



TEXAS TECH UNIVERSITY
Murrough Center for
Engineering Professionalism

Information on Comprehensive Levels of Professional Development Hours in Engineering Ethics

A Brief Background on the Engineering Ethics Courses by Distance Learning

The courses were created by the Murrough 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 managed through the CE Blackboard website. Each course of study includes assignments from the level(s) before it. For example, enrollees in the 60 PDH level will complete the 30 PDH level assignments as well as the assignments in the 60 PDH level. Enrollees in the 90 PDH level will complete the 30 PDH and 60 PDH assignments and the assignments in the 90 PDH level. The courses are designed to be completed in order.

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}

Course Outlines

30 PDH {BASIC} Level Study in Engineering Ethics

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

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

60 PDH {INTERMEDIATE} Level Studies in Engineering Ethics

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

Assignments 1 through 7 of the 30-PDH Level

Assignment 8: Viewpoints: Read assigned article(s) on viewpoints

Assignment 9: Case Analysis: Analysis of nine specific ethics cases

90 PDH {ADVANCED} Level Study in Engineering Ethics

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

Assignments 1 through 7 of the 30 PDH Level

Assignments 8 and 9 of the 60 PDH Level

Assignment 10: Research Proposal

Assignment 11: Draft Paper (~2,000 words)

Assignment 12: Final Paper

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.*

Instructor: William M. Marcy, PhD, PE

Dr. Marcy earned a Bachelor of Science in Electrical Engineering in 1964. He earned a Master of Science in Electrical Engineering in 1966. He received the first ever Interdisciplinary Ph.D. in 1972 from Texas Tech.

His experience with the U.S Government includes serving as an intelligence officer with the Central Intelligence Agency in Washington, D.C. from 1966 to 1975, eventually becoming the Chief of the Engineering and Planning Branch, Office of Security, Directorate for Administration. Dr. Marcy served as Deputy Directory of the CIA Interagency Training Center, which provided technical security training for all U.S. Government agencies, with security responsibilities for U.S. Government facilities outside the United States.

From 1975 to 1980 he served as Associate Professor of Industrial Engineering at Texas Tech. During the oil boom of the late 1970's he left Texas Tech to join Armo National Supply Company in Houston, Texas as special assistant to the president for business planning and development. Following the oil bust of the early 1980's he left NSC to form a startup company, Information Planning Corporation in Dallas, Texas.

In 1983 Dr. Marcy returned to Texas Tech as Associate Dean of Engineering and Associate Professor of Industrial Engineering being promoted to full professor in 1986. In 1987, he was selected as the director and later chair of the Computer Science Program as it became an independent department in the College of Engineering. He served in that position until 1995 when he became the Senior Associate Dean of Engineering. During the period 1984 to 1997, he also served as an outside director of FSI International Corporation, a public corporation manufacturing semiconductor-processing equipment in Chaska, MN. In 2002 Dr. Marcy became an outside director of Concorde Wealth Management Corporation in Dallas, Texas. He continues to serve as the Chair of the Board of that corporation. In 1998 he became the acting Dean of Engineering then Interim Dean of Engineering. He was selected as the permanent Dean of Engineering in April of 1998 and served in that position until being selected as Provost in June of 2002.

Dr. Marcy is a licensed professional engineer in the State of Texas (84408). Bill is one of the first professional engineers in the US to add the discipline of software engineering to his license. Bill has more than 45 years of experience as a management consultant, engineering educator, software developer and licensed professional engineer. After retiring as Provost of Texas Tech in 2008 he returned part time as Professor and Director of the Murdough Center for Engineering Professionalism in the Whitacre College of Engineering. He teaches engineering ethics on-line at both the undergraduate and graduate level. More than 4,300 engineering students have completed his engineering ethics courses.

His research interests include organized problem solving, information systems, real-time systems, robotics, artificial intelligence, high-reliability software and computer security. He has published more than 50 refereed journal articles.