Ethical Considerations in Bioengineering
- Conflict of interest – personal, professional, and financial
- Policies regarding human subjects, live vertebrate animal subjects in research, and safe laboratory practices
- Mentor/mentee responsibilities and relationships
- Collaborative research including collaborations with industry
- Peer review
- Data acquisition and laboratory tools; management, sharing and ownership of data
- Research misconduct and policies for handling misconduct
- Responsible authorship and publication
- Scientists as a responsible member of society, contemporary ethical issues in biomedical research, and the environmental and societal impacts of scientific research

Sample Ethic Questions
- What would you do in case of an authorship dispute?
- What would you do if an animal experienced an adverse effect during your experiment?
- If you need human blood for a procedure, how would you obtain it?
- What would you do if an animal injected with human neuronal stem cells in an experiment appeared to be more intelligent?
- Why can't you run a simulation instead of an *in vitro* experiment?
- Why can't you run an *in vitro* experiment instead of an *in vivo* experiment?
- How do you protect patient data?
- What institutions are in charge of animal studies?
- What institutions are in charge of human subjects research?

Sample Statistic Questions
- How did you decide on the number of experiments? (power analysis)
- How do you know if your results are statistically significant? (ANOVA, t-tests, p-value, etc)
- Can you look for effects of your treatment that you did not initially design your experiment for? For instance, what if you notice in your data that it seems like while your subjects given drug A do not have lowered blood pressure, they do have lowered blood cholesterol? (multiple comparisons, Bonferroni correction, etc)

Other Resources
- NIH Research Ethics Training: https://researchethics.od.nih.gov/
- A biologist's guide to statistical thinking and analysis: http://www.wormbook.org/chapters/www_statisticalanalysis/statisticalanalysis.html