**Algorithm Design and Analysis**

**Overview**

|  |  |
| --- | --- |
| Level | 2 (Semester 4) |
| Duration | 4 weeks |
| Lectures | 10 40-minutes lectures per week for 2 weeks |
| Practicals/tutorials | 5 2-hour practicals/tutorials for 3 weeks |

**Learning Outcomes**

* Ability to demonstrate the correctness of algorithms
* Understanding of the theory underpinning algorithmic complexity and ability to compare algorithms for efficiency
* An appreciation of the trade-offs between different types of data structures and the ability to identify an appropriate data structure for different tasks
* The ability to design, specify, describe and implement appropriate algorithms to real world problems.

**Syllabus**

* Algorithm correctness and proof
* Complexity
* Sorting algorithms
* Recursion, divide and conquer
* Graph based algorithms
* Dynamic programming