# Smart Sensor Systems

**a new specialization at 2-year master program in Electronic System Design**

**Denne informasjonen vil etter hvert dukke opp på NTNU IES sider, men vi mener at det er viktig å dele den med deg allerede nå.**

**Our new specialization focuses on practical design of smart sensor systems - 3S (see the course plan on the next page).**

**You will learn:**

- **to design and build prototypes by working on a specialized project every semester;**
- **to apply design thinking principles in development;**
- **to understand economical potential and challenges of your design;**
- **specialized knowledge necessary for your project by choosing from every course at NTNU;**
- **how to plan and perform development projects.**

**You will get the possibility to work continuously on your project for two years and acquire experience necessary to succeed after study time.**

**You will not only learn how to design and build electronic systems, you will get the chance to understand how designers and economists think.**

**Finally you will get the possibility to design your own studies, so you will get a unique education and experience profile.**

**We will be happy to answer your questions about 3S. Feel free to contact us at: dominik.osinski@ntnu.no or dag.hjelme@ntnu.no**

**IMPORTANT:**

**Admission information**

**The application portal is now open and deadlines are as following:**

| Non-EU/non-EEA students | EU/EEA students | Norwegian/Nordic students |
|---|---|---|
| 1 December 2018 | 1 March 2019 | 15 April 2019 |

| Course plan | | | | | |
|---|---|---|---|---|---|
| 2nd year | Spring | TFE4930 - Electronic Systems Design, Master's Thesis | | | |
| | Autumn | TFE4580 - Electronic Systems Design and Innovation, Specialization Project (O) | | TFE4595 - Electronic Systems Design, Specialization Course (O) | TIØ5200 - Project Organizations (VA)<br>TIØ4146 - Finance for Science and Technology Students (VA) |
| 1st year | Spring | TFE4204 - Sensor Systems Design II (O) | Elective (V) – from all NTNU courses | TTK4145 - Real-time programming (VA)<br>TTM4115 - Design of Communicating Systems (VA) | Experts in Teamwork (O) |
| | Autumn | TFE4202 - Sensor Systems Design I (O) | Elective (V) – from all NTNU courses<br>TTT4120 - Digital Signal Processing (VA) | TDT4258 - Low-Level Programming (VA)<br>TTK4155 - Embedded and Industrial Computer Systems Design (VA) | TPD4142 - Design thinking (M1A)<br>TMM4220 - Innovasjon ved Design Thinking (M1A) |
| | | | | | |
| | | **Projects** | **Elective courses** | **Programming/Electronics** | **Entrepreneur/Innovation** |

(O) – Compulsory course; (VA) – Elective course - Coordinated in teaching and examination schedules; (V) - Elective course (**you can choose from every NTNU course**); (M1A) – At least one course from group A

## More info about our project courses:

### Sensor Systems Design I

**Academic content**

Design and practical development of a dedicated sensor system: Requirement analysis; Definition of technical and functional requirements; Cost analysis; Development of a measurement system prototype using necessary tools such as: simulation tools and / or specialized software; Practical realization of a sensor system; Planning and documenting the project work.

**Learning outcome**

**Knowledge:**
After completing the course, the candidate must:

- Have advanced knowledge in the design of sensor systems and specialized insights into a given problem within sensor technology
- Apply knowledge of creating a dedicated sensor system

**Skills:**
After completing the course, the candidate must:

- Could design and build a sensor system according to defined requirements
- Could document a project according to specified guidelines

**General competence**
The candidate can:

- Analyze a technology problem and then plan, implement and document the project
- Communicate results of independent work.
- Communicate on academic issues, analyzes and conclusions in design of sensor systems, both with specialists and to the general public

**About the assessment**

Assessment is based on submitted report and promotion video. Character A-F. In the case of applications for crediting, approving and filing of subjects from previous cohorts or other institutions' corresponding education programs, each application will be processed individually and the applicant must be able to include credits reduction on overlapping subjects.

## Sensor Systems Design II

### Academic content

Design and practical development of an optimized sensor system. Optimization depends on project type and may include: energy consumption, components, size, packaging, mass production, production costs, function, user interface, etc. Development of a sensor system prototype using necessary tools such as: simulation tools and / or specialized software and selected working methods. Practical realization of an optimized sensor system; Planning and documenting the project work.

### Learning outcome

**Knowledge:**
After completing the course, the candidate must:

- have advanced knowledge in design and optimization of sensor systems and have highly specialized insight into a given problem within sensor systems
- apply knowledge of creating an optimized sensor system

**Skills:**
After completing the course, the candidate must:

- be able to design and build an optimized sensor system according to defined requirements
- be able to document a project according to specified guidelines

**General competence**
The candidate can:

- analyze a technology problem and then choose optimal solutions, plan, implement and document the project
- convey results of extensive independent work
- communicate about professional issues, analyzes and conclusions in design of optimized sensor systems, both with specialists and the general public

### About the assessment

Assessment is based on submitted report and video presentation. Character A-F.
In the case of applications for crediting, approving and filing of courses from previous cohorts or other institutions' corresponding education programs, each application will be processed individually and the applicant must be able to include credits reduction on overlapping subjects.