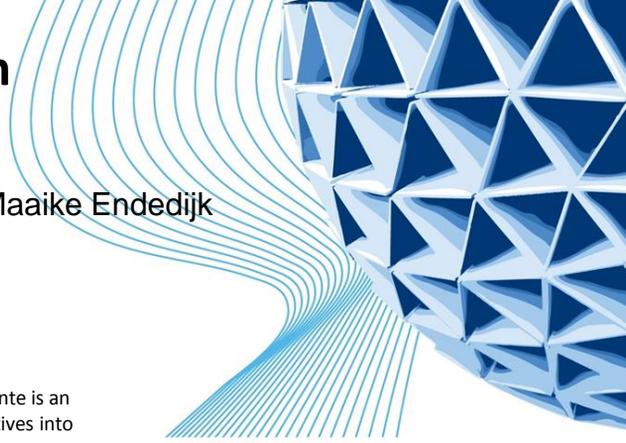


Design of interdisciplinary program for excellent students

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INTRODUCTION

The Academy of Technology and Liberal Arts & Sciences (ATLAS) at the University of Twente is an interdisciplinary program for top students, integrating both social and technical perspectives into a new engineering approach.

ATLAS fully embodies the University of Twente's motto of "High Tech, Human Touch", integrating social, technical, behavioral and design perspectives into an interdisciplinary program. This Bachelor program will qualify students for monodisciplinary Master programs in social and technological disciplines. One of the aims of interdisciplinary education is to develop interdisciplinary thinking. Interdisciplinary thinking is essential for future engineers to solve complex problems. We aimed for designing a program that stimulates the interdisciplinary thinking of students.

INTERDISCIPLINARITY

Elements to supporting students' interdisciplinary thinking:

- ATLAS has a specific learning line called "interdisciplinarity" in which the students are supported in their development of interdisciplinary thinking, knowledge and skills.
- Every semester, students work on a realistic, open-ended project that contains both social and technological elements.
- Students are confronted with phenomena that exist in both disciplines (social and technological), such as power, feedback, interaction, etc.
- The research and design skills from both disciplines are taught at the same time to learn how research and design principles can be used in the different disciplines. A unified cross-disciplinary terminology is used to aid the student's learning process.
- We will use the principle of co-teaching / co-tutoring: Teachers from different disciplines are together responsible for the design of a semester and supervision of the project groups.

Overview ATLAS curriculum

Year	Semester 1			Semester 2	
	Theme	EC	EC	Theme	EC
1	Theme	Theme with common project	12	Theme with common project	12
	Foundation	Science/Engineering *	10	Science/Engineering	5
	Foundation	Social Science **	5	Social Science	5
	Integration			Integration / generalisation	5
	Personal Pursuit	Elective	3	Elective	3
		3		4	
2	Theme	Choice out of two themes	12	Choice out of two themes	12
	Foundation/	Science/Engineering	5 - 10	Science/Engineering	5 - 10
	Extension	Social Science	5 - 10	Social Science	5 - 10
	Personal Pursuit	Elective	3	Elective	3
		5		6	
3	Specialisation	International Exchange, Qualification for Master's programme; Minor	27 10 - 27	Graduation assignment, Capstone	20
	Extension	Choice in specialisation area	0 - 17	Courses related to assignment (Capita Selecta)	7
	Personal Pursuit	Elective	3	Elective	3
			90		90

Example (fall 2013 project)

Develop a feedback system for competitive rowers and/or their coach to improve the performance of a rowing crew (6-8 persons)

Social:

- Psychology
- Learning
- Group behavior
- Motivation
- ...

Math:

- Modeling
- Differential equations
- Optimization
- ...

Physics:

- Movement
- Force
- Power
- Energy
- ...

Design:

- Design a feedback system
- Integrate technical and social aspects of rowing
- ...

Organization:

- Planning
- Working in teams
- Managing team conflicts
- Group dynamics
- ...



Communication:

- Give feedback to rowing teams
- Write product manual
- Write project report
- ...

Research:

- Literature search
- Data collection
- Data analysis
- Data validation
- ...

Interdisciplinarity:

- Measuring in technical and social sciences
- Integration of social and technical rowing aspects into the feedback system
- ...

Learning capacity:

- Learning styles (of the rowers and the students themselves)
- Rules of feedback
- ...