Information Meeting for DE5 and DE3 – **Further Study Possibilities**

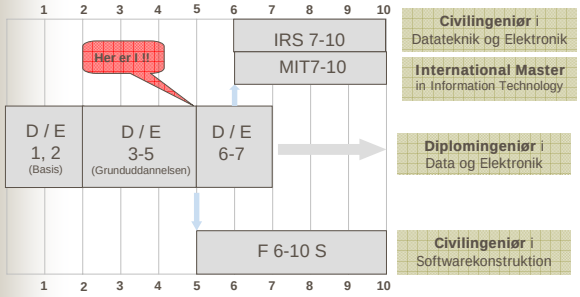
- General Education Structure
- Diplomingeniør i Datateknik og Elektronik
- Civilingeniør i Datateknik og Elektronik
- Civilingeniør i Softwarekonstruktion
- Andre muligheder

AALBORG UNIVERSITET

What's Our Current Position?

DE3-DE5 Semesters (AUE)

Uddannelsesstruktur i AUE



What Can You Choose After DE5?

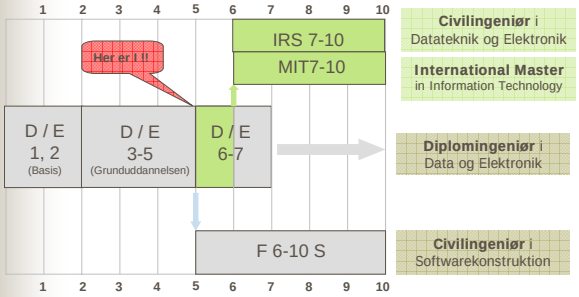
- **Diplomingeniøruddannelsen**
- **Civilingeniøruddannelsen**

Diplomingeniør i Datateknik og Elektronik

- Hvis du beslutter dig for at afslutte studiet som diplomingeniør, vælger du et specialiseringsforløb efter de første 2½ år.
- Grunduddannelsen i Datateknik og Elektronik giver adgang til forskellige specialiseringer, fx proceskontrol, signalbehandling, informatik eller kommunikationsnetværk. Uanset hvilken specialisering du vælger, udarbejder du dit afgangsprojekt i samarbejde med en virksomhed.

http://www.aaue.dk/main/dk/edu/diplom_data.html

Uddannelsesstruktur i AUE



What about the DE6 Semester?

One key semester:

- The door to **Diplomingeniør** i Data og Elektronik
- The door to **Civilingeniør** i Datateknik og Elektronik
- One door to **International Master** in Information Technology

DE6 Semester – Theme, Courses

(http://www.cs.aue.auc.dk/research/lce/6smester.htm)

- **Tema:**

  Kontrol og filtrering

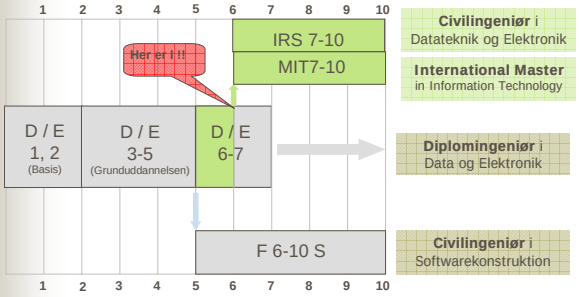
- **Courses:**
  - F6-1: Probability, statistics and stochastic processes (SE)
  - F6-2: Numerical methods in signals and systems (SE)
  - F6-3: Engineering Management
  - FP6-1: Modelling and simulation
  - FP6-2: Digital control and filtering
  - FP6-3: Applied electronics and actuators

DE6 Semester – Objective

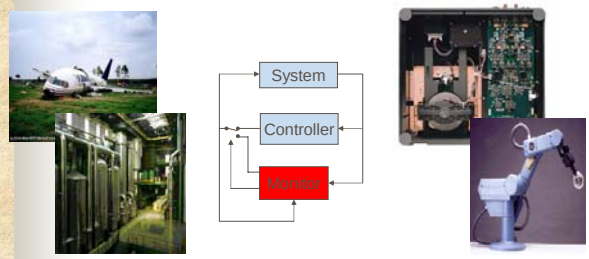
(http://www.cs.aue.auc.dk/research/lce/6smester.htm)

- To enable the students to apply feedback theory for design, realisation and test of analog/digital control
- To enable the students to apply dynamic models of mechanical, thermal or acoustic systems, and simulate them using different numerical methods
- To enable the students to design and implement model-based digital signal processing systems on specific DSPs taking application specifications into account

Uddannelsesstruktur i AUE



Hvad er IRS i den virkelige Verden?



Fault cases

Signalbehandling + Reguleringsteknik
Softwares + Hardwares
Mechanics + Intelligence

Nøgleord

- Forståelse
- Implementering af nye ting
- Udvikling
- Stor viden om kontrolsystemer og fysiske systemer
- Teknikker der kan overføres til andre områder

IRS Specialization

(http://www.aaue.dk/main/dk/edu/civil_irs.html)

- The focus of the IRS programme is to integrate some fundamental principles and techniques from the subject of *fault tolerant computing* and the subject of *fault tolerant control* into a uniformed "hybrid" framework for *reliability engineering education*.
- Some emerging intelligence techniques, such as fuzzy logic, neural networks, discrete event systems, supervisory theory and hybrid system theory, are employed as the platform and enhancement for this integration.

IRS Specialization

(http://www.aaue.dk/main/dk/edu/civil_irs.html)

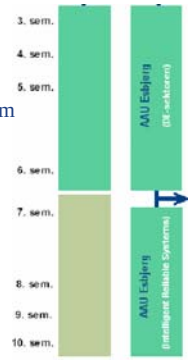
Civilingeniører med en uddannelse inden for Intelligent Reliable Systems, kan få mange forskellige typer job:

- Automatiseringskonsulent/-ingeniør
- Konsulent eller ingeniør inden for pålidelige systemer
- Hardware- og softwaredesigner med fejltolerante systemer som speciale
- IT-udvikler med speciale i tolerance overfor maskinfejl
- Udvikler af moderne elektronisk udstyr
- Forsker, underviser mm. inden for universiteter og forskningsinstitutioner, der beskæftiger sig med avancerede automatiseringsteknikker, pålidelighed, intelligensanvendelse, med videre.

More IRS Information...

- Studieordning (http://esn.aau.dk/)
- Webpage

http://www.cs.aue.auc.dk/research/lce/IRS1.htm



IRS7 Semester – Theme, Courses

- **Theme:**

  Distributed/Real-time Control Systems
- **Courses:**
  - F7-1: System identification (SE)
  - F7-2: Stochastic analysis for engineers (SE)
  - FP7-1: Scientific methods and communication
  - FP7-2: Distributed systems
  - FP7-3: Plant-wide (advanced) process control systems
  - FP7-4: Introduction to reliability and fault tolerance

IRS7 Semester – Objective

- To give students a comprehension of fundamental concepts and principles about distributed/real-time systems for control engineering
- To give students a comprehension of fundamental issues in control of plant-wide industrial processes
- To enable students to apply stochastic analysis for system identification and reliability analysis

IRS8 Semester – Theme, Courses

- **Theme:**

  Intelligent Monitoring and Fault Diagnosis
- **Courses:**
  - F8-1: Engineering responsibilities (SE)
  - F8-2: Reliability modelling and analysis I (SE)
  - F8-3: Robust control (SE)
  - FP8-1: Fault detection and diagnosis in dynamic systems
  - FP8-2: Reliability modelling and analysis II
  - FP8-3: Fuzzy logic and neural networks for engineering
  - FP8-4: Estimation and sensor information fusion

IRS8 Semester – Objective

- To give students a **comprehension** of monitoring, fault detection and diagnosis techniques
- To give students an **understanding** of some intelligent engineering techniques including neural networks, fuzzy logic
- To give students a **comprehension** of robust control, estimation and sensor fusion
- To enable students to **apply** probabilistic methods for reliability modelling, analysis and assessment
- To enable students to **apply** qualitative and quantitative intelligent and/or model-based fault detection and diagnosis for dynamic systems

IRS9 Semester – Theme, Courses

- **Theme:**

  Intelligent reliable system design
- **Courses:**
  - F9-1: Discrete event systems and supervisory control (SE)
  - F9-2: Hybrid dynamical systems (SE)
  - FP9-1: Fault tolerant control systems
  - FP9-2: Fault tolerant computer systems
  - FP9-3: Adaptive and predictive control

IRS9 Semester – Objective

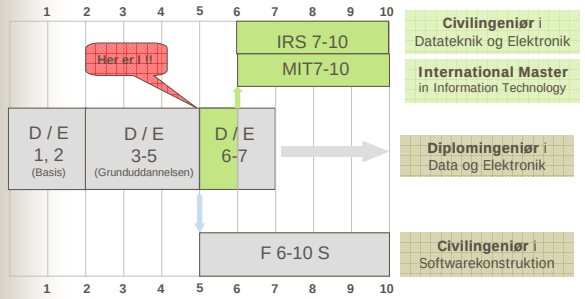
- To give students a **comprehension** of analysis, design and implementation of fault tolerant control systems
- To give students a **comprehension** of modelling, analysis and synthesis of discrete event systems and hybrid systems
- To give students a **comprehension** of adaptive control and predictive control techniques
- To enable students to **apply** quantitative and qualitative, intelligent and/or model-based methods for reliable system design

IRS10 Semester – **IRS Master Thesis work!**

Remark:

There is the possibility to combine IRS9 and IRS10 for a long-term thesis work

Uddannelsesstruktur i AUE



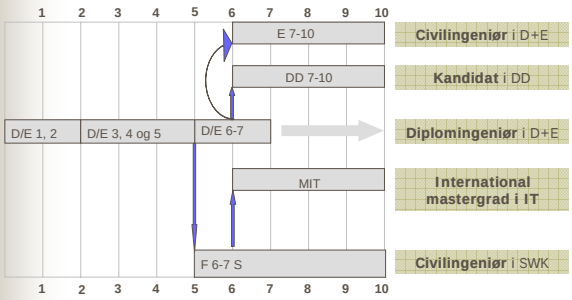
International Mastergrad i Informationsteknologi - 1 af 2

- Uddannelsen tager 2 år
- Jobs: her kan du starte tidlig med at gøre Europa til din arbejdsplads
- Første semester foregår i Sverige, andet i Tyskland og tredje i Danmark
- Fjerde semester foregår i et af de tre lande efter eget valg
- Undervisning foregår på engelsk sammen med studerende fra de tre lande
- Intet undervisningsgebyr

International Mastergrad i Informationsteknologi - 2 af 2

- Indhold
  - I løbet af de 3 første semestre beskæftiger du dig bl.a. med trådløs kommunikation, billedanalyse, kontrol teori samt ledelsesfærdigheder og forretningsadministration
  - I 4 semester skriver du afgangsprojekt

Andre muligheder - overblik



http://www.esn.aau.dk/