Ethics Lesson Plan – CE406IC  
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**Instructional materials:**
2) Teaching Module  
3) Ethics Lesson Plan  
5) PowerPoint Presentation  
6) Ethics Case Study Grading Rubric  
7) VW Emissions-cheating Scandal Case Study  
8) VW Emissions-cheating scandal articles

**Engineering Codes of Ethics:**
1) National Society of Professional Engineers (NSPE) Code of Ethics for Engineers  
2) American Society of Civil Engineers (ASCE)  
   [http://www.asce.org/inside/codeofethics.cfm](http://www.asce.org/inside/codeofethics.cfm)  
3) American Society of Mechanical Engineers (ASME)  

**3-hour Instruction Module Teaching Plan:**

**Step 1:** Assign reading material on week in advance of three-hour session  
- Velasquez – Introduction to Ethics  
- Three-Part Moral Reasoning Framework  
- VW Emissions-cheating Scandal Case Study  
- VW Emissions-cheating scandal articles  
- Ethics Case Study Grading Rubric

**Step 2:** Deliver lecture on moral development, applied ethics, and engineering codes of ethics using Teaching module (40 min.)

**Step 3:** Introduce and discuss ethics decision making framework and application to case study analysis (20 min.)

**Step 4:** Assign student teams with writing study analysis of VW emissions-cheating scandal case (Divide class into teams of 4 – 5 students) (2 hours). Facilitate composition of team case study analyses.

**Teaching Notes – Pedagogy and Learning**

**SLOs:** On completion of the module students will be able to:
1) Recognize, comprehensively describe, and discuss ethical issues related to engineering/professional economic project cost and benefit analysis.  
2) Identify engineering/professional economic ethical dilemmas and associated ethical issues, stakeholders, and pertinent facts.  
3) Explain and consider contradictory viewpoints related to engineering/professional ethical dilemmas and associated consequences.  
4) Demonstrate the ability to apply ethical concepts to support arguments in the resolution of engineering/professional specific ethical dilemmas.
5) Illustrate the ability to use engineering/professional ethics decision making frameworks to present ethical arguments and support these arguments with evidence in the form of ethical principles, stakeholder perspectives, and relevant factual background.

6) Use problem solving and critical thinking skills to construct ethical engineering/professional economic decisions based on professional codes of ethics, and conventional engineering practices.

**Teaching Objectives:**

1. Present overview of moral philosophy theory and moral development.
2. Reinforce familiarization and application of applied ethics concepts and professional engineering codes of ethics.
3. Introduce and facilitate the use of ethics decision making frameworks to solve ethics dilemmas; adopt the Framework for Moral Reasoning
4. Guide the use of the decision making framework to develop case-based analysis.

**Instructional Approach:**

Accreditation Board for Engineering and Technology, Inc. (ABET) requires that engineering graduates be prepared to address ethical problems. Teaching students to solve ethical problems is challenging as engineering ethics problems are complex and ill-structured with multiple perspectives and interpretations that are driven by the different roles that engineers play which typically have no right or wrong answers.

This module adopts a case-based approach to teaching engineering ethics as the core strategy for engaging students in the process of solving everyday ethics problems presented in the workplace environment. Everyday ethics problems often involve circumstances where engineers are challenged to balance ethical obligations owed to the corporation to maximize return on investment and professional duties to produce quality work for the safety of the public.

Engineering associations publish ethical canons to guide behavior, but must be supplemented with academic instruction to achieve what engineering ethicists have categorized in the emotional engagement (the willingness to make ethical decisions), intellectual engagement (knowing how to make ethical decisions), and particular knowledge (knowing currently accepted guidelines for ethical practice). The literature informs also the importance of professional engineering ethical codes, moral reasoning and humanist readings. This means that we must help our students to recognize ethical problems; use thoughtful reflection to address those problems by accommodating a variety of perspectives, theories, and ethical codes in their decisions. (Newberry 2004) (Hawes 2001).

As the instructor for this module, the teaching objectives should focus to:

1. push students to defend their solutions to ethical problems,
2. acquire the ability to evaluate alternative solutions from different perspectives, and
3. enhance students’ divergent thinking (e.g., understand situations from other stakeholders’ point of view).