ENG177 – Engineering Grand Challenges

Fall Semester 2024

**Instructor:** Prof.Molly Goldstein, 309 Transportation 300-8169 mhg3@illinois.edu

**Credit:** 1 credit hours

**Meeting Times:** Tuesdays noon-12:50pm in 214 Ceramics

**Prof. Goldstein Office hours and location:** Wednesdays 11:30am-12:30pm in 309TB and by appointment.

**Preferred method of contact:** My preferred method of contact is in-person during office hours or during class. I will also respond to email messages and can set up separate appointment times, but please keep in mind that I make take a full day to respond. Please include ENG177 in the subject line of all emails.

**Course Description:** Engineers have an instrumental role in improving life and our universe. Learn about global grand challenge categories of sustainability, health, security, and joy of living. Students will collaborate to investigate specific challenges during the semester and work to understand how these challenges differ in other countries.

This course also provides self-reflection experiences for students to better understand their own (evolving) approaches to their role as engineers.

**Text:** *Design for a Better World: Meaningful, Sustainable, Humanity Centered* by Don Norman. All other readings will be provided on Canvas

**Grading:**

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| *Tasks* | *Weight* | *Process* |
| Attendance | 30% | Weekly. If you miss a class you are expected to make up your absence. |
| Reflection posts | 40% | Weekly – **due before class** (submit on Canvas) –As a guide, consider the following reflections questions:1. How did the reading or video connect to your own experience?
2. What stood out to you as important, surprising, provocative, etc.?
3. What aspects of the class are you struggling with, and why?
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| Joy of Living Assignment | 30% | In groups of 2-4, you will present a way to understand and contribute to the Engineering Grand Challenge of the “Joy of Living.” Possible direction includes: Advance personalized learning, Enhance virtual reality, engineer the tools of scientific discovery |

**Schedule:**

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| **Week** | **Date** | **Topics** | **Pre-class assignment** |
| 1 | 8/27 | Introduction to Engineering Grand Challenges with guest graduate student, Vanessa Blas | Post photo to Canvas Discussion Board with brief introductionWhat this video: <https://www.youtube.com/watch?v=1GGupkdsX5E&list=PLJ8uEbBRJZKf878RK5gjmDvSciU4AUNmY&index=1> |
| 2 | 9/3 | **Intro to Sustainability** | *Design for a Better World*, Ch 13-14 |
| 3 | 9/10 | Sustainability: Red Oak Garden(Meet at Red Oak Rain Garden <https://redoakraingarden.org/visit/> at 12:15pm by the Rain Garden Bridge) – emailed 7/11 | *Design for a Better World*, Ch 15-16 |
| 4 | 9/17 | **Intro to Health;** revisiting sustainability | *Design for a Better World*, Ch 17-18 |
| 5 | 9/24 | Sustainability: Read and Reflect**No class** – Prof. Goldstein at a conference. Can spend class time on readings and video. | Watch: [Solar in Australia](https://www.youtube.com/watch?v=43lcj26OVXQ)*Design for a Better World*, Ch19-21 |
| 6 | 10/1 | **Intro to Security SIGPwny** guest speaker Bonus: attend CCIL poster session Wednesday 10/2 at Beckman Atrium 3:30-5pm.  | *Design for a Better World,* Ch22 & 23 |
| 7 | 10/8 |  Health: MRI tour. Meet at normal classroom | Read [Engineering & physical sciences in oncology](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5683724/) |
| 8 | 10/15 |  Joy of Living: Virtual Reality Tour at Grainger IDEA lab (meet in the basement of Grainger!!) guest Vanessa Blas will accompany |  *Design for a Better World,* Ch24 &25 |
| 9 | 10/22 | **Virtual Class - Zoom** McKechnie Family LIFE Home virtual hour(guest Yvona Vlach) |  *Design for a Better World,* Ch26 & 27 |
| 10 | 10/29 | Reflection & Recap: sustainability, health, and security | *Design for a Better World,* Ch28 & 29 |
| 11 | 11/5 | Joy of Living, Team Time | *Design for a Better World,* Ch30 |
| 12 | 11/12 | Joy of Living, Team Time | *Design for a Better World,* Ch36 |
| 13 | 11/19 | Joy of Living  |  *Design for a Better World* Ch37 & 38 |
| 14 | 11/26 | Thanksgiving – No class |  |
| 15 | 12/3 | Joy of Living Presentations |  |
| 16 | 12/10 | Joy of Living Presentations, Wrap-up & Conclusions |  |