**CE 3110 Mechanics of Materials – Spring 2022**

Sign up for Strength-Based project via Google form:

**SBP-1: 09/06/2021:**

**SBP-2: 10/04/2021:**

**SBP-3:11/01/2021:**

Indicate information below in the form:

1. Your name:
2. Your major:
3. Indicate your track: a) Creative, b) analytical/analysis

**Creative Track:**

* **Photography:** Take professional photos of real-life application of topics, explain relevant mechanics’ concepts (new relevant objects)
* **Film making/Animation:** (collect movies show failure due to poor structural design with explanations/Funny videos (AFV) that you can justify the event with mechanics concept)
* **Computer programming**: (Write a program that can ease up your calculation or you can do parametric study for different concepts)
* **Game design:** (design a game based on the concepts you are learning in this course)
* **Crafts:** (making things out of materials): Help instructor with building sophisticated demos for the class
* **Reading:** Share historical structural failure or catastrophic events (relevant to Mechanics of Materials topics) from articles you have read
* **Woodworking:** Help instructor with building sophisticated demos for the class
* **Standup Comedy:** make a comic presentation for the class materials (appropriate enough for class audiences)
* **Other topics:** Please share with the instructor for the approval

**Deliverable:**

1. Draft or description of your product, The Mechanics concept you will use, and potential resources should be to Huskyct by:

**SBP-1: 09/20/2021**

**SBP-2: 10/18/2021**

**SBP-3:11/15/2021**

You will receive feedback to implement in your project.

1. Submit your **final product** (either via HuskyCT or drop at instructor’s office if it is demo model) by:

**SBP-1: 10/04/2021**

**SBP-2: 11/01/2021**

**SBP-3:12/08/2021**

**Rubric:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Proficient | Developing | Beginning |
| Organization | The project/product is neat or has fluency. (3) | The project/product is partially neat or has fluency. (2) | The project/product is not neat or does not have fluency. (1) |
| Mechanics concept relevancy | One (or more) of the course topics is employed clearly. (3) | It is hard to find which course topic is employed. (2) | It is not clear which course topic is used. (1) |
| Clarity | The content is clearly communicated. (3) | The content is partially communicated. (2) | The information is barely communicated. (1) |
| Creativity/Originality | The product is novel and innovative. (3) | The product is somehow novel and innovative. (2) | The product is not novel and innovative. (1) |
| Usefulness for other students | The product can be easily used by others. (3) | Using the product is complicated for others. (2) | It is not usable for other students. (1) |

**Analytical/Design Track:**

* **Sport (specify):** analyze sport gears for the applied stresses/analyze body of an athlete when plays a sport
* **On the Playground:** choose objects/structures on the playground, analyze them under loading. Design a new activity for kids (safely!)
* **Toys:** Analyze a baby/toddler toy under loading. Design a new creative toy.
* **Fishing:** analyze fishing tools, boats,.. under different loading
* **Planting:** analyze plants structure under wind, snow. Justify the cross section of a plant.
* **Caring for animals:** Why animals have different structures for their body. How stress and strain look like in their body. Analyze or design pet accessories under different loading
* **Music:** (instrument design, analyze instruments (or their parts) under different loading
* **Cooking/baking:** Analyze or design cooking gadgets
* **Mechanical tinkering (Car fixing):**
* **Fashion (hair, clothes, shoes...):** analyze fashion accessories under loading.
* **Astronomy:** Design or analyze a telescope,Analyze or design parts of a spaceship.
* **Lego Building:** analyze Lego structures, design stable lego structures under loading
* **Yoga:** Analyze body and type of loading for different Yoga pose
* **Pottery:** Analyze or design objects made of clay under different loading. Predict failure location, improve design,…
* **Other topics:** Please share with the instructor for the approval

**Deliverable:**

1. The selected object that you will analyze or design, its preliminary geometry, its materials, expected loading, and relevant Mechanics topic should be shared with the instructor by submitting to the HuskyCY by:

**SBP-1: 09/20/2021**

**SBP-2: 10/18/2021**

**SBP-3:11/15/2021**

You will receive feedback to implement in your project.

1. Submit your final results via HuskyCT by: Note: You can choose any formats such as PowerPoint presentation, report, short video, poster,… for your project.

**SBP-1: 10/04/2021**

**SBP-2: 11/01/2021**

**SBP-3:12/08/2021**

**Rubric:**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Proficient | Developing | Beginning |
| Organization and Visualization | The project/product is neat or has fluency. Pictures/graphs/annotations are used properly in the project (3) | The project/product is not quite neat or has fluency. Pictures/graphs/annotations are partially used in the project. (2) | The project/product is not neat or does not have fluency. Minimal Pictures/graphs/annotations are used. (1) |
| Mechanics concept relevancy | One (or more) of the relevant course topics is employed clearly. (3) | It is hard to find which relevant course topic is employed. (2) | It is not clear which relevant course topic is used. (1) |
| Data | Geometry, materials, dimensions, loading and other assumptions are presented clearly. (3) | Geometry, materials, dimensions, loading and other are presented partially. (2) | Geometry, materials, dimensions, loading and other assumptions are barely presented. (1) |
| Correctness | Calculation of stress/Design are done correctly. (3) | There are numerical errors in calculation of stresses or design. (2) | There are conceptual errors in calculations. (1) |
| Usefulness for other students | The product can be easily used by others. (3) | Using the product is complicated for others. (2) | It is not usable for other students. (1) |

|  |  |
| --- | --- |
| Strength Based Projects Track | |
| Creative | Analytical/Deign |
| * Photography * Film making/Animation * Computer programming * Game design * Crafts * Reading * Woodworking * Standup Comedy: | * Sport gears * On the Playground: * Toys * Fishing * Planting * Caring for animals * Music instruments * Cooking/baking gadgets * Fashion accessories * Astronomy * Lego Building * Yoga * Pottery: |