
UNIT II

Engineering Ethics

Unit II

- Senses of ‘Engineering Ethics’
- Variety of moral issues
- Types of inquiry
- Moral dilemmas
- Moral Autonomy
 - Kohlberg’s theory
 - Gilligan’s theory
 - Consensus and Controversy
- Models of professional roles
 - Theories about right action
 - Self-interest
 - Customs and Religion
 - Uses of Ethical Theories.

The Goal

The course will develop a framework on which

- professional and ethical issues can be analyzed,
 - Build up an awareness of various views of ethical issues as well as professionals ethical rights and responsibilities.
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ENGINEERING ETHICS

- The study of moral issues and decisions confronting individuals and organizations involved in engineering and
 - The study of related questions about moral ideals, character, policies and relationships of people and organizations involved in technological activity.
 - {* Confronting – Challenging
* ideals - Principles}
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TRAINING IN PREVENTIVE ETHICS

- Stimulating the moral imagination
 - Recognizing ethical issues
 - Developing analytical skills
 - Eliciting a sense of responsibility
 - Tolerating disagreement and ambiguity
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IMPEDIMENTS TO RESPONSIBILITY

- Self-interest.
 - Fear.
 - Self-deception.
 - Ignorance.
 - Egocentric tendencies.
 - Microscopic vision.
 - Groupthink.
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SENSES OF EXPRESSION OF ENGINEERING ETHICS

- Ethics is an **activity and area of inquiry**. It is the activity of **understanding moral values, resolving moral issues** and the area of study resulting from that activity.
 - When we speak of ethical problems, issues and controversies, we mean to distinguish them from non moral problems.
 - Ethics is used to refer to the particular set of beliefs, attitudes and habits that a person or group displays concerning moralities.
 - Ethics and its grammatical variants can be used as synonyms for „morally correct“.
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WHAT IS MORALITY?

- The term 'morality' concerns with
 - what ought or ought not to be done in a given situation?
 - what is right or wrong in handling it?
 - what is good or bad about the persons, policies and principles involved in it?
 - If an action is said to be morally right it should had some moral reasons.
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MORAL REASONS

Moral reasons include

- Respecting others and ourselves,
 - Respecting the rights of others,
 - Keeping promises,
 - Avoiding unnecessary problems to others
 - Avoiding cheating and dishonesty,
 - Showing gratitude to others and encourage them to work
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VARIETIES or APPROACHES OF MORAL ISSUES

■ **MICRO-ETHICS:**

- This approach stresses more about some typical and everyday problems which play an important role in the field of engineering and in the profession of an engineer

■ **MACRO-ETHICS:**

- *This approach deals with all the social problems which are unknown and suddenly burst out on a regional or national level*
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TYPES OF INQUIRY

- Inquiry means an investigation:-
 - Engineering ethics involves investigations into values, meaning and facts.
 - Normative Inquiries
 - Conceptual Inquiries
 - Factual or Descriptive Inquiries
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NORMATIVE INQUIRY

These are about „what ought to be“ and “what is good”. These questions identify and also justify the morally desirable norms or standards.

- Some of the questions are:
 - A. How far engineers are obligated to protect public safety in given situations?
 - B. When should engineers start whistle blowing on dangerous practices of their employers?
 - C. Whose values are primary in taking a moral decision, employee, public or govt?
 - D. Why are engineers obligated to protect public safety?
 - E. When is govt justified in interfering on such issues and why?
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CONCEPTUAL INQUIRY:

- These are meant for describing the meaning of concepts, principles, and issues related to Engineering Ethics.
 - Examples are:
 - What is SAFETY and how is it related to RISK
 - Protect the safety, health and welfare of public-What does this statement mean?
 - What is a bribe?
 - What is a profession and who are professionals?
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FACTUAL (DESCRIPTIVE) INQUIRIES

- These help to provide facts for understanding and finding solutions to value based issues.
 - These are inquiries used to uncover information using scientific techniques.
 - These inquiries get to information about business realities, history of engineering profession, procedures used in assessment of risks and engineers psychology.
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MORAL DILEMMA

- Why study engineering ethics?
 - Engineering ethics is **not only teaching** moral behavior in knowing about immoral in a set of beliefs, but also **increasing the ability of engineers and other professionals to face boldly with the moral problems arising from technological advancements, changes and other related activities.**
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MORAL DILEMMA

- Dilemmas are certain kind of situations in which a **difficult choice has to be made**.
 - Moral dilemmas have **two or more foldings** - moral obligations(കുലശൈലം), duties, rights, goods or ideals come into **disagreement with each other**.
 - One moral principle can have two or more conflicting applications for a particular given situation.
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MORAL DILEMMA

There are **three types** of complexities.

- **VAGUENESS: (தெளிவற்ற):**

- This complexity arises due to the fact that it is not clear to individuals as to which moral considerations or principles apply to their situation.

- **CONFLICTING REASONS (முரண்பாடான காரணங்கள்):**

- Even when it is perfectly clear as to which moral principle is applicable to one's situation, there could develop a situation where in two or more clearly applicable moral principles come into conflict.

- **DISAGREEMENT(கருத்து வேறுபாடு):**

- Individuals and groups may disagree how to interpret, apply and balance moral reasons in particular situations.

STEPS / PROCEDURES IN FACING MORAL DILEMMAS

- **Identifying the relevant moral factors** and reasons: i.e. Finding solutions for (i) the conflicting responsibilities (ii) the competing rights and (iii) the clashing ideals involved.
 - **Collecting and gathering all the available facts** which are relevant to the moral factors while resolving.
 - **Ranking the moral considerations** or principles on the basis of importance as applicable to the situation.
 - **Considering alternative courses of action** for resolving the problems and tracing the full implications of each. i.e. conducting factual inquiries.
 - **Having talked with the colleagues, friend** about the problem getting their suggestions and alternative ideas on resolving that dilemma.
 - **Arriving at a careful and reasonable judgment** or solution by taking into consideration of all important moral factors and reasons on the basis of the facts or truths.
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MORAL AUTONOMY

- **Autonomy means self-governing** or self-determining i.e act independently.
- **Moral autonomy is concerned with the independent attitude of a person related to ethical issues.**
- It helps to improve the self-determination among the individuals.
- Autonomous **individuals think for themselves** and do not assume that customs are always right.
- They seek to reason and live by general principles.
- Their motivation is to do **what is morally reasonable for its own sake**, maintaining integrity, self-respect, and respect for others

SKILLS FOR IMPROVING MORAL AUTONOMY

- The engineers must have the **ability to distinguish and relate these moral problems** with the problems of law, economics, religions principles etc.
 - They must **possess(have) the skills of understanding,** clarifying and assessing the arguments which are against the moral issues.
 - They must have the **ability to suggest the solutions to moral issues,** on the basis of facts. These suggestions must be consistent and must include all the aspects of the problem.
 - They must have **the imaginative skill to view the problems** from all view points and also be able to suggest a proper alternative solution.
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SKILLS FOR IMPROVING MORAL AUTONOMY

- They must be able to tolerate while giving moral judgments and decisions which may cause trouble.(i.e. they have to understand the difficulties in making moral decisions.)
- They must have adequate knowledge and understanding about the use of ethical language so as to defend or support their views with others.
- They must have some better knowledge in understanding the importance of suggestions and better solutions while resolving moral problems and also about the importance of tolerance on some critical situations.
- They must understand the importance of maintaining the moral honesty i.e. the personal convictions and beliefs and individual's professional life must be integrated. They must have this skill of doing so.

KOHLBERG'S THEORY

- Moral Autonomy is based on the psychology of moral development.
 - The first psychological theory was developed by **Jean Piaget**
 - On the basis of Piaget's theory, **Lawrence Kohlberg** developed three main levels of moral development
 - Which is based on the kinds of reasoning and motivation adopted by individuals with regard to moral questions.
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STAGES OF MORAL DEVELOPMENT

Pre-conventional Level:

- It is nothing but **self-centered attitude**.
- In this level, **right conduct is very essential** for an individual which directly benefits him
- According to this level, **individuals are motivated by their willingness to avoid punishment**, or by their desire to satisfy their own needs
- This level is related to the moral development of children and some adults **who never want to go beyond a certain limit**.

STAGES OF MORAL DEVELOPMENT

Conventional Level:

- As per this level the rules and norms of one's family or group or society has been accepted as the final standard of morality.
 - When individuals are under this level, always want to satisfy others and also to meet the expectations of the society and not their self interest.
 - No adult tries to go beyond this level.
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STAGES OF MORAL DEVELOPMENT

Post- Conventional Level:

- This level is said to be attained when an individual recognizes the right and the wrong on the basis of a set of principles which governing rights and the general good which are not based on self- interest or social conventions.
- These individuals are called “**autonomous**”, because they only think for themselves and also they do not agree that customs are always correct.
- They want to live by general principles which are universally applied to all people.

Lawrence Kohlberg

- Kohlberg's theory of moral development is very much related to the goals of studying ethics at college level
 - Moral responsibility comes out of the foundation of early moral training given by an individual's parents and culture.
 - As per Kohlberg's view only few people would reach the post conventional level
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Kohlberg's Theory of Moral Development

- Each level is based on the degree to which a person conforms to conventional standards of society
 - Each level has two stages that represent different degrees of sophistication in moral reasoning.
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Table 9.5

Kohlberg's Levels and Stages of Moral Development

I. Preconventional Level

Moral reasoning is guided by external consequences. No internalization of values or rules.

Stage 1: Punishment and Obedience

"Right" is obeying the rules simply to avoid punishment because others have power over you and can punish you.

Stage 2: Mutual Benefit

"Right" is an even or fair exchange, so that both parties benefit. Moral reasoning guided by a sense of "fair play."

II. Conventional Level

Moral reasoning is guided by conformity to social roles, rules, and expectations that the person has learned and internalized.

Stage 3: Interpersonal Expectations

"Right" is being a "good" person by conforming to social expectations, such as showing concern for others and following rules set by others so as to win their approval. For example, behaving like a "good" child, student, citizen, spouse, friend, or employee.

Stage 4: Law and Order

"Right" is helping maintain social order by doing one's duty, obeying laws simply because they are laws, and showing respect for authorities simply because they are authorities.

III. Postconventional Level

Moral reasoning is guided by internalized legal and moral principles that protect the rights of all members of society.

Stage 5: Legal Principles

"Right" is helping protect the basic rights of all members of society by upholding legalistic principles that promote the values of fairness, justice, equality, and democracy.

Stage 6: Universal Moral Principles

"Right" is determined by self-chosen ethical principles that underscore the person's profound respect for ideals such as the sanctity of human life, nonviolence, equality, and human dignity. If these moral principles conflict with democratically determined laws, the person's self-chosen moral principles would take precedence, such as the conscientious objector who refuses to be drafted because of moral principles against war.

SOURCES: Based on Kohlberg (1981) and Colby & others (1983).

Criticisms of Kohlberg's theory

- **Research has not supported** Kohlberg's belief that the development of abstract thinking in adolescence invariably leads people to the formation of idealistic moral principles
 - Some cross-cultural psychologists argue that Kohlberg's stories and scoring system reflect a **Western emphasis on individual rights, harm, and justice that is not shared in many cultures.**
 - Kohlberg's **early research was conducted entirely with male subjects**, yet it became the basis for a theory applied to both males and females.
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GILLIGAN'S THEORY

Carol Gilligan's Theory of Moral Development

GILLIGAN'S THEORY

Pre-conventional Level

- This is the same as Kohlberg's first level in that the person is preoccupied with self centered reasoning, caring for the needs and desires of self.

Conventional

- Here the thinking is opposite in that, one is preoccupied with not hurting others and a willingness to sacrifice one's own interests in order to help or nurture others (or retain friendship).

Post-conventional Level

- Achieved through context-oriented reasoning, rather than by applying abstract rules ranked in a hierarchy of importance. Here the individual becomes able to strike a reasoned balance between caring about other people and pursuing one's own self-interest while exercising one's rights.
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Carol Gilligan's Model

- Feels Kohlberg's model is based on an ethic of **individual rights and justice**, which is a more common perspective for **males**
 - Gilligan's model of **women's** moral development is based on an **ethic of care and responsibility**.
 - However, when subjects are carefully matched, there do **not** seem to be systematic gender differences in moral reasoning
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CONSENSUS AND CONTROVERSY

- Consensus – Agreement
- Controversy – Disagreement



CONTROVERSY

- All individuals will not arrive at same verdict during their exercising their moral autonomy.
- Aristotle noted long ago that morality is not as precise and clear-cut as arithmetic.
- Aim of teaching engineering ethics is not to get unanimous conformity of outlook by indoctrination, authoritarian and dogmatic teaching, to improve promotion of tolerance in the exercise of moral autonomy hypnotism or any other technique but.
- [* unanimous – Common * verdict- decision * indoctrination – instruction * authoritarian, dogmatic - strict]

CONSENSUS

- The conductor of a music orchestra has authority over the musicians and his authority is respected by them by consensus as otherwise the music performance will suffer. Hence the authority and autonomy are compatible.
 - On the other hand, tension arises between the needs for autonomy and the need for concerns about authority. The difference between the two should be discussed openly to resolve the issue to the common good.
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Membership Criteria

- Complete Bachelors degree
 - Performing work commonly recognized as what engineers do
 - Being officially and licensed as a PE.
 - Acting in morally responsive ways while practicing engineers
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Differing views on Professionals

- “Only consulting engineers who are basically independent and have freedom from coercion can be called as **professionals**.” -Robert L. Whitelaw
- “Professionals have to meet the expectations of clients and employers. Professional restraints are to be imposed by only laws and government regulations and not by personal conscience.” -Samuel Florman

* Coercion – Pressure

* Restraints- limits

Characteristics of Professions

- Profession- meet the following criteria
 - Knowledge
 - Organization
 - Public Good

Who is Professional?

- Knowledge:- skills cant be mechanized
 - Organization: IEEE, ASME
 - Public Good: to protect public health safety
welfare
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Professionalism

- Qualities, competencies and Skills of professionals



MOTIVES FOR PROFESSIONALISM

- A desire for **interesting and challenging work** and the pleasure in the act of changing the world.
- **The joy of creative efforts.** Where a scientist's interest is in discovering new technology, engineers interest is derived from creatively solving practical problems.
- The engineer shares the scientist's job **in understanding the laws and riddles of the universe.**
- The sheer magnitude of the nature – oceans, rivers, mountains and prairies – leads engineers to build engineering marvels like ships, bridges, tunnels, etc., which appeal to human passion.

MODELS OF PROFESSIONAL ENGINEERS

- **SAVIOR:** The representative engineer is a savior who will redeem society from poverty, inefficiency, waste and the drudgery of manual labor.
- **GUARDIAN:** Engineers know, the directions in which and pace at which, technology should develop.
- **BUREAUCRATIC SERVANT:** The engineer as the loyal organization person uses special skills to solve problems.
- **SOCIAL SERVANT:** Engineers, in co-operation with management, have the task of receiving society's directives and satisfying society's desires.
- **SOCIAL ENABLER AND CATALYST**
- **GAME PLAYER**

* Savior – Rescuer

Professional Ethics & Virtues

- Virtue means Good character of an individual
 - It is defined as moral distinction of goodness
 - It can be defined as excellence of moral behavior
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The Four Main Virtues

- **Prudence** (mind) (விவேகம்): to think about a moral problem clearly and completely
 - **Temperance** (emotions) (தன்னடக்கம்): control attraction to positive emotions
 - **Fortitude** (emotions) (மனோபலம்): control aversion for negative emotions
 - **Justice** (will) (நீதி): choose according to truth and fairness.
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Virtue Ethics

- Focuses on the type of person we should strive to be
- Actions which reflect *good character* traits (**virtues**) are inherently *right*
- Actions which reflect *bad character* traits (**vices**) are inherently *wrong*
- Virtue ethics are tied more to individual behavior than to that of an organization (e.g. business, government)



Professional Responsibility

- Virtues Defining Professional Responsibility.
 - Professional responsibility means being morally responsible as a professional
 - Classification of virtues:
 - Self Directional Virtues
 - Public Spirited Virtues
 - Teamwork Virtues
 - Proficiency Virtues
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Professional Responsibility

1. SELF DIRECTION VIRTUES:

Fundamental virtues in exercising our moral autonomy and responsibility. e.g. self understanding, humility, good moral judgment, courage, self discipline, perseverance, commitments, self-respect and dignity

2. PUBLIC SPIRITED VIRTUES:

- Focusing on the benefit of the clients and society.
- 3 important public spirited virtues
 - Justice, Sense of community, generosity

3. TEAMWORK VIRTUES:

- Enables professionals to work successfully with others. E.g. collegiality, cooperativeness, the ability to communicate, respect for authority, loyalty to employers and leadership qualities.

4. PROFICIENCY VIRTUES: (intellectual Virtue)

- Mastery of one's craft that characterize good engineering practice e.g. competence, diligence, creativity, self-renewal through continuous education
- (mastery over the profession)

Types of Ethical Theories

Theory	Basic Concept
Virtue Ethics Theory	Virtues and Vices
Right Ethics Theory	Human Rights
Duty Ethics Theory	Duties to respect persons
Utilitarianism theory	Most good for the most people

Aristotle's theory of the “Golden Mean”

- In this theory virtue of wisdom or good judgement is highly essential for accomplishing the rational activities successfully
 - As per this theory, virtues to find the ‘golden mean’ between the extremes of excess and deficiency
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Example

- Courage is 'golden mean' between the two extreme moral grounds foolhardiness(the excess of rashness) and cowardice(the deficiency of self control)
 - (one should be courageous but should not go to extreme of being violent)
 - The skills in avoiding offences and confidentiality
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Macintyre's Theory of virtue

- Alasdair Macintyre, a contemporary ethicist, related virtues with the social practices i.e., cooperative activities that are aimed at achieving public goods.
 - According to him, any profession should develop for the sake of public goods
 - He calls public goods as internal goods
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Example

- The primary internal good of medicine is promotion of health
 - Law is social justice
 - Engineering is safety, health and welfare of public
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Uses Of Ethical Theories

- Ethical theories aid in identifying the moral considerations or reasons that constitute a dilemma.
 - They provide a precise sense of what kinds of information are relevant to solving moral development.
 - They sometimes, offer ways to rank the relevant moral considerations in order of importance and provide a rough guidance in solving moral problems.
 - The theories help us identify the full moral ramifications of alternative courses of action, urging a wide perspective on the moral implications of the options and providing a systematic framework of comparing alternatives.
 - The theories augment the precision with which we use moral terms and they provide frame works for moral reasoning when discussing moral issues with colleagues.
 - By providing frame works for development of moral arguments, the theories strengthen our ability to reach balanced and insightful judgments
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USES OF ETHICAL THEORIES

Ethical theories have so many uses. Out of them, the following three are the most

- Understanding moral dilemmas.
 - Justifying professional obligations and ideas and
 - Relating ordinary and professional morality
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Senses of responsibility

- Responsibility is a moral virtue
 - Responsibility is moral obligation
 - Responsibility is about general moral capacities of people
 - Responsibility means accountability and liability for actions
 - Responsibility means blameworthiness
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Uses of ethics

- When students enter the professional world, they will be expected to follow an explicit or implicit ethical code.
 - To responsibly confront moral issues raised by technological activity
 - How to deal with ethical dilemmas in their professional lives?
 - To achieve moral autonomy

 - * Confront - challenge
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THANK YOU
