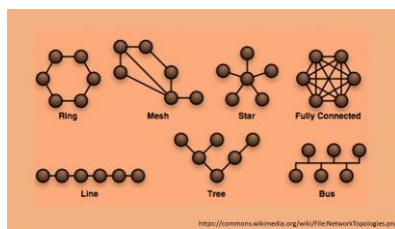
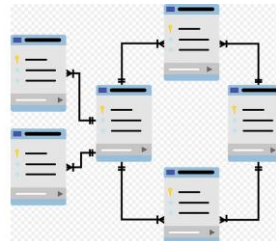


the Computer Science track (a 6 course track)



Track coordinator: Dr Andrew Brooks

Biographical details of track coordinator: <https://orcid.org/0000-0003-2414-6322>

Email: a.brooks@ucr.nl

Tel: 0118-655534

Office no. & location: Eleanor 1.09

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Databases, networks, algorithms, and operating systems are considered the cornerstones of computer science and for this reason, the track has a separate course on each of these. The track has a course on **artificial intelligence** because of the ever-growing societal impact of the application of machine intelligence.

scheduling information (subject to change)

SCICOMP102 will presented once or twice per year.

SCICOMP201 and SCICOMP202 will have deliveries alternated on spring semesters.

SCICOMP203 is delivered as an intensive 4-week course in June

SCICOMP301 and SCICOMP302 will have deliveries alternated on fall semesters.

SCICOMP102 Introduction to Computer Science

Brief Description:

This is an introductory course in problem solving and computer programming in Java. Although Java is an object oriented programming language, the course begins by introducing traditional structured programming and data constructs (i.e. selections, loops, methods, primitive types, and arrays). Then consideration is given to the object-oriented programming constructs (i.e. encapsulation, composition, inheritance, polymorphism, abstract classes, and interfaces). The second meeting of the class each week is entirely devoted to laboratory work where students tackle programming exercises and demonstrate their work. Two larger programming projects are also undertaken. There is a written midterm exam and a written final exam. By the end of the course a student will have obtained a reasonable familiarity with the Java API (Application Programming Interface) and a Java IDE (Integrated Development Environment).

Prerequisites: None

SCICOMP201 Database Management

Brief Description:

Database management systems are one of the foundations upon which a modern economy is built. The course begins by introducing SQL, a special-purpose language designed for managing data in a relational database management system (RDBMS). Then consideration is given to the theory underpinning relational databases, data storage and querying, and transaction management. The second meeting of the class each week is entirely devoted to laboratory work where students tackle exercises and demonstrate their work. Projects are undertaken to provide practical experience of the design, building, and evaluation of database management systems. An individual project provides practical experience of data cleansing. There is a written midterm exam and a written final exam. By the end of the course a student will have obtained a reasonable familiarity with both relational and non-relational database management systems.

Prerequisites: C or better grade in SCICOMP102 or by permission of the instructor

SCICOMP202 Networks and Communications

Brief Description:

Computer networks are the foundations on which the modern commercial, entertainment, industrial, and social world is built. The course begins with the history and development of the modern Internet and associated transmission media. Then consideration is given to the issues of packet structure, protocols that govern packet transmission, routing protocols, and error control. An introduction is given to network security. The second meeting of the class each week is entirely devoted to laboratory work where students tackle exercises and demonstrate their work. Projects are undertaken to provide practical experience of analysing Internet traffic, network simulation, and network security. An individual project provides practical experience of researching in-depth a specialist tool or protocol. There is a written midterm exam and a written final exam. By the end of the course a student will have obtained a reasonable familiarity with how the Internet works and how the Internet can be monitored and controlled.

Prerequisites: C or better grade in SCICOMP102 or by permission of the instructor

SCICOMP203 Artificial Intelligence

Brief Description:

The application of artificial intelligence has already impacted several sectors of society: communications, industry, commerce, medicine, and transportation. Smart cities will be able to optimize resource use and make themselves more sustainable. Emergent technologies now support research into the building of machines that learn and think like people. This course aims to provide the student with foundational abilities in: knowledge representation, learning, planning, reasoning, and searching by agents. The course will involve several laboratories and several projects, so it is important students have their own laptops and know how to program. Experience will be gained constructing a small-scale intelligent system. Homework exercises will explore historical and recent developments as well as societal impacts. There is an open-book, take-home test. By the end of the course a student will have obtained an understanding of how artificial intelligence helps shape the modern world.

Prerequisites: C grades or better in SCICOMP102 and ACCRMET101 Methods & Statistics I or by permission of the instructor

SCICOMP302 Algorithms and Data Structures

Brief Description:

Algorithms define the steps necessary to solve a particular problem. An inappropriate choice of algorithm and associated data structure can seriously impact on the performance of an application. The study of algorithm design and analysis provides techniques which help minimize the execution time of an algorithm. An emphasis is on the experimental performance analysis of algorithms. An introduction is given to NP-completeness. The second meeting of the class each week is entirely devoted to laboratory work where students tackle exercises and demonstrate their work. Projects are undertaken to provide practical experience of algorithm performance measurement and the empirical investigation of algorithms in real applications. There is a written midterm exam and a written final exam. By the end of the course a student will have obtained a reasonable familiarity with sorting and searching algorithms, breadth-first and depth-first search algorithms, and minimum spanning tree algorithms.

Prerequisites: C or better grade in SCICOMP102 or by permission of the instructor

SCICOMP301 Topics in Computer Science (currently Operating Systems)

Brief Description:

An operating system (OS) is system software that is the interface between hardware and applications. The course begins by introducing the typical structure of an OS, by distinguishing between processes and threads, and by explaining how an OS schedules work. Then consideration is given to the issues of concurrency, memory management, and file systems. The second meeting of the class each week is entirely devoted to laboratory work where students tackle exercises and demonstrate their work. Projects are undertaken to provide practical experience of modelling concurrency with Petri Nets, evaluating scheduling algorithms, and investigating part of an OS. An individual project provides practical experience of writing concurrent code. There is a written midterm exam and a written final exam. By the end of the course a student will have obtained a reasonable familiarity with how an OS manages resources and provides services to applications.

Prerequisites: C or better grade in SCICOMP102 or by permission of the instructor