Uncertainty Modelling for Intelligent Systems

Jonathan Lawry

Department of Engineering Mathematics
University of Bristol

Unit Overview

- This is a 10 credit M-level unit with about 20 contact hours (lectures).
- Assessment is 100% exam which will take place after Christmas.
- This is an Engineering Mathematics unit so the approach is naturally mathematical.
- The core mathematics required is not difficult (A level/ 1st year discrete mathematics) for the most part.
- But you will need to think logically and give formal arguments.

Topics

- **The unit in a sentence:** *Investigating reasoning under uncertainty for rational intelligent agents.*
- **A Breakdown:**

1. Quantitative Measures of Uncertainty
2. Probability Theory
3. Information and Inference
4. Dempster-Shafer Theory
5. Fuzzy Set Theory
6. Modal Logic

Recommended Reading

- Probabilistic Reasoning in Intelligent Systems, Judea Pearl, Morgan Kaufmann.
- The uncertain reasoner's companion, - a mathematical perspective, Jeff Paris, Cambridge Tracts in Theoretical Computer Science.
- Modelling and Reasoning with Vague Concepts, J. Lawry, Springer
- A first course in fuzzy logic, Hung T. Nguyen and Elbert A. Walker