Subject Name: Professional Ethics
Subject Code: HSIR14 – Professional Ethics

No. of Credit: 3

Course Objective:

- Identify the core values that shape the ethical behavior of an engineer
- To Create an awareness on professional ethics and Human values
- To appreciate the rights of others

What is Engineering Ethics?

- Ethics (Morality) – It refers to moral values that are sound or reasonable, actions or policies that are morally required (right), morally permissible (all right), or otherwise morally desirable (good).
- Engineering Ethics: It consists of the responsibilities and rights that ought to be endorsed by those engaged in engineering, and also of desirable ideals and personal commitments in engineering.
- Thirukural …

Human Values

- Human values refer to those values which are at the core of being human. The values which are considered basic inherent values in humans include truth, honesty, loyalty, love, peace, etc. because they bring out the fundamental goodness of human beings and society at large.

Five Human Values …

- Right Conduct – Contains values like self-help skills (modesty, self-reliance, hygiene etc.), social skills (good behavior, good manners, environment awareness etc.), ethical skills (courage, efficiency, initiative, punctuality etc.) and Ownership.
- Peace – Contains values like equality, focus, humility, optimism, patience, self-confidence, self-control, self-esteem etc.
- Truth – Contains values like accuracy, fairness, honesty, justice, quest for knowledge, determination etc.
- Peaceful co-existence – Contains values like psychological (benevolence, compassion, consideration, morality, forgiveness etc.) and social (brotherhood, equality, perseverance, respect for others, environmental awareness etc.)
- Discipline – Contains values like regulation, direction, order etc.

Unit 1 – Human Values

- Morals - Standards of good behaviour
- Values - To decide the amount of money that something is worth.
- Ethics - The study of what is right and wrong in human behaviour.
- Integrity - The quality of being honest and having strong moral principles.
- Work Ethic - The principle that hard work is intrinsically virtuous or worthy of reward.
- Service Learning - "Service-learning is *a pedagogy integrating academically relevant service activities that address human and community needs into a course*" -
- Civic Virtue – "Civic virtue is *the harvesting of habits important for the success of a society*" -
- Respect for Others
- Living peacefully

Unit 1 – Human Values

- Caring
- Sharing
- Honesty - *uprightness of character or action*.
- Courage - the ability to control fear in a situation that may be dangerous or unpleasant.
- Valuing time
- Co-operation
- Commitment

Unit 1 – Human Values

- Empathy – the ability to imagine how another person is feeling and so understand his/her mood.
- Self-confidence – a feeling of trust in one's abilities, qualities, and judgment.
- Character – **the way someone thinks, feels, and behaves**
- Spirituality – the quality of being concerned with the human spirit or soul as opposed to material or physical things.

Class can try to find a example … from individual perspective dimension

Theory ….

- Very Difficult
- All are same
- Many point in one meaning
- Unable to comprehend
- How to check this aspects ???
- Who wrote this ??
- What are going to do with this ????
- U have some problem ????>>>
- What is your problem ???? >>>
- We have to complete a Course ???
- Getting Placed in Corporate
- I don’t know anything … carry on ….
- Do Nothing – 5 Star …

How are we going study ????

- Engineering and Technology post us both Challenges and opportunities … Exploration of moon and planets and Explosions of Space Shuttles, Challenger in 1986 and Columbia in 2003 …
- Potential Moral Problems
- Case Based work
- Given separate team and individual activities in the class
- Personality trait test
- More emphasis on Crime laws and Ethics in it
- Assignments and Quiz in the Class …

Three Biases – Engineering and Engineering Ethics

- Isn’t Engineering Based only on Facts and Figures? -
- Isn’t Engineering Ethics about Abiding by the Law and Engineering Norms?
- Isn’t Engineering Ethics a Moral Brake on Innovation?

Case Study – Inputs

- Case input: “Dieselgate” Scandal - 11 Million Cars Called Back - VW
  - Sept. 2015 – US Environmental Protection Agency
  - Irregularities with certain software – VW diesel cars
  - Software enabled the car to detect when it was running under controlled laboratory conditions on a stationary test ring … Switching back mode of low engine power and performance …
  - Result – emission was forty times more nitrogen oxide pollutants than the levels allowed under US regulations …
  - Then … Story continues …

Cast Study – Inputs

- Volkswagen Admitted – 11 Million of its vehicles are (8 million cars in Europe) called back …
- CEO of VW American division “Michael Horn” Apologized for the “Defeat device”
- Personally question asked to Horn “Personally, no. I am not an Engineer” He continue to blame a few rogue engineers”
- Several Executive – imprisoned for their role in the scandal, large group of executives charged for their involvement.

Case Study – Several Reason to be Engineering Ethics case

- One, Deception (Scandal) – Clearly breach of unethically acceptable practice of engineering;
- Volkswagen first claimed that problem was due to a Technical Glitch, but the “Defeat device”
- Two, Original testimony to the House Committee on Energy and Commerce of the US Congress, Horn Wholeheartedly accepted responsibility … “We at Volkswagen take full responsibility for out Actions” – but at the time of Question and Answer session by members of congress – CEO Blamed “Few Rogue Engineers” – Software designed in Germany … added further ….

Case Study – Several Reason to be Engineering Ethics case

- Third, Engineering choices are often collaborative choices made by difference people at difference organizational levels “CEO mentioned at “The problem of many hands”
- Fourth, Engineering corporations operate in board societal contexts, and they deal with large group of stakeholders, to whom they have certain responsibilities.
- Fifth, many engineering choice made in the process of design – are not easily reversed afterwards

Now … Roles and Responsibilities of Engineers…

- Engineering is Profession ---- Working / Practicing
- First code of ethics – Field of medicine (Hippocratic Oath – Ancient Greece)
- Second world war – “Engineers Creed” American National society of Professional Engineers (NSPE) 1954 …
- Two basic Questions to addressed are
  - What is the moral ideal that engineering should serve?
  - What are the professional responsibilities of individual engineers?
    - Code of Ethics or code of conduct

Conclusion

- Human Interface …
- Hierarchy …
- Greediness …

- Next Class – Cases to be discussed are
  - Cases Involving the Control of Information --- Google versus China

Engineering ethics has an …

- Informational or knowledge component (for example, know what the norms for engineering are);
- A cognitive component (for example, recognize when there is an ethical issue);
- A reasoning component (for example, make a moral judgment); and
- A motivational component (for example, move yourself to act). All four dimensions can be addressed through education.

- **Case Study – Control of Information Google Vs. China**
- Google is the world's largest search engine. In 2009, it had approximately 400 million Web users, of which 200 million are located in the United States. Its global revenue from advertising amounted to $23.6 billion. China is the world's third-largest economy.
- China has a potential 384 million Internet users, and advertising revenue from China is estimated to be $15 billion to $20 billion annually. In 2006, Google began operations in China as Google.cn. Part of the agreement with the Chinese government was that the Google.cn search engine would censor information from topics that had been banned by the Chinese government.
- In January 2010, Google threatened to pull out of China after it claimed that Google and some twenty other large companies had been subjected, in December 2009, to "a highly sophisticated and targeted attack" designed to steal software codes.

- The alleged purpose of the attack was so that the Chinese government could break into the Gmail accounts of Chinese human rights activists. Although the attack was unsuccessful, Google decided it should review its operations in China. “We have decided that we are no longer willing to continue censoring our results on Google.cn, and so over the next few weeks we will be discussing with the Chinese government the basis on which we could operate an unfiltered search engine within the law, if at all.
- We recognize that this may well mean having to shut down Google.cn, and potentially our offices in China.” Three months later, in March 2010, **Google closed Google.cn and began directing its Chinese customers to a search engine in Hong Kong, Google.com.hk.** Hong Kong is a special administrative region, so the Google.com.hk search engine is not subject to Chinese government censorship. The Chinese government complained that this was a violation of the written promise Google had made when it began operations in China in 2006.

The license for Google to operate in China was up for renewal on June 30, 2010. Without the license, “Google would effectively go dark in China.” Then, in July, a compromise was reached.

The Chinese government renewed Google’s license to operate in China, and Google said that it would not automatically redirect its Chinese users to the uncensored Hong Kong site. Instead, users would go to a landing page on Google.cn that is linked to Google .com.hk.

In other words, users would have to double-click in order to get to the Hong Kong site. This solution saved face. Google agreed to obey Chinese laws while at the same time, by providing access to the Hong Kong site, the company could say that it was maintaining its anticensorship policies.

“As a company we aspire to make information available to users everywhere, including China. It’s why we have worked so hard to keep Google.cn alive, as well as to continue our research and development work in China. This new approach is consistent with our commitment not to self-censor [*sic*] and, we believe, with local law.”4 After the announcement that Google’s Chinese license had been renewed, the company’s stock rose 2.8%.

Questions to be discussed in Class …

- When it began operations in China in 2006, Google had agreed to have the search engine Google.cn censor information. Did Google have an ethical right to renege on its agreement in 2010 by directing its Chinese users to the uncensored search engine Google.com.hk?
- Google derives its revenue by selling advertising. Should Google be concerned about the type of information that users access through the various Google search engines?
- Do for-profit businesses, such as Google, have an ethical responsibility to lobby for human rights and against censorship in the various countries in which they have commercial operations?
- After the December 2009 attack, Google enhanced the security for all of its users. Does Google have any additional ethical responsibility to human rights activists to provide them with even more sophisticated architectural and infrastructure improvements so that their specific Gmail accounts cannot be compromised?

Sources: The factual information in this case has been drawn from various newspapers, including the following:

- "Google And China Work It Out, For Now", Carl Gutierrez, Forbes, July 9, 2010, accessed November 11, 2016, at http://www.forbes.com/2010/07/09/google-china-baidu-markets-equities-technology-censorship.html.

- Google Says China Licence Renewed by Government," *BBC News Business*, July 9, 2010, accessed December 28, 2010, at http://www.bbc.co.uk/news/10566318.

- Miguel Helft and David Barboza, "Google vs.China," *Washington Post*, January 14, 2010, http://www.washingtonpost.com/wp-dyn/content/article/2010/01/13/AR2010011302908.html"

- "Google Shuts China Site in Dispute over Censorship," *New York Times*, March 22, 2010, http://www.nytimes.com/2010/03/23/technology/23google.html.

A Personality to show …

- KR Sridhar, PhD
- **Founder and Chairman, Chief Executive Officer**
- Prior to founding Bloom Energy, KR Sridhar was Director of the Space Technologies Laboratory (STL) at the University of Arizona where he was also a professor of Aerospace and Mechanical Engineering. Under his leadership, STL won several nationally competitive contracts to conduct research and development for Mars exploration and flight experiments to Mars. KR has served as an advisor to NASA and has led major consortia of industry, academia, and national labs. His work for the NASA Mars program to convert Martian atmospheric gases to oxygen for propulsion and life support was recognized by Fortune Magazine, where he was cited as “one of the top five futurists inventing tomorrow, today.” As one of the early pioneers in green tech, KR also serves as a strategic limited partner at Kleiner Perkins Caufield & Byers and as a special advisor to New Enterprise Associates. He has also served on many technical committees, panels and advisory boards and has several publications and patents. KR received his bachelor’s degree in Mechanical Engineering with Honors from the University of Madras (now called NIT, Trichy), India, as well as his master’s degree in Nuclear Engineering and PhD in Mechanical Engineering from the University of Illinois, Urbana-Champaign.

The Challenger Disaster

- Jan, 27 1986 – Prelaunch teleconference (Morton Thiokol and the Marshall space flight Center) was filled with tension.
- Recommendation – Worries about the ability of O-rings to seal at low temperatures.
- Chief of O-rings Engineer Roger Boisjoly – know there was a problem and warned his colleagues about O-Rings (Sealing mechanism /Booster Rocket) too much of resiliency, they could fail to seal properly) – Escaping hot gases, will ignite fuel in the storage tank …
- Gerald Mason – NASA (Correlation between temperature and resiliency) Robert Lund – Supervising Engineer “Take off your engineering hat and put on your management hat” No launch recommendation was reversed …

The Challenger Disaster

- Roger Boisjoly was deeply upset … his professional way to handle also missed …
- The next day, just 73 seconds into the launch, exploded …
- Taking life of six astronauts and a school teacher Christa McAuliffe (NASA’s reputation)

Engineering ethics education should

(1) Provide knowledge of codes and standards;

(2) Increase awareness of ethical issues and develop the ability to identify ethical issues;

(3) Provide training in ethical decision-making; and

(4) Inspire the motivation to be ethical.

Moral	Ethics
1. More general and prescriptive based on customs and traditions.	1. Specific and descriptive. It is a critical reflection on morals.
2. More concerned with the results of wrong action, when done.	2. More concerned with the results of a right action, when not done.
3. Thrust is on judgment and punishment,in the name of God or by laws.	3. Thrust is on influence, education, training through codes, guidelines, and correction.
4. In case of conflict between the two, morality is given top priority, because the damage is more. It is more common and basic.	4. Less serious, hence second priority only. Less common. But relevant today, because of complex interactions in the modern society.
5. Example: Character flaw, corruption, extortion, and crime.	5. Example: Notions or beliefs about manners, tastes, customs, and towards laws.