

Engineering education: a vision for 2025

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TU Delft

A wide-angle, high-angle photograph of the TU Delft campus. The scene is dominated by a large, open green lawn with several paved walkways. On the left, a long, multi-story white building with a grid-like facade runs parallel to the walkway. In the background, a tall, modern glass skyscraper with a red vertical stripe stands prominently against a blue sky with scattered white clouds. Numerous young trees with fresh green leaves are planted along the paths. Several people are seen walking on the paths, adding a sense of activity to the scene.

Levels:

- **University (Ba/Ma)**
- **Higher professional education**
- **(and lower levels)**
- **(and PhD level)**



This presentation: University level

I assume:

- **Universities**: develop new methods, design your own 'solution'.
- **Transferability of results, reflection, discussion**
- **HPE**: apply methods you have learned
- **Less emphasis on theory**
- **Less emphasis on transferability, reflection, discussion**



Specialist, with a lot of technical knowledge: still needed

In addition, engineers with a broader focus

This presentation: emphasis on broader focus

Increasing focus on societal challenges



Examples of difficult choices transport

- **Rail versus road**
- **Aircraft versus high speed rail**
- **Accessibility: infrastructure versus land use planning**
- **Electric versus hydrogen versus very efficient ICE versus biofuels**

Such challenges:

- **Multiple disciplines: engineering and others**
- **Complex networks of actors**
- **Solutions difficult to implement**
- **Ex ante evaluations difficult**
- **Not only 'rational' arguments but also emotions**
- **Ethical aspects**

A few other trends

- Increasing attention paid to ‘valorisation’: making money or societal impact



Need for engineers who:

- Understand
- Can deal with it
- Research and design
- Can integrate knowledge
- Can lead multidisciplinary teams
- Can communicate with many different types of people



Knowledge needed:

Traditional knowledge

- Engineering!
- Mathematics, statistics, design methods

But also:

- Economics
- Governance, managerial sciences
- Psychology / social sciences
- Ethics
- Skills to work in teams

Not only traditional exams but also papers, presentations

- Open attitude: I do not know this so I like it, versus I do not know this so I can't
- Curiosity
- Search for inspiring and useful theories
- Search for inspiring and useful methods

Labour market (the Netherlands):

- **Job possibilities good!**
- **Earn more after 5 years than ‘hard core engineers’**
- **Often soon high management positions**

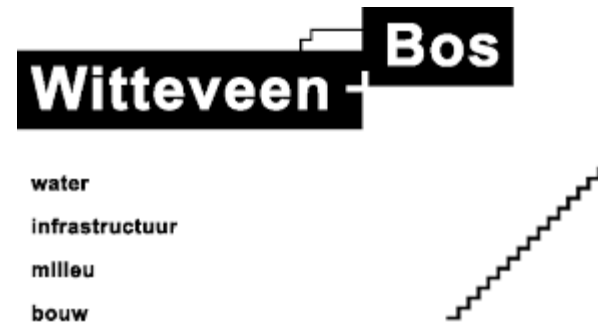


Discussions

Too few engineering students? More demand than supply.

But.... Many have a managerial position within 5 years.

Problem of employers or education



Questions?