

# **GEEN 1201**

# **Engineering as a Career**

Lecture 2 – Ethics & Standards (In Engineering)

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# Case study

R&M Machinery had for years provided XYZ Inc. with sophisticated equipment and reliable repair service. XYZ Inc. returned a failed piece of equipment. A meeting was held which included Archie Hunter, a representative from XYZ Inc.; Norm Nash, R&M's returned goods area representative, and Walt Winters, an R&M engineer intimately acquainted with the kind of equipment XYZ Inc. had returned. Norm Nash represented R&M's "official position": the piece of equipment is all right. However, during the course of the meeting it becomes apparent to Walt Winters that the problem has to be R&M's. He suspects that the equipment was not properly tested out by R&M, and that it failed because of an internal problem.

Walt keeps silent during the meeting. After the meeting he talks with Norm about his diagnosis. He suggests they tell XYZ Inc. that the problem is R&M's fault, and that R&M will replace the defective equipment. Norm replies, "I don't think

# Codes of ethics in Engineering

- Serves as a framework for making correct judgements
- Expresses the right, duties and obligations of being an engineer
- They are not laws but violating them may result is expulsion from professional society
- Different societies have own set of ethics
- Different ethics or moral guidelines may be created or stated but they exhibit similar themes in a different format
- Some professional organization
  - National Society of Professional Engineers(NSPE)
  - Institute of Electrical & Electronics Engineers(IEEE)
  - American Society of Mechanical Engineers(ASME)
  - American Institute of Chemical Engineers(AIChE)
  - Society of Automotive Engineers(SAE)

# NSPE Code of ethics

- Engineers shall hold paramount the safety, health and welfare of the public
- Engineers shall perform services only in areas of their competence
- Engineers shall issue public statements only in an objective and truthful manner
- Engineers shall act for each employer or client as faithful agents or trustees
- Engineers shall avoid deceptive acts
- Engineers shall conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession

These are also called 6 Fundamental Canons of NSPE

# IEEE code of ethics

- to accept responsibility in making decisions consistent with the safety, health, and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;
- to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
- to be honest and realistic in stating claims or estimates based on available data;
- to reject bribery in all its forms;
- to improve the understanding of technology; its appropriate application, and potential consequences;
- to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
- to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
- to treat fairly all persons and to not engage in acts of discrimination based on race, religion, gender, disability, age, national origin, sexual orientation, gender identity, or gender expression;
- to avoid injuring others, their property, reputation, or employment by false or malicious action;
- to assist

# Standards in Engineering

- A standard is *a document that defines the characteristics of a product, process or service, such as dimensions, safety aspects and performance requirements*
  - Code tells you what you need to do
  - Standards tells you how to do it
- Acts as a common language that allows engineers to talk at same level when reacting to products or processes
- Standards may refer to *a set of conditions & requirements of precise & limited application that provide a detailed description of a procedure, process, material, product or service for use primarily in procurement and manufacturing*. These are specifications
- Engineering products often also satisfy mandatory government requirements that defines the characteristics and/or the performance requirements of a product, service or process

# Different types of standards

- Voluntary
  - Written in an open environment with consensus of professionals from private and public sectors (example: ISO film speed code)
- De facto
  - Standards which are not officially approved by standards organization or government but widely used (QWERTY keyboard layout)
- Regulatory
  - Standards written or adopted by government agencies (example: Americans with Disabilities Act (ADA))
- Other
  - Standards created and used within individual companies (example: Customer technical support tickets to be worked on within a week)

# Why are they important?

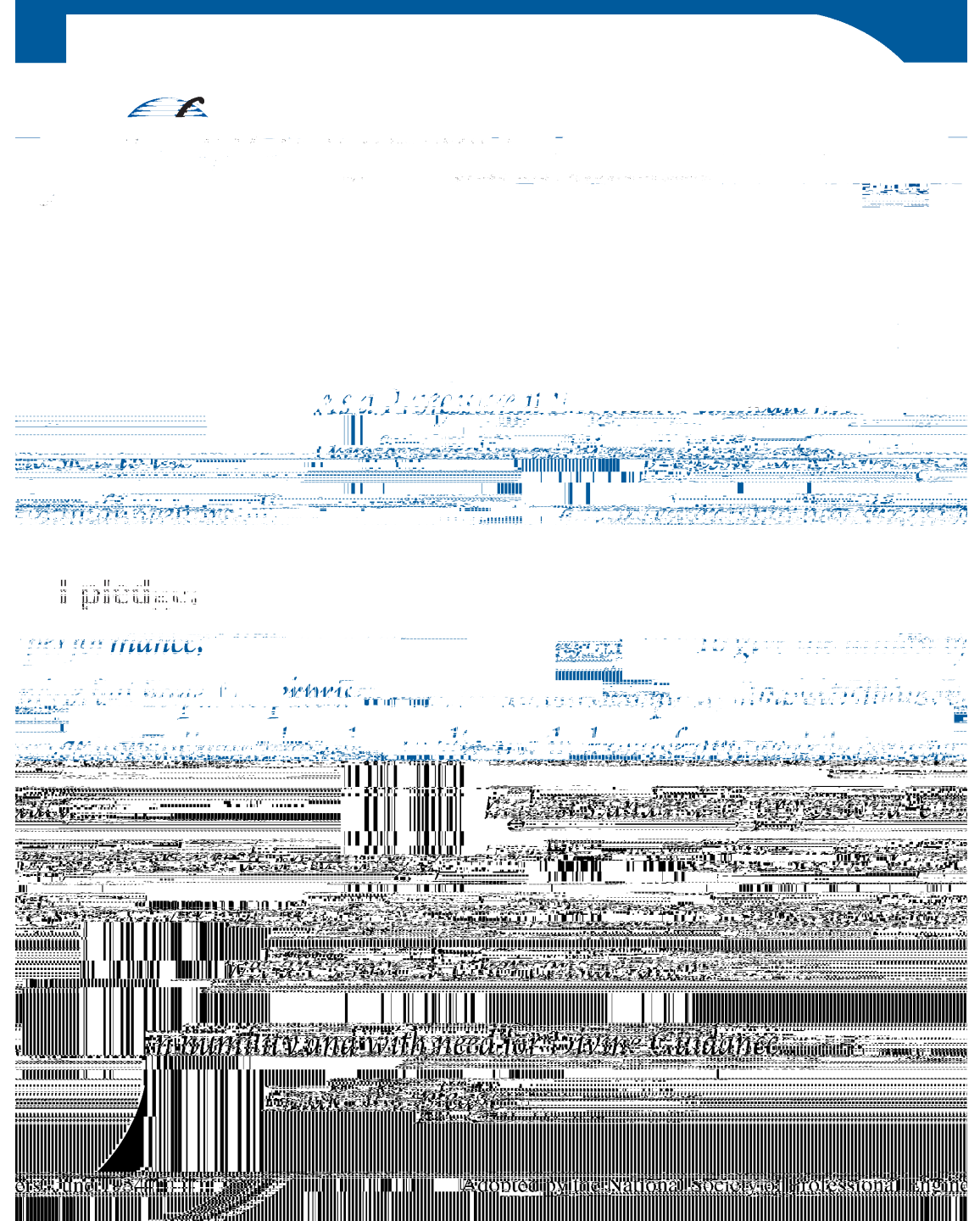
- Uniformity: Parts and components made in different locations must have same specifications
- Reliability in service: Services offered in one store outlet should be the same at another
- Product safety: Services and components should be safe for use no matter who or where they are offered or manufactured
- Ease of information exchange: Components designed in US can be manufactured in factories around the world and assembled together



# Examples of Different Standards Organizations and search engines

- ASTM(American Society for Testing and Materials develops standards and test procedures for determining material properties pertaining to the field of application )
- UL(Underwriters Laboratories for product safety tests & certification)
- ANSI(American National Standards Institute helps develop

# NSPE Engineers' Creed



## Assignment # 2

- a. Study ASME Code of ethics and correlate them with NSPE and IEEE code of ethics
- b. Identify different National and International Standards organizations that are responsible for creating standards in Aerospace Engineering.