

# ***Development of Communication Protocols (TIUDPK-01)***

## ***Fall 2009 – 5 ECTS***

### **Objectives of the course**

Today, almost every embedded device communicates with its surroundings. Hence, a deep understanding of communication protocols and their usage are important. The course presents general issues in association with designing, implementing and using of protocols. During the course the participant will obtain practical experience in the use of the TCP/IP protocol suite. Further, the participant will gain experience in designing, implementing and testing of a standard protocol.

### **Course contents**

- Introduction to the OSI reference model, protocol layers and their service model
- The UDP/IP and TCP/IP protocol suite & sockets
- Application programming design based on the UDP/IP and TCP/IP protocols
- Introduction to Standard Organizations & protocol specifications (ETSI, IETF, 3GPP)
- Standard notations for protocol descriptions (ASN.1 & ABNF)
- Object-Oriented design of protocols
- Implementation of protocols in a layered model
- Techniques for testing and validation of protocols
- Introduction to tools for development, analysis and test of protocols

### **Prerequisites**

The course assumes basic knowledge within the field of Data Communication, corresponding to the course I-DKT1 and basic knowledge about object-oriented programming in e.g. C++.

### **Name of lecturer**

Martin H. Stender

### **Type of course/teaching methods**

50% theory and 50% exercise and project work.

### **Literature**

Will be announced later (Selected research articles)

### **Course homepage**

<http://kurser.iha.dk/eit/tiudpk>

### **Provider**

Engineering College of Aarhus

### **Part of the following academic regulations**

Master's degree in Engineering (Information Technology)

### **Course enrolment**

Send an e-mail with the following contents to [info@agse.dk](mailto:info@agse.dk)

- Student registration number and name
- Course title

### **Learning outcomes and competences**

The participants must at the end of the course be able to:

- Define and describe the principals behind a layered protocol stack and the service model
- Assess, discuss and use UDP/IP and TCP/IP for real-time applications
- Assess, discuss and use standard notations for protocol descriptions
- Assess and discuss design principals of a protocol stack
- Use Object-Oriented principals for modelling and designs of protocols
- Use techniques for testing and verifying protocols

### **Course parameters**

- **Language of instruction:** Danish or English
- **Level of course:**
- **Semester/quarter:** Q1
- **Hours per week:**
- **Capacity limits:** None

### **Assessment**

Oral exam with external examiner. 7-point grading scale.