WU Engineering degree (EngD)
Design for Agrifood & Ecological Systems

4TU. School for Technological Design
STAN ACKERMANS INSTITUTE

TU Delft · TU/e · UNIVERSITY OF TWENTE. · WAGENINGEN

WAGENINGEN
UNIVERSITY & RESEARCH

Engineering Doctorate (EngD) at WUR

- In January 2023 WUR started the EngD education program
  - 2 year post-master program
  - Design for Agrifood and Ecological Systems
  - 4th Education program within WUR, next to BSc, MSc, PhD

- Training and education to become a designer
  - 1 year (48-60 ECTS)
  - Individual study program
- Make a "design"
  - 1 year (60-72 ECTS)
  - Tangible (e.g. drone technology) or virtual (e.g. redesign landscape)

The Designer Postmaster Programme 'Design for AgriFood and Ecological Systems'

General principles EngD

- Training and education to become a designer
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  - Individual study program
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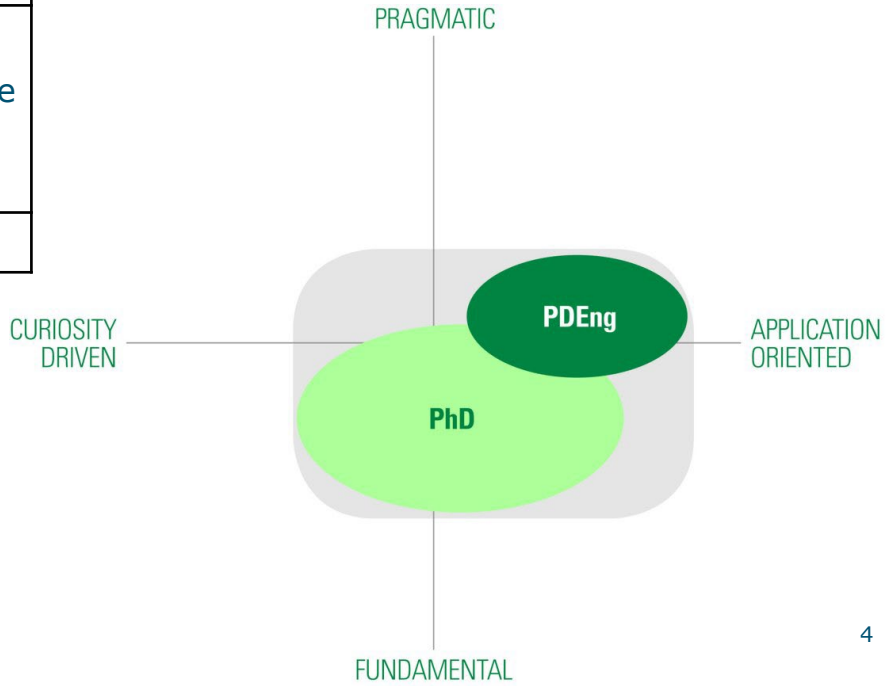
- Learning outcomes. The EngD candidate
  - Has insight, knowledge and skills to independently develop a design
  - Has clear in-depth knowledge and insight in the domain they work in and can translate this to a neighbouring scientific fields
  - Can place the design in the context of the user

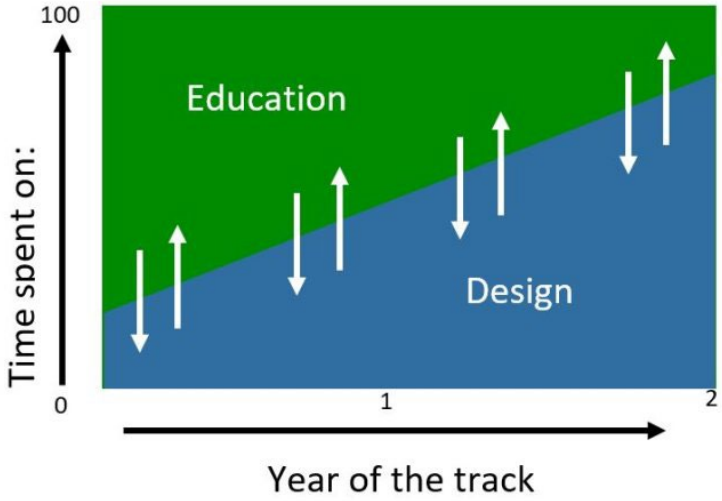
Difference with PhD

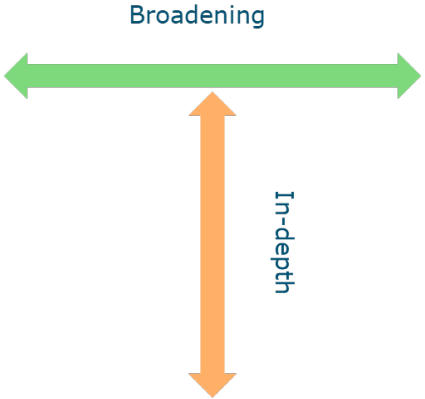
	PhD	EngD
Duration	4 years	2 years
Training/ Education	15%	50%
Focus	(New) fundamental scientific research / knowledge	Translation of (scientific) knowledge into a (practical) design
End result	Thesis	Design



Guiding principle

- Clear combination of training/education and development of the design
- Flexibility in individual training: mandatory courses (12 ECTS), free choice (48 ECTS)
- The WU education model: T-shaped skills





1) Scientific / technical know-how
2) Competences and skills
3) Able to translate knowledge in real-world applications

Training and education activities

- Candidates make a TSP to plan their courses

- Courses to be followed:
  - EngD specific courses
    - E.g.: Principles of Design
    - Provided by relevant chair groups
    - Most still need to be developed (when required)
  - Specific MSc-levelled courses
  - Graduate School courses
  - EngD courses at other 4TU universities, other (inter)national partners

Training and education activities (48-60 ECTS)

Type of courses:

- Generic / methodological courses
- In depth courses
- Competences and skills training
- Laboratory and working visits
- Career development
- Design discussion groups
- (Inter)national meetings

The Design

- Design assignment is scheduled for 1 year (60–72 ECTS)
    - Note: Time spent on design and education depends on background candidate
- Assignments come from the field (i.e. commissioning parties)
- Commissioning parties: industrial sector, businesses, government agencies, NGOs, and education or research institutions
- Together with the commissioning party:
    - Design assignment is made specific, clear, measurable, and verifiable
    - Objective, methodology and criteria are well defined
- Design assignment may be part of larger project including various design assignments :
    - In that case, each EngD candidate works on one of the design
    - Synthesis is achieved jointly and under supervision

The Design

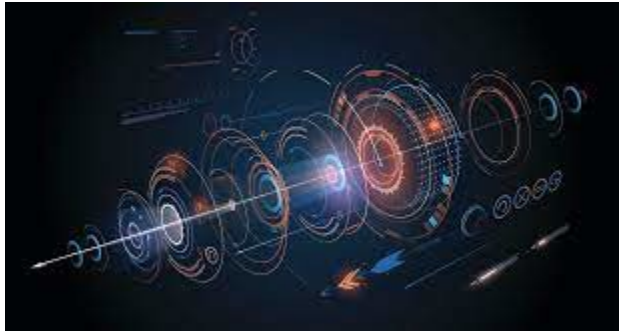
Tangible or virtual

- Examples:

- Food and feed design (including plant-free fruit design)
- Designing regenerative agricultural systems
- Barn floor design in accordance with ammonia / welfare guidelines
- Field robot system design for harvesting, weeding, etc.
- Photosynthesis/phenotyping monitoring systems for crops
- Designs for greenhouse horticulture
- Optimising of Rainwater Harvesting systems for sustaining Urban Green
- Process design for separating proteins, colouring or aromatic substances
- High density human movement in an era of pandemics
- Optimising wild corridors between natural areas
- Digital twins design

Evaluation (1)

- Diploma is based on:
  - Obtained training and education activities
  - Evaluation of the produced design (description) and oral defence thereof
- Design is presented via:
  - Report containing a description of:
    - Theoretical background
    - Description of the design process, design steps
    - Model calculations / simulations and validation or
    - Test of the design in lab/pilot/live situation.
  - Prototype (when applicable) or virtual design



Evaluation (2)

- Examining Board
  - Member of the EngD Board (technical chair)
  - Primary supervisor (with WU ius promovendi)
  - Daily supervisor
  - Practice and business supervisors
  - WU opponent
  - Non-WU opponent
- Presentation / defence of design in public before Examining Board

Supervision

- At least 2 WU supervisors of which at least 1 has ius promovendi
- At least 1 supervisor from the commissioning party

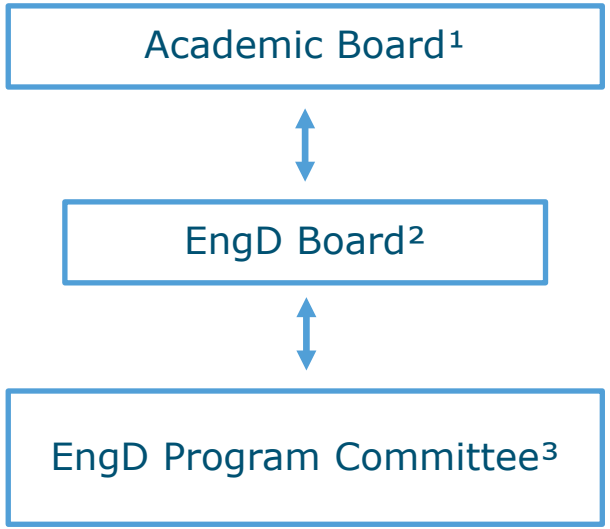
- Criteria for EngD supervisors are:
  - Experience with leading complex design projects
  - Technological and methodological knowledge of the design field
  - Competences and skills for supervising
  - Knowledge of financial/economical, legal, social, logistical, and ethical aspects of the design and design process.

Organisation of WU EngD

1. Final responsibility. Activities and issues delegated to EngD College

2. = Dean of Research, 3 profs. with affinity and insight in EngD training and education, EngD candidate

3. = EngD coordinator, 5 lecturers from different science groups, EngD candidate and 1 external member from the field



Types of EngD candidates

1. Employed EngD candidate	Temporarily employed by WU / Paid EngD position (UFO profile Technical Researcher in Training (TOIO) of the CAO NU)
2. Staff EngD candidate	University employee (UFO profile other than “TOIO”) who is admitted to the EngD programme to create a technological design
3. Externally funded EngD candidate	Registered as EngD candidate but not employed by WU. External funder/employer allows the candidate to follow the EngD programme and pays for the training and education

Budget Employed EngD

(see extra info for budget other types of EngD candidates)

Costs	Chair group	Corporate
Education costs (Courses, lectures, practicals,...)	€ 10,000	€ 10,000
Supervision time	€ 33,567	
Tuition fee (WUR account, email, storage, software licences, access Campus facilities, printing,..)	0*	
Design associated research costs	Variable	
Salary appointed EngD candidate: € 2,541 x 24 months (VSNU salary scale TOIO) x 52.4% (*loonheffingen*) x 34.8% (overhead)*	€ 126,927	
Total	**€ 170,494 + Variable costs**	
How to cover		
Certificate remuneration ("ontwerperspremie“ 5/6 of the “promotievergoeding”)**	€ 43,567	
External budget	€ 126,927	
Design associated research costs	Variable	
Total	**€ 170,494 + Variable costs**	

* Tuition fee is covered in the overhead of the salary

** There will be a certificate remuneration after successful completion of the EngD trajectory.

How to find EngD projects / candidates

- Contact potential companies, institutions interested in:
  - Design development
  - Training of own staff
- Candidates:
  - MSc students who want to do a postmaster training (but not a PhD) showing interest in (technological) design
  - Employees of companies interested in strengthening their design knowledge and skills
- WU site: www.wur.eu/engd
- Admission requirements are comparable to PhD requirements

Link to EngD website

Admission

- Candidate is registered via registration form and required documents to the EngD Office (engd@wur.nl)
- Admission requirements:
  - Masters degree (recognised by NUFFIC) in line with the EngD training track or
  - Masters degree with work experience in line with the EngD training track
  - Proficiency in English
  - Evaluation of CV and motivation letter (evaluated by WU supervisors) on:
    - Design-oriented in attitude and interest
    - Motivated to complete the track
    - Skilled to work in a team
    - Communicative with good social skills
- When criteria are not met they can follow “Approval phase”
  - Max 8 ECTS
  - Set up on individual basis by supervisors and programme committee and approved by the EngD Training/Education Committee

More information

engd@wur.nl

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