

## Programme Specification (PG)

Awarding body / institution:	Queen Mary University of London
Teaching institution:	Queen Mary University of London
Name of final award and programme title:	MSc Physics: Condensed Matter Physics
Name of interim award(s):	
Duration of study / period of registration:	1 calendar year
QMUL programme code(s):	F3S4
QAA Benchmark Group:	
FHEQ Level of Award:	Level 7
Programme accredited by:	
Date Programme Specification approved:	
Responsible School / Institute:	School of Physics and Astronomy

Schools / Institutes which will also be involved in teaching part of the programme:

Collaborative institution(s) / organisation(s) involved in delivering the programme:

University College London, Kings College London and Royal Holloway, University of London

Disclaimer: The availability of modules offered by KCL, UCL and RHUL are outside of QMUL's control and we cannot guarantee that all modules will be running each year.

### Programme outline

This is a one calendar year full-time MSc in Condensed Matter Physics. Although the MSc Physics streams are mainly distinguished by the 60 credit MSc project, there are also compulsory modules specified for each stream (see Programme structure section). Students can take 8 taught modules including one compulsory and seven electives from the modules available.

### Aims of the programme

The purpose of this programme is manifold: To allow students holding a (generic, e.g. BSc Physics) first degree to specialise in a particular area of Physics (condensed matter in the case of this stream). To train graduates in research skills suitable for both further (post-graduate research) studies and employment (e.g. industrial research). To enable students who did not gain a

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sufficiently high first degree classification (e.g. a second class degree) to continue with postgraduate studies.

**What will you be expected to achieve?**

Students successfully completing the programme will have a deep knowledge of advanced topics in physics, including a solid understanding of phase transition and the relation between Quantum Mechanics and the property of materials. The programme includes a one-term long project, supervised by one of the researchers in our School, that students can choose among a wide range of topics of current interest in condensed matter physics. This MSc programme will prepare a student for a PhD in condensed matter physics, but also more generally, for research and employment in fields that require excellent analytic skills and the ability to model complex systems.

Academic Content:	
A 1	Know the fundamental laws and physical principles, along with their applications, in a specific area of physics.
A 2	Manage their own research, making use of journal articles and other primary sources.
A 3	Communicate complex scientific ideas, concisely, accurately and informatively.
A 4	Use mathematical analysis to model physical behaviour and interpret the mathematical descriptions of physical phenomena.

Disciplinary Skills - able to:	
B 1	To solve advanced problems in physics using appropriate mathematical tools (to order of magnitude or more precisely as appropriate).
B 2	To plan and execute an investigation and to critically analyse the results, drawing valid conclusions.
B 3	To prepare a detailed technical report on their project and compare their results with published data ,expected outcomes or theoretical predictions.
B 4	To identify relevant physical principles and translate problems into mathematical statements.

Attributes:	
C 1	Acquire and apply knowledge in a rigorous way
C 2	Explain and argue clearly and concisely
C 3	Connect ideas and information within their field of study

C4	Critically evaluate the reliability of different sources of information
C5	Acquire substantial bodies of new knowledge

### How will you learn?

The majority of taught modules consist of three hour lecture blocks, with some modules incorporating substantial computer laboratory sessions. The project is undertaken within the "Condensed Matter and Materials Physics" research group at QMUL and uses computational, theoretical or laboratory methods as appropriate and may well involve additional, technical training. In all cases the project involves weekly one to one meetings with the supervisor.

### How will you be assessed?

The majority of taught modules are assessed by a final examination (typically 90% of the final mark) and by coursework (typically 10% of the final mark), although individual module mark schemes may vary from this. The compulsory MSc Physics project is assessed by the final written report (90% of the final mark) and student performance during the project (10% of the final mark).

### How is the programme structured?

Please specify the structure of the programme diets for all variants of the programme (e.g. full-time, part-time - if applicable). The description should be sufficiently detailed to fully define the structure of the diet.

The programme consists of 120 credits of taught modules (chosen from the list of approved modules) taken during semesters 1 and 2 (and examined during the May/June examination period) and a compulsory 60 credit MSc Physics Research Project (SPA7012P) undertaken during semesters 2 and 3. The MSc project will be based on a Condensed Matter Physics topic. In addition to the Condensed Matter Physics project, there is one compulsory taught module: SPA7008P Electronic Structure Methods

Students can pick from any of the level 7, 15 credit elective modules to the total of 120 credits:

INK7022P Mathematical Methods for Theoretical Physics  
INK7020P Lie Groups and Lie Algebras  
INR7007P Statistical Mechanics  
INU7001P Advanced Quantum Theory  
INU7067P Advanced Topics in Statistical Mechanics  
SPA7018P Relativistic Waves & Quantum Fields  
SPA7001P Advanced Quantum Field Theory  
SPA7024P Functional Methods in Quantum Field Theory  
SPA7031P Differential Geometry in Theoretical Physics  
SPA7029P Collider Physics  
INU7071P Galaxy Dynamics, Formation and Evolution  
INU7056P Advanced Physical Cosmology

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INU7003P Atom and Photon Physics  
 INK7048P Advanced Photonics  
 INU7022P Quantum Computation and Communication  
 INR7015P Quantum Electronics of Nanostructures  
 INU7014P Molecular Physics  
 INU7017P Particle Physics  
 INR7003P Particle Accelerator Physics  
 INK7066P Modelling Quantum Many-Body Systems  
 INU7016P Order and Excitations in Condensed Matter  
 INK7037P Theoretical Treatments of Nano-systems  
 INR7012P Physics at the Nanoscale  
 SPA7008P Electronic Structure Methods  
 INR7008P Superfluids, Condensates and Superconductors  
 INK7067P Advanced Condensed Matter  
 INK7032P Standard Model Physics and Beyond  
 INR7002P Nuclear Magnetic Resonance  
 INR7014P Statistical Data Analysis  
 INK7034P String Theory and Branes  
 INK7054P Supersymmetry  
 SPA7023P Stellar Structure and Evolution  
 SPA7005P Cosmology  
 SPA7019P Relativity and Gravitation  
 SPA7006P Electromagnetic Radiation in Astrophysics  
 INU7045P Planetary Atmospheres  
 INU7008P Solar Physics  
 SPA7022P Solar System  
 SPA7010P The Galaxy  
 SPA7004P Astrophysical Plasmas  
 INU7026P Space Plasma and Magnetospheric Physics  
 SPA7009P Extrasolar Planets & Astrophysical Discs  
 INK7051P Environmental Remote Sensing  
 INU7013P Molecular Biophysics  
 INK7068P Cellular Biophysics  
 INK7001P Theory of Complex Networks  
 INK7002P Equilibrium Analysis of Complex Systems  
 INK7004P Dynamical Analysis of Complex Systems  
 INK7005P Mathematical Biology  
 INK7003P Elements of Statistical Learning  
 SPA7028P Advanced Cosmology  
 SPA7029P Collider Physics  
 SPA7031P Supersymmetric Methods in Theoretical Physics  
 INR7018P Computer Simulation in Condensed Matter  
 INK7069P Dark Matter and Dark Energy  
 SPA7032P Introduction to Strings and Branes (N.B. From September 2018)  
 INU7089P Physical Models of Life  
 Plus any new level 7 modules belonging to SPA and the intercollegiate programme.

Academic Year of Study

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester
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Programme Title: MSc Physics: Condensed Matter Physics

Module Title	Module Code	Credits	Level	Module Selection Status	Academic Year of Study	Semester

### What are the entry requirements?

The entrance requirements would require students to have at least an upper second class degree in Physics or closely related discipline; in exceptional circumstances students may be admitted with a lower second class degree. Students would have to achieve at least 6.5 IELTS score and the equivalent in the relevant TOEFL assessment. This is in line with the current Science and Engineering requirements.

### How will the quality of the programme be managed and enhanced?

### How do we listen to and act on your feedback?

The Staff-Student Liaison Committee provides a formal means of communication and discussion between Schools and its students. The committee consists of student representatives from each year in the school/institute together with appropriate representation from staff within the school/institute. It is designed to respond to the needs of students, as well as act as a forum for discussing programme and module developments. Staff-Student Liaison Committees meet regularly throughout the year. Each school operates a Learning and Teaching Committee, or equivalent, which advises the School/Institute Director of Taught Programmes on all matters relating to the delivery of taught programmes at school level including monitoring the application of relevant QM policies and reviewing all proposals for module and programme approval and amendment before submission to Taught Programmes Board. Student views are incorporated in this Committee's work in a number of ways, such as through student membership, or consideration of student surveys.

All schools operate an Annual Programme Review of their taught undergraduate and postgraduate provision. The process is normally organised at a School-level basis with the Head of School, or equivalent, responsible for the completion of the school's Annual Programme Reviews. Schools/institutes are required to produce a separate Annual Programme Review for undergraduate programmes and for postgraduate taught programmes using the relevant Undergraduate or Postgraduate Annual Programme Review pro-forma. Students' views are considered in this process through analysis of the NSS and module evaluations.

### What academic support is available?

The students will be allocated an academic advisor as well as a project supervisor. Weekly project supervision meetings are expected.

### Programme-specific rules and facts

### Specific support for disabled students

Queen Mary has a central Disability and Dyslexia Service (DDS) that offers support for all students with disabilities, specific learning difficulties and mental health issues. The DDS supports all Queen Mary students: full-time, part-time, undergraduate, postgraduate, UK and international at all campuses and all sites.

Students can access advice, guidance and support in the following areas:

- Finding out if you have a specific learning difficulty like dyslexia
- Applying for funding through the Disabled Students' Allowance (DSA)
- Arranging DSA assessments of need
- Special arrangements in examinations
- Accessing loaned equipment (e.g. digital recorders)
- Specialist one-to-one "study skills" tuition
- Ensuring access to course materials in alternative formats (e.g. Braille)
- Providing educational support workers (e.g. note-takers, readers, library assistants)
- Mentoring support for students with mental health issues and conditions on the autistic spectrum.

### Links with employers, placement opportunities and transferable skills

The School has a dedicated SEPnet Employer Engagement Officer who provides links between students and industry, arranging work placement opportunities.

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## Programme Specification Approval

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**Person completing Programme Specification:**

Dr Rodolfo Russo

**Person responsible for management of programme:**

Dr Rodolfo Russo

**Date Programme Specification produced / amended by School / Institute Learning and Teaching Committee:**

17 January 2019

**Date Programme Specification approved by Taught Programmes Board:**