



## **Faculty of Computer Studies**

**M150A: Data, computing and information (Part A)**

### **Course Guide**

## **M150A: Data, computing and information (Part A)**

**Credit Points/Credit Hours** 15/4

### **Pre-requisites:**

EL111

### **Short Description:**

The M150A course is an introduction to the computer-based information processing that has brought a revolution in our daily lives. Computers are tools that allow us to greatly increase our understanding of the world and change it: for better or for worse. For this reason, it is vital that we understand them. This course includes 8 units of study about data and information, data representation, analogue and digital domains, integration of data, storage and transmission of data and the structure of hardware and software systems.

### **Aims:**

The course aims to:

- introduce a number of concepts concerning data and information;
- help students to recognize, analyze, and differentiate the diverse ways in which data can be acquired, transformed and presented;
- examine some of the social, political and legal dimensions of data and information;
- challenge students with the dilemma of privacy versus openness;
- relate data, information and computing systems to wider personal, cultural, social, scientific, technological and organizational contexts;
- provide a foundation for future study;
- foster a sense that computers can be used creatively as well as mechanically;
- develop a sense of the joy of enquiry.

### **Learning Outcomes:**

The Learning Outcomes of this course are given below.

#### **A. Knowledge and understanding:**

After studying the course, the student will be able to:

- A1. Explain the nature of data, methods of capture and how such data can be converted into different representations;
- A2. Identify the operations and data in a simple (not necessarily computing) system

and demonstrate how agreed standards are essential;  
A3. Describe the basic composition of a simple computing system;

**B. Cognitive skills:**

After studying the course, the student will be able to:

- B1. Analyze a small computer program in terms of its inputs, programming structures and outputs;
- B2. Analyze a simple problem in terms of the necessary operations that are required to develop a program;.

**C. Key skills:**

After studying the course, the student will be able to:

- C1. Demonstrate study skills at a level appropriate to higher education, such as timetabling study; read critically for meaning and take effective notes; and use study aids such as dictionaries and glossaries;
- C2. Read and understand a simple computer program;
- C3. Communicate appropriately with your tutor and other students using email and online conferences;
- C4. Locate information on a given subject from the World Wide Web.

**D. Practical and/or professional skills:**

After studying the course, the student will be able to:

- D1. Design simple computer program structures.
- D2. Demonstrate basic skills to be able to progress to more advanced level studies at the AOU or any other university.

## **Course Structure:**

The course includes 8 units from blocks 1 and 2.

### Block 1 Learning about data

This block describes what data is and examines techniques of data acquisition and some general aspects of data storage.

Unit 1 Data and information: an introduction

Unit 2 Representation

Unit 3 Crossing the boundary: analogue universe, digital worlds

Unit 4 Integrating data

Unit 5 Storing, getting and sending your data

### Block 2 The computer: processing data

Block 2 is an introduction to computer programming. In the introductory course M150A, only one unit is studied as an introduction to computer hardware and software.

Unit 6 The structure of hardware and software

Unit 7 An introduction to programming using JavaScript

Unit 8 Programs and data

## **Table of Contents:**

### **Unit 1: Data and information: an introduction**

1 Introduction

2 Daily life and computers

3 Sensing, data and turning it into something usable

4 Computers as tools for finding

5 Computers as tools for working with data

6 Controlling things; selling things

7 Unit summary

### **Unit 2: Representation**

3 Properties of representations

4 Picking representations

5 Sharing and formats

6 Case study (including computer-based activities)

7 Unit summary

### **Unit 3: Crossing the boundary – analogue universe, digital worlds**

- 1 Introduction
- 2 The worlds we live in
- 3 Analogue information: digital representation
- 4 Crossing the boundary
- 5 Going back
- 6 What if? ... changing the digital world
- 7 Crossing the boundary – a final word
- 8 Unit summary

#### **Unit 4: Integrating data**

- 1 Introduction
- 2 Basic concepts about data and representations
- 3 Signaling what's important
- 4 Text to hypertext
- 5 Combining representations – hypermedia
- 6 Beyond basic mark-up: introducing XML
- 7 Unit summary

#### **Unit 5: Storing, getting and sending your data**

- 1 Introduction
- 2 Storing and accessing data in documents
- 3 Transmitting data
- 4 Accessing data
- 5 Ethical, legal and security issues
- 6 Unit summary

#### **Unit 6: The structure of hardware and software**

- 1 Introduction
- 2 Hardware, software and computer systems
- 3 The resources of a computer, and how they are managed
- 4 Running a program
- 5 Types of programming language
- 6 The structure of computer programs
- 7 Unit summary

#### **Unit 7: An introduction to programming using JavaScript**

- 1 Introduction
- 2 Getting started
- 3 Programming for selection: the if statement

- 4 Programming for repetition: the while statement
- 5 Programming for repetition: the for statement
- 6 Unit summary.

### **Unit 8: Programs and data**

- 1 Introduction
- 2 Structure data
- 3 Functions.
- 4 Events and event handlers
- 5 Strings
- 6 Unit summary.

### **Assessment:**

The assessment for the M150A course consists of the following 3 components:

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

### **Grade Distribution:**

The percentage grade distribution for the above 3 components is as follows:

- 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%.

Study week	Course text	Other components /notes	Practical activities	Assignments / Assessments
0	Course Guide Course Companion	ETMA Guide for Students	Access Web site – download TMA01 Check access to conferences Test eTMA system	
<b>Block 1: DATA</b>				
1	1. Data and information		Conference activity	
3	2. Representation		Conference activity	
5	3. Crossing the boundary		Conference activity	
7	4. Integrating data		Conference activity	TMA01 due date Quiz/MTA
9	5. Storing, getting and sending your data		Conference activity	
<b>Block 2: COMPUTING</b>				
10	6. The structure of hardware and software			
12	7. An introduction to programming using JavaScript			
14	8 Programs and Data			TMA02 due date
16	Examination			