

Subject Description Form

Subject Code	COMP6704																																																			
Subject Title	Advanced Topics in Optimization																																																			
Credit Value	3																																																			
Level	6																																																			
Pre-requisite / Co-requisite/ Exclusion	Nil.																																																			
Objectives	<ul style="list-style-type: none"> • Acquire fundamental knowledge in optimization; • Learn about (advanced) optimization methods and techniques; • Apply the knowledge in optimization and problem solving; 																																																			
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ul style="list-style-type: none"> (a) Formulate optimization problems; (b) Aware of the conditions for optimality; (c) Solve unconstrained optimization problems; (d) Solve the optimization problems using linear programming, quadratic programming or nonlinear programming techniques; 																																																			
Subject Synopsis/ Indicative Syllabus	<p>This subject will focus on mathematical programming problems and solutions.</p> <ul style="list-style-type: none"> • Optimization Problems • Optimality Conditions • Unconstrained Problems and Solutions • Linear Programming • Quadratic Programming • Nonlinear Programming 																																																			
Teaching/Learning Methodology	39 hours of class activities including – lectures and tutorials.																																																			
Assessment Methods in Alignment with Intended Learning Outcomes	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="width: 30%;">Specific assessment methods/tasks</th> <th rowspan="2" style="width: 10%;">% weighting</th> <th colspan="6">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th style="width: 5%;">a</th> <th style="width: 5%;">b</th> <th style="width: 5%;">c</th> <th style="width: 5%;">d</th> <th style="width: 5%;"></th> <th style="width: 5%;"></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 style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td></td> <td></td> </tr> <tr> <td>2. Assignment</td> <td style="text-align: center;">25</td> <td style="text-align: center;">✓</td> <td></td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td></td> <td></td> </tr> <tr> <td>3. Examination</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> <td style="text-align: center;">✓</td> <td></td> <td></td> </tr> <tr> <td>Total</td> <td style="text-align: center;">100 %</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>Quiz: 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 Assignment: assessment of the ability for problem solving through real case studies and implementation of a prototype system for demonstration Exam assessment of the overall performance by written report and oral presentation.</p>						Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)						a	b	c	d			1. Quiz	20		✓	✓	✓			2. Assignment	25	✓		✓	✓			3. Examination	55	✓	✓	✓	✓			Total	100 %						
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3. Examination	55	✓	✓	✓	✓																																															
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Student Study Effort Expected	Class contact:	
	Lectures/Tutorials	39 Hrs.
	Other student study effort:	
	Self Study	83Hrs.
	Total student study effort	122Hrs.
Reading List and References	<ol style="list-style-type: none"> 1. Nocedal, J. and S. Wright (2006) Numerical optimization. Springer, New York. 2. Boyd, S. and L. Vandenberghe (2004) Convex optimization. Cambridge University Press, Cambridge UK. 3. Sinha, S.M. (2006) Mathematical programming. Netherlands: North Holland. 	