



Faculty of Computer Studies

M206 B: Computing: An Object Oriented Approach (Part B)

Course Guide

M206B: Computing: An Object Oriented Approach (Part B)

Credit Points/ Credit Hours 15/4

Pre-Requisites:

M206A

Short Description:

This course covers software development and system modeling of object-oriented computing and modern network computing. Its practical approach teaches new ideas and skills, such as analytical techniques that equip students to identify or design software components needed for computer-based solutions to real problems.

Aims:

The aims of this course are:

- To introduce students to software development and system modeling including UML notation.
- To enable students to grasp the details of software development.
- To introduce students to Network Computing.

Learning Outcomes:

The Learning Outcomes of this course are given below.

A. Knowledge / Understanding of:

- A1. Various ideas and concepts of computing and software.
- A2. Skillful use of complex practical software.
- A3. Recognizing complex systems and be able to speculate about their parts and to design and complete or extend them.
- A4. Applying object-oriented analysis and design ideas.
- A5. Developing small Smalltalk applications including their graphical user interface (GUI).
- A6. Understanding issues concerning large scale software development including those due to group working.
- A7. Describing concepts of human-computer interaction and be able to analyze, design and implement user interfaces.

B. Cognitive Skills:

- B1. Analyzing, designing, implementing and testing a system or change request according to sets of requirements.

- B2. Planning and allocating the resources required for a software project.
- B3. Critically evaluating the quality of software technology.
- B4. Applying the concept of design by contract to the analysis, design, implementation and testing of a software system.

C. Key Skills:

- C1. Finding information from a range of sources to support a task.
- C2. Planning complex tasks.
- C3. Using advanced varieties of associations, collaborations and orchestration.
- C4. Using appropriate numerical, mathematical and abstraction skills.
- C5. Enabling students to progress to more advanced level studies.
- C6. Communicating knowledge and understanding of the course via assessment process, and communicating with peers via conferences informally.

D. Practical and / or Professional Skills:

- D1. Using advanced software tools within Smalltalk environment.
- D2. Using appropriate programming skills.
- D3. Developing user interfaces appropriate for particular platforms.
- D4. Analyzing the professional issues involved in the development and modeling of software.
- D5. Documenting the software systems using notations appropriate to different stages of the software development.
- D6. Practicing exercises of different software technology issues.

Course Structure:

The M206B course consists of a total of 3 blocks of study. Each block covers one of the key themes in the course.

Table of Contents:

Block V: Software Development: Modeling a System

- An overview of software development and UML notation
- Requirements analysis: The negotiated statement of requirements
- The initial structural model: Class diagram, class descriptions, invariants, derived associations
- Component based software development: encapsulation, coherence, coupling, reuse
- Dynamic models: Use cases, walk-throughs, sequence diagrams

Block VI: Software Development: Detailed Design and Implementation

- Building interactive applications: an introduction to Open GUI and associated widgets
- Masters and disciples.

- HCI: direct manipulation, usability, metaphors, evaluation, visualisation
- User interface development: design principles, scenarios, storyboards, style guides
- Design: Class specifications
- Implementation: Implementing use cases, error handling, encapsulation, attaching a GUI

Block VII: Computing and Networks

- Operating systems, computer architecture and databases (simple queries)
- Persistent objects, streams and files
- The Internet, Security and Network computing

Assessment:

- Tutor-marked assignments: 2 TMAs
- Quiz/Mid-term Assessment: 1 MTA
- Final Exam: 1 Final Exam

Grade Distributions:

- Tutor-marked assignments: 35%
- Quiz/MTA: 15%
- Final Exam: 50%

Course Calendar (Indicative Version):

There are 2 Tutor Marked Assignments, 1 Midterm Assessment and 1 Final Exam associated with this course. Course result is determined on the basis of student's scores in TMAs, Midterm Assessment and the Final Exam. To be sure of passing the course the student needs to score at least 40% (at least 20% in TMA and Quiz/MTA and at least 20% in the final exam) in the above 3 components and achieve an overall average score of 50%.

| Week | Course Text | Downloaded Information | Assignments / Assessments |
|-------------|--------------------|-------------------------------|----------------------------------|
| 1 | Chapter 31 | | |
| 2 | Chapter 32,33 | | |
| 3 | Chapter 34,35,36 | Chapter 36.See WEBSITE | |
| 4 | Chapter 37,38 | Chapter 38.See WEBSITE | |
| 5 | Chapter 39 | | TMA 01 due date |
| 6 | Chapter 40 | | |
| 7 | Chapter 41,42,43 | | |
| 8 | Chapter 44,45 | Chapter 44.See WEBSITE | Quiz/MTA |
| 9 | Chapter 46 | | |
| 10 | Chapter 47 | Chapter 47.See WEBSITE | |
| 11 | Chapter 48,49 | | |
| 12 | Chapter 50,51 | Chapter 51.See WEBSITE | |
| 13 | Chapter 52 | Chapter 52.See WEBSITE | TMA 02 due date |
| 14 | Chapter 53 | Chapter 53.See WEBSITE | |
| 15 | Revision | | |
| 16 | Final Exam Period | | |