Engineering Tripos Part IIB, 4M21: Software Engineering and Design, 2017-18

Module Leader
Dr E Punskaya

Lecturer
Dr E Punskaya

Timing and Structure
Lent term. 16 lectures (including integrated examples classes). Assessment: 100% exam.

Prerequisites
You must not take this module if you have already taken 3F6.

Objectives
As specific objectives, by the end of the course students should be able to:

• Understand the benefits of object-oriented analysis and design, its concepts and processes.
• Be familiar with formal design tools for object orientated design and analysis.
• Recognise and understand some frequently used design patterns.
• Be aware of the process involved in user interface design.
• Understand software development methodologies.
• Understand the main issues and processes necessary to achieve effective software product development.

Content
Software forms an important part of many modern engineering products, from telecommunications to automotive to internet-based systems. This course will provide an understanding of the technical and management processes involved in the design of software systems. Software engineering concepts are considered at a range of scales, from the manipulation of object-orientated concepts, through architectural design components, to the building of large complex software systems.

Software Design (10L)

• Concepts Behind Software Design: managing complexity of the software systems and minimizing risks.
• Object-Oriented Software Design Principles: abstraction, problem partitioning, how to identify components.
• Object-Orientated, Design and Analysis: classes and objects, encapsulation and data hiding, abstraction and inheritance, polymorphism.
• Formal Tools: introduction to UML.
• Design Patterns: frequently occurring design techniques and their role in building systems.
• Principles of Good Design and User Interface Design: designing experiences, designing for the user, use cases, process and main elements, usability.

Software Systems and Engineering (6L)
- Quality Assurance and Risk Management: testing, automated testing, tools.
- Software Development Methodologies: from waterfall to agile programming.
- Software Management: project lifecycle, source code control, code reviews, testing, the nightly build, release management, maintenance and refactoring, organising software teams.
- Software Innovation and Entrepreneurship.

Booklists

Please see the Booklist for Group M [2] Courses for references for this module.

Examination Guidelines

Please refer to Form & conduct of the examinations [3].

Last modified: 31/05/2017 09:49

Source URL (modified on 31-05-17): http://teaching.eng.cam.ac.uk/content/engineering-tripos-part-iib-4m21-software-engineering-and-design-2017-18

Links

[1] mailto:op205@cam.ac.uk