

## Subject Description Form

<b>Subject Code</b>	AMA522
<b>Subject Title</b>	Scheduling
<b>Credit Value</b>	3
<b>Level</b>	5
<b>Pre-requisite/ Co-requisite/ Exclusion</b>	Nil
<b>Objectives</b>	Enable students to understand the ideas, methods and techniques in scheduling problems and apply them to optimally allocating resources in manufacturing, production and service industries.
<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) Identify different structures of various kinds of scheduling problems.</li> <li>(b) Design and formulate real world scheduling problems.</li> <li>(c) Apply the principles and mechanisms of scheduling to real world scheduling problems.</li> <li>(d) Apply various scheduling rules and algorithms for scheduling problems.</li> <li>(e) Synthesize mathematical knowledge in modeling real world scheduling problems.</li> </ul>
<b>Subject Synopsis/ Indicative Syllabus</b>	<p><u>Overview of scheduling problems and applications</u></p> <p>Objective function, regular cost functions, just-in-time principle, earliness/tardiness penalties, deterministic and/or stochastic models.</p> <p><u>Single-machine and parallel-machine scheduling</u></p> <p>Sequencing jobs on a single machine; mean weighted flow time, total weighted number of tardy jobs, linear and quadratic functions of earliness/tardiness; SPT rule, EDD rule and V-shape of an optimal sequence; dynamic programming algorithms.</p> <p><u>Stochastic scheduling models</u></p> <p>Random processing times and due dates; normal, exponential and other probability distributions for processing times; minimizing expected cost functions; random machine breakdowns and Poisson process; specific and general stochastic objective functions.</p> <p><u>Computational complexity</u></p> <p>NP-hardness and polynomial time.</p> <p><u>Applications</u></p> <p>Manufacturing systems and other industrial and business operations.</p>

<b>Teaching/Learning Methodology</b>	The subject will be delivered mainly through lectures and tutorials. The teaching and learning approach is mainly problem-solving oriented. The approach aims at the development of mathematical techniques and how the techniques can be applied to solving problems. Students are encouraged to adopt a deep study approach by employing high level cognitive strategies, such as critical and evaluative thinking, relating, integrating and applying theories to practice.																																												
<b>Assessment Methods in Alignment with Intended Learning Outcomes</b>	<table border="1" data-bbox="486 488 1401 965"> <thead> <tr> <th data-bbox="486 488 807 689" rowspan="2">Specific assessment methods/tasks</th> <th data-bbox="807 488 963 689" rowspan="2">% weighting</th> <th colspan="5" data-bbox="963 488 1401 622">Intended subject learning outcomes to be assessed (Please tick as appropriate)</th> </tr> <tr> <th data-bbox="963 622 1050 689">a</th> <th data-bbox="1050 622 1136 689">b</th> <th data-bbox="1136 622 1222 689">c</th> <th data-bbox="1222 622 1308 689">d</th> <th data-bbox="1308 622 1401 689">e</th> </tr> </thead> <tbody> <tr> <td data-bbox="486 689 807 757">1. Assignments/Project</td> <td data-bbox="807 689 963 757">20%</td> <td data-bbox="963 689 1050 757">✓</td> <td data-bbox="1050 689 1136 757">✓</td> <td data-bbox="1136 689 1222 757">✓</td> <td data-bbox="1222 689 1308 757">✓</td> <td data-bbox="1308 689 1401 757">✓</td> </tr> <tr> <td data-bbox="486 757 807 824">2. Mid-term test</td> <td data-bbox="807 757 963 824">20%</td> <td data-bbox="963 757 1050 824">✓</td> <td data-bbox="1050 757 1136 824">✓</td> <td data-bbox="1136 757 1222 824">✓</td> <td data-bbox="1222 757 1308 824">✓</td> <td data-bbox="1308 757 1401 824"></td> </tr> <tr> <td data-bbox="486 824 807 891">3. Examination</td> <td data-bbox="807 824 963 891">60%</td> <td data-bbox="963 824 1050 891">✓</td> <td data-bbox="1050 824 1136 891">✓</td> <td data-bbox="1136 824 1222 891">✓</td> <td data-bbox="1222 824 1308 891">✓</td> <td data-bbox="1308 824 1401 891"></td> </tr> <tr> <td data-bbox="486 891 807 965">Total</td> <td data-bbox="807 891 963 965">100 %</td> <td colspan="5" data-bbox="963 891 1401 965"></td> </tr> </tbody> </table> <p data-bbox="486 981 1401 1048">Continuous Assessment comprises of assignments/ project and a mid-term test. A written examination is held at the end of the semester.</p>					Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					a	b	c	d	e	1. Assignments/Project	20%	✓	✓	✓	✓	✓	2. Mid-term test	20%	✓	✓	✓	✓		3. Examination	60%	✓	✓	✓	✓		Total	100 %					
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