

# COURSE DETAIL

## NATURAL COMPUTING

**Country**

United Kingdom - Scotland

**Host Institution**

University of Edinburgh

**Program(s)**

University of Edinburgh

**UCEAP Course Level**

Upper Division

**UCEAP Subject Area(s)**

Computer Science

**UCEAP Course Number**

120

**UCEAP Course Suffix****UCEAP Official Title**

NATURAL COMPUTING

**UCEAP Transcript Title**

NATURAL COMPUTING

**UCEAP Quarter Units**

4.00

**UCEAP Semester Units**

2.70

## Course Description

This course teaches about bio-inspired algorithms for optimization and search problems. The algorithms are based on simulated evolution (including Genetic algorithms and Genetic programming), particle swarm optimization, ant colony optimization as well as systems made of membranes or biochemical reactions among molecules. These techniques are useful for searching very large spaces. For example, they can be used to search large parameter spaces in engineering design and spaces of possible schedules in scheduling. However, they can also be used to search for rules and rule sets, for data mining, for good feed-forward, or recurrent neural nets and so on. The idea of evolving, rather than designing, algorithms and controllers is especially appealing in AI. In a similar way it is tempting to use the intrinsic dynamics of real systems consisting e.g. of quadrillions of molecules to perform computations for us. The course includes technical discussions about the applicability and a number of practical applications of the algorithms.

### Language(s) of Instruction

English

### Host Institution Course Number

INFR11161

### Host Institution Course Title

NATURAL COMPUTING

### Host Institution Course Details

<http://www.drps.ed.ac.uk/22-23/dpt/cxinfr11161.htm>

### Host Institution Campus

University of Edinburgh

### Host Institution Faculty

### Host Institution Degree

**Host Institution Department**

School of Informatics

**Course Last Reviewed**

2022-2023

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