Engineering Tripos Part IIB, 4M21: Software Engineering and Design, 2018-19

Module Leader

Dr E Punskaya [1]

Lecturer

Dr E Punskaya

Timing and Structure

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

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: 17/05/2018 15:02

Source URL (modified on 17-05-18): https://teaching.eng.cam.ac.uk/content/engineering-tripos-part-iib-4m21-software-engineering-and-design-2018-19

Links
[1] mailto:op205@cam.ac.uk
[2] https://www.vle.cam.ac.uk/mod/book/view.php?id=364101&chapterid=56281
[3] https://teaching.eng.cam.ac.uk/content/form-conduct-examinations