ENG177 – Engineering Grand Challenges

Fall Semester 2023

**Instructor:** Prof.Molly Goldstein, 309 Transportation 300-8169 [mhg3@illinois.edu](mailto:mhg3@illinois.edu)

**Credit:** 1 credit hours

**Meeting Times:** Thursdays 4-4:50pm in 207 Transportation Bld.

**Prof. Goldstein Office hours and location:** Mondays 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 on campus and through an international context. Students will collaborate to investigate specific challenges during the semester and work to understand how these challenges differ in other countries. We will travel to Brisbane, Australia for ~2 weeks in early January with a full itinerary of contextual engineering learning and cultural exploration. (Cultural highlights include excursions to the Gold Coast, a national park, and an animal sanctuary.)

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

**Text:** All readings will be provided on Canvas

**Grading:**

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| *Tasks* | *Weight* | *Process* |
| Attendance | 20% | Weekly. If you miss a class you are expected to make up your absence. |
| Reflection posts | 20% | Weekly – due each Friday by 5pm (submit on Canvas) –As a guide, consider the following reflections questions:   1. How did the weekly class 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? |
| Joy of Living Assignment | 30% | In groups of two, 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 |
| Post-Travel Reflection | 30% | In a maximum of 2,000 words, reflection your growth and learning in the international travel component of our class. Should speak to Engineering Grand Challenges and Cultural Growth. To be submitted via Canvas. |

**Schedule:**

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| **Week** | **Date** | **Topics** | **Pre-class assignment** |
| 1 | 8/24 | Introduction to Engineering Grand Challenges. Course travel information  Guest: Hannah Dougherty | Post photo to Canvas Discussion Board with brief introduction |
| 2 | 8/31 | On the notion of culture – Why does it matter? | Watch Bourrelle, J. [“How Culture Drives Behaviours”](https://youtu.be/l-Yy6poJ2zs) |
| 3 | 9/7 | Intro to the Joy of Living; Culture | 1. Watch [Cultural Humility](https://www.youtube.com/watch?v=Ww_ml21L7Ns) (TEDx Talk given by Dr. Juliana Mosley  2. Watch [Cultural Iceberg](https://youtu.be/woP0v-2nJCU) for a quick refresher |
| 4 | 9/14 | Intro to Sustainability; Team time for Joy of Living Project |  |
| 5 | 9/21 | Sustainability: Savoy Solar Farm | Watch: [Solar in Australia](https://www.youtube.com/watch?v=43lcj26OVXQ) |
| 6 | 9/28 | Sustainability: Red Oak Garden |  |
| 7 | 10/5 | Health Grand Challenges: Intro to CCIL/Cancer Center  Guest: Dr. Marci Pool | 1. Read [Engineering & physical sciences in oncology](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5683724/) |
| 8 | 10/12 | Health Grand Challenges: Poster Session  Beckman Atrium |  |
| 9 | 10/19 | Australian Culture  Guest: Australian Foreign Exchange Student |  |
| 10 | 10/26 | Indigenous science & Pre-departure information  Guest: Hannah Dougherty | Watch: [“The case to recognise Indigenous knowledge as science”](https://youtu.be/X5QON5l6zy8) |
| 11 | 11/2 | Team Time |  |
| 12 | 11/9 | Joy of Living, Team Presentations |  |
| 13 | 11/16 | Joy of Living, Team Presentations |  |
| 14 | 11/23 | Thanksgiving – No class |  |
| 15 | 11/30 | Final pre-departure information  Guest: Hannah Dougherty |  |