

**Arab Academy for Science and Technology and Maritime Transport
Computer Science Curriculum
Course Syllabus**

Course Code: CS464	Course Title: Soft Computing	Classification: E	Coordinator's Name: Dr. Mohamed Mostafa	Credit Hours: 3
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Pre-requisites: CS366 (Introduction to Artificial Intelligence)	Co-requisites: None	Schedule: Lecture: 2 hours Tutorial-Lab: 2 hours		
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Office Hours:

Course Description:

This course introduces soft computing methods which, unlike hard computing, are tolerant of imprecision, uncertainty and partial truth. The principal constituents of soft computing are fuzzy logic, neural network theory, support vector machines and genetic algorithms.

Textbook:
Soft computing: integrating evolutionary, neural, and fuzzy systems, By Andrea Tettamanzi et. al., Springer

References:

Kecman, V., *Learning and Soft Computing*, The MIT Press, Cambridge, MA.

Course Objective/Course Learning Outcome:	Contribution to Program Student Outcomes:
Understand the difference between hard and soft computing methods.	(SO1) Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
Be able to apply several soft computing techniques for learning from experimental data.	
Understand what is fuzzy logic and apply it in various applications	
Model problems using support vector machine	(SO2) Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
Use genetic algorithms to solve soft computing problems	SO6) Apply computer science theory and software development fundamentals to produce computing-based solutions.

Course Outline:

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| <ol style="list-style-type: none">1. Introduction to Optimization2. Genetic Algorithms3. Genetic Programming and Evolutionary Strategies4. Introduction to Artificial Neural Networks5. Applications of ANN6. Neural Network Learning | <ol style="list-style-type: none">7. Introduction to Fuzzy logic8. Fuzzy Rules9. Fuzzy Inference10. Particle Swarm Optimization11. Support vector machine12. Comparison of soft computing approaches |
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Grade Distribution:

7th Week Assessment (30%)

12th Week Assessment (20%)

Year Work (10%)

Final Exam (40%)

Policies:

Attendance:

AASTMT Education and Study Regulations (available at aast.edu)

Academic Honesty:

AASTMT Education and Study Regulations (available at aast.edu)

Late Submission:

Late submissions are graded out of 75% (1 week late), 50% (2 weeks late), 25% (3 weeks late), 0% (more than 3 weeks late)