# Case Studies in Software Design

**Subtask Two:** Developing a Software Design

**Due Date:** Friday 27th November 2015

**Marks Available:** 40 (40% of the overall coursework assessment)

For this subtask you will be producing a software and interaction design for one of the two major case studies, working in teams of 3 (or in exceptional cases, teams of four). This year, the two case studies are:

1. A ticketing / billing system for an urban public transport network
2. A sensor-based agricultural field data collection, visualisation and automation system

Your designs will be implemented in Java by another group during the final subtask so remember that, just as you will be implementing a design from another group, another group will be implementing your designs. It is important to make the materials clear and concise.

Details about confirming your team composition and which case study you will be working on will be circulated separately on the blackboard site and during classes.

Both case studies have been selected as good examples where object-oriented design involves significant trade-offs. Your designs should reflect this methodology; we do expect object-oriented designs and implementations.

## About the designs

Using the case study materials provided, you need to create designs upon which an implementation will be based.

The designs should include both a design specification for user interactions, and a UML model of the software (class & sequence diagrams) that show how your concept can be implemented.

The interaction designs must include:

* A set of three personas that illustrate different types of user who might need to make use of your system;
* A set of three scenarios that illustrate different interactions that need to be supported by the system and that place these interactions in the broader context of users’ concerns
* A set of three alternative concept designs that show that you have considered a diverse range of possible responses
* A set of three detailed storyboards that specify key interface behaviours for your chosen design.

Building on the interaction designs you will need to develop a UML model to specify the underlying functional behaviour of the system. This will require you to identify the major classes of object needed to implement the system, allocate responsibilities to those classes, and map out important interactions between objects that will implement key functions of your system. To specify the functional design of your system, you will need to create:

* A class diagram that shows the major classes in your system, the type signatures of the primary methods for those classes, and the relationships between the classes
* A textual account (perhaps using CRC cards) of the way that the primary responsibilities in the system are distributed between classes
* A set of three sequence diagrams that specify the interactions between objects in your system to handle the more complex areas of functionality.

## Deliverables

The UML models may be submitted using a suitable modelling environment available on a standard university desktop (e.g. StarUML or Visual Paradigm) or as good quality image files (i.e. ones that you can easily read all details).

You must also upload all designs to the module BlackBoard site by the deadline.

UI designs may be presented in any appropriate form. Paper sketches should be scanned and converted to an appropriate image or document file.

Other documentation should be submitted in either Word or PDF format, combined in a single ZIP or 7z file.

## Marking

You will present your UML models and interaction designs during a walkthrough. All team members must attend the walkthrough. Individuals who do not attend their group walkthrough will be given a mark of zero for this subtask.

The walkthrough will last approximately 50 minutes. This will consist of 25 minutes for you to present your designs and 25 minutes for discussions and feedback - you should present your designs to us as if we were the clients. Timeslots for the walkthroughs will be made available via the module Blackboard site for your group to choose from.

## Team and individual marks

It is up to you how you divide the work. If there are issues with the level of contribution within the team, these need to be raised in advance of the submission deadline with the module delivery team. By default, marks will be awarded equally for all students in the group, however lack of contribution by individual members (assessed via a peer review exercise) may result in some group members being awarded proportionately lower marks.

All the design materials created for this subtask must be uploaded as a single ZIP (or 7z) file to the module Blackboard site via the subtask two assignment upload link. This deadline is shortly before the walkthroughs but must contain all the materials that you wish to present.

The deadline for electronic submission is **Friday 27th November 2015**