

**Learning Programme A-level Physics A OCR 2018-2019**

**St Ambrose College Upper Sixth**

<b>Topic/Content</b>	<b>Objectives/Skills from gov.org</b>	<b>Homework</b>	<b>Assessment</b>	<b>Success Criteria OCR Physics A</b>	<b>Stretch &amp; Challenge (Thirst for Learning)</b>
<p>Progress will be according to the teaching group needs as teachers will use differentiated approaches to tailor delivery appropriately.</p> <p>Below is expected topic delivery timing.</p>	<p><b>A-level Physics must encourage students to:</b></p> <ul style="list-style-type: none"> <li>• develop essential knowledge and understanding of different areas of the subject and how they relate to each other</li> <li>• develop and demonstrate a deep appreciation of the skills, knowledge and understanding of scientific methods</li> <li>• develop competence and confidence in a variety of practical, mathematical and problem solving skills</li> <li>• develop their interest in and enthusiasm for the subject, including developing an interest in further study and careers associated with the subject</li> <li>• understand how society makes decisions about scientific issues and how the sciences contribute to the success of the economy and society (HSW).</li> </ul>	<p>Pupils need to spend at least one hour per week consolidating their class work for every hour they have a lesson in school.</p> <p>Pupils will also be set topic appropriate tasks and work either on past examination questions to be completed at home or as formal assessment within lessons.</p> <p>Some of these will be via the online Kerboodle.com</p>	<p><b>Tasks listed below will be teacher assessed with diagnostic feedback provided. These tasks are to be carried out under exam conditions in lessons where appropriate. All tasks are Exam Board questions or Exam Board practical skills assessments. If pupils are absent for these assessments, if time permits they will complete them upon their return ASAP before data reporting is completed.</b></p> <p><b>These will be used to form judgements / interim grades. Final grades will be based using these and the end of unit tests, and end of year examinations.</b></p>	<p><b><u>Grade A</u></b></p> <p><b><u>Knowledge and Understanding</u></b></p> <p>Candidates at this level could normally:</p> <ul style="list-style-type: none"> <li>• recall a wide range of the content from all areas of the specification</li> <li>• use detailed knowledge and understanding to explain scientific systems and phenomena, and apply this to novel situations where these were presented to them</li> <li>• select and use appropriate scientific terminology in their descriptions and explanations</li> <li>• select, organise and present information in an ordered and logical manner</li> <li>• show an understanding of the wider implications of science, including its benefits and drawbacks.</li> </ul>	<p>Access to Kerboodle resources and online textbook, matched to course structure.</p> <p>Physical textbooks to use in school (need to sign out).</p> <p>Resources on school ICT shared area for boys to stretch and challenge themselves</p> <p>Free access (via registration) to senecalearning.com which uses intelligent algorithms and mind palace skills and is an excellent accelerated learning platform.</p> <p>Use of physicandmathstutor.com for non-OCR stretch exam question practise (good for paper 3).</p>

	<p><b>Assessment overview</b></p> <p>The entire A level course content is in six modules:</p> <ul style="list-style-type: none"> <li>• Module 1 – Development of practical skills in physics (ongoing both years).</li> <li>• Module 2 – Foundations of physics (ongoing both years).</li> <li>• Module 3 – Forces and motion (lower 6<sup>th</sup>).</li> <li>• Module 4 – Electrons, waves and photons (lower 6<sup>th</sup>).</li> <li>• Module 5 – Newtonian world and astrophysics (upper 6<sup>th</sup>).</li> <li>• Module 6 – Particles and medical physics (upper 6<sup>th</sup>).</li> <li>• <i>Exam 01 assesses content from modules 1, 2, 3 and 5. (37%). 20<sup>th</sup> May 2019.</i></li> <li>• <i>Exam 02 assesses content from modules 1, 2, 4 and 6. (37%). 24<sup>th</sup> May 2019.</i></li> <li>• <i>Exam 03 assesses content from all modules (1 to 6). (26%). 3<sup>rd</sup> June 2019.</i></li> </ul> <p>All include synoptic assessment.</p> <p>Students sit three exams in May / June 2019 and complete the Practical component (PAGs) through the course to pass. Check above for dates – <b>note historically earlier than usual.</b></p>	<p>system we have subscribed to so all students must have a working login for this system.</p>	<p><b>Other tasks will be set in lessons and homework that will be self or peer assessed, and the marks will be recorded. These will be appropriate to the teaching group and the topic being delivered at the time.</b></p> <p><u>First half term</u></p> <p>Post-summer mock exams (September) on modules 1-4, for projected UCAS grades.</p> <p>Exam questions based on Unit 5 and 6</p> <p>Capacitors topic test</p> <p>PAG 9</p> <p><u>Second half term</u></p> <p>Exam questions based on Unit 5 and 6</p> <p>Circular Motion topic test</p> <p>Electric Fields topic test</p>	<p><b><u>Application of knowledge and understanding, analysis, synthesis and evaluation</u></b></p> <p>Candidates at this level could normally:</p> <ul style="list-style-type: none"> <li>• plot graphical data accurately, and describe trends in data</li> <li>• perform complex calculations involving more than one step</li> <li>• interpret and analyse data presented to them and relate this to their knowledge and understanding of content in the specification</li> <li>• understand the development of scientific ideas</li> <li>• sequence scientific concepts and processes in a logical and orderly manner</li> <li>• use extended writing in their responses to questions.</li> </ul> <p><b><u>Experiment and Investigation</u></b></p> <p>Candidates at this level could normally:</p> <ul style="list-style-type: none"> <li>• plan and safely carry out investigations based on a sound</li> </ul>	<p>Physics and Engineering Society every week where boys choose topics to present to their peers, and prepare for Q &amp; A sessions after their presentation</p> <p>Boys are encouraged to visit museums such as MOSI, and the University of Manchester.</p> <p>Joining central Manchester library is encouraged.</p> <p>Boys can plan activities for the KS3 Science Society run on Thursday lunchtimes, for younger boys.</p> <p>Students encouraged to volunteer as mentors for GCSE students struggling with their physics studies.</p>
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<p><u>First half term</u></p> <p><u>Teacher 1 SQ</u></p> <p>Unit 5 commence with Circular Motion</p> <p><u>Teacher 2 AG</u></p> <p>Unit 6 commencing with Capacitors</p> <p><u>Second half term</u></p> <p><u>Teacher 1 SQ</u></p> <p>Unit 5 continue with Gravitational Fields</p> <p><u>Teacher 2 AG</u></p> <p>Unit 6 continue with Electric Fields and Electromagnetism</p>	<p><b>Content Overview</b></p> <p>Content is in six modules, each divided into key topic areas:</p> <p><b>Module 1 – Development of practical skills in physics</b></p> <p>1.1 Practical skills assessed in a written examination</p> <p>1.2 Practical skills assessed in the practical endorsement</p> <p><b>Module 2 – Foundations of physics</b></p> <p>2.1 Physical quantities and units</p> <p>2.2 Making measurements and analysing data</p> <p>2.3 Nature of quantities</p> <p><b>Module 3 – Forces and motion</b></p> <p>3.1 Motion</p> <p>3.2 Forces in action</p> <p>3.3 Work, energy and power</p> <p>3.4 Materials</p> <p>3.5 Newton’s laws of motion and momentum</p> <p><b>Module 4 – Electrons, waves and photons</b></p> <p>4.1 Charge and current</p> <p>4.2 Energy, power and resistance</p> <p>4.3 Electrical circuits</p> <p>4.4 Waves</p>		<p><u>Christmas break</u></p> <p><u>Third half term</u></p> <p>Exam questions based on Unit 5 and 6</p> <p>Gravitational Fields topic test</p> <p>Magnetic Fields topic test</p> <p>PAG 10</p> <p><u>Fourth half term</u></p> <p>Exam questions based on Unit 5 and 6</p> <p>Mock Exams start 11<sup>th</sup> March 2019 (on all module 1-6 material covered).</p> <p>PAG 7</p> <p>PAG 8</p> <p>PAG 11</p>	<p>knowledge and understanding of the specification content</p> <ul style="list-style-type: none"> <li>• interpret their results fully, using a variety of techniques</li> <li>• evaluate the results of their investigations and the methods used</li> <li>• produce a wide range of relevant results and use appropriate statistical techniques to analyse them.</li> </ul> <p><b><u>Synthesis of knowledge, understanding and skills</u></b></p> <p>Candidates at this level could normally:</p> <ul style="list-style-type: none"> <li>• produce sophisticated responses to questions, drawing on the scientific knowledge and understanding set out in the specification</li> <li>• apply their knowledge and understanding successfully to unfamiliar contexts and data</li> </ul> <p><b><u>OCR Physics Assessment Objectives</u></b></p> <p><b><u>A01</u></b></p> <p>Demonstrate knowledge and understanding of scientific ideas,</p>	
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<p><u>Christmas break</u></p> <p><u>Third half term</u></p> <p><u>Teacher 1 SQ</u></p> <p>Unit 5 continue with Oscillations (SHM). Start Thermal Physics.</p> <p><u>Teacher 2 AG</u></p> <p>Unit 6 continue with Nuclear and Particle Physics (1)</p> <p><u>Fourth half term</u></p> <p><u>Teacher 1 SQ</u></p> <p>Unit 5 continue with Thermal Physics and start Astrophysics;</p>	<p>4.5 Quantum physics</p> <p><b>Module 5 – Newtonian world and astrophysics</b></p> <p>5.1 Thermal physics 5.2 Circular motion 5.3 Oscillations 5.4 Gravitational fields 5.5 Astrophysics and cosmology</p> <p><b>Module 6 – Particles and medical physics</b></p> <p>6.1 Capacitors 6.2 Electric fields 6.3 Electromagnetism 6.4 Nuclear and particle physics 6.5 Medical imaging</p> <p>Students gain practical skills throughout the course. These are assessed in the written examinations and in the practical endorsement (component 4). Activities that could count towards the practical endorsement are indicated in the specification.</p> <p>Exam season begins 13<sup>th</sup> May 2019 and so all content must be finished before this.</p>		<p><u>Easter break</u> Over Easter PAG 12 research and first draft <b>must</b> be done</p> <p><u>Fifth half term – for 3 weeks before exam season begins</u></p> <p>Mock exam(s) review</p> <p>PAG 12 review / update</p> <p>Practise exam questions</p>	<p>processes, techniques and procedures.</p> <p>31-34% at A-level</p> <p><u>A02</u></p> <p>Apply knowledge and understanding of scientific ideas, processes, techniques and procedures:</p> <ul style="list-style-type: none"> <li>• in a theoretical context</li> <li>• in a practical context</li> <li>• when handling qualitative data</li> <li>• when handling quantitative data</li> </ul> <p>40-43% at A-level</p> <p><u>A03</u></p> <p>Analyse, interpret and evaluate scientific information, ideas and evidence, including in relation to issues, to:</p> <ul style="list-style-type: none"> <li>• make judgements and reach conclusions</li> </ul>	
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<p>aim to complete.</p> <p><u>Teacher 2 AG</u></p> <p>Unit 6 complete Nuclear and Particle Physics (2). Start Medical Imaging.</p> <p><u>Easter break</u></p> <p><u>Fifth half term</u></p> <p><u>Teacher 1 SQ</u></p> <p>Unit 5 complete and revision.</p> <p><u>Teacher 2 AG</u></p> <p>Unit 6 complete and revision. PAG 12 (research) review.</p>	<p><b><u>External exam details for end of U6th – start 20<sup>th</sup> May 2019.</u></b></p> <p><b>20-05-19: Modelling Physics (Paper1) Marks: 100</b>  <b>Duration:</b> 2 hours 15 mins  <b>Weighting:</b> 37%  Assesses content from modules 1, 2, 3 and 5</p> <p><b>24-05-19: Exploring Physics (Paper2) Marks: 100</b>  <b>Duration:</b> 2 hours 15 mins  <b>Weighting:</b> 37%  Assesses content from modules 1, 2, 4 and 6</p> <p><b>03-06-19: Unified physics (Paper3) Marks: 70</b>  <b>Duration:</b> 1 hour 30 mins  <b>Weighting:</b> 26%  Assesses content from all modules (1 to 6)</p> <p><b><i>Practical endorsement in physics (4) - L6th &amp; U6th Pass / Fail by April 2019. Non-exam assessment</i></b></p>			<ul style="list-style-type: none"> <li>• develop and refine practical design and procedures</li> </ul> <p>25-28% at A-level</p>	
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