

31Y4 Programming Language Paradigms

Lecturers

Dr R Clark (rgc@cs.stir.ac.uk)

Dr C Shankland (ces@cs.stir.ac.uk)

Prerequisites

3133 / 3193

Learning Outcomes

The student should know and understand:

- The principal programming language concepts and the way they are dealt with in the imperative, object-oriented, functional and logic language paradigms
- The underlying principles behind language design and see that superficially very different languages are often, in fact, very similar
- How modules and classes can be used to structure large programs and how they provide abstraction, information hiding and encapsulation
- The central role of data structures in language design
- The use, implementation and complexity of data structures and an appreciation of where each is appropriate
- How to employ simple formal grammars for sentence generation and parsing.

Transferable Skills

- Ability to plan work, to understand how tasks can be specified, to undertake independent creative activity and to bring it to a successful conclusion.
- Ability to organise and present technical material in written form.

Contents

- The imperative (procedural and object-oriented) language paradigm including: types, variables, declarations, expressions, statements, procedures, methods, parameter passing, modules and classes.
- Inheritance and dynamic binding in the object-oriented language paradigm.
- Storage allocation: run-time stack, heap storage and garbage collection.
- Data abstraction and libraries, iterators, the hiding of implementation detail in collections.
- Definition of syntax and semantics.
- The functional and logic language paradigms.
- Scripting languages and the impact of the Internet on language design.

Assessment

Programming Assignment (Data Structures) - 25% ;
Investigation/report (Comparative Languages) - 25% ;
Examination - 50%

Textbooks

Comparative Programming Languages, L B Wilson and R G Clark (3rd edition, updated by R G Clark), Addison Wesley, 2001.

Computing Science Schedule

31Y4

2004

Requirements

In order to obtain a pass grade for the unit you must

- Submit all items of assessed coursework
- Attend the examination.

If you fail to submit any item of assessed coursework you will be awarded no grade for the unit as a whole. This rule may be relaxed for students who can show good cause for failure to submit. 'Good cause' may include illness (for which a medical certificate or other evidence will be required).

If you are unable to attend the exam, you must apply to the Faculty of Management for a deferred exam. The Faculty has established procedures for this: further information is available from the Faculty Office.

In addition, Regulation 14 of the University's First Degree Regulations sets out attendance rules for classes that have been defined by the Department as prescribed. In this unit, the prescribed classes are the tutorials and practicals.

Assignment Details

<i>Assignment</i>	<i>Topic</i>	<i>Due Date</i>
Assignment 1	Data Structures	30 th March 2004
Assignment 2	Comparative Languages	20 th April 2004

31Y4 Schedule

Lectures : The first lecture will be on Friday 13th Feb in B4 at 1000.

Day	Time	Room
Monday	1600	A5
Wednesday	1100	A4
Friday	1000	B4

Tutorials

One tutorial per week.

Tutorials will commence in the week beginning **Monday 16th February**.

Practicals

One practical per week on Thursdays at 9.00.

The first practical is on **Thursday 26th February**.