

## COS333: STUDY-GUIDE FOR THE ACADEMIC YEAR 2013

What do various "paradigms" of programming languages have in common, and in what aspects do they differ? This is the main question which we want to address in this course. The best way to tackle this question is to look at the *formal semantics* of those programming languages. COS333 is thus very much a course in *theoretical computer science*. The four "paradigms" which we want to study are the *imperative*, the *functional*, the *logical*, and the *object-oriented* paradigm. Consequently this course will also be organised in four main sections – see below. *For each paradigm 7 Lectures are planned; (28 Lect. in total).*

### "Mental Equipment" needed for COS333

It is presumed that all students who attend this course already have:

- *good* knowledge in *discrete mathematics*, including set theory and algebra of functions.
- *basic* knowledge in compiler construction, (for example from course COS341).

If you do not already bring this "Mental Equipment" along, then it is expected that you will teach yourself some discrete mathematics and compiler construction at home during your own time. This self-education on background knowledge is necessary – otherwise you would struggle in COS333. It is expected that every student spends about *3 hours per week on background studies, in addition* to the hours that you need to spend on COS333 as such. Please prepare yourself mentally for a challenging course.

### COURSE LITERATURE

- *Functional Programming*: a lecture-script will be provided to you for "mahala". ☺
- *Logic Programming*: a lecture-script will be provided to you for "mahala", too. ☺
- *Imperative Programming*: "*The Formal Semantics of Programming Languages*", by Glynn Winskel.
- *Object-Oriented Programming*: "*Foundations of Object-Oriented Languages*", by Kim B. Bruce.

It is *not* necessary that each student buys both books! Instead, it is strongly *recommended that always two students together make up a study-team*, such that *each team possesses a copy of each book*, to study them together as a team. (Unfortunately there does *not exist* one single textbook which contains *all* the theory).

### ASSESSMENT

COS333 follows a *continuous* assessment scheme without any artificial split between "semester" and "exam". *For each* of the four "paradigms" there will be two tutorials and one test, according to the table below. *All* assessments follow a strict "*closed-book*" policy: you must know your "stuff" in your mind. *To pass the course, at least 50 Marks* must be accumulated. There is *no re-exam* for students who have failed. *Sick-Notes from Clinic* can only be accepted for Tests, but not for Tutorials: Missed Tutorials are marked 0!

	<b>Tutorial I</b>	<b>Tutorial II</b>	<b>TEST</b>	<b>Sum</b>
<b>A: Functional Programming</b>	<b>3</b>	<b>3</b>	<b>19</b>	25
<b>B: Logic Programming</b>	<b>3</b>	<b>3</b>	<b>19</b>	25
<b>C: Imperative Programming</b>	<b>3</b>	<b>3</b>	<b>19</b>	25
<b>D: Object-oriented Programming</b>	<b>3</b>	<b>3</b>	<b>19</b>	25
<b>TOTAL</b>	12	12	76	<b>100</b>

### PREPARATION TIME!

To be a student successful in COS333, you will need to invest *at least* the following amount of preparation time for *each* assessment – (please take this advice very serious, and write your times into your diary):

- at least *4 hours* for *each Tutorial*,
- at least *25 hours* for *each Test*.

These hours do *not* include the additional hours needed for the above-mentioned background studies.

### Further Details, including: Lecturer, Teaching Assistants, Consultation Hours, etc.

- See online at <http://www.cs.up.ac.za/courses/COS333>

All online announcements are officially part of the study guide and instructions.

*Plagiarism is strictly forbidden*, and has disciplinary consequences when found.