



# AP Programme in IT Technology

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Information for Incoming Erasmus Students  
2019-2020



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## About the Academy

Dania Academy is a modern higher education centre, with international campuses in the cities of Randers and Viborg.

Dania was established on 1 January 2009 and has a long-standing tradition for developing and offering higher education, English-taught programs in the area:

- International Marketing
- Tourism and Hotel Management
- International Hospitality Management
- IT Technology
- Automotive Management

The Automotive Management program is located in Viborg.



### Excellent facilities

Dania's Viborg Campus is located in new and modern buildings, which we share with VIA University College. The Campus offers excellent study facilities to its students, including the latest IT equipment and 24-hour access to the IT centre.

### The City of Viborg

The city of Viborg has 45,000 inhabitants and the whole municipality has 100,000. In medieval times Viborg was the capital of Jutland and the roman cathedral and the high court for West Denmark are reminiscences of the former clerical and juridical power of the town. Viborg also has a well preserved town centre where you will find many traces of the medieval town.

In Viborg exchange students will be at a very modern and internationally oriented campus which Dania shares with a large university college.



## Conditions for Erasmus students

- Erasmus exchange students must attend all subjects of any given semester enrolled into. This is due to our multidisciplinary and group-work oriented approach to teaching. All absence from classes is registered (this is also the case for our full-time students). You cannot put together a study program consisting of modules from different semesters or programs.
- All exams, tests and projects of the semester(s) enrolled into **must** be taken. Exams at the end of the 2<sup>nd</sup> semester may also cover 1<sup>st</sup>-semester content.

## Teaching methods

Dania uses a multi-disciplinary approach to teaching. The classes are a combination of discussion and group-work. Our lectures will not repeat what is written in books, but rather use textbook theories on case examples. This practical approach is also used while writing projects where the focus will be on how theories in fact are used in real life. Therefore, we are working closely with actual companies with solving concrete problems. This practical approach creates more value and hand-on experience for students.

It can take time to get used to our teaching methods. This, and the fact that most Erasmus students are not used to being taught in English, mean that most students that are in their 2<sup>nd</sup> or 3<sup>rd</sup> year at their home institution will still get ample challenges in our 1<sup>st</sup> or 2<sup>nd</sup> semester classes.

## Important dates

Semester dates and holidays: see [Fact Sheet](#)

## Module overview:

	Modules	ECTS	Exams
<b>1<sup>st</sup> semester</b>	Network Technology	5	First year exam: multidisciplinary exam covering all modules (external)
	Embedded Systems	8	
	Programming	7	
	Project management and business skills	10	
<b>2<sup>nd</sup> semester</b>	Network Technology	13	Technology exam (internal)
	Embedded Systems	10	
	Programmering	7	
<b>3<sup>rd</sup> semester</b>	Network Design	10	Elective exam (internal)
	IT development	5	
	<i>Electives:</i> <ul style="list-style-type: none"> <li>• Security or</li> <li>• Datacenter/Cloud</li> </ul>	15	

## Module descriptions:

Please note that the descriptions for Network Technology, Embedded System and Programming cover both 1st and 2nd semester. Descriptions for the individual semesters will be available in December.

## Network Technology 1<sup>st</sup> and 2<sup>nd</sup> semester (17 ECTS):

### Content

This national subject element consists of network and server technologies, operating systems, network security and communication including protocols and services. The subject element also contains design and the use of networks and network-based/cloud solutions. Generally, work is done with design, development, testing and documentation as well as the dissemination of secure and sustainable solutions.

### Learning objectives for Network technology

#### Knowledge

The student will gain knowledge and understanding about:

- Network and server technologies overall, and the difference between physical and virtual technologies.
- Operating systems as well as the difference between different systems and data management, including security.
- Network security, including different products.
- Communication protocols and their use for different architecture.

#### Skills

The student will get the skills to:

- Apply network technology and hardware in connection with design, planning and implementation of complex, secure and sustainable network solutions.
- Apply network technological knowledge in connection with administration, operation and monitoring of complex network solutions.
- Communicate and document tasks and solutions within networks
- Use tools and equipment related to the design, development and testing of solutions.
- Evaluate network security in concrete products.

## **Competencies**

The student will learn to:

- Manage analysis, needs identification, design, development and testing of secure network solutions.
- Manage planning and quality management of own network and server technology-related tasks.
- Acquire new knowledge, skills and competencies within network and server technologies.
- Participate in practice-orientated development processes in teams

## **Embedded Systems 1<sup>st</sup> and 2<sup>nd</sup> semester (18 ECTS):**

### **Content**

This national subject element contains signal handling, competent technology, communication, Internet of Things-techniques, protocols, interfacing, selection and application of embedded systems as well as components for integrated solutions. The subject element generally works with design, development, testing and documentation as well as the dissemination of secure and sustainable solutions.

### **Learning objectives for Embedded systems**

#### **Knowledge**

The student will gain knowledge and understanding about:

- Communication and interface technique in general, as well as how they are used in selected solutions.
- An overview of electronic modules, as well as how selected modules are built up
- Protocols including communication protocols, their structure as well as what differences and uses there are.
- Internet of Things-techniques, construction generally and selected solutions in more details.
- Applied technical mathematics within the subject area to understand electronics and/or communication.
- Operating systems, their distinctive features and use.
- A general understanding of signal management as well as an understanding of how it is used and included in solutions.

#### **Skills**

The student will get the skills to:

- Evaluate, select, adapt and use embedded systems and components in secure and sustainable solutions
- Build and use test systems
- Document and disseminate tasks and solutions with the use of embedded components and systems.

## **Competencies**

The student will learn to:

- Manage analysis, needs identification, design, development and testing of secure embedded and sustainable solutions
- Manage the analysis, diagnostics, testing and servicing of the technology involved in working with electronic systems, taking into account financial, environmental and quality requirements
- Acquire new knowledge, skills and competencies within the subject area
- Participate in practice-orientated development processes in teams

## **Programming 1<sup>st</sup> and 2<sup>nd</sup> semester (14 ECTS):**

### **Content**

The subject area consists of the basic elements of programming, use of environments and data handling as well as design, development, testing and documentation of solutions.

## **Learning objectives for Programming**

### **Knowledge**

The student will gain knowledge and understanding about:

- Programming techniques in different types of language.
- Overall algorithms and design patterns and in connection with their selected programming language.

### **Skills**

The student will get the skills to:

- Use tools and equipment related to the design, development and testing of programmes.
- Document, disseminate and support programming-related solutions in connection with internal and customer-facing relationships.
- Evaluate and select simple algorithms for solving specific problems.

### **Competencies**

The student will learn to:

- Acquire new knowledge, skills and competencies within programming.
- Participate in practice-orientated development processes in teams.
- Manage the design, development and testing of larger solutions in multidisciplinary cooperation.

## **Project Management and Business Skills 1<sup>st</sup> semester (10 ECTS)**

### **Content**

This subject element includes innovation, project management, economy, quality and resource management, advisory and consultative functions, as well as documentation and dissemination

### **Learning objectives for Project management and business skills**

#### **Knowledge**

Knowledge The student will gain knowledge and understanding about:

- What innovation is, and how to use innovative methods in problem solving
- Project management in connection with development projects within IT.
- How a company is organised, including the parts that control the company, as well as how one can describe the economic issues overall.
- Quality and resource management as part of a development project and as part of the management of maintenance of IT operations.
- Advisory and consultative functions when IT-specialists need to understand and solve the customer's needs.

#### **Skills**

The student will get the skills to:

- Communicate in writing and orally to both professional people and customers.
- Apply innovative problem-solving methods, with a focus on customer needs.
- Evaluate the complexity of a given technical problem.

#### **Competencies**

The student will learn to:

- Handle customer tasks in order to convert customer needs into reliable solutions.
- Manage planning and control their own technical tasks as well as engage in interdisciplinary projects.
- In a structured context, acquire new knowledge, skills and competencies by understanding companies and customers' use of IT.

## **Network Design 3rd Semester (10 ECTS)**

### **Contents**

The target for the student is to build new knowledge and competence within network communication. This can be the creation of various forms of network and networks and how the security within such solutions are created.

### **Learning objectives for Network design**

#### **Knowledge**

The student has knowledge and understanding about:

- Server technologies.
- Network security.

#### **Skills**

The student will get the skills to:

- Use knowledge from network technology in connection with design, projecting, implementation of complex network solutions.
- Use knowledge of network security for analysis of network or products.

#### **Competences**

The student will learn to:

- Handle and analyse, identify requirements, present suggestions, design, prepare specification of network and security solutions in all project stages.
- Handle projecting and planning of network and security solutions.

## **IT Development 3rd Semester (5 ECTS)**

### **Contents**

The subject will help the student gain skills in projecting IT solutions. Knowledge and skills increase within designing projects for network design with focus on security, automation and architecture. In addition, there will be focus on hardware technologies, with specific focus on designing systems.

### **Learning objectives for IT development**

#### **Knowledge**

The student has knowledge and understanding about:

- IT process models
- Network security

#### **Skills**

The student will get the skills to:

- Assess and communicate technical network solutions to the company and client.
- Apply network technology/hardware knowledge in connection with projecting and estimation of costs for complex solutions.
- Use knowledge from network security to analysis of network or products.

#### **Competences**

The student will learn to:



- Coordinate, ensure quality and handle resource management of implementation of network and security initiations.
- Coordinate in relation to administration, operation, monitoring, maintenance and network problem solving.

## **Electives 3<sup>rd</sup> Semester**

### **Security (15 ECTS)**

#### **Contents**

This course will offer theoretical knowledge into the subject area of cybersecurity. Students taking this course, will have an opportunity to apply that theoretical knowledge during the course, while also learning how to create their own cybersecurity lab, for learning and testing in a secure and controlled environment.

#### **Knowledge**

- The student can acquire, develop and demonstrate knowledge based on structured learning and working with a chosen area of the IT-Security domain.

#### **Skills**

- The student can acquire, develop and demonstrate skills based on structured learning and working with a chosen area of the IT-Security domain.

#### **Competencies**

- The student can gain and demonstrate competencies using appropriate tools, techniques and methods within a chosen area of the IT-Security domain.

### **Data Center/Cloud (15 ECTS)**

#### **Contents:**

The course aims to give the students practical and theoretical knowledge to understand cloud and hybrid solutions in datacenters. Structuring cloud solutions with Design Patterns – which will be used as foundation for choosing the right solution combination. Describing common cloud platforms and their usage for the students. Similarly, the students will know about various features of popular cloud platforms. Students must know how to take advantage of cloud programming paradigms. The students will also learn the concept of modern Big Data analysis on cloud platforms using various data mining tools and techniques. Students get a set of skills enabling them to handle the common operation tasks in a Datacenter – this includes defining IT policies, strategies and procedures to actual building and configuration to common maintenance tasks. Common tools for datacenter maintenance such as backup, scripting and automation used in practical situations. During the course, we will build minor datacenters to illustrate and practice work on how to configure and set these up.

- Cloud concepts including hybrid solutions
- Cloud design patterns
- Cloud programming paradigms
- Server setup and configuration
- Changemanagement
- IT procedures, politics and strategies
- Directory services
- Logging
- User education
- Access control
- IT contracts

- Automation and scripting
- Backup
- Virtualization

### **Knowledge**

- Has knowledge of server setup
- Has knowledge of change management
- Has knowledge of it-procedures, politics and strategies
- Has knowledge of standard tools for system operation
- Has knowledge of user education
- Can understand IT contracts
- Can understand backup
- Can understand virtualization
- Can understand automation and scripting
- Understand various basic concepts related to cloud computing Technologies
- Understand the architecture and concept of different cloud models: IaaS, PaaS, SaaS
- Understanding of design and Implementation parameters for Hybrid cloud computing
- Understand basic design patterns for cloud solutions
- Understand the basic principles for designing a datacenter
- Understand Cost metrics, Service Quality metrics/ SLA's and Pricing model.

### **Skills**

- Configuration of standard servers
- Participate in creation of it-strategies and politics
- Create and document it-procedures
- Use standard tools for system operation including backup and virtualization
- Can use a current scripting language to automate routine tasks
- Assess technical cloud solutions based on the company and clients requirements.
- Work with cloud programming platforms and tools

### **Competences**

- The student can gain competences using standard tools for system operation through structured learning