i.e., student time on task) not hours spent teaching (i.e., faculty time on delivery). This requires a change in perspective and thinking that is student-centric/learning rather than teacher-centric/metric. The "studio" credit hour designation provides more flexibility for delivery of content via "lecture" that is highly interweaved with time for putting lectured content into "practice," "team activities," "design challenges," "presentations," and other similar "hands-on" activities, all of which take an extended period of time. Our goal is for students to leave class having experienced learning rather than simply knowing what to learn. The "studio" hours are not just more "lecture time."

Students successfully completing the two courses, from a knowledge perspective, have a combined exposure to concepts presented in ENGR 131/132 (4 credit hours) and CS 159 (3 credit hours). The modeling emphasis of the two courses, along with the expanded development of computer tools (Excel®, LabView®, MATLAB®, Python and C) provides a excellent foundation for students entering their second year. Therefore, the 3.5 credit hours for each course provides students with the equivalent of 7 credit hours after successfully completing ENGR 142.

The proposed courses have been piloted during the Fall '08 as ENGR 19500 (5 sections having a combined enrollment of 289 students)/Spring '09 as ENGR 19500 (5 sections with a combined enrollment of 280 students); during the Fall '09 (3 sections having a combined enrollment of 180 students)/Spring '10 as ENGR 19500 (3 sections with a combined enrollment of 170 students); during the Fall '10 (3 sections having a combined enrollment of 183 students)/ Spring '11 as ENGR 19500 (3 sections with a combined enrollment of 181 students); and during the Fall '11 (3 sections having a combined enrollment 207).

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE ENGINEERING
CURRICULUM COMMITTEE

ECC Minutes 9/10/12

Date 11-26-12

Chairman ECC

David Radcliffe
Kamyar Haghighi Head of the School of Engineering Education
Epistemology Professor of Engineering Education

ENGR 19500H – SPRING 2012
CREATIVITY AND INNOVATION IN ENGINEERING DESIGN II

COURSE OBJECTIVES:

This course will build on the foundation you developed in ENGR 19500H Fall 2011 by continuing to reinforce fundamental engineering competencies. You will continue to develop a holistic approach to integrating multiple disciplines to facilitate your ability to construct innovative and quantitatively rigorous engineering solutions. Finally, you will extend your skill development in project management, engineering fundamentals, sustainability, oral and graphical communication, logical thinking, and modern engineering tools (e.g., C, Excel, LabVIEW, MATLAB, Python, and rapid-prototyping). Successful completion of this course will enable you to:

1. Describe, in greater depth, the engineering disciplines at Purdue and the interrelationships among them as well as know what graduates of at least three disciplines of engineering do.
2. Apply engineering fundamentals and basic engineering science concepts to create feasible engineering solutions that are justifiable;
3. Use a problem identification process to create written engineering criteria to satisfy a problem;
4. Use an engineering formulation and solving process to translate an engineering scenario into a mathematical model;
5. Explain how an engineering problem solving process relates to a design process;
6. Design a process to communicate technical information orally and visually and demonstrate skills for cross-cultural communication;
7. Further development of strategies to facilitate generating creative ideas for complex design challenges;
8. Apply an engineering problem solving and design process to: generate ideas, model, analyze, predict, and build an innovative object of engineering interest taking into consideration its societal and environmental impact;
9. Implement complex algorithmic solutions to engineering problems/designs using the most appropriate computer tool (C, Excel, LABVIEW, MATLAB, and Python) and be able to explain your rationale for your choice;
10. Apply a systems approach in solving engineering problems and in undertaking design projects;
11. Synthesize your knowledge of effective and ethical membership on a technical team (i.e., teaming skills) to appropriately behavior for; and
12. Exhibit a work ethic appropriate for the engineering profession.

COURSE EXPECTATIONS:

You are expected to:

- Be an active problem solver, contributor, and discussant in class;
- Be prepared and accountable for class by reading the assigned material ahead of time and be able to answer simple questions over said material;
- Be held accountable for the material that is, or is not, explicitly discussed in class;

- Have a public presence in the class;
- Attend class because of a community expectation;
- Be cooperative with your team and work with them, not compete against them;
- Learn interdependently with your team and your peers;
- Learn to be accountable to your team and have your team accountable to you;
- Be prepared to meet with your team outside of class to complete assignments; and
- Rely on your peers, as well as the faculty and staff to learn the course material;

COURSE PREREQUISITES:

Enrollment in this course requires prior admission to the First-Year Engineering Honors Program as well as successful completion of ENGR 19500H during the Fall 2011 semester, or ENGR 131 and concurrent enrollment in ENGR 19500 (Engineering Tools course).

college: E cohort: Honors

COURSE GRADE COMPUTATION:

Exam 1	15%
Exam 2	15%
Comprehensive Final Exam	15%
Ready Assessment Transitions (RAT's)	2%
Activity Check for Understanding's (CFU's)	10%
Homework	16%
Projects:	
Project 1: Demo[+], Report	2%
Project 2: Demo[+], Presentation[*], Report	6%
Project 3: Demo[+], Presentation[*], Report	19%
Attend TWO (2) "Industrial Social Seminars"[++]	S/F
	100%

[+]This component project grade consists of the actual demonstration plus any sub-deliverables (e.g., design reviews, subtasks, design notebook).

[*]This component project grade consists of the oral presentation plus any sub-deliverables associated with the presentation (e.g., PowerPoint slides, poster).

[++]The "Industrial Social Seminar" assignment has two components: Register for AND attend TWO (2) scheduled "Industrial Social Seminars." Completing both of these is a requirement for passing the course regardless of your current grade. See the section "INDUSTRIAL SOCIAL SEMINAR ASSIGNMENT" below for more details.

This course will make extensive use of student teams. As such, homework, activities, ready assessment transitions (RAT's), activity check for understanding's (CFU's), and project grades may reflect some combination, in part or as a whole, your individual effort and teamwork. Exam grades will, in their entirety, represent your individual understanding of the course material. *In general*, your final course grade will consist of no less than 70% of your own individual contributions. You are reminded that learning team accountability (your accountability to the team and the team's accountability to you) is an essential element of this course. As such, the course instructor reserves the right to use: materials submitted by your team to reflect your individual effort (in the

form of a grade); materials submitted by individuals to reflect your team's effort (in the form of a grade); materials randomly collected by individuals to reflect your team's effort (in the form of a grade); the weakest material submitted by individuals to reflect your team's effort (in the form of a grade); or materials submitted by pairs of team members to reflect your individual or team effort (in the form of a grade).

The following grading scale will be used to determine your semester course grade:

$90\% \leq A < 100\%$, $80\% \leq B < 90\%$, $70\% \leq C < 80\%$, $60\% \leq D < 70\%$, and $F < 60\%$

You are, in the minimum, guaranteed a letter grade for the course that corresponds to your course grade percentage as determined by the course grade computation (see above). However, the course instructor reserves the right to review a borderline student on a case-by-case basis. Factors that may use to evaluate such cases include: class attendance, participation, teaming, grade improvement, and the like. **Please be reminded that if you fail to complete the "Engineering Your Major II" assignment as defined above, you will automatically receive a letter grade of F in the course regardless of your current numeric score.**

COURSE REQUIRED TEXT BOOKS:

The course has two required text books:

1. Engineering Fundamentals and Problem Solving, 6th Edition
   Authors: Eide, Jenison, Northup and Michelson
   Publisher: McGraw-Hill Higher Education
   ISBN 978-0-07-319158-4
2. Teamwork and Project Management, 3rd Edition
   Author: Smith and Imbrie
   Publisher: McGraw-Hill Higher Education
   ISBN: 0-07-310367-5

OTHER REFERENCE MATERIALS:

1. A Book on C, 4th Edition
   Authors: Al Kelly and Ira Pohl
   Publisher: Addison-Wesley
   ISBN: 0-201-18399-4

Books carried over from "Creativity and Innovation in Engineering Design I"

2. Programming in Python 3, 2nd Edition
   Author: Summerfield
   Publisher: Addison Wesley
   ISBN 978—0-321-68056-3
3. Introduction to MATLAB 7 for Engineers, 7th Edition
   Author: William J Palm III
   Publisher: McGraw-Hill Higher Education
   ISBN 978-0-07-254818-1
4. Engineering Design: A Project Based Introduction, 3rd Edition
   Authors: Dym and Little
   Publisher: Wiley Higher Education
   ISBN: 978-0-470-22596-7

5. National Academy of Engineering, "Grand Challenges for Engineering", available at http://www.engineeringchallenges.org/, last accessed 11/2008.

COURSE OFFICE HOURS:

Daytime Office Hours:

TBD in ARMS B098 Demonstration Studio

Evening Office Hours

Monday, 6:30 p.m.-8:30 p.m. in ARMS B098 Design Studio
Wednesday, 6:30 p.m.-8:30 p.m. in ARMS B098 Design Studio

IMPORTANT DATES (TO BE UPDATED AS THE SEMESTER PROGRESSES)

January 13 – Last day change from ENGR 195H to ENGR 132
January 16 – Martin Luther King Jr. Day, no class
January 23 – Last day to drop a course without it appearing on your record
January 25 – Project 1 *Demonstration*
January 27 – Project 1 *Executive Summary* to be submitted electronically
February 15 – Exam 1
February 22 – Project 2 *Electronic Poster* and *Oral Presentations*
February 24 – Project 2 *Report* to be submitted electronically
March 12-16 – Spring Break, No class
March 19 – Last day a course assignment may be cancelled (with passing or failing grade)
April 4 – Exam 2
April 23 – Project 3 *Demonstration*
April 25 – Project 3 *Oral Presentations*
April 27 – Project 3 *Report* to be submitted electronically
April 28 – Last day of all Spring classes
April 30 – May 5 – Final Exams week

INDUSTRIAL SOCIAL SEMINAR ASSIGNMENT:

This is a Purdue Engineering Student Council (PESC) sponsored informational event featuring industrial representatives providing their insights on the different engineering disciplines. Advanced registration for a seminar is required for attendance to count. Failure to attend a seminar for which you are registered will jeopardize your ability to complete this requirement. Not attending the Industrial Social Seminars (ISS) for which you have registered will result in you failing the course regardless of your current grade. Space is limited; failure to attend an ISS because of space limitations will not be considered a valid excuse.

Registering to attend the Industrial Social Seminar:

1. Go to https://engineering.purdue.edu/ECN/Resources/Tools/EGO/ and click on the "Industrial Social Seminar's – Spring 2012 (Honors Only)" event.
   a. To provide an equal opportunity for you to register for the industrial representative of your choice, there will be two registration periods.
      I. On January 13th at 6:00 p.m., registration will open for you to select at most one (1) ISS to attend;

II. On January 20th at 6:00 p.m., registration will open for you to select a 2nd ISS and/or to drop and reselect another ISS to attend.

b. Registering to attend a specific ISS will remain open until 6:00 p.m. the day before the seminar (approximately 25 hours). At that time the signup will be frozen (i.e., you will not be able to add or remove your name from the registration list).

c. Prior to the registration freeze date for a specific ISS, you can add/remove your name from a list as many times as you desire within the constraint of available space and the number of seminars for which you are allowed to signup.

d. **Space is limited for each of these events; failure to attend an ISSs because of space limitations will not be considered a valid excuse for not being able to fulfill this course requirement.**

e. To satisfy the Register/Attend criteria, your instructor will compare the seminar for which you where registered with your attendance at that specific ISS event.

As with anything electronic, it is always a good practice to: a) check to make sure your name appears on the list after you believe you have registered; and b) print a copy of the list for your records.

Completing both of these is a requirement for passing the course regardless of your current grade.

ATTENDANCE:

You are expected to attend ALL classes. In keeping with the Purdue University Class Attendance and Absence Reporting Policy (see http://www.purdue.edu/odos/services/classabsence.htm), only the instructor can excuse a student from classes or course responsibilities. For this course excused absences are limited to: documented illness; extended absences noted by the Office of the Dean of Students; or Purdue sanctioned field trips that do not conflict with an exam. If you miss class for one of the aforementioned excuses, you will need to bring documentation to your course instructor in a timely fashion (prior to a class is considered timely, after the fact is generally not) that corroborates your excuse. Once approved, you will have one week to arrange with your TA, through your course instructor, a means for making up any material you missed.

Please note, students having an excessive number of unexcused absences (i.e. more than 10% of the regularly scheduled class meetings) will automatically be dropped one letter grade regardless of his/her class standing.

ACADEMIC DISHONESTY:

You are expected to abide by the Purdue University Student Code of Conduct (see http://www.purdue.edu/ODOS/osrr/conductcode.htm). Turning in work that is not your own or any other form of scholastic dishonesty will result in a grade of zero (0) on an assignment/exam or may result in a grade of F for the entire course. Should the circumstances warrant a grade of F in the course, your name will automatically be forwarded to the Office of the Dean of Students. In addition, knowingly to aid and abet,

directly or indirectly, other parties in committing dishonest acts is in itself dishonest. In such cases, all parties involved will receive a zero (0) on the assignment/exam or may result in a grade of F for the entire course. Should the later be necessary, the names of all those involved will be forwarded to the Office of the Dean of Students.

Please pay special attention to the following paragraph regarding teamwork (or working collaboratively with others). During this course, you will be working in teams and as such you are expected, and will be encouraged to, work in teams and help each other. This is done because it has been shown that students learn more effectively while working together. Since course grades are not curved, there is no penalty for helping someone else. However, there is, at times, confusion over when it is ok to "collaborate with a teammate (or someone in the course)" and when collaborating with someone else turns into academic dishonesty.

When an assignment specifies that it is:

1. an **ALL-CLASS Assignment** – you should feel comfortable talking to anyone in the course (and working side-by-side with them) about any aspect of an assignment from gaining conceptual insight to developing an appropriate model to specifying assumptions to writing out a solution. If the assignment was to develop some kind of computer tool model/solution, working side-by-side with other members of the course to gain conceptual insight, develop logic, outline syntax, and implement/debug said logic and syntax would be considered acceptable behavior. In such cases all individuals involved in the assignment should be appropriately acknowledged in the materials submitted.
2. a **TEAM Assignment** – you should feel comfortable talking to anyone on your team (and working side-by-side with them) about any aspect of an assignment from gaining conceptual insight to developing an appropriate model to specifying assumptions to writing out a solution. If the assignment was to develop some kind of computer tool model/solution, working side-by-side with other members of your team to gain conceptual insight, develop logic, outline syntax, and implement/debug said logic and syntax would be considered acceptable behavior. In such cases all individuals involved in the assignment should be appropriately acknowledged in the materials submitted.
3. an **INDIVIDUAL Assignment** – you should feel comfortable talking to anyone in the course about an assignment to gain conceptual insight only. Any act other than having a "conceptual conversation," even if mutually agreed upon, would be considered academic dishonesty. If the assignment was to develop some kind of computer tool model/solution, working with others to gain conceptual insight would be considered acceptable behavior. Any act other than having a "conceptual conversation" or "providing debugging insight," even if mutually agreed upon, would be considered academic dishonesty.

OTHER EXPECTATIONS, RULES, OR COMMENTS:

1. A "Failure to Follow Instructions" is now being invoked. This is a new rule this semester, which penalizes you for repetitive or flagrant violations of assignment instructions. After two repetitive or flagrant violations of assignment

instructions, your assignment will automatically be returned with a grade of zero (0) with no chance of re-dress.

2. Hand-written work:
   - All hand-written homework will be submitted on Engineering Paper.
   - All hand-written work will be submitted with your name, your team number and section ID printed in the upper right hand corner of your paper. In addition, you must sign your work below your name. Your signature indicates that *"this is your work and that you have a general understanding of all the information that is being submitted."*
   - When submitting a team hand-written homework, you should follow the same rules as stated above, except making sure to include the names of all the team members that participated. In the case of a team assignment, the signature of each individual below his/her name implies that *"you were an active participant in preparing the document and that you have a general understanding of all the information that is being submitted."*
   - Please be aware when submitting a team homework, only one copy may be submitted. Submitting multiple copies of the same team assignment will result in a penalty of 5% times the number of works submitted. Also please let this serve as notice: A late penalty will be awarded to a team assignment if submitted late because a team member fails to act responsibly, even if it was completed on time.
   - Any homework submitted after the due date and time will be deemed late and will automatically be awarded a late penalty of 30%. Late homework will be accepted until a solution is posted or the assignment is returned, whichever occurs first.

3. Computer Tool Assignments:
   - You need to follow the Code Standard associated with the particular computer tool to receive maximum credit.
   - Computer tool assignments will always be submitted using the appropriate header file that includes your name, your team number and section ID.
   - You will always provide an electronic signature (signature: your full name). The electronic signature indicates that *"this is your work, or in the case of a team assignment that you were an active participant in preparing the document, and that you have a general understanding of all the information that is being submitted."*
   - Please be aware when submitting team computer tool assignments, only one copy may be submitted. Submitting multiple copies of the same team assignment will result in a penalty of 5% times the number of works submitted. Also please let this serve as notice: A late penalty will be awarded to a team assignment submitted late because a team member fails to act responsibly, even if it was completed on time.
   - Any computer tool assignment submitted after the due date and time will be deemed late and will automatically be awarded a late penalty of 30%. Late

computer tool assignment will be accepted until a solution is posted or the assignment is returned, whichever occurs first.

4. You will be assigned to a team and will remain on that team until teams are reformed or the semester ends, whichever comes first.

Semester 2 - Overview

Week	Discussion and Activity Topics
1	Introduction: Semester Overview Continuous distribution Probability and confidence intervals
2	Normal Distribution Plot and other PDFs Teams: Code of cooperation Design Challenge 1 PROJECT 1: Introduction MATLAB: String Handling
3	Hypothesis Testing PROJECT 3: Introduction PROJECT 1: Demonstration MATLAB: Symbolic Toolbox
4	Design of Experiments PROJECT 2: Introduction C: Introduction
5	More on tools to facilitate creative thinking and the House of Quality Design Challenge: Testing sensor performance C: Conditional structures and Functions
6	C: Arrays and Loops
7	Vectors Analyzing Mechanical Systems PROJECT 2: Peer review Drafts – and final Presentations C: Pointers
8	Defining strategies for effective design Analyzing Mechanical Systems: Statics Newton's Laws Design Challenge 2: Most Beautiful Machine C: Multidimensional Arrays
9	Quality Functional Deployment Process Analyzing Mechanical Systems: Free Body Diagrams More on the House of Quality C: Pointers, Arrays and file manipulation PROJECT 3: Design Review
10	Analyzing Mechanical Systems: Advanced topics in Python Programming Challenge: Design algorithms in C
11	Strength of Materials C programming tips and techniques
12	Conservation – Universal Accounting Equation Conservation of Mass
13	Conservation of Energy
14	Electrical Energy Circuit Analysis

15	Circuit Analysis
16	PROJECT 3: Demonstration, Presentation and Written Report