

## **ELC 5358 – Introduction to Computational Intelligence**

Revised August 2010

### **Course Content**

#### **Swarm Intelligence**

Foundations

Ants, Termites, Gnats, Birds

Applications

#### **Evolutionary Computation**

Genetic Algorithms

Boundary Marking

Particle Swarm Search

No Free Lunch Theorems

Evolutionary Informatics

#### **Fuzzy Systems (Zadeh's Paper)**

Fuzzy Sets

Fuzzy Logic

Fuzzy Relationships

Fuzzy Inference (Fuzzy Logic Tutorial by Marks)

Alternate fuzzy logic operations

Adaptation of fuzzy systems

Disjunctive versus conjunctive reasoning

#### **Feedforward Neural Networks (Marks Tutorial, Reed/Marks Book)**

Foundations of pattern classification & regression

Rosenblatt Perceptron

Training

Neural Smoothing

QwikNet Software

Applications

#### **Matlab/Software Project**

Each student will invert a swarm

#### **Paper Project**

Each student will propose and present a summary of a paper from the current computational intelligence literature.

#### **Grading**

Two Quizzes: 40%

Final Examination: 25%

Software Project: 20%

Paper Project: 15%