

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

Course Code: CS403	Course Title: Optimization Techniques	Classification: E	Coordinator: Dr. Essam Elfakharany Lecturer:	Credit Hours: 3
Pre-requisites: CS301 (Numerical Methods)	Co-requisites: None	Schedule: Lecture: 2 hours Tutorial-Lab: 2 hours		
Office Hours:				
Course Description: Course Description: Solution of Ordinary differential equations, Optimization Models in Operations Research Linear and Non-linear models, Simplex Search for Linear Programming, Duality and Sensitivity in Linear Programming, Multi-objective Optimization and Goal Programming, Unconstrained Nonlinear Programming, Selected Methods for Constrained Nonlinear Programming : Lagrange Multiplier Methods and Penalty and Barrier Methods.				
Textbook: Onwubolu G., Babu B., <i>New Optimization Techniques in Engineering</i> , Springer.				

References:

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Course Objective/Course Learning Outcome:

Contribution to Program Student Outcomes:

1. Solve Ordinary differential equations

2. Use mathematical models in which one seeks to minimize or maximize an objective function subject to constraints

(SO1) Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions

3. Solve linear programming problems

4. Solve nonlinear programming problems

5. Solve nonlinear programming 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. Solution of Ordinary differential equations2. Optimization Models in Operations Research3. Linear and Non-linear models4. Simplex Search for Linear Programming5. Duality and Sensitivity in Linear Programming13. | <ol style="list-style-type: none">6. Multi-objective Optimization and Goal Programming7. Unconstrained Nonlinear Programming8. Selected Methods for Constrained Nonlinear Programming: Lagrange Multiplier Methods and Penalty and Barrier Methods. |
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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)

