CS2300 Java Program Construction

Level: 2 Credits: 10 Teaching Period: 1 Module Tutor: Dr M Chli

Aims

This module will build on the foundations laid in CS1020 Java Programming Foundations. It will introduce inheritance and related software structuring concepts that provide the object-oriented approach to software development with much of its power. Students' programming capability will be enhanced through substantial practical work and increased knowledge of software development techniques, including use of graphical user interfaces (GUIs).

Content

Improving object-oriented program structures through inheritance: subtyping, inclusion polymorphism, heterogeneous collections
Method overriding and dynamic method dispatch
Abstract methods and classes, interfaces
Visibility and scope: inner classes and packages
GUI programming: Swing components, layout, event handling, event listeners, use of inner classes
Exceptions, exception handling, use with I/O

Extensive case studies illustrating application of programming language concepts to systematic software construction.

Transition from an introductory to a standard devleopment environment.

Teaching

Lectures: 22 hours (2 hours/week)
Practical classes: 11 hours (1 hour per week)

Assessment

Written exam: 75% (1.5 hours, in January)
Practical assignment: 25%

Module outcomes *What the student should gain from successful completion of the module*	*Teaching/Learning Methods*	*Assessment Methods*
Knowledge and Understanding		
Object-oriented software structuring concepts and corresponding Java language support Principles of GUI construction and event-based execution	Lectures and recommended reading	Exam
Intellectual Skills		
Analyse requirements and design suitable software structures using object-oriented techniques	Lectures, practical classes and coursework	Exam and coursework
Professional/Subject-Specific Skills		
Use a range of standard Java class libraries, including selected libraries relating to GUIs, containers and I/O Apply the concepts of event-driven programming in the construction of simple GUI applications Undertake systematic testing and debugging using appropriate tools	Lectures, practical classes and coursework	Exam and coursework
Transferable Skills		
Enhanced capabilities in problem solving, modelling and abstraction	Practical classes and coursework	Coursework

Learning resources

Barnes & Kolling: Objects First with Java – A Practical Introduction Using BlueJ (3rd ed), Pearson Education, 2006

Other study requirements to take this module

CS1020 Java Programming Foundations
CS2190 Software Lifecycle (desirable but not essential co-requisite)