



TEXAS TECH UNIVERSITY

Murdough Center for Engineering Professionalism

Information on Comprehensive Levels of Professional Development Hours in Engineering Ethics via Distance Learning

A Brief Background on Texas Tech's Engineering Ethics Courses by Distance Learning

The courses were created by the Murdough Center for Engineering Professionalism at Texas Tech University in the early 1990s with encouragement and financial support from the Texas Board of Professional Engineers and the National Council of Examiners for Engineering and Surveying (NCEES).

During the early years, the courses were taken by several staff and board members of engineering licensing boards to determine course applicability to and appropriateness for licensed engineers in their jurisdictions who had shown a need for various levels of reminders about the importance of ethics in engineering practice.

Since 1990, licensed engineers from all 50 states have enrolled in our distance learning courses in engineering ethics. Although not required to do so, some enrollees inform us that they are being compelled by their licensing board to take our course. Frequently enrollees end up praising our courses and expressing the view that all practicing engineers should take at least one course in engineering ethics.

The courses are web-assisted, meaning material will be downloaded from the course website and your thoughts posted in an on-line discussion forum; assignments will be submitted via email.

Materials for Engineering Ethics Courses

Assignments are based on excerpts from *Engineering Ethics Concepts, Viewpoints, Cases and Codes* 2nd Edition © 2008, Edited by Smith, Harper and Burgess.

Material extracted from book:

Principles of Ethics for Engineers: Articles on Intuition, Utilitarianism, Respect for Persons and Virtue Ethics
{Basic, Intermediate, Advanced Levels}

Codes of Ethics: Study of NCEES and NSPE Codes
{Basic, Intermediate, Advanced Levels}

Viewpoints by Individual Engineers, Ethicists & Organizations - 6 articles
{Intermediate, Advanced Levels}

Cases on Critical Thinking, Honesty, and Responsibility - 13 cases
{Intermediate, Advanced Levels}

Additional ADVANCED Level assignment: ~2,000-word Research Paper on a topic related to engineering Ethics.

Goals and Objectives of Courses

The goals are to promote Understanding, Communication, Insight, and Problem Solving Abilities related to ethics in the engineering profession.

Understanding: a clear understanding of professional ethics when practicing engineering

Communication: an increased ability to communicate ethical concerns & potential conflicts

Insight:

- An ability to recognize ethical dilemmas
- A familiarity with various codes of ethical conduct
- An appreciation for the frequency that ethical dilemmas are encountered in professional engineering work experiences
- A better understanding of one's own values, and

Problem Solving: an awareness of ethical problem solving methods including getting the facts, listing options, testing those options, making a decision and acting.

Overall Objectives and Learning Outcomes

The overall objectives of this course are to develop the ability to:

1. Communicate willingly and effectively with others on ethical issues.
2. Differentiate among personal ethics, legally required ethics and ethics based on the engineer's responsibility to protect the public's health, safety and welfare.
3. Recognize and resolve ethical problems by learning about ethics resources available for guidance, considering numerous case studies, understanding the ethical component of the problems by discussion of case studies, and analyzing situations presented by case studies.
4. Formulate solutions to ethical problems by recognizing the consequences of actions taken; apply different perspectives on ethical problem solving such as duties, consequences; distinguish between rules and relationships; analyze what is expected, knowing what's right, and doing what's right; and comprehend, compare, evaluate and act on these solutions.

To accomplish these objectives, enrollees will:

1. Review basic knowledge and fundamental definitions of professionalism and ethics.
2. Develop an understanding of ethics as it relates to the profession by reviewing codes of ethics and other guidelines for decision making.
3. Apply the concepts of ethics codes and other guidelines to simple actions of living and working, complex actions in the workplace, and to case studies of actual and illustrative work situations.
4. Relate consequences resulting from both simple and complex actions to their immediate supervisor, the employees they supervise, and the public.
5. Analyze case study examples and situations in order to distinguish between choosing between right and wrong, and choosing among competing goods.
6. Develop skills to formulate, analyze, and compare solutions to ethical dilemmas encountered in the workplace and relationships with others.
7. Learn to evaluate the value and effect of the various solutions by obtaining all the facts, listing and testing the options, making a decision and knowing when and how to take action... *and having the willingness and courage to do so.*

Course Outlines

BASIC Level Study in Engineering Ethics

(30 Professional Development Hours)

Description: A study of three ethical theories; application to cases and engineering Codes of Ethics.

Assignments:

- Assignment 1: Study of *Intuitions*
- Assignment 2: Study of *Utilitarianism*
- Assignment 3: Study of *Respect for Persons*
- Assignment 4: Study of *Virtue Ethics*
- Assignment 5: Application of an Ethical Theory to a Code of Ethics
- Assignment 6: Position Paper (~1,200 words)
- Assignment 7: Obtaining Guidance from Licensing Board Rules

INTERMEDIATE Level Studies in Engineering Ethics

(60 Professional Development Hours)

Description: A study of viewpoints on ethics, ethics case studies, and codes of ethics applied to actual cases

- Assignment 1: Study of *Intuitions*
- Assignment 2: Study of *Utilitarianism*
- Assignment 3: Study of *Respect for Persons*
- Assignment 4: Study of *Virtue Ethics*
- Assignment 5: Application of an Ethical Theory to a Code of Ethics
- Assignment 6: Position Paper (~1,200 words)
- Assignment 7: Obtaining Guidance from Licensing Board Rules
- Assignment 8: Viewpoints: Read assigned article(s) on viewpoints in the text
- Assignment 9: Case Analysis: Analysis of 9 specific ethics cases from the text

ADVANCED Level Study in Engineering Ethics

(90 Professional Development Hours)

Description: Independent study and research into topics related to ethical responsibilities of engineers to their clients, the profession, and society

- Assignment 1: Study of *Intuitions*
- Assignment 2: Study of *Utilitarianism*
- Assignment 3: Study of *Respect for Persons*
- Assignment 4: Study of *Virtue Ethics*
- Assignment 5: Application of an Ethical Theory to a Code of Ethics
- Assignment 6: Position Paper (~1,200 words)
- Assignment 7: Obtaining Guidance from Licensing Board Rules
- Assignment 8: Viewpoints: Read assigned article(s) on viewpoints in the text
- Assignment 9: Case Analysis: Analysis of 9 specific ethics cases from the text
- Assignment 10: Research Proposal
- Assignment 11: Draft Paper (non-penalty based evaluation)
- Assignment 12: Final Paper (~2,000 words)