Programme Information		
Programme Title	Programme Code	HECoS Code
Optics and Photonics	F3U4 F3U424	For Registry Use Only

Award	Length of Study	Mode of Study	Entry Point(s)	Total Credits	
				ECTS	CATS
MSc -F3U4	1 calendar year (12 months)	Full-time	Annually in October	90	180
MSc – F3U424	2 calendar years (24 months)	Part-time	Annually in October	90	180
PG Diploma - F3U4D	N/A	N/A	*	60	120
PG Certificate - F3U4C	N/A	N/A	*	30	60
* The PG Certificate and PG Diploma are exit awards and are not available for entry. You must apply to and join the MSc.					

Ownership			
Awarding Institution	Imperial College London	Faculty	Faculty of Natural Sciences
Teaching Institution	Imperial College London	Department	Physics
Associateship	Diploma of Imperial College (DIC)	Main Location(s) of Study	South Kensington Campus
External Reference			
Relevant QAA Benchmark Statement(s) and/or other external reference points		N/A	
FHEQ Level		7	
EHEA Level		2nd Cycle	
External Accreditor(s) (if applicable)			
External Accreditor 1:	N/A		
Accreditation received:	N/A	Accreditation renewal:	N/A
Collaborative Provision			
Collaborative partner	Collaboration type	Agreement effective date	Agreement expiry date
N/A	N/A	N/A	N/A

Specification Details	
Programme Lead	Professor Christopher Dunsby Dr Mary Matthews Dr James McGinty Professor Mark Neil
Student cohorts covered by specification	2025-26 entry
Date of introduction of programme	October 01
Date of programme specification/revision	March 24

Programme Overview

Optics is of key importance as a scientific discipline in its own right, with applications in many industrial sectors including engineering, life sciences, medicine, ICT and high-tech manufacturing.

Imperial has offered an advanced programme in optics for over 90 years and the current MSc in Optics and Photonics draws on our experience as one of the largest centres for optics-based research and application in the UK.

The main coursework (i.e. lectures and laboratory work) takes place in the first two terms. The first term consists of practical laboratory work and three lecture-based modules that together provide a key grounding in some of the essential knowledge and skills underpinning optics. In the second term, you choose from a range of advanced topics at the forefront of current optical research and practice, and carry out a laboratory-based project to design and build a working optical system. There is also a chance to undertake a self-study project in an area of your choice. Your studies finish with a four-month, full-time Master's research project which is usually carried out in one of our academic research groups but may be with one of our industrial partners or, where appropriate arrangements can be made, abroad.

Graduates of this course are well qualified to apply their knowledge in a wide range of industrial contexts, as well as in a research environment. They find employment with a variety of careers in industry and many move on to doctoral studies at leading universities in the UK and around the world.

Learning Outcomes

On successful completion of the programme, our aim is that you will have achieved the following Learning Outcomes, based on the different activities, and be able to:

1) Use theoretical knowledge of the fundamental laws and principles of optics and photonics, and appropriate mathematical techniques applied to the physical world to solve real-world problems in optics.
2) Organise as part of a team the design, and execute safely, a series of experiments or computations, including the identification and use of appropriate specialist equipment.
3) Evaluate and select appropriate theoretical knowledge of optical principles and mathematical techniques to support practical work.
4) Model and simulate complete optical experiments and systems using appropriate specialist software.
5) Determine the strength and validity of results obtained from experiments, models or simulations, include appropriate consideration of errors, and draw conclusions.
6) Report the results of experimental work in writing.
7) Evaluate the inter-relationships between a range of complex/advanced topics in optics and photonics, and explain their application.
8) Critically examine the scientific literature to design an experimental, theoretical and/or computational investigation that extends current knowledge in the field.
9) Execute an extended research project, analyse the results and formulate new knowledge that can be applied to real-world situations.
10) Present the details of the research project, the work carried out, results and conclusions to a specialist audience orally and in writing.

Students not eligible for the MSc may be awarded alternative awards (see "Progression and Classification").

For the award of the PG Certificate (30 ECTS), students would achieve the learning outcomes 1-6.

For the award of the PG Diploma (60 ECTS) students would achieve the learning outcomes 1-8.

The Imperial Graduate Attributes are a set of core competencies which we expect students to achieve through completion of any Imperial degree programme. The Graduate Attributes are available at: www.imperial.ac.uk/about/education/our-graduates/

Entry Requirements	
Academic Requirement	The minimum requirement is normally a 2:1 UK Bachelor's Degree with Honours in Physics, Mathematics or Electrical Engineering (or a comparable qualification recognised by the university). For further information on entry requirements, please go to www.imperial.ac.uk/study/apply/postgraduate-taught/entry-requirements/
Non-academic Requirements	Applicants with relevant work experience (or a comparable qualification recognised by the university) will be considered on a case-by-case basis and in accordance with Imperial's MSc entry requirements.
English Language Requirement	Standard requirement (PG) Please check for other Accepted English Qualifications
Admissions Test/Interview	Borderline applicants, and those whose background and/or qualification is non-standard will be interviewed.

The programme's competency standards documents can be found at: www.imperial.ac.uk/media/imperial-college/faculty-of-natural-sciences/department-of-physics/public/students/current-students/pgt/FoNS-Competence-Standards---Physics-PGT.pdf

Learning & Teaching Approach

Learning and Teaching Delivery Methods

The programme is delivered using a range of methods including lectures and classworks, laboratory classes (including computational work) and directed supervision on projects. It may be possible for projects to be carried out partly or wholly at an external organisation and requests will be considered on a case by case basis.

Lectures are 50-minute oral presentations. The lecturer provides supporting material that may include notes, problem sheets and solutions and other resources. Learning is guided through classworks (where a timetabled session is used for a group problem solving exercise) and regular problem sheets. Lectures may be 'flipped', where recorded material is provided in advance of classwork and group exercises. All of the material that lecturers provide is available online via Blackboard. Lecturers provide office hours as informal drop-in question and answer sessions for students.

Practical/Laboratory is timetabled for a total of 160 hours over Term 1 and Term 2. Your first laboratory work will be short well-scripted experiments so that you can understand the operation of key optical experimental equipment, understand the basic procedures and the protocols of safe working in the laboratory and keep a good laboratory notebook. As your work develops in the laboratory your experiments will be less scripted and you will be expected to plan the progression of your experiment. Some of these experiments will involve computation, modelling or simulation. The last laboratory exercise will require you to design, build and test an optical system to address a given problem. In the laboratory you will work in a group of 2 or 3 students. You will write up your work individually, and you will be asked to write reports in a range of different formats that are routinely required in reporting scientific work.

You will complete 2 project exercises: a small self-study project which is carried out individually, and the main summer Master's research project which is carried out individually or in pairs.

The self-study project requires you to take a topic or subject area (this is selected from a list that is provided) and conduct a review of the scientific literature and provide a written report explaining the background to the topic, its development and its current status. Each topic has a member of staff assigned as the project supervisor and you are encouraged to meet regularly to discuss your progress and plans. The self-study project takes place over Term 2 and in the last week of that term you will submit your report and give a short oral presentation on your work.

Your summer Master's research project is chosen from a list of projects offered by staff, or you can propose your own (subject to us having appropriate resource to support it). Each project is supervised by a member of staff. Typically you will meet your project supervisor weekly, though it may vary depending on the nature of your project. You will begin your project work towards the end of May when all other activities are complete meaning that you can work full-time on your project for four months. At the end of the project you will submit a dissertation and give a short oral presentation.

Overall Workload

Your overall workload consists of scheduled contact time including lectures, classworks, laboratory and project work, and independent learning. While your actual contact hours may vary according to the elective modules you choose to study, the following gives an indication of how much time you will need to allocate to different activities at each level of the programme. At Imperial, each ECTS credit taken equates to an expected total study time of 25 hours. Depending on the combination of elective modules taken, you will normally accumulate either 90 or 92.5 ECTS for the MSc. Therefore, the expected total study time is 2250-2312.5 hours over entire MSc programme (including the summer). This is composed of approximately 1000-1062.5 hours associated with the taught modules, 375 hours associated with laboratory work and 875 hours associated with project work. Should you choose electives such that your total is 92.5 ECTS, the Programme Lead will discuss this with you so that you are aware of the additional workload.

Assessment Strategy

Assessment Methods

The assessment method is largely determined by the nature of the module.

Most lectured/taught modules are predominantly assessed summatively by written examinations in January and April/May, but some include assessed coursework and/or practical work.

Laboratory work is assessed by written reports. You will be asked to write these reports in different styles to reflect the different ways in which scientific work is reported. These are marked by staff before being returned to you.

Both the self-study project and summer Master's project are assessed by a written report (self-study approximately 6,000 words, research project 30,000 words) and short oral presentations (each of 20 minutes including questions).

This choice of assessments across the different activities ensures that the assessments are more evenly spread across the year, with regular deadlines for laboratory report submission across the terms, and written examinations coming after periods when there are no scheduled activities.

The balance of the different assessment also reflects the emphasis on laboratory and practical work. This table shows an indicative relative weighting of the different assessments over the programme. The exact balance will depend on your chosen electives.

Written examinations	44%
Laboratory work	17%
Project work (self-study + summer)	39%

Academic Feedback Policy

Feedback will be provided for all assessments carried out as part of this programme and takes many forms depending on the nature and learning outcomes of the module involved. Examples of feedback mechanisms include:

- Oral feedback to a group may be provided during or after lectures
- Oral feedback and guidance while you are working in the laboratory
- Personal feedback may follow from discussion with lecturers after lectures or during office hours

- Personal feedback from your project supervisors
- Personal feedback on your oral presentations
- Interactive feedback may follow from peer group discussion
- Written feedback may take the form of solutions to coursework or writing on formal reports
- Approximately 6 weeks into the Master's project you will give a short oral presentation on your progress and project plans which provides an opportunity for formative feedback

Other aspects of feedback come from taking time to think about what you do or do not understand well, and from other discussions with teaching staff, lab demonstrators, project supervisors and your classmates.

For formal summative assessment of coursework the university's policy is to provide formal feedback within 10 working days of submission for most exercises and the Department of Physics adheres to this policy. For any exceptions, you will be informed in advance of the coursework being set.

Imperial's Policy on Academic Feedback and guidance on issuing provisional marks to students is available at: www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/

Re-sit Policy
Imperial's Policy on Re-sits is available at: www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/

Mitigating Circumstances Policy
Imperial's Policy on Mitigating Circumstances is available at: www.imperial.ac.uk/about/governance/academic-governance/academic-policy/exams-and-assessment/

Additional Programme Costs		
This section should outline any additional costs relevant to this programme which are not included in students' tuition fees.		
Description	Mandatory/Optional	Approximate cost
N/A	N/A	N/A

Important notice: The Programme Specifications are the result of a large curriculum and pedagogy reform implemented by the Department and supported by the Learning and Teaching Strategy of Imperial College London. The modules, structure and assessments presented in this Programme Specification are correct at time of publication but might change as a result of student and staff feedback and the introduction of new or innovative approaches to teaching and learning. You will be consulted and notified in a timely manner of any changes to this document.

Programme Structure[1]

FHEQ Level 7
For the MSc, you will study all core and compulsory modules. Those that engage in the course part time will undertake all modules from Group A within the first year and the Group B modules in the second year. You choose elective modules to a total of 25 to 27.5 ECTS. The choice is free (there are no pre-requisites) but is subject to availability. You are advised to aim for a balance of taught modules in Term 1 and Term 2. Those that engage in the course part time should balance elective modules between first and second year of the programme.

Code	Module Title	Core/ Compulsory/ Elective	Group	Term	Credits
PHYS70024	Imaging	Compulsory	A	Autumn	5
PHYS70025	Lasers	Compulsory	A	Autumn	5
PHYS70026	Optical Measurement and Devices	Compulsory	B	Autumn	5
PHYS70027	Optics and Photonics Laboratory	Core	A	Autumn-Spring	15
PHYS70028	Self-Study Project	Core	A	Autumn	5
PHYS70034	Masters Research Project	Core	B	Summer	30
PHYS70007	Optical Communications Physics	Elective		Autumn	5
PHYS70010	Quantum Optics	Elective		Autumn	7.5
PHYS70029	Optical Design	Elective		Spring	5
PHYS70017	Laser Technology	Elective		Spring	7.5
PHYS70031	Biomedical Imaging	Elective		Spring	5
PHYS70032	Opto-electronic Devices	Elective		Spring	5
PHYS70033	Fibre and Ultrafast Lasers	Elective		Spring	5
				Credit Total	90-92.5

[1] **Core** modules are those which serve a fundamental role within the curriculum, and for which achievement of the credits for that module is essential for the achievement of the target award. Core modules must therefore be taken and passed in order to achieve that named award. **Compulsory** modules are those which are designated as necessary to be taken as part of the programme syllabus. Compulsory modules can be compensated. **Elective** modules are those which are in the same subject area as the field of study and are offered to students in order to offer an element of choice in the curriculum and from which students are able to select. Elective modules can be compensated.

Progression and Classification

Award and Classification for Postgraduate Students

Award of a Masters Degree
To qualify for the award of a postgraduate degree you must have:

1. accumulated credit to the value of no fewer than 90 credits at Level 7
2. and no more than 15 credits as a Compensated Pass;
3. met any specific requirements for an award as outlined in the approved programme specification for that award.

Classification of Postgraduate Taught Awards

The university sets the class of Degree that may be awarded as follows:

1. Distinction: 70.00% or above
2. Merit: 60.00% or above but less than 70.00%.
3. Pass: 50.00% or above but less than 60.00%.

For a Masters, your classification will be determined through:

- The Programme Overall Weighted Average meeting the threshold for the relevant classification band.

Your degree algorithm provides an appropriate and reliable summary of your performance against the programme learning outcomes. It reflects the design, delivery, and structure of your programme without unduly over-emphasising particular aspects.

Exit Degrees:

Award of a Postgraduate Certificate (PG Cert)
To qualify for the award of a postgraduate certificate a student must have a minimum of 30 credits at Level 7.

Award of a Postgraduate Diploma (PG Dip)
To qualify for the award of a postgraduate diploma a student must have passed modules to the value of no fewer than 60 credits at Level 7 (this may include no more than 10 credits as a Compensated Pass).

Programme Specific Regulations

N/A

Supporting Information
The Programme Handbook is available from the department.
The Module Handbook is available from the department.
Imperial's entry requirements for postgraduate programmes can be found at: www.imperial.ac.uk/study/pg/apply/requirements
Imperial's Quality & Enhancement Framework is available at: www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance
Imperial's Academic and Examination Regulations can be found at: www.imperial.ac.uk/about/governance/academic-governance/regulations
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This document provides a definitive record of the main features of the programme and the learning outcomes that you may reasonably be expected to achieve and demonstrate if you take full advantage of the learning opportunities provided. This programme specification is primarily intended as a reference point for prospective and current students, academic and support staff involved in delivering the programme and enabling student development and achievement, for its assessment by internal and external examiners, and in subsequent monitoring and review.