ENGR 122 **Homework 14**

NOTE: INDIVIDUALS: Use engineering format for problems 1 through 3. Use non-engineering format for problem 4. Each student should turn in problems 1 through 4 separately from the team homework.

TEAMS: You do not need to turn anything as a team for this assignment. Please note the due dates for the Design Journal and project Video.

1. You a loan a friend $350 and give the following terms for paying you back:
    a. Weekly interest rate of 1.5%
    b. Daily compounding
    c. Must be paid off in 3 months (84 days, 12 weeks)

    If the friend will take the entire 12 weeks to pay you back, what is the future value of the loan? **$418.95**

2. You receive a loan of $8000 from a friend. The terms of the loan include a semi-annual interest rate of 5% that is compounded monthly. If you pay equal installments each month over 10 years to pay off the loan, how much will you be paying each month? **$105.72**

3. At the beginning of August, you decide to buy a 65" TV which costs $2000. You don't need it until the beginning of February for a Superbowl party you are hosting; so, you decide to put the TV on layaway. For layaway, you have to pay an initial service fee of $15 along with 10% of the cost of the item. After placing the TV in layaway, you pay off the remaining cost of the TV in 26 weeks. If the annual interest rate is 15% compounded weekly (assume 52 weeks in a year), how much are your weekly installments? How much did you pay overall using the layaway program? **$71.96 & $2085.96**

4. As you finish up your first year engineering courses, you will no longer be taking the same courses as students with other engineering majors. It is important that you be advised by a faculty member in your chosen major. You can also check BOSS to see if you have an advisor already assigned to you. If not, please go to the Program Office for your major and ask the secretary there that you need an advisor:

Discipline	Program Office
Biomedical Engineering	BEC 103
Chemical Engineering	BEC 110
Civil Engineering	BOGH 257
Electrical Engineering	NETH 123

Discipline	Program Office
Industrial Engineering	BOGH 222
Mechanical Engineering	BOGH 257
Nanosystems Engineering	BEC 110
Cyber Engineering	NETH 123

Please go by to meet your advisor to determine when he or she will be advising students. It is very important that you get a curriculum check sheet and start filling in your grades and planning your quarters. You can find a curriculum sheet online using a Google search such as "civil engineering curriculum Louisiana Tech," and these are also available outside Bogard Hall 210. Your advisor will be helping to make sure you stay on track, but please remember that you are the one with the most at stake, so ask questions to figure out when you should enroll in various courses and which courses are only offered once per year.

The Associate Dean for Undergraduate Studies and the Student Success Specialists primarily provide advising of incoming students, so please start developing relationships with your advisor and the Program secretary as you move forward.

This is the start of the team homework. Please submit one paper per group. Use non-engineering format for your solutions.

5. Continue to work on your final design. Bring what you need to class next time to work on your project; while it's not necessary to work on your prototype in class, you do have a limited amount of time to use the classroom equipment. It's also a good time to talk with your instructor about technical issues. Only a couple more class periods remain before the Design Expo. Be sure to bring your safety glasses if you plan to do any fabrication.

4. **Design Journal: Due Class 19**

NOTE: Please email your design journal to your professor. One design journal is required per team, preferably in Microsoft Word or Adobe Acrobat format. In the syllabus, the design project accounted for 20% of your grade. Your design journal will count as 1/3 of your project grade and will allow your instructor to have input to your grade.

Please complete an electronic design journal to document the development of your "product." We don't expect you to spend much time developing the design journal, since you should have all of the content for the journal already. Please include the following components in the journal in the order below:

1. Title Page: Project name, team members, ENGR 122 course section, instructor, date
2. Final project description from problem 7 of homework 12
3. Problems 4 and 6 from homework 8 (for the memo make sure you use proper memo formatting, including signatures)
4. Problems 2 – 9 from homework 9.
5. Problems 5 and 6 from homework 10
6. Problem 6 from homework 11
7. Problem 8 from homework 12
8. Problem 6 from homework 13
9. Include pictures of your final product and from your final presentation to the judges. This could include pictures of your prototype, a PowerPoint presentation of your work, or the things you printed out for your display at the Expo.

Please put titles and brief descriptions where appropriate. For example, when presenting prototype three, you might say that "Prototype three is shown below. This prototype advanced prototype two by adding an ultrasonic sensor and sheet metal brackets for the servos . . ."

5. Design Video: Due Class 19

Student teams are required to develop a video documenting their product and experience. There are a number of free video editing software editing packages. One member of your design team will need to open a YouTube account and post your video to the web. Please follow the guidelines below when entering your video into YouTube.

Video Title: Include project name, teacher's last name, and the quarter. For the 2017-18 academic year, the "quarter" listed will be either Fall 2017, Winter 2018 or Spring 2018. Use the exact spacing and characters shown here so your instructor can locate your video. example: Remote Controlled Dog - Hall - Spring 2018

Video Description: Describe your video, and mention that the video was created at Louisiana Tech. example: This video details a project completed in ENGR 122 at Louisiana Tech University as part of the Living with the Lab first-year engineering course sequence. The product demonstrated here is the "remote controlled dog" which utilizes a GPS sensor, an RF transmitter, an RF receiver, and vibrating motors to direct the dog.

Category: Please select "science and technology"

Privacy: Please select "share this video with the world." Remember, only team members who are comfortable with an image of them being on YouTube should be visible in the video.

After your video has been posted on YouTube, please email the link for your video to your instructor for grading.
Required video content:

- The length of video should be between 2 and 5 minutes.
- Include the course number (HNRS 122 or ENGR 122), the location (Louisiana Tech), the term (Fall, Winter, Spring), and the year.
- Describe the problem you are trying to solve (re-enact the problem?).
- Show how the product solves the problem (show product demo).
- Provide a technical description of your product (show and discuss sensors, etc.).
- Briefly discuss the disciplines that the project required (biomedical, chemical, civil, cyber, electrical, industrial, mechanical, nanosystems, chemistry, biology, . . .).

Some suggestions:

- We encourage a creative approach.
- At least one student should speak in the video - it needs to be personal.
- You are not required to identify yourself.
- The videos will be posted to YouTube, so keep this in mind when deciding whether or not you want to be on the video; also remember that you are representing LA Tech.
- Music must conform to YouTube license agreements (music copyright).
- Show design alternatives.