Module Information

- Module web page
  - http://www.cs.nott.ac.uk/~rxq/g53clp.htm
- Module schedule (might be updated during the module!)
- Textbooks
- Extra reading materials
- Assessment
Who Can Attend?

- Mainly third-year Single Honours or Joint Honours Computer Science students
- Other students from outside the School who are suitably qualified
- Available to Erasmus students
- Prerequisites
  - G51IAI – Introduction to Artificial Intelligence
- Students who have taken G52AIP (Artificial Intelligence Programming) may NOT take G53CLP
Module Assessment

- Exam
  - 80% of the assessment
  - Covering all materials in the lectures
    - Reading materials NOT covered but help better understanding of lecture contents
  - 2 hours
  - 6 questions from which you should answer 4
    - One compulsory
    - Three optional
Module Assessment

- Lab sessions
  - 20% of the assessment
  - Practicing CP in ILOG OPL, IBM
    - Details to come soon at the module web page
    - 3 sessions in later part of the module
Module Introduction

- Lectures
  - ~18-20 hours
  - Thursday 11.00-13.00, A26, Business South

- Lab sessions
  - 3 one-hour sessions
  - Tuesday 16.00-17.00, A32, Computer Science
Module Schedule

- Course Intro; Overview to CP; CSP
- Constraint based scheduling (CBS): Introduction & Intro to Scheduling
- CBS: Problem definition & CP Techniques
- Constraint Propagation & Consistency Techniques
- CBS: Propagation
- Basic Search Strategies & Ordering Theory

G53CLP – Constraint Logic Programming

Dr R. Qu
Module Schedule

- Modelling CSP & Demo 8-Queen Problem
- Modelling & Demo Sudoku
- Constraint Optimization Problems (COP) & Demo
- Lab 1: exercises
- Lab 2: exercises
- Lab 3: assignment

Practice
Textbooks

- **Search Methodologies: Introductory Tutorials in Optimisation and Decision Support Techniques (Burke & Kendall), 2005**
  - Good introduction on a number of current techniques
  - Chapter 9 «Constraint Programming»
  - In library
Textbooks

- **Foundations of Constraint Satisfaction** (*Tsang*), 1993
  - Online version available [http://www.bracil.net/edward/FC\_S.html](http://www.bracil.net/edward/FC_S.html)
  - Well written & easy to read
  - Good coverage of algorithms (pseudo-code)
Useful Readings

- **Constraint Processing** *(Dechter)*, 2003
  - Good for both beginners and advanced readers
  - In library
Useful Readings

- Programming with Constraints: An Introduction (*Marriott & Stuckey*) 1998
  - Good for both beginners and advanced readers
  - In library
Other Readings

- Principles of Constraint Programming (Apt), 2003
  - Good for both advanced readers and beginners
  - Formal but easy to read
  - Online slides available at http://homepages.cwi.nl/~apt/pcp/ for those who are interested
  - In library
Other Readings

- The Essentials of Constraint Programming *(Fruhwirth & Abdennadher)*, 2003
  - Light but covers all important issues & applications
  - A number of real world applications
  - In library
Aims of the Course

- Constraint programming
  - Theory
    - Concepts of constraint satisfaction
    - Search techniques in CP
    - Modeling the problems
    - Examples of CSP/applications
  - Constraint based scheduling – state-of-the-art research in the literature & School
Aims of the Course

- Constraint programming
  - Practical
    - Introduction on IBM ILOG OPL
    - Lab sessions of case study in ILOG OPL IDE
    - Hand-on exercises in solving CSP/COP problems
    - Overview of CP languages/tools