Welcome to G53ASD
AUTOMATED SCHEDULING

Lecturer:
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The University of Nottingham
Module Details

**Module Code:** G53ASD

**Location and Time:** Tuesday, 11:00, room B53
Tuesday, 12:00, room B53

**Prerequisites (desirable but not essential):**

- Mathematics for Computer Scientists (G51MCS)
- Mathematics for Computer Scientists (G51MC2)
- Artificial Intelligence Methods (G51BAIM)

**Assessment:** One written 2 hour examination
Aim and Objectives

Aim:
• To provide a sound understanding of the fundamental techniques and algorithms for scheduling problems from a range of commercial and service sectors.

Objectives:
• To give an understanding of the methods and techniques that are available for building scheduling systems.
• To introduce a number of scheduling applications from a variety of industrial and service sectors and show how software packages are designed to solve them.
Contents

What will be covered in this course?

- Description of the module
- Introduction to Scheduling and Classification of Scheduling Problems

General Purpose Procedures Applied to Scheduling
3. General Purpose Procedures Applied to Scheduling
4. Simulated Annealing
5. Tabu-Search
   Exercise: Tabu Search, Solution
6. Genetic Algorithm

Timetabling Problems
7. Graph Coloring Heuristics
Contents

8. University Timetabling


9. Employee Timetabling

Exercise:

10. Solving a Nurse Rostering Problem with Enhanced Tabu Search

Lecture given by Dr. Kath Dowsland
Contents

11. Nurse Rostering
   Lecture given by Greet Vanden Berghe

Production Scheduling
Single Machine Deterministic Models

12. Completion Time Models
13. Lateness Models
14. Tardiness Models
15. Sequence Dependent Setup Models
   Exercise: Single Machine Scheduling Problems, Solution

Multiple Machines Problems

16. Project Scheduling
   Exercise: Project Scheduling, Solution
17. Flow Shop Scheduling
   Exercise: Flow Shop, Solution
Contents

18. Job Shop Scheduling
   Exercise: Job Shop, Solution

   New Approaches to Scheduling Problems

19. Fuzzy Scheduling
20. Design of Scheduling Systems NEW
21. Demonstration of LEKIN – Software System for Production Scheduling NEW
   Lecture given by Gareth Beddoe

22. Revision Lecture

Example of Exam Questions, Solution
Literature

Recommended Reading

1. *Operations Scheduling with Applications in Manufacturing and Services*,
   Michael Pinedo and Xiuli Chao,

2. *Scheduling, Theory, Algorithms, and Systems*,
   Michael Pinedo,
Other Good Books

3. *Deterministic Scheduling Theory*
   Gary Parker,

4. *Scheduling Under Fuzziness*
   Roman Slowinski, and Miciej Hapke, (eds)

5. *Scheduling Algorithms*
   Peter Brucker,
Lecture Notes

• Lecture Notes will be available online on the module website:
  
  http://www.cs.nott.as.uk/~sxp

• All announcements for the module will be made in lectures and put on the course website