# Industry Master; Engineering Work Experience part-time Job

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## Abstract

The Systems Engineering Master education in Kongsberg requires from students that they work part-time. This document describes the needs and expectations for the part-time job. The main purpose of the part-time job is that the students build up engineering experience. This experience helps to appreciate Systems Engineering teaching, it facilitates their further personal development in becoming broader engineers.



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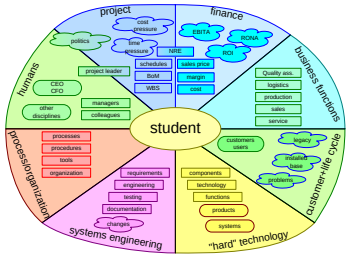


# Objectives of this Presentation

*company HR and supervisors*

provide inspiration by examples

provide background for part-time job

to benefit the most as company from IM student-employee

to get the most benefit for the competence development of the IM student

*student*

provide background for part-time job

provide support by examples

to provide the most value to the company

to achieve maximum personal growth

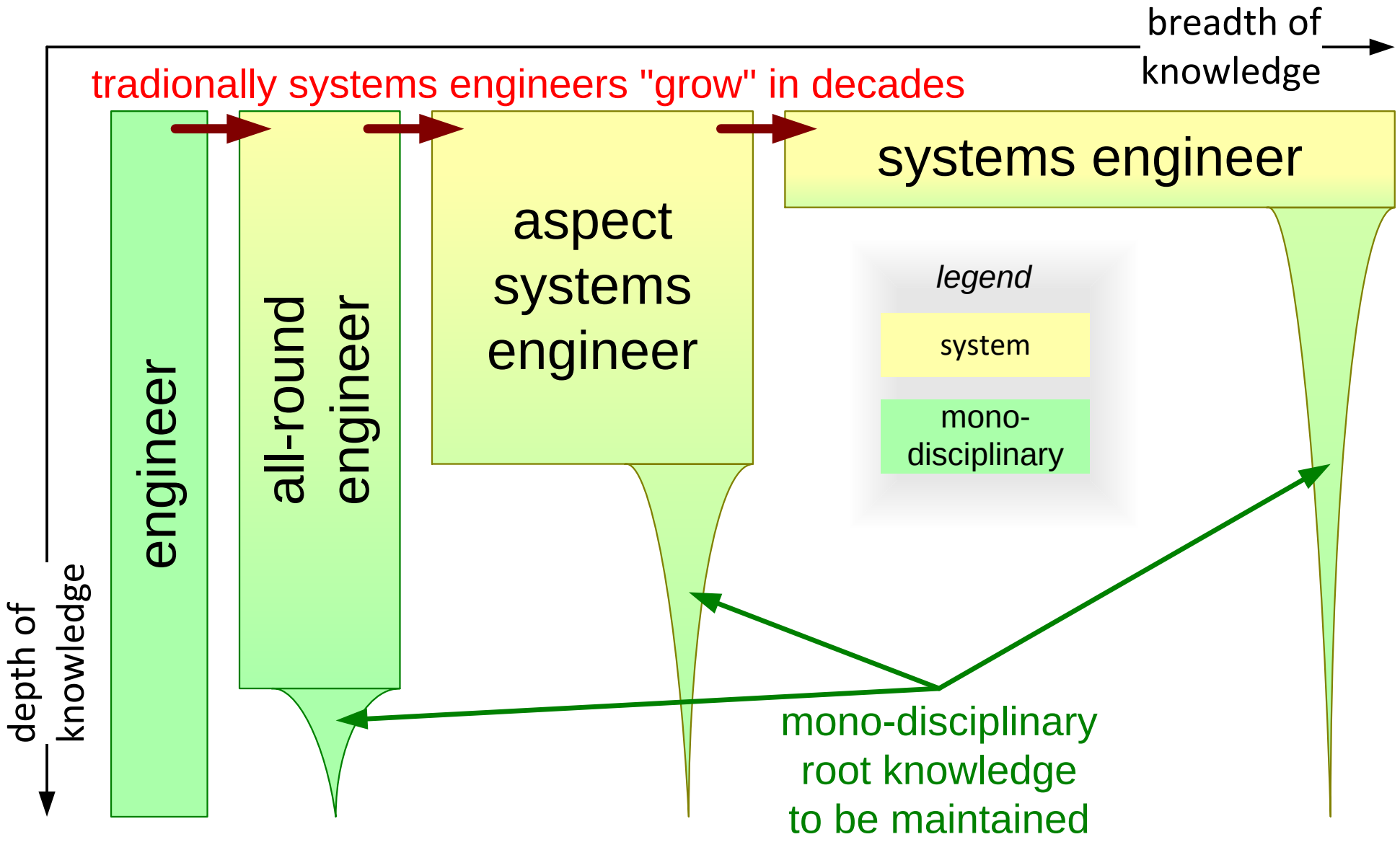
*University of South-Eastern Norway*

share how to provide students with experience

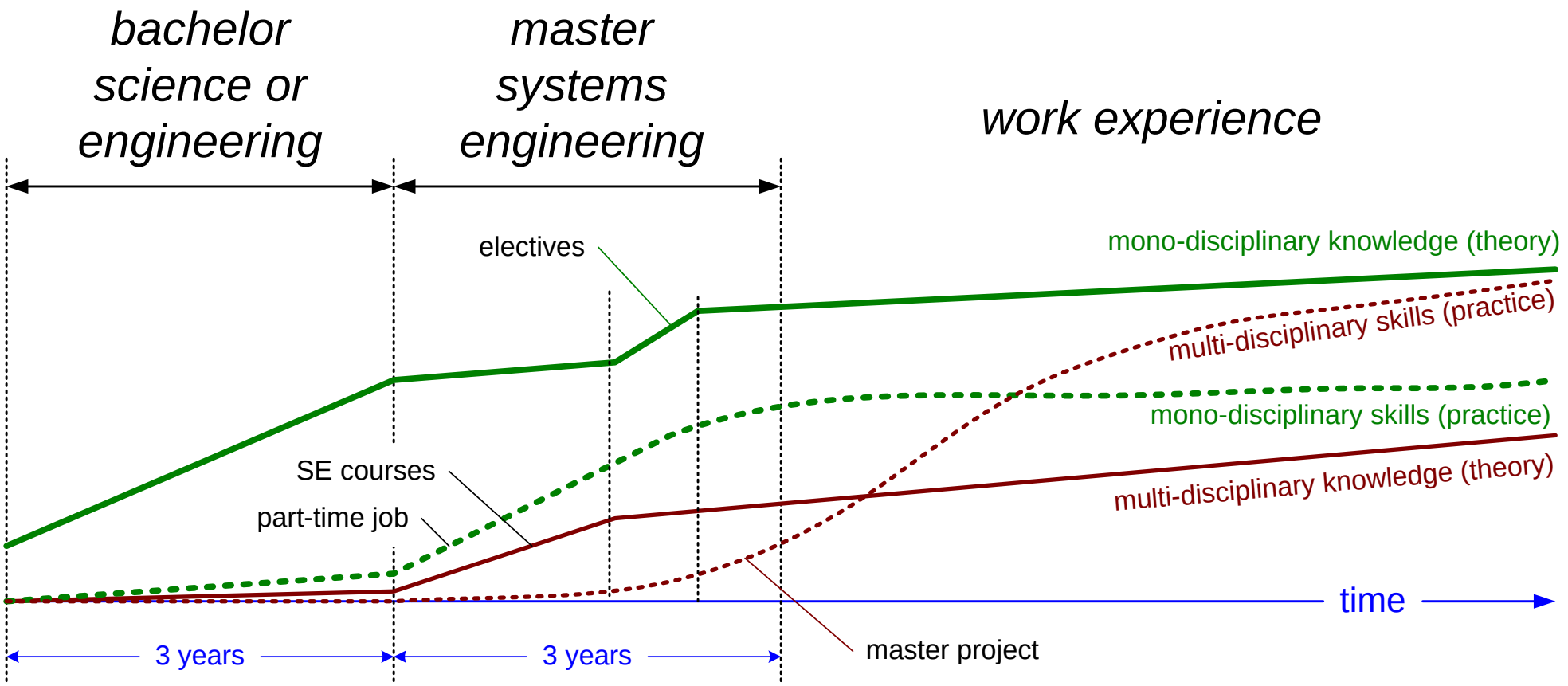
to ensure industry involvement

to ensure industry value

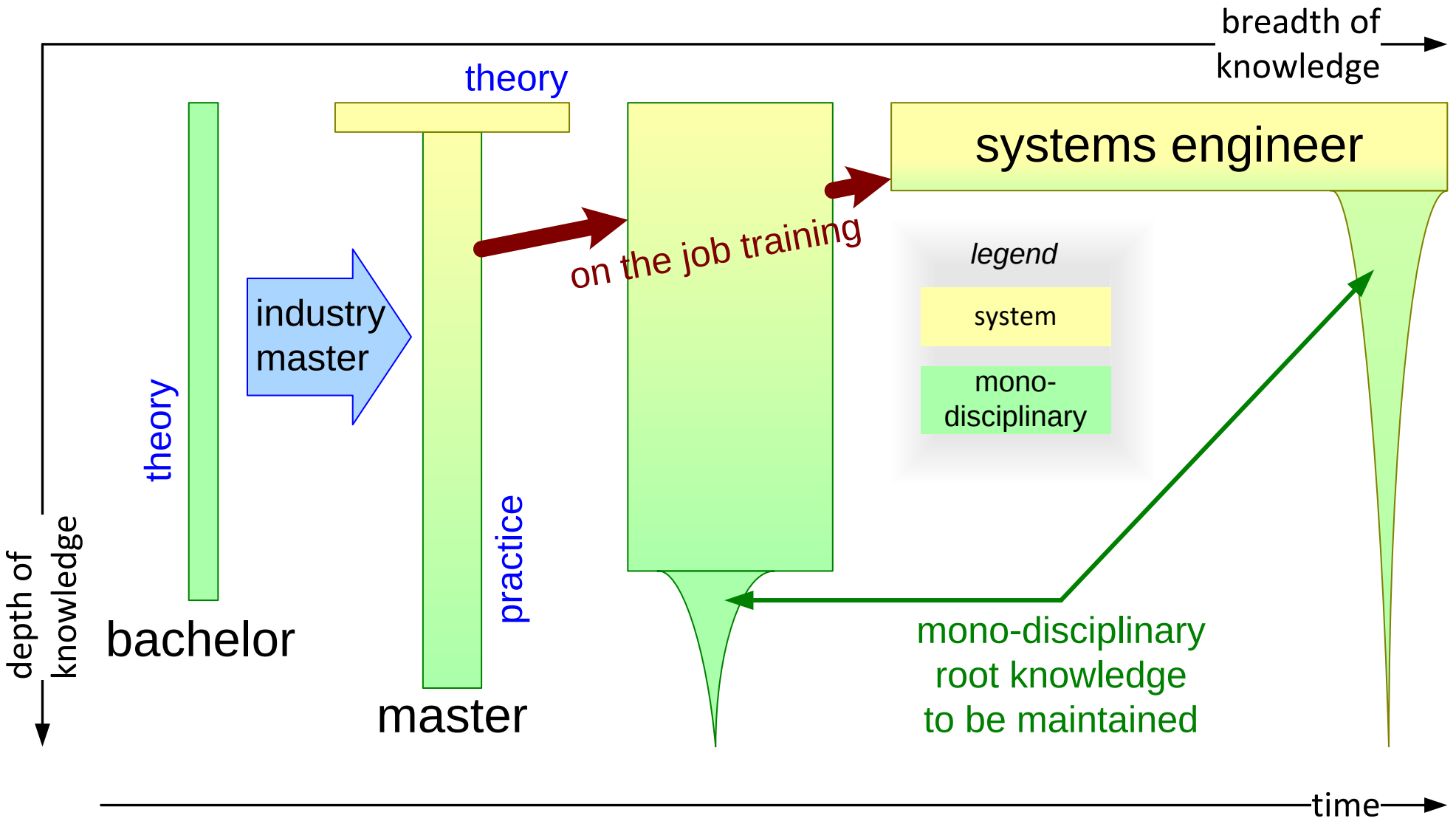
# Evolution from Engineer to Systems Engineer



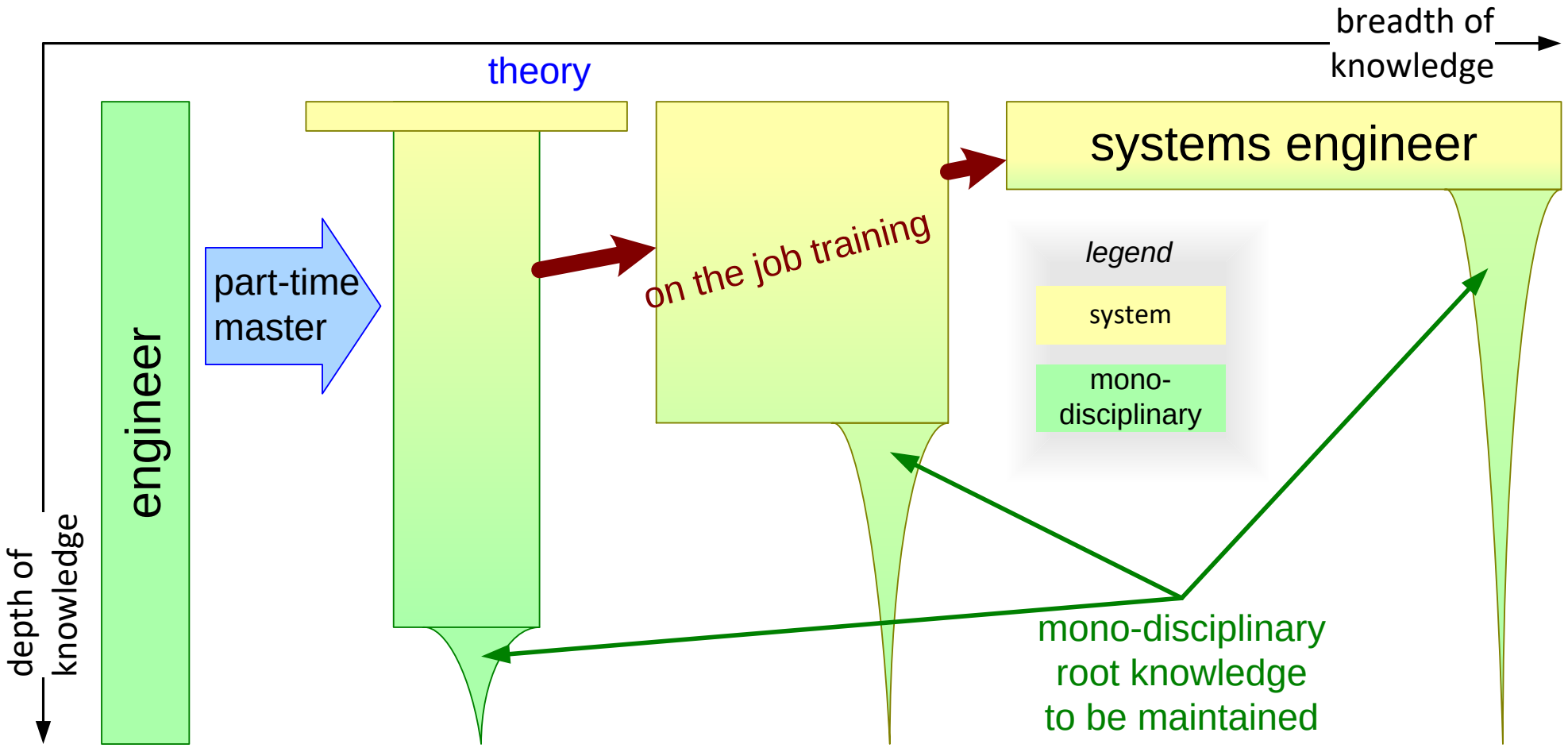
# Industry Master time line



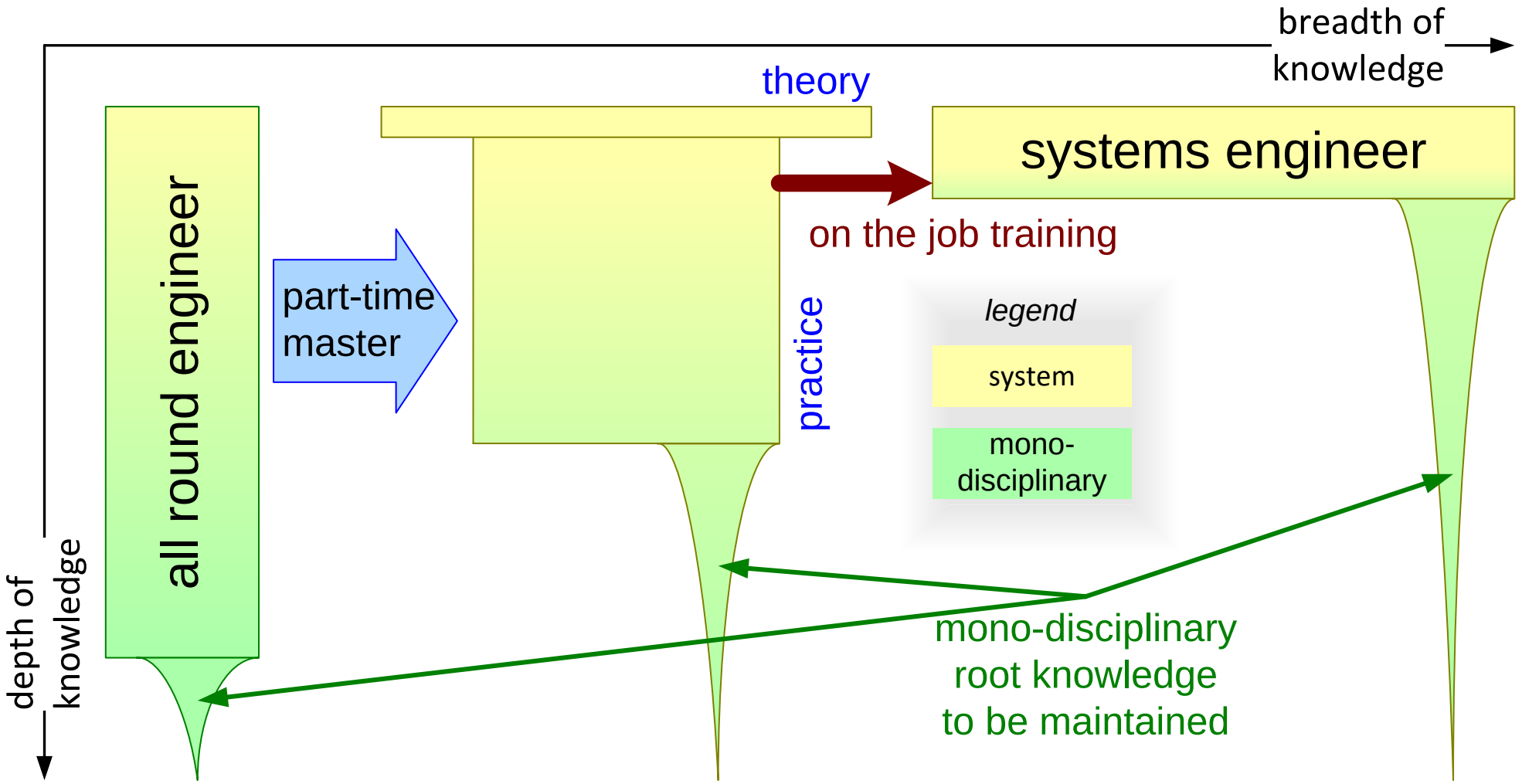
# Intended growth of Industry Master students



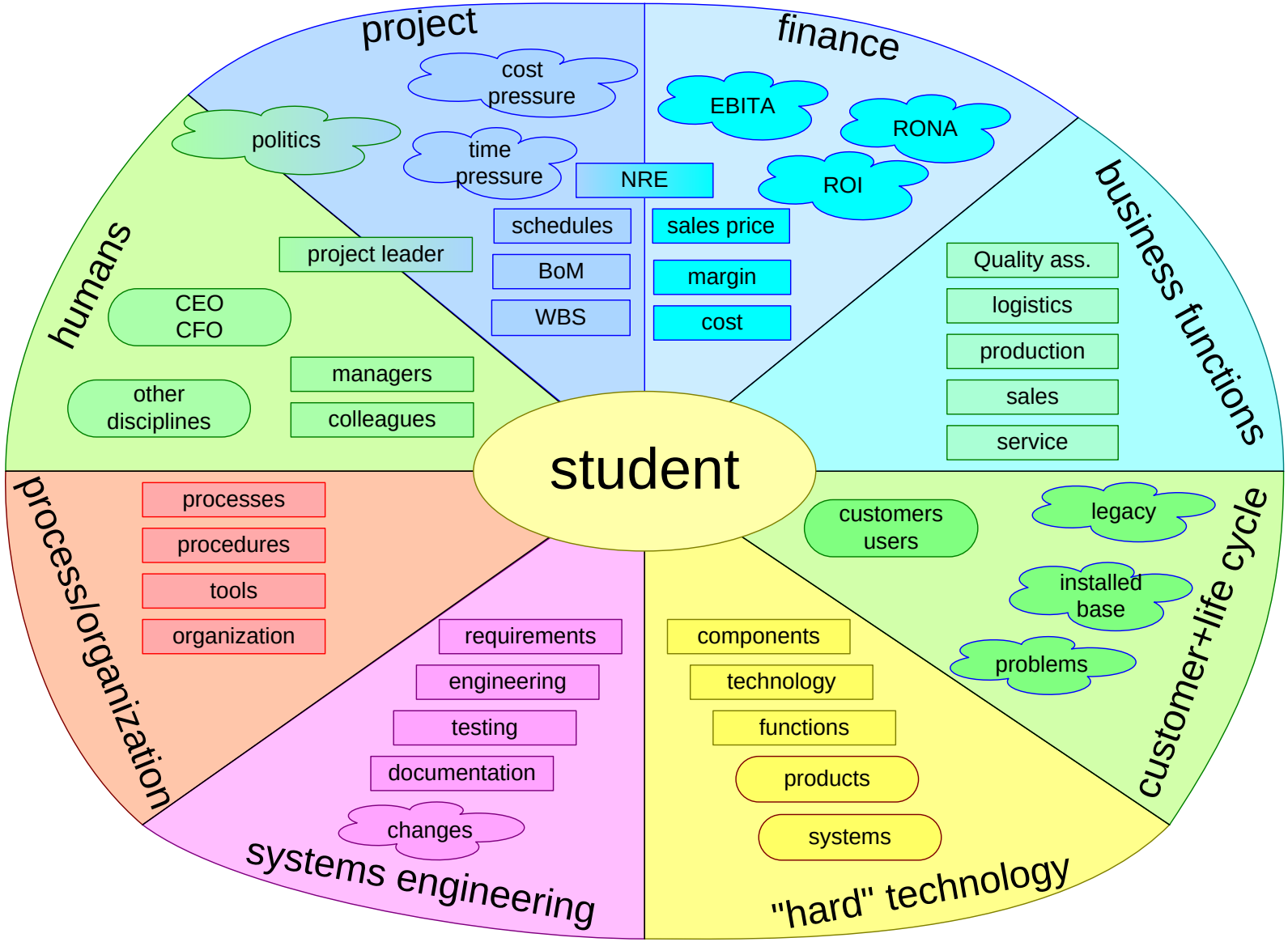
# Intended growth of Part-time student (1)



# Intended growth of Part-time student (2)



# Overload of Impressions for Fresh Bachelors



# Employer Guidelines

*What is the employer expected to do?*

+ Treat industry master as "normal" engineer.

! Taking part-time into account.

+ Provide limited scope engineering tasks.

+ Allocate capacity and responsibility for work and study related coaching

+ Provide regular feedback to the student

+ Appraise according HR system

+ involve students in meetings and business processes

*What does the employer get in return?*

+ normal engineering tasks are being done

+ inquisitive employee

+ broader and productive engineers tailored to own needs and domain

+ long term more systems engineers

# Industry Master student Guidelines

*What is the employee expected to do?*

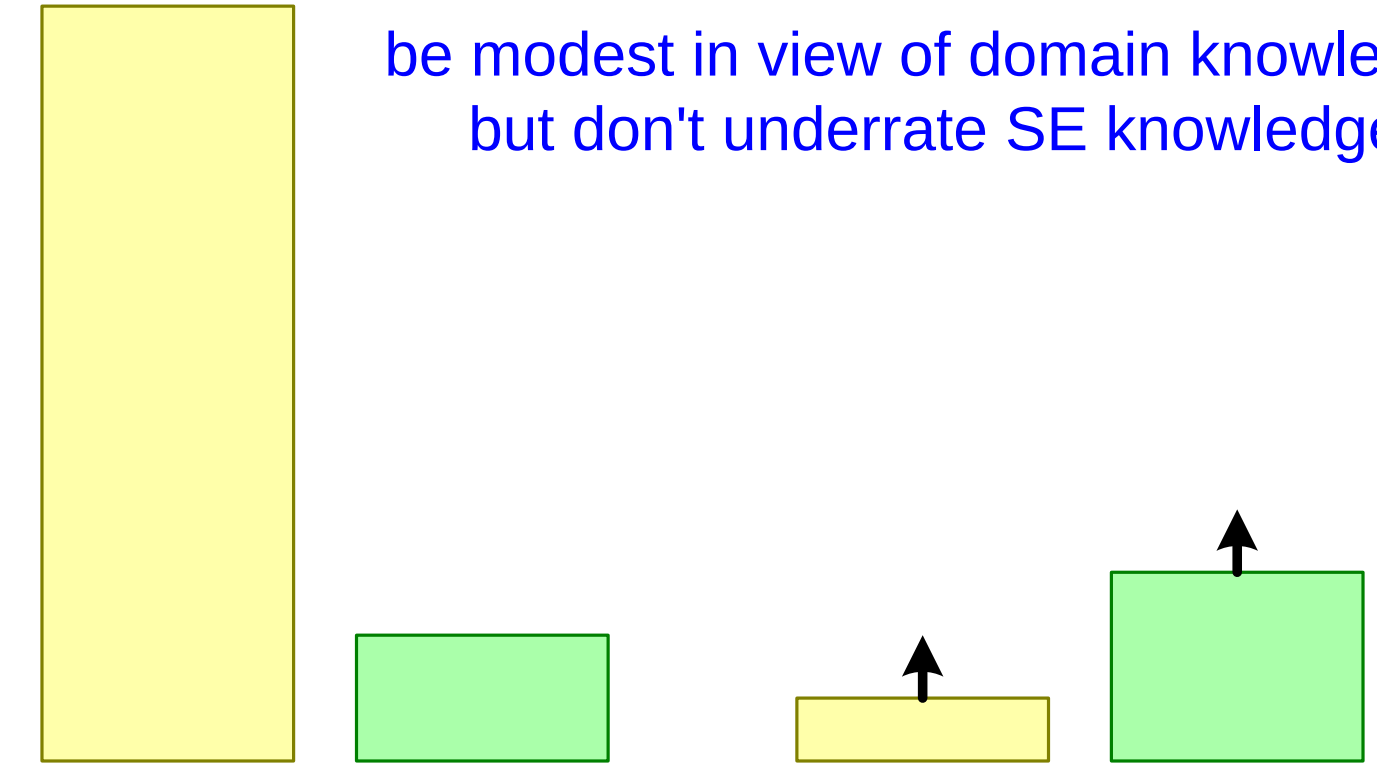
+ to perform normal engineering tasks
+ to be inquisitive, curious, wondering
+ to be cooperative
+ to work hard (it is more difficult to deliver part-time)
+ to reflect on theory and practice of Systems Engineering
+ to apply as much exercises and home work on local situation

*What does the employee get in return?*

+ building up engineering experience
+ appreciation for Systems Engineering methods and techniques
+ a rich frame of reference
+ personal development

# IM students and older Colleagues

be modest in view of domain knowledge
but don't underrate SE knowledge



# Roles

| *company supervisor* | *student* | *University of South-Eastern Norway* |
|---|---|---|
| keep in contact with BUC | work | provide education |
| work related | study | provide workshops: |
| what tasks, duties | try-out SE techniques and methods in job (low-key) | monitor growth |
| when, how much time | apply exercises and home work on local situation | monitor SE relevance |
| how | reflect | keep in contact with HR, supervisor, and students |
| feedback on results | attend education and workshops | |
| embedding in organization | keep in contact with supervisors and BUC | |
| study related | | |
| support to find right: | | |
| means, people, documentation | | |
| stimulates reflection | | |
| monitors growth | | |

# What is Competence?

Attitude (perseverance, faith, critical, constructive, etc.)

*train*

Ability (know when to use what skill and knowledge)

*apply/use often, experience*

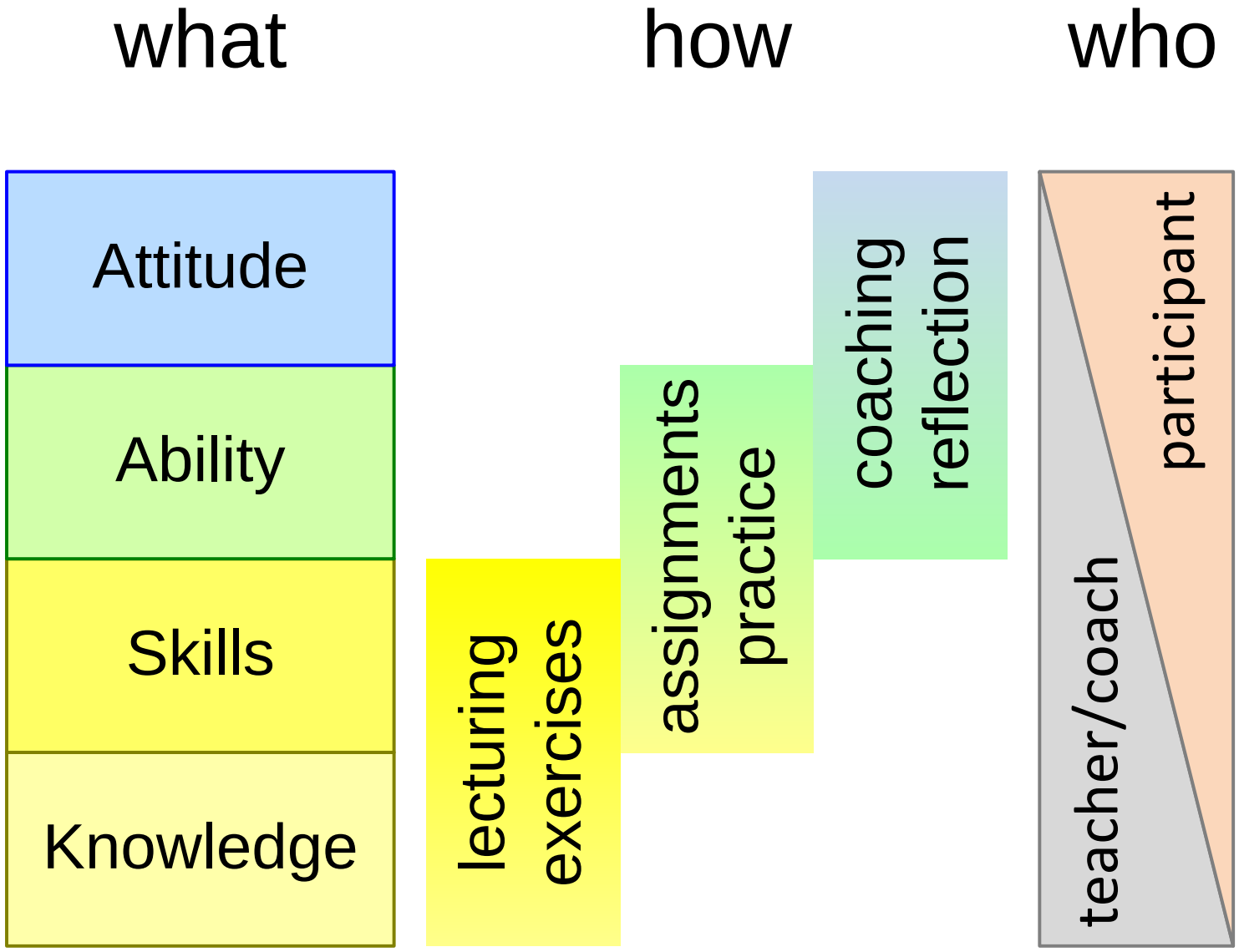
Skills (calculate missing angle, calculate hypothenusa)

*exercise*

Knowledge (triangle has 3 corners, sum of angles is 180 degrees, Pythagoras $c^2 = a^2 + b^2$)
*learn*

Competence = Knowledge + Skills + Ability + Attitude

# Competence Program Partitioning



# Examples of Respective Tasks for Students

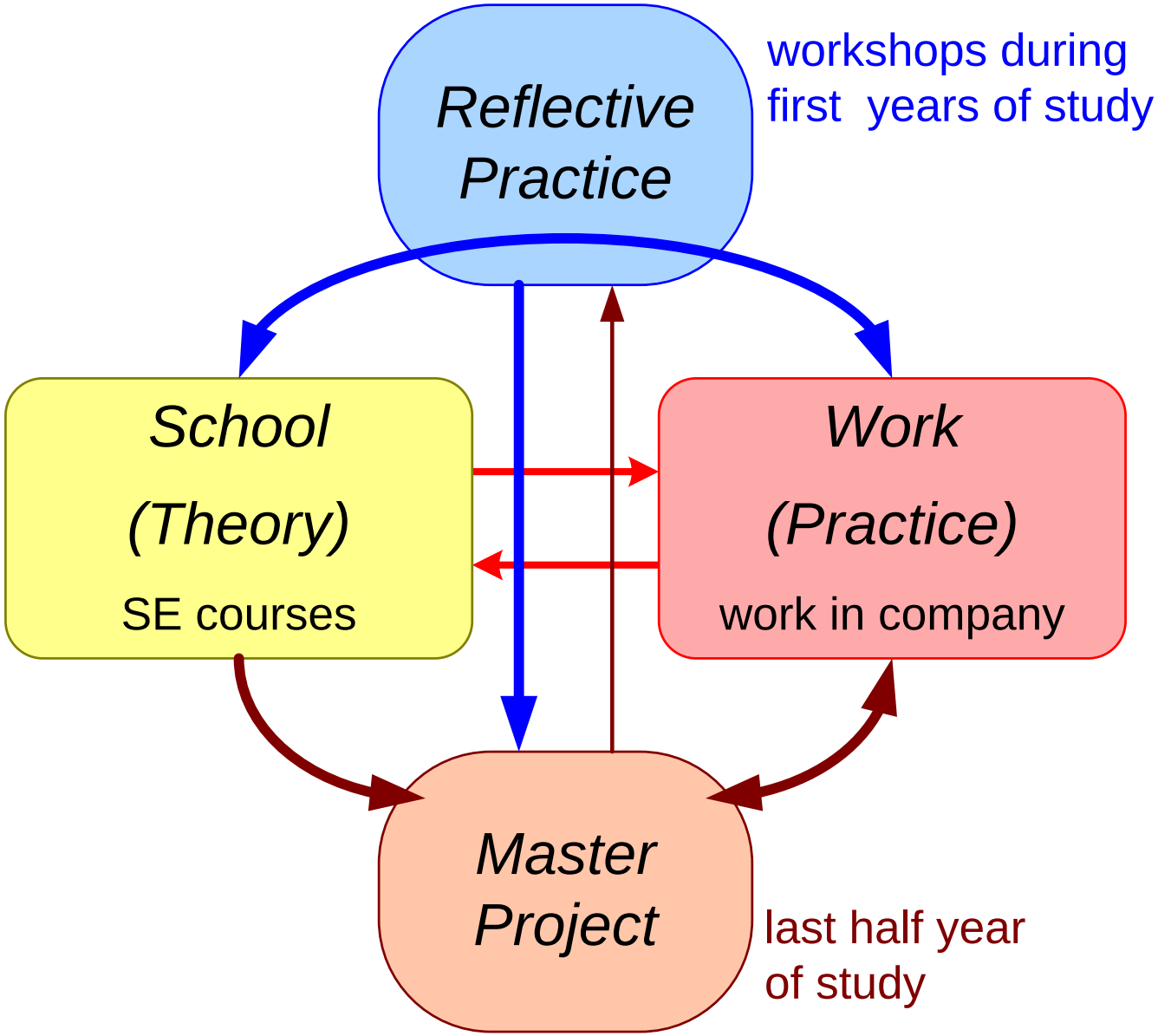
*typical engineering tasks*

1. make minor change(s) to component or function
2. make sizable change(s) to component or function
3. add feature(s) or function(s) to component
4. execute tests at subsystem level
5. participate in requirement review at component level

# Task Evolution

tasks evolve, similar to other new engineers

# RP: Stimulate Students to Relate Theory and Practice



# Non-disclosure of Confidential Information

All information exchanged between USN staff and students is to be treated as confidential

Academic supervisors are not allowed to make any confidential information public without permission of the company

Exception is information that was already known to the supervisor or is already public

See publication procedure http://www.gaudisite.nl/BuskerudSEpublicationProcedureSlides.pdf

# Reflection by WWHWWW Questions

Why

Who

What

When

How

Where

# Example Questions

*Example questions for Mentors*

What change/feature/... is asked for?

What are the requirements for this change/feature/...?

Who is asking for it?

Why is that stakeholder asking for it?

What are the needs and concerns of this stakeholder?

When is the deadline for this task?

How will the task be realized?

What tools, methods, techniques have to be applied?

What company processes apply?