

Metaheuristics for Spring 2014
SYST/OR 670

Prereq: OR 541 or permission of instructor

Instructor: Dr. Rajesh Ganesan, rganesan@gmu.edu, office hrs Thur 3-4 PM

This course covers both basic and advanced topics on the theory and practice of metaheuristic approaches to solve optimization problems that are not solvable by exact methods such as LP, IP, NLP, and DP due to computational burden and/or lack of well-defined objective function. The course will stress on several applications and algorithmic aspects of the metaheuristic approaches while keeping in mind both time and space in terms of the computational aspects. The course will use Excel and Matlab. You are welcome to use the free-download software ParadisEO for metaheuristic which runs on C++.

Text book:

Planning and Scheduling in Manufacturing and Services - Pinedo, Michael L.
ISBN 978-1-4419-0910-7 (also an e-version is available from Springer)

Notes prepared from

- Operations scheduling – Michael Pinedo and Xiuli Chao
- Metaheuristics – El-Gazhali Talbi
- Essentials of Metaheuristics – Sean Luke (GMU Comp Sc faculty)

Topics

Applications:

- Several heuristics with applications in sequencing, scheduling, parameter optimization and assignment problems

Algorithms:

- Single solution Metaheuristics- Local search – guided and iterative, tabu search, simulated annealing etc
- Population Metaheuristics- evolutionary computation – Genetic algorithm, swarm intelligence
- Hybrid approaches
- Parallel Metaheuristics

Student Evaluation Criteria

Mid-term:	40%
Project	20%
Final Exam:	40%

Academic Policy:

All academic policies as given in the Honor System and code will be strictly followed. Visit URL <http://www.gmu.edu/catalog/apolicies/#Anchor12>

Grades:

Letter grades will be decided as follows:

97% and above –A⁺, 94-96%- A, 90-93% -A⁻, 86-89- B⁺, 83-85%-B, 80-82%-B⁻, 76-79%- C⁺, 73-75%- C, 70-72%-C⁻, 66-69%-D⁺, 63-65%-D, 60-62%-D⁻, at or below 59%-F

Please visit <http://mason.gmu.edu/~rganesan/class.html> to check for announcements, Practice problems, and solutions