CS4004 Software Testing and Inspection

Timetable	**Lectures (Norah Power)** Monday 13.00 SG18 and Tuesday 12.00 SG18
Starting Week 1	**Tutorials (Annette McElligott)** Thursday 12.00 KB1-19 and Monday 12.00 SG18 **Note:** Tutorials begin on Thurs each week
Starting Week 1	**Labs (Anila Mjeda)** Wednesday 11.00 in CS144 and Friday 12.00 in CS144
	Attendance at Labs and Tutorials is compulsory. 3% penalty per session missed.
Assessment	Assignment 1 Bug reporting assignment start Week 1, due Week 4
All assignments are worth 10% each	Assignment 2 White box testing start Week 4, due Week 7
	Assignment 3 Black box testing start Week 7, due Week 10
	Assignment 4 Technical report start Week 10, due Week 12
	Final exam 60%
Exam over-ride	Exam questions related to 4 assignments – you must achieve 40% in these questions or lose all your Project marks for the relevant question.

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Notes

Learning outcomes:

On successful completion of this module, students will be able to take a program specification and write appropriate test cases for it; given a specification and an implementation of a program, write the appropriate tests, run them, and report systematically on the errors found.

Overview of CS4004:

- Overview and **terminology**
- Quality/Risks/Specifications
- Testing paradigms; exploratory testing
- Bug tracking; Bug reporting process
- Bug Logging in Bugzilla
- Bug report writing
- The life cycle of a bug
- Need for and role of Specifications
- Inspections and Reviews
- Control flowgraphs (CFGs)
- Path testing/Coverage
- Debugging
- Bug categorization
- Test case design
- Equivalence partitioning
- Boundary value analysis
- Types of testing/Inspection
- Levels of testing
- Test planning
- Code inspection/specification inspection
- The organisation of the work/Testing strategies
- Testing tools
- Test case Automation

Terminology:

A term is not the same as a word ….

Notes

A **term** is a word that has a single well-established meaning within a given context.

(But it might have more than one definition!)

Software testing terms

Testing

1. **Software testing** is the process of executing a program or a piece of software with the intention of finding errors. (Myers)

2. **Software testing** is the process of preparing and running test cases in order to verify the correctness of a program with respect to defined user needs.

3. **Software testing** is the overall process of planning, preparing and carrying out a suite of different types of tests designed to validate a system or program under development, in order to achieve an acceptable level of quality and to avoid unacceptable risks.

Notes

An Error is a mistake made by a human (programmer, designer, analyst, tester, user…) in their work. "To err is human."

Errors, etc.

A Bug is a fault found in a program, usually the result of an error by a programmer, designer or analyst. Loosely speaking, bugs don't occur only in programs...

A Defect is more generic than a bug; generally any result of an error found in any software artifact such as a specification or a program.

What do we mean by an artifact?

A Failure is a symptom of a bug, evidence of its existence; what happens when you run the program that has the bug. The behaviour of the program under test departs from **the expected outcome.**

Various types of **meetings** are used in order to try to find defects in documents including specifications and source code. Often called **human testing** these include:

- ✓ Walkthroughs,
- ✓ Inspections and
- ✓ Technical Reviews.

Inspection

An Inspection is a well-defined process for identifying defects in documents or other software artifacts by means of human testing. Originally described in 1976 by Michael Fagan, software inspection is widely practised and intensively researched.

Notes

Debugging

What you do when you find a defect while testing (your own program).

Debugging is a two step process:-

a. Determine the exact nature and location of the bug
b. Fix the code to remove the bug/error

The difference between testing and debugging?

Who?

When?

Why?

How?