

# St John's Curriculum Overview – Year 12

## Introduction

- Physics at St Johns is studied at **A-Level only**. We cover the **AQA Physics specification (7408)**
- Students work towards **three externally assessed written exams** in A-Level Physics. Paper 1: Sections 1-5 & 6.1 and is a combination of multiple choice, short and long answer questions. Paper 2: Sections 6.2, 7 & 8 as well as assumed knowledge from 1-5 & 6.1, and a combination of multiple choice, short and long answer. Paper 3: Practical skills, Data analysis and one of sections 9, 10, 11, 12 & 13.
- The specification has been written in a context-free style, allowing suitable contexts to be chosen.
- We allow each of options 9-12 (Astrophysics, Medical Physics, Engineering Physics and Turning Points in Physics) to take place in the same class, allowing students to start specialising.
- 40% of marks across the question papers will assess mathematical skills at higher tier GCSE level
- Practical work done to support teaching of the content will serve to cover the requirements of the practical skills module, which is assessed in **written examinations** and through the **Practical Endorsement**. This Practical Endorsement contains 5 different CPACs (Common Practical Assessment Criteria)

|                               |  |
|-------------------------------|--|
| <b>Subject title</b>          | <b>Physics</b>   |
| Setting arrangements          | Course entry requirements:<br>GCSE Maths 5 and<br>GCSE Physics 5 or<br>GCSE Combined<br>Science 55 |
| Time allowance each fortnight | 9 hours  |

## Topics, Content and Assessment covered during the course

| Term          | Teacher 1 topics and content   | Teacher 1 Assessment details  | Teacher 2 topics and content   | Teacher 2 Assessment details                                      |
|---------------|--|---|--|---|
| <b>Term 1</b> | Required Practical activity<br><b>1. Measurements &amp; their Errors (ME)</b><br>1.1 Use of SI units and their prefixes<br>1.2 Limitation of physical measurements<br>1.3 Estimation of physical quantities<br><b>2. Particles &amp; Radiation (PR)</b><br>2.1.1. Constituents of the atom<br>2.1.2 Stable and unstable nuclei<br>2.1.3 Particles, antiparticles and photons | Homework questions from booklet.<br>Tests: ME 1, PR 1<br>Required Practical 1:<br>Stationary Waves                  | <b>3. Waves (Wa)</b><br>3.1.1 Progressive waves<br>3.1.2 Longitudinal and transverse waves<br>3.2.3 Refraction at a plane surface<br>3.1.3 Principle of superposition of waves and formation of stationary waves | Homework questions from booklet.<br>Tests:<br>Wa 1, Wa 2, Wa 3    |
| <b>Term 2</b> | 2.1.4 Particle interactions<br>2.1.5 Classification of particles<br>2.1.6 Quarks and antiquarks<br>2.1.7 Applications of conservation laws<br>2.2.1 The photoelectric effect<br>2.2.2 Collisions of electrons with atoms   | Homework questions from booklet.<br>Tests: PR 2, PR 3, PR 4<br>Required Practical 2:<br>Young's slits & Diffraction | 3.2.1 Interference<br>3.2.2 Diffraction<br><b>4 Mechanics and materials (Me &amp; Ma)</b><br>4.1.1 Scalars and vectors<br>4.1.2 Moments  | Homework questions from booklet.<br>Tests:<br>Wa 4, Wa Full, Me 1 |

|               |  |   |  |   |
|---------------|--|---|--|---|
| <b>Term 3</b> | 2.2.3 Energy levels and photon emission<br>2.2.4 Wave-particle duality<br><b>5. Electricity (EI)</b><br>5.1.1. Basics of electricity<br>5.1.4. Circuits<br>5.1.2. IV characteristics | Homework questions from booklet.<br>Tests: PR 5, PR Full, EI 1<br>Required Practical 3: g by freefall                       | 4.1.3 Motion along a straight line<br>4.1.4 Projectile motion<br>4.1.5 Newton's laws of motion   | Homework questions from booklet.<br>Tests: Me 2                   |
| <b>Term 4</b> | 5.1.2. IV characteristics<br>5.1.3. Resistivity  | Homework questions from booklet.<br>Tests: EI 2<br>Required Practical 5: Resistivity<br>Required Practical 4: Young modulus | 4.1.7 Work, energy and power<br>4.1.8 Conservation of energy<br>4.1.6 Momentum<br>4.2.1 Bulk properties of solids<br>4.2.2 The Young modulus | Homework questions from booklet.<br>Tests:<br>Me 3, Me Full, Ma 1 |
| <b>Term 5</b> | 5.1.5. Potential dividers<br>5.1.6. Emf and r  | Homework questions from booklet.<br>Tests: EI 3<br>Required Practical 6: Emf & r  | <b>6.1.1 Circular motion (CM)</b>  | Homework questions from booklet.<br>Tests: CM 1                   |
| <b>Term 6</b> | <b>6.2 Thermal Physics (Th)</b><br>6.2.1. Thermal energy transfer  | Homework questions from booklet.<br>Tests: EI Full, EOY 12 exam<br>Required Prac: mop up                                    | <b>6.2 Thermal Physics (Th)</b><br>6.2.1. Thermal energy transfer  | Homework questions from booklet.<br>Tests: EOY 12 exam, CM 1      |

**Resources Recommended for Revision and where they are available:**

- AQA A level Physics textbook – various available online/book stores
- AQA A level Physics revision guide – various available online/book stores
- Mr Friend has every AQA past paper since 2001 (Physics and Maths tutor goes back to 2009)
- Use good **revision websites** (and suitable videos) to give an alternative wording to some explanations.

<http://www.physicsandmathstutor.com/past-papers/a-level-physics/>

**Homework:**

- Review the relevant **booklet** after each lesson using the relevant textbook pages
- Complete exam questions in the **booklet** and ready for the next lesson
- Do the **summary questions** in the textbook and check the answers
- Revise effectively for each test and exam
- Act upon feedback from all assessments

### **Additional support and help for the course**

- Once you know what areas of each topic you do not understand, do more past paper exam questions and revise those areas in your private study sessions.
- Ask your teachers for help!
- Attend the **year 12 revision sessions** which will run from Term 1. Dates and times will vary each year, ask your teacher.

### **Extra Curricular:**

- Physics Olympiad
- PAT tests
- Residential trip to CERN
- Supporting younger students in Science lessons
- Support running science club for year 7 students
- Overseas trip to the Gambia to teach science practical experiments to students in Africa