



## COURSE SYLLABUS

### Projekt i systemteknik Systems Engineering Project 8 credits (8 högskolepoäng)

**Course code:** PA1475

**Main field of study:** Software Engineering

**Disciplinary domain:** Technology

**Education level:** First cycle

**Specialization:** GXX - First cycle, in-depth level of the course cannot be classified

**Language of instruction:** Swedish

**Applies from:** 2022-01-17

**Approved:** 2021-04-29

#### 1. Decision

This course is established by Dean 2021-04-16. The course syllabus is approved by Head of Department of Software Engineering 2021-04-29 and applies from 2022-01-17.

#### 2. Entry requirements

Admission to the course requires 2 credits completed in Object-oriented Design and 6 credits completed in Software Development.

#### 3. Objective and content

##### 3.1 Objective

The course aims to, as closely as possible, emulate a systems engineering project, with an emphasis on the software area as it can normally be conducted in industry. In this course, the student practices methods and models that will support this engineering approach. Work is developed in a group which places demands on the skills of leadership, collaboration and communication both orally and in writing, this as employees in the group and towards customers and other stakeholders. Overall, the student will need to use his skills in systems engineering and its relationships between different needs to solve an engineering problem.

##### 3.2 Content

The course covers the following areas:

- An overview of system technology e.g. what is a system
- What is a life cycle for a system
- The technical processes e.g. Business or Mission analysis process, architecture definition process and decision management process
- Modulation and simulation as an approach to understand how to get forward with the customer requirements as good as possible
- Key concepts of different development stages e.g. requirement elicitation
- A critical review of commitment culture in relation to requirement elicitation towards a desired result for a customer
- An understanding of the human relationship when building a system as a group where such as group dynamics and limited group capacities arise

#### 4. Learning outcomes

The following learning outcomes are examined in the course:

##### 4.1 Knowledge and understanding

On completion of the course, the student will be able to:

- Develop a knowledge of system technology by being able to independently describe in detail the finished system and its elements
- Define an understanding of a professional approach and working method that is based on commitment culture, regarding both the group and the whole as well as the individual in the group, e.g. we make clear agreements, we follow the agreements and we have an understanding between the client and the contractor
- Discuss practical experiences of some of the organizational and communication problems that can arise in group of program developers

#### 4.2 Competence and skills

On completion of the course, the student will be able to:

- Be able to account for the phases of a group project in systems engineering, how dependencies between the tasks affect each other as well as the properties of the system being built
- Be able to account for and exemplify how different technical and non-technical areas and aspects affect the development of a technical system
- Be able to prepare and give an oral presentation that describes the system developed using a project form

#### 4.3 Judgement and approach

On completion of the course, the student will be able to:

- Describe a professional approach to a way of working based on a commitment culture

### 5. Learning activities

The course structure will use a CDIO (Conceiving, Designing, Implementing, Operating) way of working. Lectures with workshops will create an experience that gets the student to conceive the next step in theory and practice for software development. These experiences and practices are then to be used when designing and implementing the idea to reach an operating status for what is been built. With this workshop and problem-based thinking the intention is to reach an understanding of a system possibilities and constrains. A group project will be established and through out the entire time group supervision will be used where critical reviewing of how work has been done in a regular project -based teaching with discussions. The course will use theoretical as well as practical tools to find out bottlenecks when constructing a software entity. The projects will be presented orally and in writing.

### 6. Assessment and grading

Modes of examinations of the course

Code	Module	Credits	Grade
2205	Project assignment	6.5 credits	GU
2215	Written report	1.5 credits	AF

The course will be graded A Excellent, B Very good, C Good, D Satisfactory, E Sufficient, FX Fail, supplementation required, F Fail.

The information before a course occasion states the assessment criteria and make explicit in which modes of examination that the learning outcomes are assessed.

An examiner can, after consulting the Disability Advisor at BTH, decide on a customized examination form for a student with a long-term disability to be provided with an examination equivalent to one given to a student who is not disabled.

### 7. Course evaluation

The course evaluation should be carried out in line with BTH:s course evaluation template and process.

### 8. Restrictions regarding degree

The course can form part of a degree but not together with another course the content of which completely or partly corresponds with the contents of this course.

### 9. Course literature and other materials of instruction

1. Software Engineering, 10th edition  
Author: Ian Sommerville  
Publisher: Pearson Education Limited  
Published: 2016, Number of pages: 810  
ISBN 10: 1-292-09613-6  
ISBN 13: 978-1-292-09613-1

2. A guide for Systems Engineering 4th edition  
Author: Davi D: Walden, Garry J, Roedler, Kevin J, Forsberg, R. Douglas Hamelin, Thomas M. Shortell (Eds): INCOSE System Engineering  
Publisher: Wiley  
Published: 2015, Antal sidor: 290  
ISBN 978-1-118-99940-0

3. Projects in Computing and Information Systems.  
A student's Guide, 3rd edition  
Author: Christian W. Dawson

Publisher: Pearson Education Limited  
Published: 2015, Number of pages: 303  
ISBN: 978-1-292-07346-0 (print)  
978-1-292-08112-0 (PDF)  
978-1-292-08111-3 (eText)

4. Scrum and Xp from the Trenches  
How we do Scrum, 2nd edition  
Author: Henrik Kniberg  
Publisher: C4Media, Publisher of InfoQ.com  
Published: 2015, Number of pages: 184  
ISBN: 978-1-392-22427-8

#### **10. Additional information**

This course replaces the course PA1464

Översättning/Translation