

# Engineering and Beyond

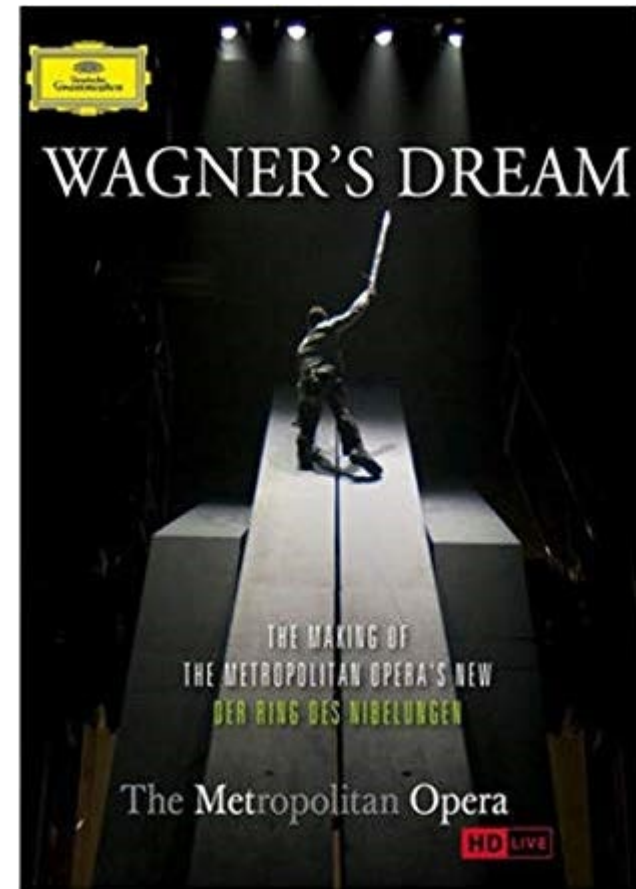
Movies

# Engineering Movies

- Wagner's Dream
  - Flash of Genius
  - Hidden Figures
  - Underwater Dreams
  - Erin Brockovich
  - The Wind Rises
- Rationale:
    - To enable students to see broad connections in engineering to society and ethics.
    - To give students a chance to develop research skills and critically think about how all research elements can be synthesized to create a complete picture of engineering events.

# Wagner's Dream

- Documentary about the 2011 Met Opera restaging of Wagner's The Ring Cycle
- Issues to consider:
  - Safety
  - Creativity and design constraints
- Explore outside DVD:
  - Think of how performer safety factors into stagecraft
  - How creativity and constraints influence designers



# Flash of Genius (available on Netflix)

- Movie about Robert Kearns and his legal battle against Ford for stealing his intermittent windshield wiper design
- Issues to consider:
  - Safety
  - Intellectual property
- Explore outside DVD:
  - Think of how Robert Kearns' life influenced his role
  - How patents are an important part of engineering



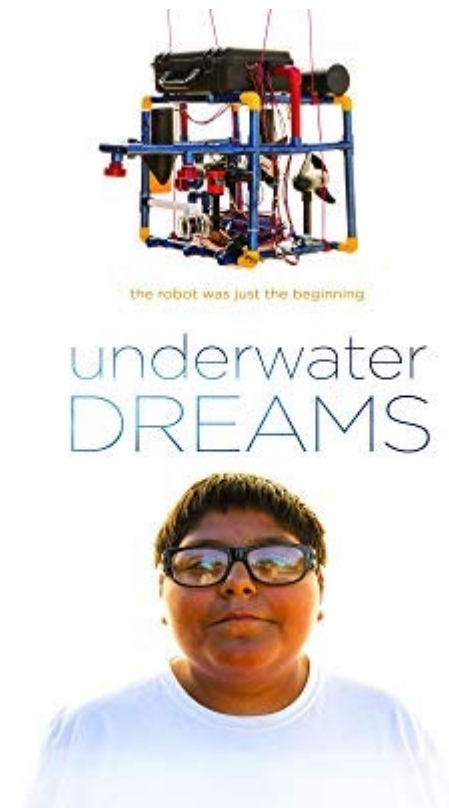
# Hidden Figures

- Movie about the women who played an role in NASA's Mercury program
- Issues to consider:
  - URM in STEM fields
- Explore outside DVD:
  - How URM are represented in STEM today
  - How are URM retained in STEM



# Underwater Dreams

- Documentary about HS students in AZ who win a URV competition
- Issues to consider:
  - URM in STEM fields
- Explore outside DVD:
  - How do engineers overcome design issues
  - How do you recruit engineering students



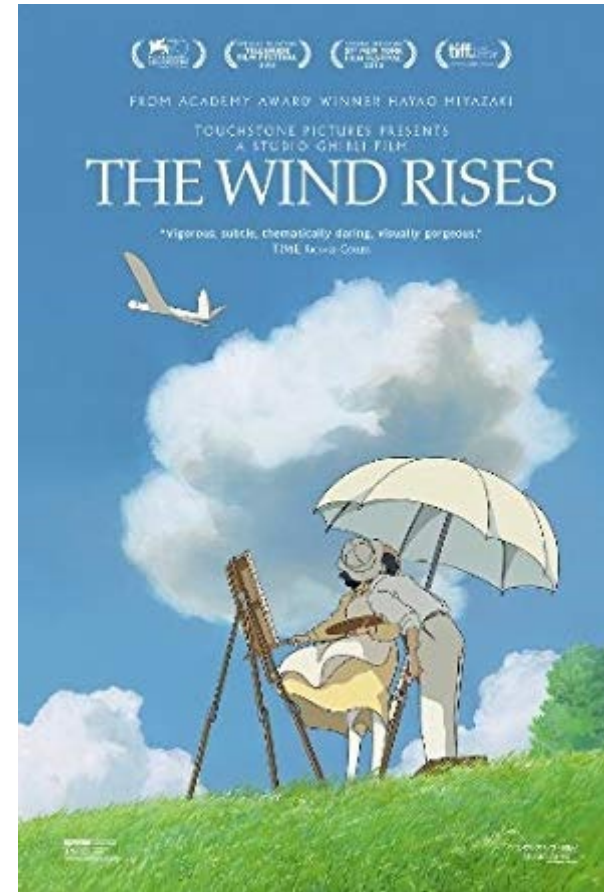
# Erin Brockovich

- Movie about how Erin Brockovich led a legal battle against a company that poisoned a community
- Issues to consider:
  - Safety
- Explore outside DVD:
  - How engineers can speak out against these oversights
  - How do engineers consider the community they serve



# The Wind Rises (available on Netflix)

- Movie about the early career of Jiro Hirokoshi
- Issues to consider:
  - Nationalism
- Explore outside DVD:
  - What role does STEM play in building a nation
  - How can designs have unintended consequences





# Typical Format

- Explore the historical context of the movie.
  - What is the context of the movie?
  - What is the historical accuracy of the movie?
- Engineering in the movie
  - How is engineering depicted in the movie?
    - What is the predominant field shown in the movie?
  - Who are the engineers depicted in the movie?
    - What are their lives like?
  - What counts as engineering in the movie?
- What are the implications for engineering in the movie?
  - Are there racial/gender/SES/political intersections?
  - What are the ethical/moral/social implications of engineering in the movie?

# Social Issue

- A **social issue** is a problem that influences a considerable number of the individuals within a society.
- Social issues are distinguished from economic issues; however, some issues (such as immigration) have both social and economic aspects.
  - There are also issues that don't fall into either category, such as warfare.
- There can be disagreements about what social issues are worth solving, or which should take precedence.
  - Different individuals and different societies have different perceptions.

# Social Issue

- A distinct but related meaning of the term "social issue" (used particularly in the United States) refers to topics of national political interest, over which the public is deeply divided and which are the subject of intense partisan advocacy, debate, and voting.
  - In this case "social issue" does not necessarily refer to an ill to be solved, but rather to a topic to be discussed.

• Social Issue. (n.d.). Retrieved January 16, 2017 from Wikipedia: [https://en.wikipedia.org/wiki/Social\\_issue](https://en.wikipedia.org/wiki/Social_issue)

# Morals vs. Ethics

- Morality is defined as having and living according to a moral code, or principles of right and wrong.
  - Culturally different.
  - Affected by time.
- Ethics is the philosophy of morals.
  - Explores the idea of morality and its place in society and addresses questions about morality.
  - Systematizing, defending, and recommending concepts of right and wrong conduct.
- Typically, a common application in engineering ethics is safety.
  - Other ethical issues can also exist though. Are there more than one kind expressed in the movie?

- Morality. (n.d.). Retrieved January 16, 2017 from Wikipedia: <https://en.wikipedia.org/wiki/Morality>
- Ethics. (n.d.). Retrieved January 16, 2017 from Wikipedia: <https://en.wikipedia.org/wiki/Ethics>

# Expectations

- Go beyond the movie!
  - Use articles, books, other videos.
- YOU are the teacher!
  - Guide us towards what you think is important to understand.
- Emphasize the visual!
  - Put some thought into how visual your presentation should be.

# General overview

- Teams of 4 are to be self selected.
  - Teams will determine when to watch movie over shared screen.
- Presentations should last between 15-20min of voice-over.
  - Will be posted on Google Drive
- Formats given are suggestions for minimum effort.

# Tips

- Start SOONER than later!
  - Availability for viewings are fleeting!
- Get together to watch and take notes.
  - Typically the majority of the engineering and design takes place within the first half of the movie, but watching the whole movie is still encouraged.
- Utilize library and internet sources to investigate the real events depicted.
  - Wikipedia is ok to start your investigation but use their sources.
  - IMDB helps too. (Maybe there's more than one movie that can help you.)
- BE CREATIVE!

# !!BEWARE!!

- If you just give me a synopsis of the movie you were assigned, the highest grade the team will get is a D.
- Use resources and CITE them!
- If you use screen captures, cite that too!
- Citing for movies:
  - <https://owl.english.purdue.edu/owl/resource/560/11/>
- Citing for websources:
  - <https://owl.english.purdue.edu/owl/resource/560/10/>