ICE-EM Access Grid Room Project

Subject Information Form

Note: Subject Information form due AMSI preferably **28 January 2011** (latest 9 February 2011).

This form must be both electronically completed and transmitted.

Administration

1. Department and institution

   School of Mathematical and Physical Sciences

   University of Newcastle

2. Subject name and code

   Discrete Optimization

   N/A

3. Handbook entry URL, subject homepage URL, host honours student hand-out URL

   - Handbook entry URL

     N/A

   - Subject homepage URL

     N/A

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- Host Honours student hand-out URL

  N/A

4. **Lecturer** name and contact details

   Name: Professor Natashia Boland

   Phone: 02 4921-6717

   Email: Natashia.Boland@newcastle.edu.au

   Homepage: N/A

5. **Honours coordinator** name and contact details

   Name: Martin Savelsbergh

   Phone: 02-4921-5534

   Email: Martin.Savelsbergh@newcastle.edu.au

6. Start date, end date, number of teaching weeks

   Start date: Monday 4th March 2013 (Semester Week 1 start date)

   End date: Friday 7th June 2013 (Semester Week 13 end date)

   Number of teaching weeks: 12 (preferably classes should start in semester week 1 and end by May 31st, however an extra week is reserved in case any make-up class is needed)

7. Contact hours per week

   2 hours

8. Description of electronic access arrangements for students (for example, WebCT)

   AGR for lectures, plus email (any documents students need will be emailed to them, and they will need to scan and email assignments to be marked)

Academic

1. Overview of subject content

   This course will address models, theory and methods for integer programming and/or combinatorial optimization. Topics will be selected from
   - advanced modelling with combinatorial objects and integer variables
   - methods for integer programming
   - duality and decomposition
   - polyhedral analysis
   - methods for combinatorial optimization

2. Detailed syllabus, preferably week by week

   - Weeks 1-4: Optimization modelling with integer variables, methods for solving integer programs (preprocessing, branch-and-bound, cutting plane methods if time permits)
   - Weeks 5-8: Polyhedral analysis and applications in integer programming
   - Weeks 9-12: Duality theory, including an introduction to combinatorial dual problems, Lagrangian duality and decomposition, and other forms of duality if time permits

3. Detailed breakdown of assumed prerequisite knowledge, including host prerequisite subject URLs

   - Linear algebra, to 2nd-year level, and
   - Knowledge of Linear Programming is helpful but not essential

4. Assessment

   (i) Exam/assignment/class work breakdown

Exam	70 %
Assignment	30 %
Class work	0 %

   (ii) Assignment due dates

   TBA in class, but anticipate 3 assignments, each covering material in the corresponding 4-week block, due to be submitted in Weeks 5, 9 and 13 of semester.

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(iii) Approximate exam date

10-14th June range (exam will be a 3-hour exam)

5. Required student resources

- Text/printed notes

  Notes to be supplied as needed by email. Access to "Integer and Combinatorial Optimization" by G.L. Nemhauser and L.A. Wolsey, (1988) is strongly recommended. Access to "Integer Programming" by L.A. Wolsey, (1998) is desirable, but not essential.

- Software (local access)

  None required

Institutional Honours Details

1. Weight of subject in total honours assessment at host department

   11% (1 of 6 courses)

2. Thesis/subject split at host department

   35/65

3. Honours grade demarcators at host department

   - H1 = 85-100 %
   - H2a = 75-84 %
   - H2b = 65-74 %
   - H3 = 50-65 %

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