COURSE DETAILS

Course Code: F71OM
Full Course Title: Optimisation Methods in Finance
SCQF Level: 11
SCAF Credits: 10
Available as Elective: No

DELIVERY LEVEL

Undergraduate: No  Postgraduate Taught: Yes  Postgraduate Research: No

Additional Information:

COURSE AIMS

This course will demonstrate how recent advances in optimization modelling, algorithm and software can be applied to solve practical problems in computational finance. Previous exposure to optimization theory and methods is not assumed.

LEARNING OUTCOMES – SUBJECT MASTERY

Ability to formulate and solve practical problems arising in finance using modern optimization methods and software. Familiarity with different formulations, their purpose, strengths and weaknesses.

LEARNING OUTCOMES – PERSONAL ABILITIES

SYLLABUS

• Linear Programming: Computing a dedicated bond portfolio, Asset pricing and arbitrage.
• Quadratic Programming: Portfolio optimization (Markowitz model).
• Conic Optimization: Approximating covariance matrices.
• Integer Programming: Constructing an index fund.
• Stochastic Programming: Asset/Liability management. The role of simulation in modelling and solving stochastic programming problems.
• Risk Modelling: Value-at-Risk, Conditional Value-at-Risk.
• Robust Optimization: Robust portfolio selection.

COURSE RELATIONSHIPS

N/A

LOCATION AND ASSESSMENT METHODS

<table>
<thead>
<tr>
<th>Edi</th>
<th>SBC</th>
<th>Ork</th>
<th>Dub</th>
<th>Malay</th>
<th>IDL</th>
<th>COLL</th>
<th>ALP</th>
<th>OTH</th>
<th>Method</th>
<th>Weight</th>
<th>Exams</th>
<th>Type</th>
<th>Diet</th>
<th>Synoptic Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Examination</td>
<td>50</td>
<td>120</td>
<td>Assessment</td>
<td>Semester 2</td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coursework</td>
<td>50</td>
<td>120</td>
<td>Assessment</td>
<td>Semester 2</td>
<td></td>
</tr>
<tr>
<td>Y</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Examination</td>
<td>100</td>
<td>120</td>
<td>Reassessment</td>
<td>Semester 2</td>
<td></td>
</tr>
</tbody>
</table>

Re-assessment in the next academic year.