

# Engineering Ethics

est final

what is Engineering Ethics?

→ is set of rules and guidelines that engineers adhere to as a moral obligation to their profession & world

→ the study of moral values, issues, and decisions involved in engineering practice

includes

- responsibility
- ideals
- character traits
- social policies
- relationship from individual & corporation

why Engineering Ethics?

receive inputs in

- basic engineering sciences
- Design
- manufacture
- software skill
- technical problem solving ability

## ④ fundamental aspects of engineering ethics

- identify & enlist the type of ethical issues in his/her engineering career
- Clarify the related concepts theories
- Guide & help in confronting & resolving ethical & moral dilemmas
- Stimulate critical & responsible reflection and useful discussion on these issues

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मिथ्या -  
Moral Dilemmas :-

ethical dilemma

→ refers to situations in which  
generally a difficult choice has to be made  
based on conflicting moral issues  
involved

आत्मनिर्णय

Moral Autonomy :- → self determining  
or Independence

→ is a skill-habit of thinking  
rationally about ethical issues

→ is concerned with decision  
making power of a person  
with regard to ethical issues

How to solve dilemma

→ Refute the dilemma

→ Value theory approach

Find alternative solution

a ethical dilemma is a  
problem in the decision  
making process between two  
possible options, neither  
of which is  
absolutely acceptable from  
ethical  
perspective



## Moral Development theory

Kohlberg's theory:- (ethics of rules & rights)

According to Lawrence Kohlberg's theory of moral development has three levels.

Pre-conventional level	Conventional level.	Post-conventional level
<p>① This is the most primitive level</p> <p>② Primary motive of any individuals is to satisfy themselves → to escape punishment &amp; obeying to authority implicitly</p>	<p>① loyalty and identification are the hallmarks of this level</p> <p>② Primary motive of any individuals is to satisfy others → obeying to the dictates of family or group implicitly in cost of own self interest</p>	<p>① Individual at this level is able to think of principles of rights, right conduct, general good regardless of convention &amp; individual interest</p> <p>② seek to do what is morally reasonable and to maintain integrity</p>

③

mainly this behavior seen in children.

many of the grown ups do not raise themselves above this level

④ Any conduct is taken to be right which benefits individuals.

⑤ up to age nine

⑥ self focused

③

most adults do not cross or think beyond this stage

स्वायत्त भावित

अपेक्षित मूल्य

⑤ age nine to adolescence

⑥ other focused

③

These people do not follow customs ( रीतिनीति )

④ They are called autonomous

∵ they are not susceptible to customs & beliefs unless they are for public good.

⑤ adulthood

⑥ Higher focused



\* what is Ethics?

→ Ethics refers to standards of conduct, standards that indicate how one should behave based on moral duties & virtues, which are derived from the principles of right & wrong.

\* Theories of Ethics

① Religious Ethics

② Duty Ethics

③ Utilitarianism

④ Kant Approach to Ethics

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## Kant's Approach to Ethics

→ According to Kant ( ~~is~~ if something is wrong  
it is always wrong )

can your action be consistently generalized?  
ask yourself " what if everyone did that "

→ In Kant's view, happiness does not equal  
morality

only goodwill has ultimate moral value  
moral rules should be universal.

special pleading — nationalizing to  
ourselves

The golden rule — treat others the  
way you wanted to  
treated

Veil of ignorance → imagine the  
situation from  
both point of view



\* what are typical ethical issues that engineers encounter

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① safety

② Acceptable Risk

③ Compliance (अनुपालन)

④ confidentiality

⑤ Environmental health

⑥ Data integrity

⑦ conflict of interest

⑧ honesty / dishonesty

⑨ Fairness

⑩ Societal  
Impact

⑪ Accounting  
for uncertainty

## Ethical Frameworks

① **Rights** approach :- which option best respects the rights of all who have a stake?

② **Utilitarian** approach :- which option will produce the most good & do the least harm

③ **Justice** approach :- which option treat people as I want to be treated

④ **Ethics care** approach :- which option best for those most in need

⑤ **Virtue** approach :-

eye final  
==

which option leads me to act as a responsible person



## # Two dimensions of Ethics in engineering

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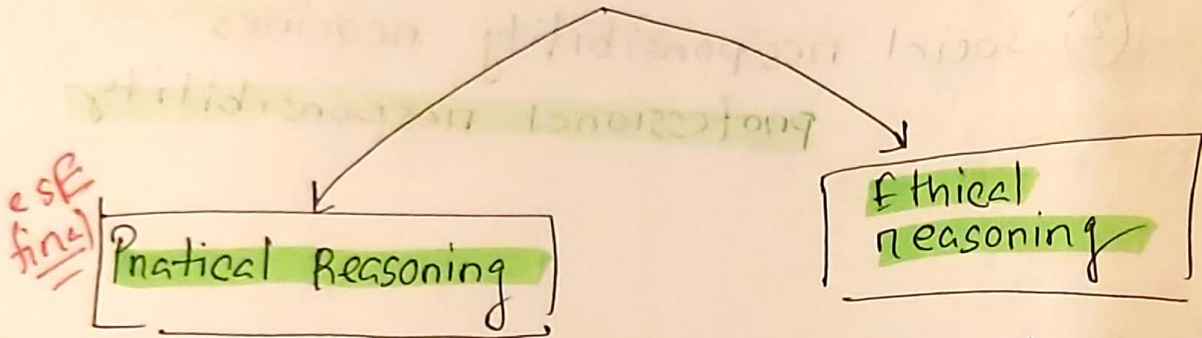
(1) Engineers need to be socially responsible when building product & process for society

(2) social responsibility requires professional responsibility

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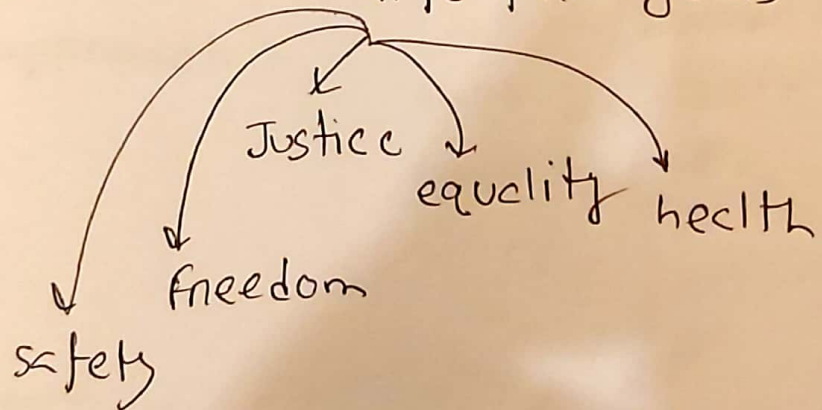
# Social Responsibilities requires taking into consideration the need of Society

# Reasoning :- focus on finding the best or at least the reasonably better means for obtaining goals (health, safety etc)



— uses different methods mathematics & science

— is a type of practical reasoning that concerns certain societal or life form goals





## # The components of The engineering code of ethics

Q. 1: Three components:-

① The Fundamental canon:-

articulate basic components of ethics engineering

② The Rules of practice.

clarify & specify in detail the fundamental canon

③ Professional obligations:-

elaborate the obligations the engineers have

## Law vs moral

## CSE Fins 1

### Legal + moral

designing a safe  
system

### Legal + Immoral

owning a slave  
pre civil war in US

### Illegal + moral

Parking the no  
park zone,  
  
to come to the  
aid an injured  
person

### Illegal ~~immoral~~ + Immoral

killing  
an  
innocent  
person



Q is stealing always wrong? when it is  
right to steal?

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→ stealing to feed family ethically  
wrong  
but morally correct

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Q would you risk your life to save another  
person?

→ Yes but depends on condition

(1) if one of my family member whom I  
have affection and  
care

(2) if one is important member for  
a community, can do something  
for good for society

(3) if one has better standard to  
provide someone good  
livelihoods

- ① tell the customer about the problem and let them decide what you should do next

[CES Final:- Q 2b]

— 0 —  
ANSWER  
what is Integrity? CSE final

- Integrity is the qualification of being honest & having strong moral principles ; moral uprightness
- It is regarded by many people as the honesty & truthfulness / accuracy of one's action
- It is generally a personal choice to hold oneself to consistent moral & ethical standard



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## Plagiarism

Q. What is plagiarism?

— the act of stealing someone's work attempting to "pass it off" as your own.

applicable to : term papers w  
photographs w  
songs w  
ideas w

Q. Copyright

title (17) U.S. code

— form of protection

— to the authors of original works

provided to published  
unpublished work

- 1) literary
- 2) dramatic
- 3) musical
- 4) artistic
- 5) intellectual work

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what is copyright?

provided by :  
U.S. Copyright  
Office

copyright is a federal law in the US CODE  
Title 17 which is a form of protection

provided to published & unpublished work  
to the authors of original work.

what is fair use?

fair Use:

written law

- a (statute) under copyright law

- allows for the use of (limited) portions of work that has copyright

- without taking permission from the original author

purpose: education  
research

limited portion:

"there is no specific no. of words, lines or notes that may be taken without permission"

- give credit always

- if unsure, ask for permission

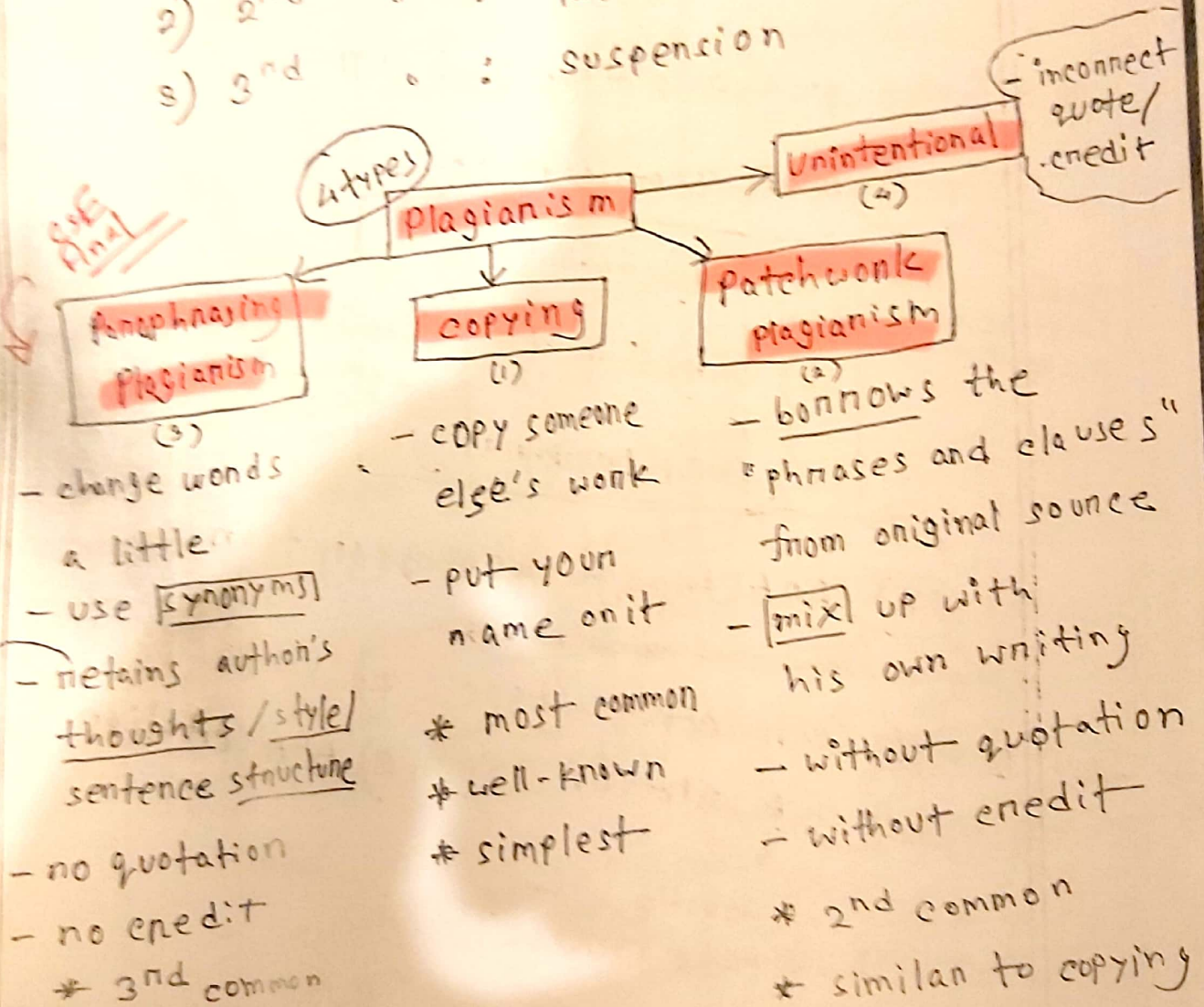
Legal implications



Legal implications: results/consequences  
of being <sup>involved</sup> in something  
acc. to the law

Ex: SUST's policy:

- 1) 1st offense: fail on assignment
- 2) 2nd " : fail on the whole course
- 3) 3rd " : suspension



▣ Confidentiality (acc. to APA guidelines)  
— participant's records are kept anonymous

\* IRB - The Institutional Review Board  
— Each institution establish this.  
— composed of scientists and non-scientists

what is ethics of

▣ Reporting of Research: CSE final

- no false / deceptive data in reports.
- if significant errors — connection must
- not present other's work as own, give credit, if used.

# Fraud: explicit effort to misrepresent data  
↓  
— ~~stolen~~

\* Safeguards against fraud: it's a peer review.  
— when researcher submits his article, it's needed.

\* Replication: test accuracy by repeating the original / basic procedures.  
— repeat prev. research study.