

# *Engineering Ethics*



## Lecture – 5: Ethics and Design – I

# Ethics and Design

- In many respects, the ethical problems of engineers are like the ethical problems in general as they call for decisions about what we should do.

- If I can see that the situation, I am in now is very much like situations that I or others have faced in the past, evaluating what was done before (and what the consequences were) can be very helpful in deciding what to do now.
- If a situation was handled well, this can provide positive guidance for what to do now.
- If it was not handled well, this can serve as a lesson about what not to do.

- The present may resemble the past in important respects but not in every respect.
- The future may resemble the past in many respects, too; however, there is no guarantee that it will this time.
- We live in a complex world filled with change and uncertainty.

- With regard to deciding what it is morally best to do, we might wish for a surefire method for determining the one best choice.
- But what if we cannot find such a method?
- Here is where a comparison with problems of engineering design can be helpful.

## Example 1

- Brad is in the second year of his first full-time job after graduating from Engineering Tech. He enjoys design, but he is becoming increasingly concerned that his work is not being adequately checked by more experienced engineers. He has been assigned to assist in the design of a number of projects that involve issues of public safety, such as schools and overhead walkways between buildings. He has already spoken to his supervisor, whose engineering competence he respects, and he has been told that more experienced engineers check his work. Later he discovers that his work is often not adequately checked. Instead, his drawings are stamped and passed on to the contractor. Sometimes the smaller projects he designs are under construction within a few weeks after the designs are completed.

- At this point, Brad calls one of his former professors at Engineering Tech for advice. “I’m really scared that I’m going to make a mistake that will kill someone,” Brad says. “I try to over-design, but the projects I’m being assigned to are becoming increasingly difficult. What should I do?” Brad’s professor tells him that he cannot ethically continue on his present course because he is engaging in engineering work that surpasses his qualifications and may endanger the public. What should Brad do?




*A range of options are open to him:*




1. Brad could go to his supervisor again and suggest in the most tactful way he can that he is uncomfortable about the fact that his designs are not being properly checked, pointing out that it is not in the firm's interests to produce designs that may be flawed.





2. He might talk to others in the organization with whom he has a good working relationship and ask them to help him persuade his supervisor that he (Brad) should be given more supervision.

3. He might tell his supervisor that he does not believe that he can continue to engage in design work that is beyond his abilities and experience and that he might have to consider changing jobs.



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4. He could find another job and then, after his employment is secure, reveal the information to the state registration board for engineers or others who could stop the practice.

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5. He could go to the press or his professional society and blow the whistle immediately.

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6. He could simply find another job and keep the information about his employer's conduct to himself, allowing the practice to continue with another young engineer.

- 7. He could continue in his present course without protest.

To be ethically and professionally responsible, Brad should spend a considerable amount of time thinking about his options. He should attempt to find a course of action that honors both his obligation to protect the public and his obligation to his employer. It is also completely legitimate for Brad to try to protect and promote his own career, insofar as he can while still protecting the public.

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With these guidelines in mind, we can see that the *first* option is probably the one he should try first.

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The *second* is also a good choice if the first one is ineffective.

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The *third* option is less desirable because it places him in a position of opposition to his employer, but he may have to choose it if the first two are unsuccessful.

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The *fourth* option produces a break in the relationship with his employer, but it does protect the public and Brad's career.

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The *fifth* also causes a break with his employer and threatens his career.

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The *sixth* and *seventh* are clearly unjustifiable because they do not protect the public.

There are, of course, still other options Brad can consider.

The important point is that Brad should exercise his imagination to its fullest extent before he takes any action.

He must “*brainstorm*” to find a number of possible solutions to his problem.

Then he should attempt to *rate* the solutions and select from among those he finds best.

Only after this fails is he justified in *turning to less satisfactory options*.