**Computational Intelligence**

**Overview**

|  |  |
| --- | --- |
| Level | 4 (Semester 7) |
| Duration | 4 weeks |
| Lectures | 10 times 40-minute lecture per week for 2 weeks |
| Practicals/tutorials | 5 times 2 hours per-week, for 3 weeks |

**Learning Outcomes**

1. **Knowledge and Understanding of:** basic concepts of Nature inspired computing, Fuzzy methods and Model-based Reasoning.
2. **Intellectual Skills:** Able to use knowledge and understanding of appropriate principles and guidelines to synthesise solutions to tasks in Computational Intelligence. Able to critically evaluate alternatives.
3. **Practical Skills:** Able to use Model-based Reasoning tools (e.g. the Morven Fuzzy Qualitative Reasoning System) and Nature Inspired Computing tools (e.g. Artificial Immune System software). Able to apply concepts to construct and solve problems.
4. **Transferrable Skills:** Solve problems. Evaluate outcomes and alternatives.

**Syllabus**

* Introduction to Neural Nets
* Multi-layer Perceptrons
* Genetic Algorithms and Genetic Programming
* Particle Swarm Optimisation
* Artificial Immune Systems
* Fuzzy Logic
* Fuzzy Clustering
* Qualitative and Fuzzy Qualitative Reasoning
* Model-based Diagnosis
* Learning Qualitative Models