

## Subject Description Form

<b>Subject Code</b>	COMP1433					
<b>Subject Title</b>	Introduction to Data Analytics					
<b>Credit Value</b>	3					
<b>Level</b>	1					
<b>Pre-requisite/ Co-requisite/ Exclusion</b>	Nil					
<b>Objectives</b>	<p>The objectives of this subject are to:</p> <ol style="list-style-type: none"> <li>1. understand data analytics concepts;</li> <li>2. apply data analytics tools; and</li> <li>3. strengthen students' mathematics background for computing</li> </ol>					
<b>Intended Learning Outcomes</b>	<p>Upon completion of the subject, students will be able to:</p> <p><i>Professional/academic knowledge and skills</i></p> <ol style="list-style-type: none"> <li>(a) understand basic data analytics concepts;</li> <li>(b) manipulate, analyse and visualise data; and</li> <li>(c) understand and apply related mathematics operations</li> </ol>					
<b>Subject Synopsis/ Indicative Syllabus</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Topic</th> </tr> </thead> <tbody> <tr> <td> <p><b>1. Data Analytics Basics</b></p> <p>Defining data requirements, collecting data, processing data, cleaning data and analysing data</p> </td> </tr> <tr> <td> <p><b>2. Data Processing</b></p> <p>Data manipulation, data analysis, data visualisation</p> </td> </tr> <tr> <td> <p><b>3. Statistical Analysis</b></p> <p>Basic statistical functions, linear regression, time series analysis</p> </td> </tr> <tr> <td> <p><b>4. Linear Algebra and Calculus</b></p> <p>Vector basics, matrix basics, differentiation, integration, finding maxima and minima</p> </td> </tr> </tbody> </table> <p>The aforementioned topics will be taught with the aid of a suitable programming language such as R.</p>	Topic	<p><b>1. Data Analytics Basics</b></p> <p>Defining data requirements, collecting data, processing data, cleaning data and analysing data</p>	<p><b>2. Data Processing</b></p> <p>Data manipulation, data analysis, data visualisation</p>	<p><b>3. Statistical Analysis</b></p> <p>Basic statistical functions, linear regression, time series analysis</p>	<p><b>4. Linear Algebra and Calculus</b></p> <p>Vector basics, matrix basics, differentiation, integration, finding maxima and minima</p>
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<b>Teaching/Learning Methodology</b>	Lectures on data analytics and mathematics concepts (e.g., using R) will be given through lectures. There will be in-class activities for active learning. Hands-on lab/exercises will be arranged for students to practice data analytics tools. Students will also be required to study e-learning materials.																															
<b>Assessment Methods in Alignment with Intended Learning Outcomes</b>	<table border="1" data-bbox="581 344 1388 873"> <thead> <tr> <th data-bbox="581 344 862 520" rowspan="2">Specific assessment methods/tasks</th> <th data-bbox="862 344 1024 520" rowspan="2">% weighting</th> <th colspan="3" data-bbox="1024 344 1388 449">Intended subject learning outcomes to be assessed</th> </tr> <tr> <th data-bbox="1024 449 1143 520">a</th> <th data-bbox="1143 449 1261 520">b</th> <th data-bbox="1261 449 1388 520">c</th> </tr> </thead> <tbody> <tr> <td data-bbox="581 520 862 632"><b>Continuous Assessment</b></td> <td data-bbox="862 520 1024 632" rowspan="2"><b>55%</b></td> <td colspan="3" data-bbox="1024 520 1388 632"></td> </tr> <tr> <td data-bbox="581 632 862 737">1. Assignments, Test, Quizzes</td> <td data-bbox="1024 632 1143 737">✓</td> <td data-bbox="1143 632 1261 737">✓</td> <td data-bbox="1261 632 1388 737">✓</td> </tr> <tr> <td data-bbox="581 737 862 806"><b>Examination</b></td> <td data-bbox="862 737 1024 806"><b>45%</b></td> <td data-bbox="1024 737 1143 806">✓</td> <td data-bbox="1143 737 1261 806">✓</td> <td data-bbox="1261 737 1388 806">✓</td> </tr> <tr> <td data-bbox="581 806 862 873">Total</td> <td data-bbox="862 806 1024 873">100%</td> <td colspan="3" data-bbox="1024 806 1388 873"></td> </tr> </tbody> </table> <p data-bbox="581 890 1411 1037">The assignments/test/quizzes (individual assessment) are used to assess learning outcomes (a) – (c) (e.g., how to apply R). Finally, students are assessed by a formal examination, covering learning outcomes (a) – (c).</p>					Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed			a	b	c	<b>Continuous Assessment</b>	<b>55%</b>				1. Assignments, Test, Quizzes	✓	✓	✓	<b>Examination</b>	<b>45%</b>	✓	✓	✓	Total	100%			
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<b>Student study effort expected</b>	<p data-bbox="581 1073 1411 1121">Class Contact:</p> <table border="1" data-bbox="581 1121 1411 1192"> <tr> <td data-bbox="581 1121 1255 1192">▪ Class/ Learning Activities</td> <td data-bbox="1255 1121 1411 1192">39 Hrs.</td> </tr> </table> <p data-bbox="581 1213 1411 1247">Other student study effort:</p> <table border="1" data-bbox="581 1247 1411 1331"> <tr> <td data-bbox="581 1247 1255 1331">▪ Self-study, Assignments, e-Learning</td> <td data-bbox="1255 1247 1411 1331">66 Hrs.</td> </tr> </table> <table border="1" data-bbox="581 1331 1411 1402"> <tr> <td data-bbox="581 1331 1255 1402">Total student study effort</td> <td data-bbox="1255 1331 1411 1402">105 Hrs.</td> </tr> </table>					▪ Class/ Learning Activities	39 Hrs.	▪ Self-study, Assignments, e-Learning	66 Hrs.	Total student study effort	105 Hrs.																					
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<b>Reading list and references</b>	<p data-bbox="581 1423 1411 1457"><b>Reference Books:</b></p> <ol data-bbox="581 1478 1411 1822" style="list-style-type: none"> <li data-bbox="581 1478 1411 1520">1. Beecher, K., <i>Computational Thinking</i>, BCS, 2017.</li> <li data-bbox="581 1520 1411 1562">2. Teetor, P., <i>R Cookbook</i>, O’Reilly Media, 2011.</li> <li data-bbox="581 1562 1411 1646">3. Wickham, H. and Grolemond, G., <i>R for Data Science</i>, O’Reilly Media, 2017.</li> <li data-bbox="581 1646 1411 1730">4. Boyd, S. and Vandenberghe, L., <i>Introduction to Applied Linear Algebra</i>, Cambridge University Press, 2018.</li> <li data-bbox="581 1730 1411 1822">5. Stewart, J., <i>Calculus: Early Transcendentals</i>, 8<sup>th</sup> Edition, Cengage Learning, 2015.</li> </ol>																															