
CO2001 User Interfaces and HCI

Credits: 10 **Convenor:** Dr R. Zare & Dr E.Tadjouddine **Semester:** 1st

Prerequisites: *Essential: CO1003, CO1005, CO1012*

Lectures: 15 hours

Surgeries: 8 hours

Laboratories: 18 hours

Class Test Hours: 2 hours

Independent Study: 32 hours

Assessment: *Coursework: 100%*

Subject Knowledge

Aims To introduce students to the subject of Human Computer Interaction through the medium of object-oriented programming using relevant programming concepts.

Learning Outcomes Students should be able to demonstrate an understanding of advanced object-oriented techniques such as Graphical User Interface (GUI) concepts, the event-driven model of programming, and threading. They should be able to construct GUI based applications and applets in Java. Students should be able to demonstrate a knowledge of and be able to apply basic HCI concepts.

Methods Class sessions together with course notes, recommended textbook, worksheets, and some additional hand-outs and web support.

Assessment Three pieces of marked coursework consisting of two class tests and an individual mini-project and a marked engagement throughout.

Skills

Aims Students should be able to produce written work in a number of different formats; analyse problems, formulate strategies to solve them, design a plan, carry out the required research, implement and evaluate the solution; recognise the need for information, and then locate and access that information.

Learning Outcomes On successful completion of the module students should be able to:

- analyse user interface requirements, understand the development and implementation of suitable solution strategies for user friendly graphical interfaces.
- develop graphical user interfaces in Java to satisfy problems of moderate complexity using threads, applications and Files.

Methods Class sessions, worksheets with feedback from markers, Linux, Java 1.8, JavaFX, JRE plugin for web browser, JDE.

Assessment Three pieces of marked coursework consisting of two class tests and an individual mini-project and an assessed Effort throughout.

Explanation of Prerequisites The purpose of the module is to enable students to design and implement interactive graphical user interfaces using advanced object oriented techniques and data structures in Java. The module therefore assumes that CO1003 - Program design, CO1005 - Data structures and Development environment and CO1012 - Discrete Structures have been taken.

Module Description Graphical user interfaces are a vast class of software systems that are designed for interacting with the users. Programs with GUIs are *event* driven, i.e., the program reacts to actions of the users which are called events. GUI based applications are also often “multithreaded”. Multithreaded execution is an essential feature of the Java platform and enables concurrency.

The objectives of the module are to lead the students on to advanced event driven programming techniques for building multithreaded graphical user interfaces (GUIs) and adding rich graphics functionality and interactivity to Java applications.

Syllabus Graphical User Interfaces and their implementation in Java. Event-driven programming in Java. HCI: introduction to applets. Extended exception handling. Introduction to threading. File input/output.

Reading List

- [A] C. Thomas Wu, *An Introduction to Object-Oriented Programming with Java, 5th (international) edition*; ISBN: 978-0071283687, McGraw-Hill.
- [B] Johan Vos. Weiqi Gao, Stephen Chin, Dean Iverson, and James Weaver, *Pro JavaFX: A Definitive Guide to Building Desktop, Mobile, and Embedded Java Clients*, Apress.
- [C] Paul Fische, *An Introduction to Graphical User Interfaces with Java Swing*, Addison Wesley.
- [C] Kathy Walrath, Mary Campione, Alison Huml, Sharon Zakhour, *The JFC Swing Tutorial: A Guide to Constructing GUIs (2nd Edition) (Java Series) (Paperback)*, Prentice Hall PTR.
Also available online at:
<http://java.sun.com/docs/books/tutorial/uiswing/index.html>
- [C] Mauro Marinilli, *Professional Java User Interfaces*, Wiley.
- [C] Scott Oaks, Henry Wong, *Java Threads (Paperback)*, Oreilly.
- [C] Kathy Walrath, Mary Campione, Alison Huml, *The Java Tutorial: A Short Course on the Basics (Java Series) (Paperback)*, Prentice Hall PTR.
- [C] Isaac Rabinovitch, Sharon Zakhour, Scott Hommel, Jacob Royal and Thomas Risser, *The Java Tutorial, Fourth Edition*, Prentice Hall, Fourth edition, 672 pages.
- [C] Chet Hasse, Romain Guy, *Filthy Rich Clients*, Addison Wesley.

Resources Online resources, course notes, departmental web page, study guide, worksheets, handouts, lecture rooms with projection facilities and OHPs.

Module Evaluation Course questionnaires, course review.