This document provides a definitive record of the main features of the programme and the learning outcomes that a typical student may reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities provided. This programme specification is intended as a reference point for prospective students, current students, external examiners and academic and support staff involved in delivering the programme and enabling student development and achievement.

<table>
<thead>
<tr>
<th>Programme Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programme Title</td>
</tr>
<tr>
<td>Award(s)</td>
</tr>
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<td>Programme Code</td>
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<tr>
<td>Associateship</td>
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<tr>
<td>Awarding Institution</td>
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<td>Teaching Institution</td>
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<td>Faculty</td>
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<td>Department</td>
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<tr>
<td>Main Location of Study</td>
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<td>Mode and Period of Study</td>
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<td>Cohort Entry Points</td>
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<td>Relevant Benchmark Statement(s) and/or other external reference points</td>
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<tr>
<td>Total Credits</td>
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<th>Specification Details</th>
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<tr>
<td>Student cohorts covered by specification</td>
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<tr>
<td>Person responsible for the specification</td>
</tr>
<tr>
<td>Date of introduction of programme</td>
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Programme Overview

The MSc in Physics is tailored to able BSc graduates who wish to deepen their knowledge of physics and who are looking to pursue a research career within a university, industrial or national research laboratory. The course is open to both physicists and students from mathematics, chemistry or engineering disciplines, provided they have a sufficiently strong physics and mathematics background.

The programme includes a wide selection of lecture modules, including modules from the Department’s specialised postgraduate programmes. There is a laboratory skills training component and a chance to undertake a self-study project in an area of choice.

F3U1: The MSc in Physics students finish with a three-month, full-time project, usually with one of the academic research groups.

F3U10: The MSc in Physics with Nanophotonics has two compulsory lecture modules in the autumn term (Imaging, Plasmonics & Metamaterials) and a further compulsory module in the spring term (Advanced topics in Nanophotonics). There is a chance to undertake a self-study project in nanophotonics. Students finish with a three-month, full-time project also on nanophotonics, usually with one of the academic research groups.

F3V1.1: The MSc in Physics with Quantum Dynamics has three compulsory lecture modules in the autumn term (Quantum Optics, Quantum Information, Quantum Systems I) and a further compulsory module in the spring term (Quantum Systems II). There is a chance to undertake a self-study project in quantum dynamics. Students finish with a three-month, full-time project on quantum dynamics, usually with one of the academic research groups.

F3U1R: MSc in Physics with Extended Research. The second academic year is devoted to an extended, independent research project. It is normally possible to transfer to or from the MSc in Physics in the first 6 months of the course.

Learning Outcomes

The Imperial Graduate Attributes are a set of core competencies which we expect students to achieve through completion of any Imperial College degree programme. The Graduate Attributes are available at: www.imperial.ac.uk/students/academic-support/graduate-attributes

MSc in Physics graduates will have:
- Acquired an understanding of selected areas of physics at the frontiers of knowledge, beyond the undergraduate level;
- Extended their knowledge of advanced mathematical methods;
- Received training in research skills and methodology;
- Experienced undertaking a major, individual, physics-related project and reporting the results in a full scientific report and oral and poster presentation;
- Developed communication skills, both written and oral, to specialised and non-specialised audiences.
F3U10: In addition, graduates will have:
- Undertaken an intellectually challenging and stimulating degree programme in nanophotonics;
- Been equipped for doctoral research in plasmonics, metamaterials, or in general nanoscale photonics.

F3V1.1: In addition, graduates will have:
- Undertaken an intellectually challenging and stimulating degree programme in quantum dynamics.
- Been equipped for doctoral research in atomic physics, quantum photonics, quantum information, or in general quantum physics.

<table>
<thead>
<tr>
<th>Entry Requirements</th>
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<tr>
<td><strong>Academic Requirement</strong></td>
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<td><strong>English Language Requirement</strong></td>
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The programme’s competency standards documents can be found at: [https://www.imperial.ac.uk/physics/students/current-students/taught-postgraduates/](https://www.imperial.ac.uk/physics/students/current-students/taught-postgraduates/)

<table>
<thead>
<tr>
<th>Learning &amp; Teaching Strategy</th>
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| **Scheduled Learning & Teaching Methods** | • Lectures  
• Problem classes  
• Practical work  
• E-learning |
| **E-learning & Blended Learning Methods** | • Blackboard  
• Panopto |
| **Project and Placement Learning Methods** | • Self-study project  
• Independent research project |

<table>
<thead>
<tr>
<th>Assessment Strategy</th>
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</table>
| **Assessment Methods** | • Examinations  
• Small projects  
• Written report  
• Oral presentation  
• Poster  
• Dissertation |

| Academic Feedback Policy |
The feedback policy will follow the guidelines of the Department of Physics, where feedback for minor pieces of coursework should be provided to the student within two weeks of the work being submitted. Feedback for major pieces of coursework should be provided within four weeks, though marks may not be available until after the Board of Examiners meeting.

Re-sit Policy

Students will be permitted to retake written examination on one occasion only. Students will not be permitted to retake practical classes and projects.

Mitigating Circumstances Policy

If the student has a serious problem affecting study, coursework or examinations, they must ensure that they inform both the Personal Tutor/Cohort Mentor and the Programme Director. These issues can range from health issues, physical or mental, acute or chronic and bereavement or financial hardship. The student should submit a mitigating circumstances form to their department within 5 working days of the assessment or coursework submission deadline. The form must be supported by appropriate documentation. A medical certificate is essential where illness affects an exam – telling someone afterwards is not sufficient. They must contact the Programme Director if a problem arises on the day of an exam.

### F3U1, F3U1R: Programme Structure

<table>
<thead>
<tr>
<th></th>
<th>Full-time</th>
<th>Autumn Term</th>
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<td>Projects</td>
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### F3U10: Programme Structure

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### Core Modules (Practical)

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### Elective Modules

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### Projects

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### Assessment Dates & Deadlines

<table>
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<tr>
<th>Written Examinations</th>
<th>January and May. Modules taken outside the MSci programme may have examinations at other times.</th>
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<tbody>
<tr>
<td>Coursework Assessments</td>
<td>Continuous</td>
</tr>
<tr>
<td>Project Deadlines</td>
<td>January and September [F3U1R January and June]</td>
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<tr>
<td>Practical Assessments</td>
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### Assessment Structure

### Marking Scheme

#### Final Degree Classifications

**Pass - a candidate must achieve:**

- A programme weighted final mark of 50% or higher, plus a weighted aggregate mark of at least 50% in the lecture modules, plus a weighted aggregate mark of at least 50%, with no individual mark below 40%, for the Research Skills module, the self-study project module and the independent research project.

**Merit - a candidate must achieve:**

- A programme weighted final mark of 60% or higher, plus a weighted aggregate mark of at least 50% in the lecture modules, plus a weighted aggregate mark of at least 50%, with no individual mark below 40%, for the Research Skills module, the self-study project module and the independent research project.

**Distinction - a candidate must:**

- A programme weighted final mark of 70% or higher, plus a weighted aggregate mark of at least 60% in the lecture modules, plus a weighted aggregate mark of at least 60%, with no individual mark below 40%, for the Research Skills module, the self-study project module and the independent research project.

**F3U1R** To advance to the second year, a student must achieve a weighted aggregate mark of 50% in both the Taught modules and the Practical modules, and pass all the practical modules with a mark of 40% or higher.
## Module Weightings: Physics

<table>
<thead>
<tr>
<th>Module</th>
<th>% Module Weighting</th>
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<tbody>
<tr>
<td>A module; if module has been covered at undergraduate study, then pick a module from group C</td>
<td>7.43%</td>
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<tr>
<td>B module; if module has been covered at undergraduate study, then pick a module from group C</td>
<td>7.43%</td>
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<tr>
<td>Elective modules to the value of 30 ECTS</td>
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<tr>
<td>Research Skills</td>
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<tr>
<td>Self-Study Project</td>
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<tr>
<td>Research Project</td>
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## Module Weightings: Physics with Nanophotonics

### Taught (52%)

<table>
<thead>
<tr>
<th>Module</th>
<th>% Module Weighting</th>
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</thead>
<tbody>
<tr>
<td>A module; if module has been covered at undergraduate study, then pick a module from group C</td>
<td>7.43%</td>
</tr>
<tr>
<td>B module; if module has been covered at undergraduate study, then pick a module from group C</td>
<td>7.43%</td>
</tr>
<tr>
<td>Imaging</td>
<td>7.43%</td>
</tr>
<tr>
<td>Plasmonics and Metamaterials</td>
<td>7.43%</td>
</tr>
<tr>
<td>Advanced Topics in Nanophotonics</td>
<td>7.43%</td>
</tr>
<tr>
<td>Elective modules to the value of 12 ECTS</td>
<td>7.43% each</td>
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<table>
<thead>
<tr>
<th>Module</th>
<th>% Module Weighting</th>
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<tbody>
<tr>
<td>Research Skills</td>
<td>6%</td>
</tr>
<tr>
<td>Self-Study Project</td>
<td>6%</td>
</tr>
<tr>
<td>Research Project</td>
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## Module Weightings: Physics with Quantum Dynamics

### Taught (52%)

<table>
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<tr>
<th>Module</th>
<th>% Module Weighting</th>
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<tbody>
<tr>
<td>A module; if module has been covered at undergraduate study, then pick a module from group C</td>
<td>7.43%</td>
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<tr>
<td>B module; if module has been covered at undergraduate study, then pick a module from group C</td>
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<tr>
<td>Module</td>
<td>% Module Weighting</td>
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<tr>
<td>Quantum Optics; if module has been covered at undergraduate study, then pick a module from group C</td>
<td>7.43%</td>
</tr>
<tr>
<td>Quantum Information; if module has been covered at undergraduate study, then pick a module from group C</td>
<td>7.43%</td>
</tr>
<tr>
<td>Quantum Systems I</td>
<td>7.43%</td>
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<tr>
<td>Quantum Systems II</td>
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<tr>
<td>Elective Modules to the value of 6 ECTS</td>
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**Practical (48%)**

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<tr>
<td>Self-Study Project</td>
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<td>Research Project</td>
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**Module Weightings: Physics with Extended Research**

<table>
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<th>Module</th>
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<tr>
<td>A module; if module has been covered at undergraduate study, then pick a module from group C</td>
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<tr>
<td>B module; if module has been covered at undergraduate study, then pick a module from group C</td>
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<td>PH3-ACP</td>
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<tr>
<td>PH9-TMTM</td>
<td>Mathematical Methods Physicists</td>
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<td>PH9-OIM</td>
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<td>PH9-MSTPM</td>
<td>Advanced Topics in Nanophotonics</td>
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<tr>
<td>PH4-PM</td>
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<tr>
<td>Quantum Systems I</td>
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<tr>
<td>Quantum Systems II</td>
<td>Elective (C) MScQD Core</td>
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<tr>
<td>Advanced Quantum Information</td>
<td>Elective (C) MScQD Core</td>
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<td>PH9-GRST</td>
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<tr>
<td>PH9-GSSP</td>
<td>Physics MSc Self-Study project</td>
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<td>PH9-GPROJ</td>
<td>Physics MSc Project</td>
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<td>PO3.6</td>
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<td>PT3.5</td>
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<td>PT3.1</td>
<td>Foundations of Quantum Mechanics</td>
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<td>Group Theory</td>
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<td>Light &amp; Matter</td>
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<td>PT3.4</td>
<td>Statistical Mechanics</td>
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<td>PT3.6</td>
<td>Complexity &amp; Networks</td>
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<td>PO3.3a</td>
<td>Lasers</td>
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<td>PO3.3b</td>
<td>Imaging and Biophotonics</td>
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<td>PO3.7a</td>
<td>Medical Imaging: X-Rays and Ultrasound</td>
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<tr>
<td>PO3.7b</td>
<td>Medical Imaging: Nuclear Diagnostics &amp; MRI</td>
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<tr>
<td>PO3.2</td>
<td>Plasma Physics</td>
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<td>PO3.5</td>
<td>Principles of Instrumentation</td>
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<td>PO4.10</td>
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<td>PO4.9</td>
<td>Advanced Hydrodynamics</td>
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<td>PO4.4b</td>
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<td>PO4.3</td>
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Please note that additional modules from outside the department as well as a range of specialist modules within the Department of Physics may be taken at the discretion of the Programme Director.
## Supporting Information

<table>
<thead>
<tr>
<th>Description</th>
<th>URL</th>
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<tbody>
<tr>
<td>The Programme Handbook is available at:</td>
<td><a href="http://www.imperial.ac.uk/natural-sciences/departments/physics/students/current-students/taught-postgraduates/">http://www.imperial.ac.uk/natural-sciences/departments/physics/students/current-students/taught-postgraduates/</a></td>
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<tr>
<td>The Module Handbook is available at:</td>
<td><a href="http://www.imperial.ac.uk/natural-sciences/departments/physics/students/current-students/taught-postgraduates/">http://www.imperial.ac.uk/natural-sciences/departments/physics/students/current-students/taught-postgraduates/</a></td>
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<tr>
<td>The College’s entry requirements for postgraduate programmes can be found at:</td>
<td><a href="http://www.imperial.ac.uk/study/pg/apply/requirements">www.imperial.ac.uk/study/pg/apply/requirements</a></td>
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<td>The College’s Quality &amp; Enhancement Framework is available at:</td>
<td><a href="http://www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance">www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance</a></td>
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<td>The College’s Academic and Examination Regulations can be found at:</td>
<td><a href="https://www.imperial.ac.uk/about/governance/academic-governance/regulations">https://www.imperial.ac.uk/about/governance/academic-governance/regulations</a></td>
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<tr>
<td>Imperial College is an independent corporation whose legal status derives from a Royal Charter granted under Letters Patent in 1907. In 2007 a Supplemental Charter and Statutes was granted by HM Queen Elizabeth II. This Supplemental Charter, which came into force on the date of the College’s Centenary, 8th July 2007, established the College as a University with the name and style of &quot;The Imperial College of Science, Technology and Medicine&quot;.</td>
<td><a href="http://www.imperial.ac.uk/admin-services/secretariat/college-governance/charters/charter-and-statutes/">http://www.imperial.ac.uk/admin-services/secretariat/college-governance/charters/charter-and-statutes/</a></td>
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<tr>
<td>Imperial College London is regulated by the Office for Students (OfS)</td>
<td><a href="https://www.officeforstudents.org.uk/">https://www.officeforstudents.org.uk/</a></td>
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