

## BTEC Engineering

### Revision and homework checklist

Revision topic - Unit 1: The Engineered World

<http://www.technologystudent.com/>

*Use section headings as search terms within technology student*

	Topic	Homework Week commencing	Formal examination Week commencing
<b>A1</b>	<p><b>Engineering sectors and products</b> Types of products from the following engineering sectors:</p> <ul style="list-style-type: none"> <li>● aerospace</li> <li>● automotive</li> <li>● communications</li> <li>● electrical/electronic</li> <li>● mechanical</li> <li>● biomedical</li> </ul>	5 <sup>th</sup> November 2018	10 <sup>th</sup> or 17 <sup>th</sup> December 2018  Followed by resit opportunity  11 <sup>th</sup> or 25 <sup>th</sup> February 2019
<b>A2</b>	<p><b>Mechanical and electrical/electronic engineering processes</b> Processes including health and safety issues, characteristics, applications and advantages/disadvantages of the following engineering processes:</p> <ul style="list-style-type: none"> <li>● machining – turning, milling, drilling</li> <li>● forming – casting, forging</li> <li>● fabrication – welding, shearing</li> <li>● electrical/electronic – PCB manufacture, surface mount technology</li> </ul>		Followed by a final resit opportunity  1 <sup>st</sup> April 2019
<b>A3</b>	<p><b>Scales of production</b> Characteristics and advantages/ disadvantages of the following scales of production used in engineering manufacture:</p> <ul style="list-style-type: none"> <li>● one-off/jobbing production</li> <li>● batch production</li> <li>● mass production</li> <li>● continuous production</li> </ul>		
<b>A4</b>	<p><b>Modern production methods</b> Applications and advantages/ disadvantages of the following modern production methods for production/assembly lines:</p> <ul style="list-style-type: none"> <li>● Robots</li> <li>● CNC machinery</li> </ul>		
<b>B1</b>	<p><b>Modern and smart materials in engineering</b> Applications, characteristics, properties and advantages/disadvantages of the following modern and smart materials used in engineering:</p> <ul style="list-style-type: none"> <li>● Modern composite materials <ul style="list-style-type: none"> <li>● GRP</li> <li>● carbon fibre</li> <li>● Kevlar</li> </ul> </li> <li>● Modern high performance materials <ul style="list-style-type: none"> <li>● Tungsten</li> <li>● Titanium</li> <li>● nickel/cobalt super alloys</li> <li>● ceramics</li> </ul> </li> </ul>	12 <sup>th</sup> November 2018	

	<ul style="list-style-type: none"> <li>● Smart materials <ul style="list-style-type: none"> <li>● SMAs</li> <li>● shape memory polymers</li> <li>● electrochromic materials</li> <li>● piezoelectric actuators and transducers</li> </ul> </li> </ul>		
<b>B2</b>	<b>Modern material foams in engineering</b> Applications, characteristics and advantages/disadvantages of metallic foams as used in the automotive, biomedical and aerospace sectors e.g. aluminium, steel.	12 <sup>th</sup> November 2018	
<b>B3</b>	<b>Modern material processes in engineering</b> Process, applications, characteristics and advantages/disadvantages of powder metallurgy: <ul style="list-style-type: none"> <li>● powder mixing/blending</li> <li>● pressing/compacting</li> </ul>	19 <sup>th</sup> November 2018	
<b>B4</b>	<b>New technologies in engineering</b> Applications, characteristics and advantages/disadvantages of the following new technologies used in engineering sectors: <ul style="list-style-type: none"> <li>● optical fibres in communication</li> <li>● hydrogen fuel cells</li> <li>● surface nanotechnologies</li> <li>● telematics</li> <li>● blended wing bodies</li> <li>● bionics</li> </ul>		
<b>C1</b>	<b>Sustainable engineered products</b> Characteristics, applications and advantages/disadvantages of LCA at the following stages for engineered products: <ul style="list-style-type: none"> <li>● raw materials extraction</li> <li>● material production</li> <li>● production of parts</li> <li>● assembly</li> </ul> Applications, characteristics, properties and advantages/disadvantages of LCA at the following stages for engineered products: <ul style="list-style-type: none"> <li>● use</li> <li>● disposal/recycling</li> </ul>	26 <sup>th</sup> November 2018	
<b>C2</b>	<b>Minimising waste production in engineering</b> Characteristics, applications and advantages/disadvantages of minimising waste production throughout the life cycle of engineered products, using the four Rs: <ul style="list-style-type: none"> <li>● Reduce materials and energy.</li> <li>● Reuse materials and products where applicable.</li> <li>● Recover energy from waste</li> <li>● Recycle materials and products or use recycled materials</li> </ul>		
<b>C3</b>	<b>Lean manufacturing</b> Characteristics, applications and advantages/disadvantages of minimising waste at the production stage in engineering, using the following lean manufacturing techniques: <ul style="list-style-type: none"> <li>● Just-in-Time</li> <li>● Kaizen</li> <li>● poka-yoke</li> </ul>	3 <sup>rd</sup> December 2018	

<b>C4</b>	<b>Renewable sources of energy in engineering</b> Processes, characteristics, applications and advantages/disadvantages of using the following renewable sources of energy in engineering: <ul style="list-style-type: none"><li>● wind energy using turbines and wind farms</li><li>● solar energy using photovoltaic cells and solar water heaters</li><li>● hydro energy using dams, barrages and wave power</li><li>● geothermal energy using heat pumps and exchangers</li></ul>		
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