Recommended topics
For 2\textsuperscript{nd} round of group presentations

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http://rotorlab.tamu.edu/me489
Recommended topics

Pick one of the GRAND CHALLENGES FOR ENGINEERING in the 21st Century

http://www.engineeringchallenges.org/

Make solar energy economical
Provide energy from fusion
Develop carbon sequestration methods
Manage the nitrogen cycle
Provide access to clean water
Restore and improve urban infrastructure
Advance health informatics
Engineer better medicines
Reverse-engineer the brain
Prevent nuclear terror
Secure cyberspace
Enhance virtual reality
Advance personalized learning
Engineer the tools of scientific discovery
GRAND CHALLENGES FOR ENGINEERING in the 21st Century

- Justify Need – Why is this challenge important? Why is it important for the US and the world?
- Note state of the art and current pitfalls and shortcomings
- What is the needed knowledge to achieve goal? Note practical constraints (technological, economic, political)
- Where are the resources to attain the goal?
- How can you (us) get involved to face the challenge?
- When do you foresee the challenge will be resolved?
Comments on group presentations: Autonomous Vehicles & BigDog
Question – autonomous vehicles

Are the autonomous cars able to sense objects beyond immediate interferences, i.e., a wrecked vehicle behind the 18 wheeler in front of you?

How do sensors pick up edges or middle of roads that are only one lane and do not have lane lines (country back roads) to keep the car on the proper side of the road?

I will really miss driving if we go in that direction. I really enjoy the “thrill” of driving although it may be “illegal”
Questions – autonomous vehicles

What are other projects that will replace “people”? (as controllers or drivers?)

For example: pilots maneuvering UAVs (unmaned aerial vehicles), rescue missions, dirty jobs, etc.

Will these vehicles (robots) have any negative effects in our economy? As more and more jobs are taken by robots?

Economy must change – educate more. Any task that is repetitive can be performed by a robot or can be outsorced.
Are there plans to make larger “Alpha Dogs” in the future? What are the applications of Atlas?

How deep into Artificial Intelligence are we? Will humans not be needed one day?

What is the future of Artificial Intelligence and long will it be?

Are biological imitations (cheetah, dog) really better than robots w/o animal-like features?
Any organization (professional, corporation, government, social, religious) has rules for appropriate behavior. Rules are based on principle of fairness. All Western orgs. have similar practices of ethical behavior. See ASME rules (prior lecture)
Ethics in the workplace

After a deal is struck, is it legal and appropriate to receive a gift of appreciation worth more than 50 dollars?

Perhaps. Never accept a gift for work that you are supposed to do (it is part of your regular duties or job description)
Since different cultures have different interpretations of an event and hence there is no universal definition of “ethical conduct,” what shall we do if there is a conflict of interest? e.g. refusing a gift from a Chinese is a very disrespectful act, as gifts from Chinese tend to be high in value.

Conflict of interest presumes one exploits a professional or official capacity in some way to obtain (gain) personal or corporate benefit. Cultures do have different patterns of accepted behavior; still (definition) of conflict of interest holds.
Ethics in the workplace

Do business/ethical rules regarding the acceptance of gifts/bribes apply to unemployed people seeking internships/co-ops/full time positions?

Remember the basics:
Do the right thing when no one is watching.
If it smells fishy or if it is “too good” then avoid it!
Questions

Around this time of year, many students are looking for jobs or getting ready to accept job offers. What should you look for in a job offer? Can you negotiate certain things? What questions should one ask once receiving an offer?

Besides $$ and benefits, you have to be satisfied with the company's reputation, environment, and culture (growth potential too). The offer must detail the role you will play in the company. Get the intangibles in writing (further education, travel and time away from home, balancing work and personal life).

See resource DECISION TIME! Salary evaluation
http://careercenter.tamu.edu/docs/SalaryEvaluationSlides.pdf
Questions

What can A&M do to become more marketable?

How are we going to better our school to get a higher ranking? By making admissions more competitive, curriculum more rigorous?
A Plan for Transforming Engineering Education at TAMU

TAMU College of Engineering – Strategic Plan (2011-2015)
Reflects on the global landscape and the pace of change in S&T and proposes a transformation in engineering education (content and delivery).

You will assess the goal for UG education and ponder on why is the transformation needed (now) and how well are you prepared to face the challenges of engineering in the global marketplace

Be an active participant in your education!