

# Thematic Weeks: a New Concept in Engineering Education

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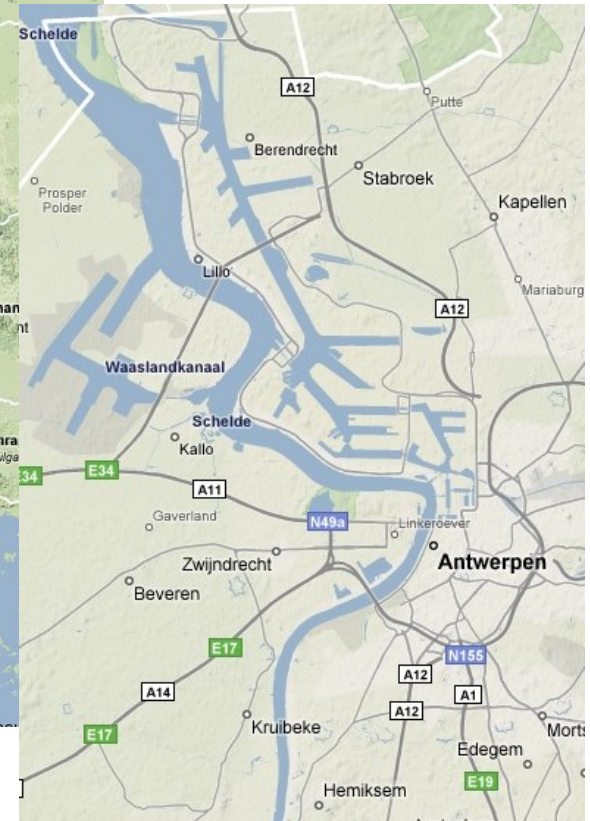
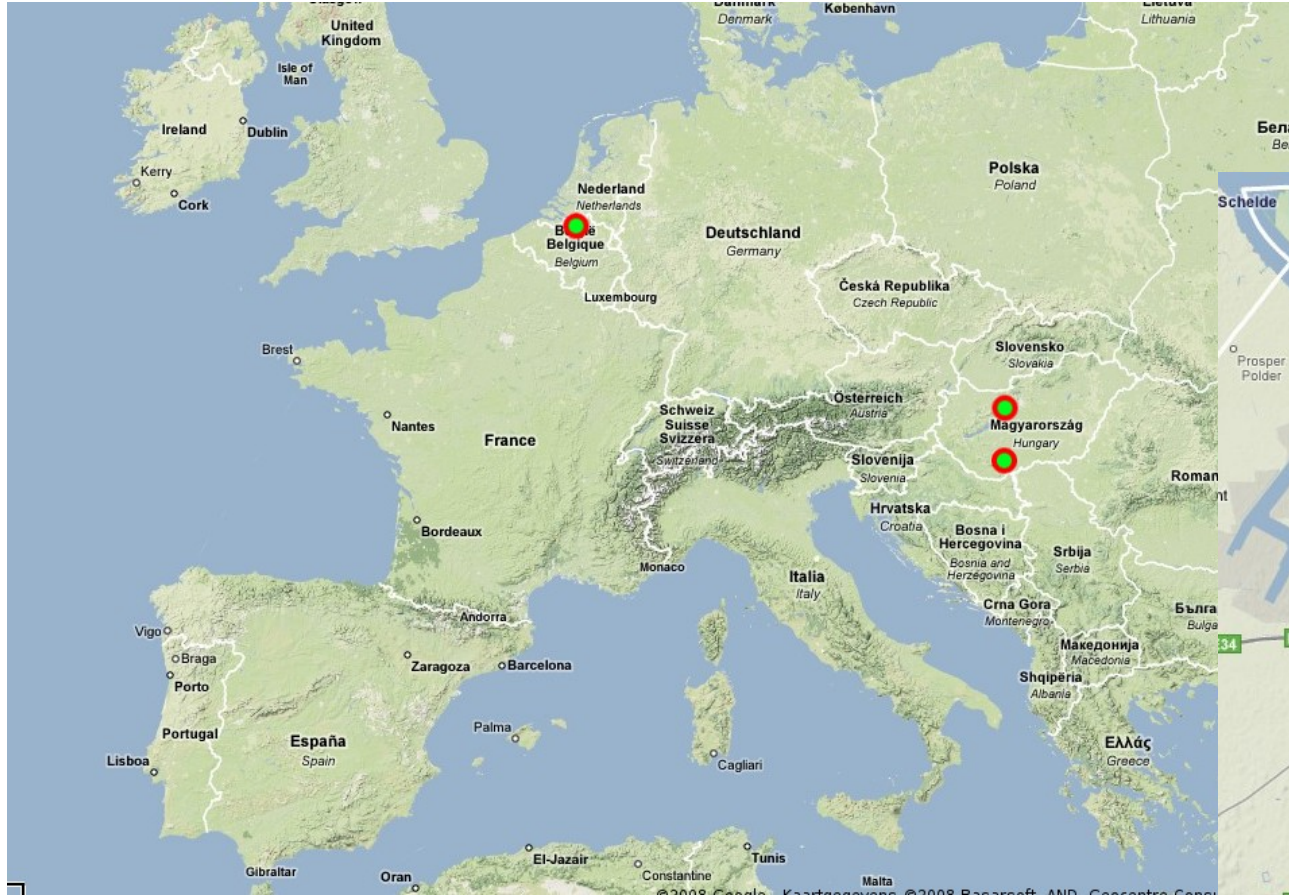


# Overview



- Where? Who?
- Introduction
- Context
- Concept
  - Student Involvement
- Case Studies / Examples
- Evaluation & feedback
- Future
- Conclusion

# Where?



Population: Belgium 10.4 million, Antwerp 466.000



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# Who?



## – University College of Antwerp:

- Dept. of Applied Engineering: Electronics-ICT
  - # Students: +/- 350
  - Degrees: Academic Bachelor & Master, Professional Bachelor
- E-lab Research Group
  - 9 Researchers
    - » Wireless Sensor Networks
    - » Digital Watermarking
    - » Medical Image Processing
    - » Realtime Location Systems
    - » GRID Computing
    - » Network Traffic Simulation



# Who?



- Professors / Senior Lecturers
    - » Filip Van der Schueren
    - » Maggy Goossens
    - » Leo Vaningelgem
  - Department Supervisor
    - » Sigrid Pauwels
  - PhD Students & Researchers
    - » Jeroen Doggen (me)
    - » Tim Schaepe
    - » Frederik Schrooyen
  - Masters Students (now graduated)
    - » Anthony Castreuil
    - » Kevin Pelkmans
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# Introduction

- Transformation of higher education in Belgium
  - Old system → Bachelor/Master format
  - Research oriented curriculum
- Job profiles from industry
  - Mix of hard & soft skills
- Applied vs fundamental research
- Student = co-researcher

# Overview

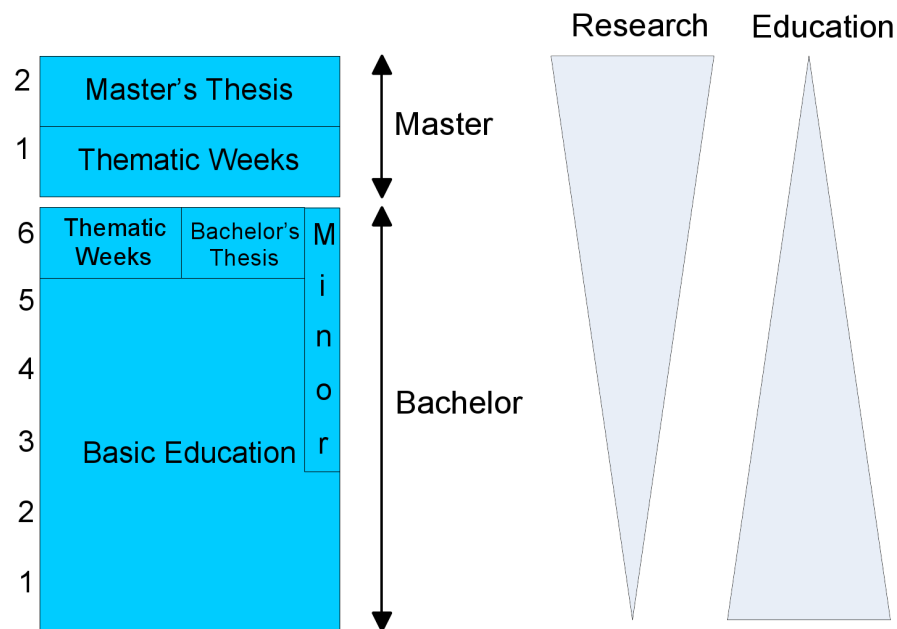


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# Context

- Academic Profile for Applied Engineering
- Educational Concept
  - Progressive building and training of research skills

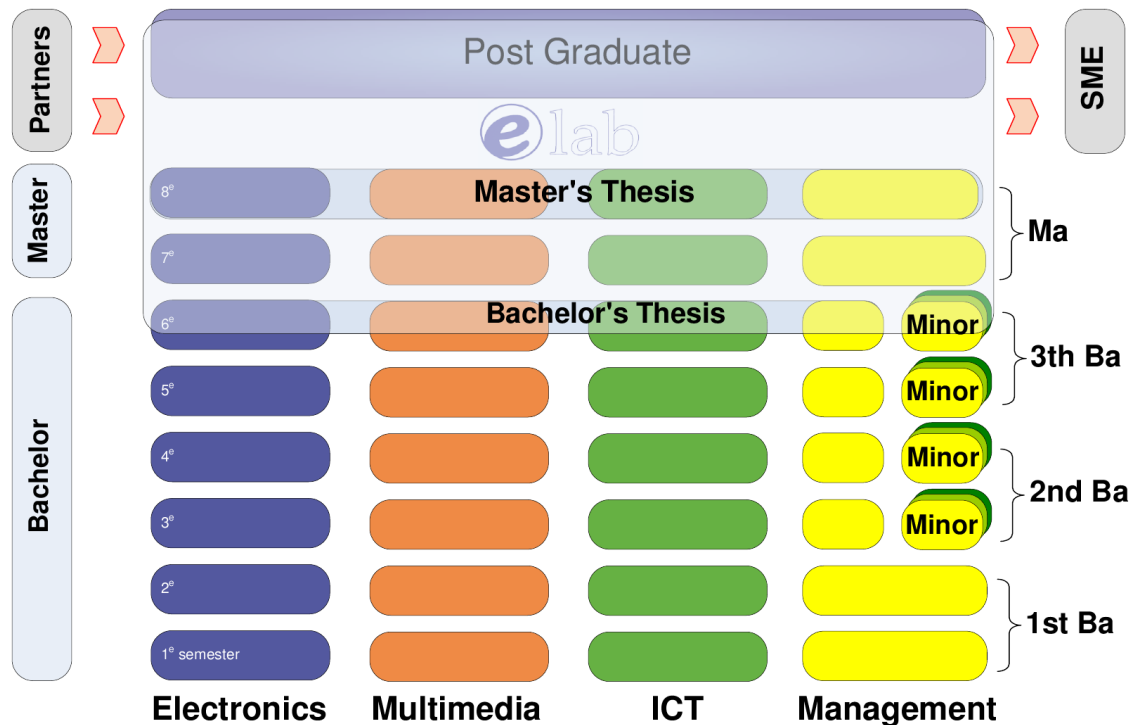


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# Context

## – Educational Concept

- Educational program
- Industrial liaison and co-operation



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# Concept



- One week courses (where possible)
- Combination of:
  - Theory
  - Exercises and lab sessions
  - Guest lectures & excursions
  - Week project

# Student Involvement



## – Levels of responsibility

- Professor
  - Topic selection, quality control
  - “Yearly supervision”
- Researcher (ofter PhD student)
  - Theory, lectures, exercises, projects
  - “Daily supervision”
  - Quality control
- Master students
  - Projects, exercises, (lectures)
  - “Hourly supervision”
  - Quality control

# Overview



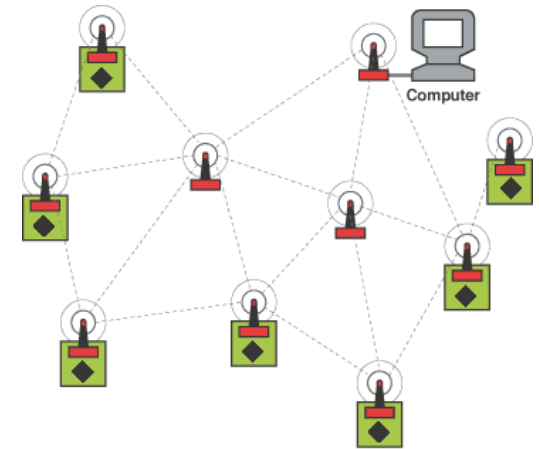
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# Case Studies / Examples



## – Wireless Sensor Networks

- Basic course:
  - Hardware, software, networking
- Guest Lectures
  - GreenPeak Technologies
  - IBBT research Project: Wireless Building Automation
- Projects
  - End-user application: database management & control
  - Sensor node design and development (XBee)
  - Low-level embedded application development
    - » Temperature monitoring, alarm systems,...



# Case Studies / Examples



- Real-time Location Systems
  - European Intensive Program (PoRaC)
- GRID Computing
- Medical Image Processing
  
- Digital Watermarking
- Network traffic simulation
- 3D Modeling and animations



# Case Studies / Examples



## – Non-technical “weeks”

- Project Management
  - Organized by a Belgian Bank (KBC)
- Writing a software manual
- Small Business Project
  - Not organized using the concept of thematic weeks
  - Develop own product or service
  - RPG, business plan, market research,...
  - National awards: [www.geencursus.be](http://www.geencursus.be), Smart-Ad

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# Evaluation & Feedback



## – Student evaluation

- Portfolio based
  - At the end of the semester
  - Report on Sunday
  - Include their own reflections on “their week” and other weeks
    - » Used in PDCA cycle
- Written and/or oral examination

## – Teacher evaluation

- Performed by organizing students
  - Anonymous questionnaire

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# Future



- Students proposed changes to the system
  - More time for projects
    - Moving deadlines
    - Thematic *two*-weeks
      - » Less topics but more thorough
  - The project management week should come first
- Open up the system for external students from industry and academia
- PhD summer schools

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# Conclusion



- Definition of applied research
- Specific job profiles
- Very fast time-to-market
- Student involvement
  - Managerial skills
  - Feedback and evaluation



Thank you for your attention!

Questions?