

# Course Outline

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## 1. Document Information

<b>Degree Program</b>	Computer Science
<b>Course Number</b>	CS 437
<b>Course Title</b>	Machine Learning and Soft Computing
<b>Semester Hours</b>	3
<b>Course Coordinator</b>	Norman Carver
<b>Revision Term</b>	Spring 2020
<b>Latest Revision</b>	Fall 2020

## 2. Catalog Description

An introduction to the field of machine learning and soft computing. It covers rule-based expert systems, fuzzy expert systems, artificial neural networks, evolutionary computation, and hybrid systems. Students will develop rule-based expert systems, design a fuzzy system, explore artificial neural networks, and implement genetic algorithms.

## 3. Textbooks

- Negnevitsky, M. (2011). Artificial Intelligence: A Guide to Intelligent Systems. Pearson, 3rd Edition. ISBN: 9781408225745.

## 4. References

## 5. Course Learning Outcomes

- To obtain the theoretical and practical knowledge for design and development of basic intelligent systems.
- To study soft computing technologies.

## 6. Assessment of the Contribution to Student Outcomes

Outcome	1	2	3	4	5	6	7
Assessed	X	X	X	X	X	X	

## 7. Prerequisites by Topic

CS 330 with a grade of C or better or graduate standing.

## 8. Major Topics Covered in the Course

1. Introduction to Intelligent Systems {3 classes}
2. Rule-Based Expert Systems {4 classes}
3. Introduction to Expert Systems Programming {4 classes}
4. Uncertainty Management in Rule-Based Expert Systems {5 classes}
5. Fuzzy Expert Systems {6 classes}
6. Frame-Based Expert Systems {2 classes}
7. Artificial Neural Networks {5 classes}
8. Evolutionary Computation {5 classes}
9. Hybrid Intelligent Systems {3 classes}
10. Knowledge Engineering and Data Mining {3 classes}

NOTE: When course is taken as 500-level credit (CS 591 "Special Topics"), there will be additional requirements such as a research project.