CS5030
Software Engineering Principles

Introduction

Lecturer

- Dharini Balasubramaniam
  - Senior Lecturer in the School of Computer Science
- Research Interests
  - Software architecture, uncertainty in software, software ethics, programming and domain-specific languages
- Contact
  - cs5030.lec@cs.st-andrews.ac.uk
  - Online classes and in-person Q&A sessions
  - Email for appointments outside these times

Key policy information

- You are assumed to be familiar with the whole student handbook
- Read the Good Academic Practice policy
- Check that coursework submitted to MMS has been received successfully, and that it's the right piece of coursework
- Coursework submitted after deadline is subject to automatic penalty
- Any special circumstances must be documented immediately through the self-certification system, and followed up with the DoPGT if you are seeking any allowance
- You must be available for the entire exam period
- Familiarise yourself with the School and University health & safety guidance
- Key points from student handbook

Motivation

- Software everywhere
- Our society is now heavily reliant on software
  - Enormous benefits from it
- But there are also frequent reports of
  - Software bugs with serious consequences
  - Poor and costly software project management
  - Ethical violations
  - Concerns relating to sustainability

Questions

- Why is software development challenging?
- What can help us overcome these challenges?
- What are some of the ethical concerns in software development?

Aim

- To examine some key concepts in small and large scale software development

Learning outcomes

On successful completion of this module, the student should be able to:

- list the key concerns that are common to all software development processes
- select appropriate process models, approaches and techniques to manage a given software development process
- elicit requirements for a software product and translate these into a documented design
- identify dependability and security issues that affect a given software product
- describe the role that testing and reuse play in the implementation phase and how these activities relate to the wider software process

Syllabus

- Introduction to software engineering
- Software engineering lifecycle and processes
- Requirements engineering
- Software architecture and design
- Software quality
- Software testing
- Software evolution and reuse

- Cross-cutting concerns of ethics and sustainability

Changes from last year

- Live lectures
- Revised reading list
- Minor changes to syllabus content
  - Based on module review + student feedback

Acknowledgements

- Module content based on
  - Textbooks on the topic
  - Material from reading list
  - Content from previous years

Access to module material

- Overall entry point: MMS or MySaint
- Recordings: Panopto
- All other resources (lecture slides, coursework specifications, reading list, etc): studres
- Interaction: Teams
- Coursework submission and feedback: MMS

- All (may) require University login

Class schedule

- Live lectures on Teams
  - 12.00 UK time on Wednesdays and Thursdays
- Live discussion sessions on Teams
  - 12.00 UK time on Tuesdays (lecture in week 1)
  - Discussion of content from week n in week n+1
- Optional in-person Q&A sessions
  - 16.00 UK time on Fridays (except week 1) in JC 1.33 a and b
- Classes will start at 5 minutes past the hour and finish at 10 minutes to the hour

Questions and feedback

- Questions
  - Please post to appropriate channel on Teams or ask during classes
  - Email me if it’s specific to your work
  - I will set up a module FAQ if that might be useful

- Feedback
  - Email me whenever you wish

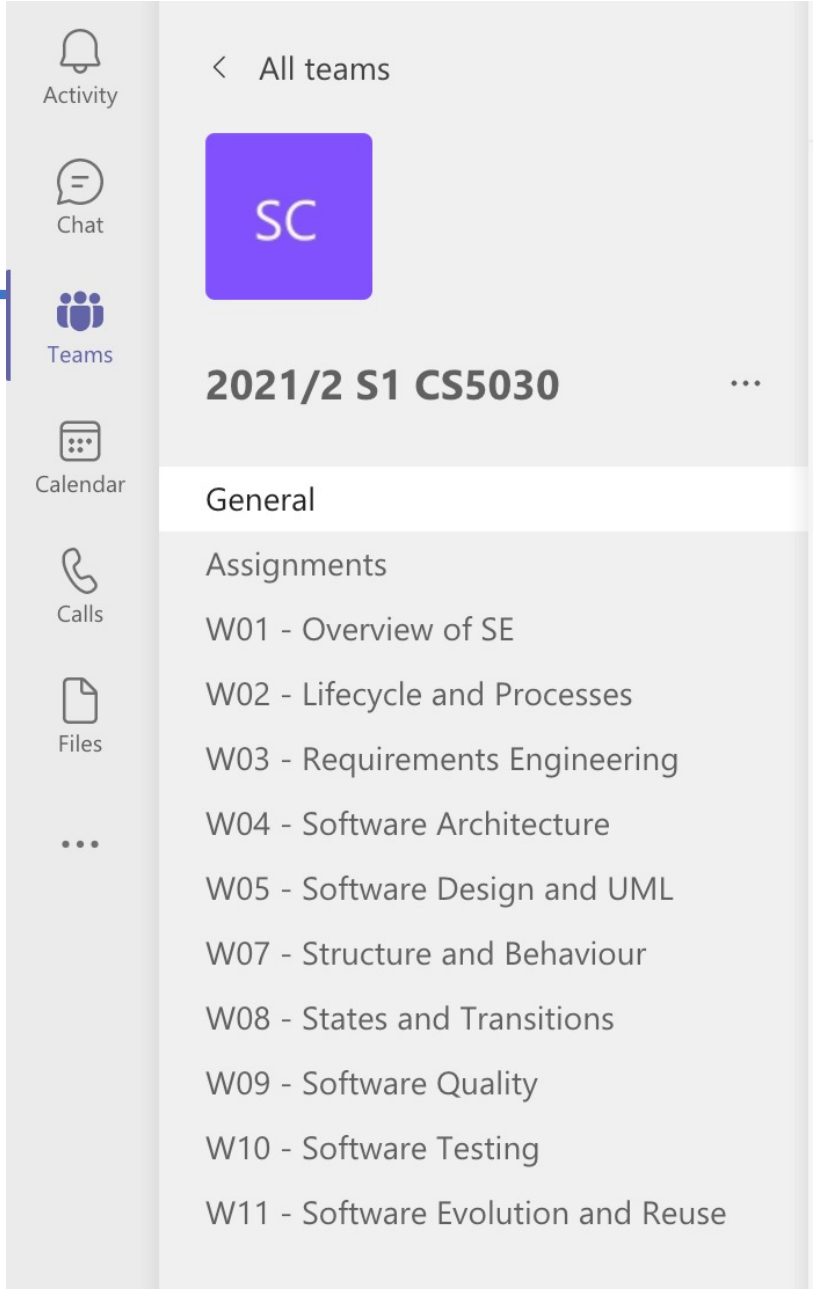
Assessment

- Continuous assessment (60%) – due dates on MMS
  - Formative group work
  - Group report (25%)
  - Modelling and analysis (35%)

- End of semester assessment (40%)
  - 8-hour take-home exam

CS5030 – Teams

- Via browser or desktop app
- For core teaching and interaction
- Post questions and comments on appropriate channel

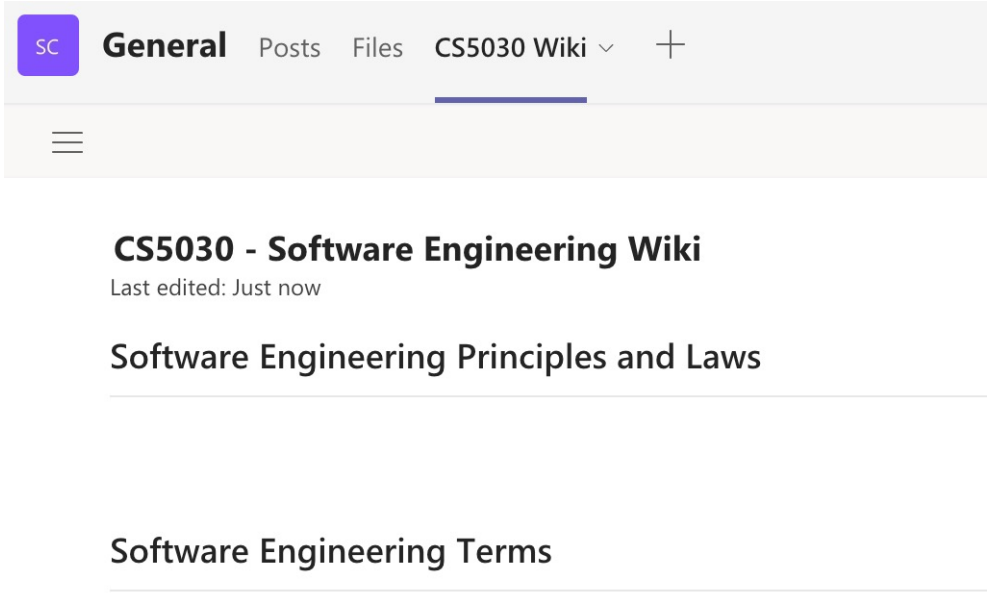


CS5030 Teams – protocol

- I will start each scheduled session
  - Please wait until I do so and then join the meeting with your mic muted
- Students can join with camera on or off
- To ask or answer a question, or make a comment,
  - either use the 'raise hand' facility in Teams,
  - or post in the meeting chat
  - I will moderate participation because this is a large class
  - Unmute your mic when it's your turn

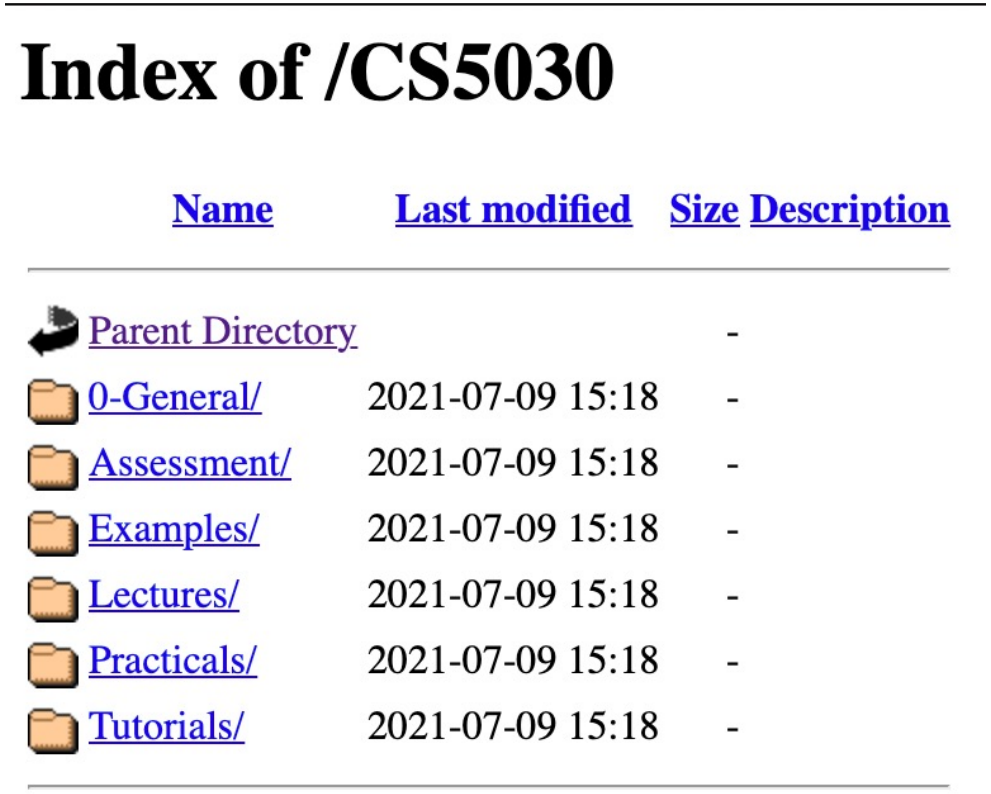
CS5030 wiki

- Wiki of software engineering laws, principles, terms …
- To be developed by all of us



studres

- Student resources
  - read-only



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Device & software requirements

- School labs are open at the moment
  - 24/7 access subject to health & safety guidance
- Own devices
  - School guidance on spec
- Software
  - Report writing
  - UML modelling (for eg, diagrams.net, PlantUML, …)
  - Sharing work in groups (for eg, OneDrive, Overleaf, …)
  - Reference management (for eg, Zotero, Mendeley, …)

Textbooks

- Software Engineering (Global Edition)
  - Ian Sommerville, 2016
- Learning UML 2.0
  - Russ Miles & Kim Hamilton, 2006
- Clean Coder
  - Robert Martin, 2011
- Various papers / articles as indicated in reading list
  - General proxy login for access to digital libraries

Some SE research groups and centres

- Software Engineering Institute, CMU
- The Irish Software Research Centre
- Software Engineering Research Group, TUDelft
- Imperial College London
- Microsoft Research
- SE and Design Group, Open University
- Google Research
- IBM Research

Ethics research groups

- De Montford University – computing & social responsibility
- University of Toronto – sustainability informatics
- Alan Turing Institute – data ethics
- University of Oxford – information ethics
- University of Colorado Boulder – internet rules lab