

## Subject Description Form

<b>Subject Code</b>	COMP6704																														
<b>Subject Title</b>	Advanced Topics in Optimization																														
<b>Credit Value</b>	3																														
<b>Level</b>	6																														
<b>Pre-requisite / Co-requisite/ Exclusion</b>	Nil.																														
<b>Objectives</b>	<ul style="list-style-type: none"> <li>• acquire fundamental knowledge in optimization;</li> <li>• learn about (advanced) optimization methods and techniques;</li> <li>• apply the knowledge in optimization and problem solving;</li> </ul>																														
<b>Intended Learning Outcomes</b>	<p>Upon completion of the subject, students will be able to:</p> <ul style="list-style-type: none"> <li>(a) critically evaluate the literature of optimization;</li> <li>(b) demonstrate a comprehensive understanding of optimization techniques and optimization solvers;</li> <li>(c) tackle problems in one's research area by using optimization techniques and optimization solvers</li> </ul>																														
<b>Subject Synopsis/ Indicative Syllabus</b>	<p>This subject will focus on mathematical programming problems and solutions.</p> <ul style="list-style-type: none"> <li>• Optimization Problems</li> <li>• Optimality Conditions</li> <li>• Unconstrained Problems and Solutions</li> <li>• Linear Programming</li> <li>• Quadratic Programming</li> <li>• Nonlinear Programming</li> </ul>																														
<b>Teaching/Learning Methodology</b>	39 hours of class activities including – lectures and tutorials.																														
<b>Assessment Methods in Alignment with Intended Learning Outcomes</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="width: 35%;">Specific assessment methods/tasks</th> <th rowspan="2" style="width: 15%;">% weighting</th> <th colspan="3" style="width: 50%;">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th style="width: 16.6%;">a</th> <th style="width: 16.6%;">b</th> <th style="width: 16.6%;">c</th> </tr> </thead> <tbody> <tr> <td>1. Quiz</td> <td style="text-align: center;">20%</td> <td></td> <td style="text-align: center;">✓</td> <td></td> </tr> <tr> <td>2. Assignment</td> <td style="text-align: center;">25%</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> </tr> <tr> <td>3. Group Project</td> <td style="text-align: center;">55%</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> </tr> <tr> <td><b>Total</b></td> <td style="text-align: center;"><b>100 %</b></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p><b>Quiz:</b> assessment of the theoretic studies with respect to the understanding of the relevant subject matters including new concepts, algorithms and techniques by proving answers to the given questions.</p> <p><b>Assignment:</b> assessment of the ability of applying and implementing optimization techniques to problem solving through real case studies.</p>			Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)			a	b	c	1. Quiz	20%		✓		2. Assignment	25%	✓	✓	✓	3. Group Project	55%	✓	✓	✓	<b>Total</b>	<b>100 %</b>			
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<b>Total</b>	<b>100 %</b>																														

	<b>Group Project:</b> assessment of the ability for identifying important issues in current research and exploring solutions through surveys and case studies, and the ability to collaborate as a team for problem-solving and communicate the research findings effectively in both oral and written formats.	
<b>Student Study Effort Expected</b>	Class contact:	
	Lectures/Tutorials	39 Hrs.
	Other student study effort:	
	Self-study	83Hrs.
	Total student study effort	122Hrs.
<b>Reading List and References</b>	<ol style="list-style-type: none"> <li>1. Nocedal, J. and S. Wright (2006) Numerical optimization. Springer, New York.</li> <li>2. Boyd, S. and L. Vandenberghe (2004) Convex optimization. Cambridge University Press, Cambridge UK.</li> <li>3. Sinha, S.M. (2006) Mathematical programming. Netherlands: North Holland.</li> </ol>	