UNIVERSITY OF LONDON | INTERNATIONAL PROGRAMMES

Course information 2018–19
IS1168 Introduction to computer systems architecture and programming

This unit presents an up-to-date introduction to computer science and programming. It introduces the foundations of computer architecture together with data representation, manipulation and storage. The use of algorithms for problem solving is introduced. The unit further introduces the concepts of operating systems and computer networks. Against these concepts fundamental programming methods, constructs and concerns will be introduced using the Java programming language.

Exclusions

The course may not be taken with *IS1181 Digital infrastructures for business*

Aims and objectives

- develop an understanding of the fundamentals of hardware and software technologies that underlie contemporary computer-based information systems
- develop an understanding of the underlying structure and theories of computers and programming
- provide the skills needed to develop algorithms for programming solutions
- provide the skills needed to write simple programs in Java

Essential reading

For full details please refer to the reading list:

Brookshear, J.G. *Computer Science: An Overview*. (Boston: Pearson)

Carrano F.M. *Imagine! Java: Programming Concepts in Context*. (Boston: Pearson)

Reynolds, C. and P. Tymann *Schaum's Outline of Principles of Computer Science* Schaum's Outline Series. (New York: McGraw-Hill)

Learning outcomes

At the end of the course and having completed the essential reading and activities students should be able to:

- ☑ Identify the basic elements of hardware and explain their functions and how they fit together to form an architecture
- ☑ Explain how data is represented, manipulated and stored within a computer system
- ☑ Identify and explain the functions of operating systems
- ☑ Explain how computers interact through local and wide area networks
- ☑ identify various different types of programming languages and appreciate how they have evolved since the early days of computer programming
- ☑ Design algorithms to solve basic programming problems
- ☑ Explain common data types and structures
- ☑ Explain basic programming structures
- ☑ explain the underlying concepts of object-oriented programming

Write simple but effective programs in Java

Assessment

This course is assessed by a three-hour unseen written examination.

Syllabus

This is a description of the material to be examined. On registration, students will receive a detailed subject guide which provides a framework for covering the topics in the syllabus and directions to the essential reading

Computer Architecture and Organization: *The origins of computer science; Elements of a computer; Von Neumann architecture; Data representation; The binary system*

Operating Systems: *Operating system architecture; Memory management; Process scheduling; Semaphores and deadlocks*

Networking: *Network fundamentals; The TCP/IP reference model; Internet protocols ; The World Wide Web*

Problem Solving and Programming Concepts: *Programming language generations; Algorithms & pseudocode; The object-oriented programming paradigm*

Introducing Programming with Java: *Structure and components of a Java program; input and output; Objects, attributes, methods; Arithmetic and Boolean expressions; Variables and constants, data types; pre-defined Java classes; Control structures; Arrays*

Students should consult the appropriate *EMFSS Programme Regulations*, which are reviewed on an annual basis. The *Regulations* provide information on the availability of a course, where it can be placed on your programme's structure, and details of co-requisites and prerequisites.