

LOUGHBOROUGH UNIVERSITY

Regulations for the Honours Degree Programmes in

Physics and Mathematics

These Programme regulations refer to the conduct of this programme in the Session 2010/2011 and should be read in conjunction with University Regulation XX and the relevant Module Specifications. Notice of change will be given by the Department responsible for the programme.

1. Structure

- (1) Administrative responsibility for the programmes rests with the Department of Physics.
- (2) The programmes lead to the award of BSc or MPhys.
- (3) (a) The duration of the BSc programme is either 6 semesters or 8 semesters. Students opting to take eight semesters are required to spend the year following Part B either (a) on an approved course of study at a University abroad or (b) undertaking professional training. These lead to the award of the Diploma in International Studies or the Diploma in Industrial Studies respectively in accordance with Senate Regulation XI.

(b) The duration of the MPhys programme is either 8 semesters or 10 semesters. Students opting to take ten semesters are required to spend the year following Part B either (a) on an approved course of study at a University abroad or (b) undertaking professional training. These lead to the award of the Diploma in International Studies or the Diploma in Industrial Studies respectively in accordance with Senate Regulation XI.

2. Content

(1) *Part A - Introductory Modules*

Semesters 1 and 2

COMPULSORY MODULES (total modular weight 40)

Code	Title	Modular Weight
MAA340	Calculus (continues in Semester 2)	20
MAA342	Linear Algebra (continues in Semester 2)	20

Semester 1

COMPULSORY MODULES (total modular weight 40)

Code	Title	Modular Weight
MAA141	Geometry, Vectors & Complex Numbers	10
PHA101	Mechanics	10

PHA102	Electricity & Magnetism	10
PHA190	Information Skills	10

Semester 2

COMPULSORY MODULES (total modular weight 40)

Code	Title	Modular Weight
MAA255	Differential Equations	10
PHA201	Atomic and Thermal Physics	10
PHA202	Light	10
PHA285	Physics Laboratory	10

(2) **Part B - Degree Modules****Semester 1**

(i) COMPULSORY MODULES (total modular weight 60)

Code	Title	Modular Weight
MAB150	Vector Calculus	10
MAB160	Numerical Methods 1	10
PHB101	Waves	10
PHB106	Nuclear Physics	10
PHB110	Solid State Physics	10
PHB185	Joint Physics Laboratory	10

Semester 2

(i) COMPULSORY MODULES (total modular weight 60)

Code	Title	Modular Weight
MAA241	Sequences and Series	10
MAA270	Introduction to Probability Statistics	10
MAB240	Fourier Analysis & Partial Differential Equations	10
PHB201	Fields	10
PHB202	Quantum Mechanics 1	10
PHB203	Thermal Physics	10

(3) **Part I**

BSc candidates opting to take eight semesters and MPhys candidates opting to take ten semesters are required to take either (a) an approved course of study at a University abroad or (b) professional training.

(4) **Part C of the BSc programme - Degree Modules****Semester 1**

(i) COMPULSORY MODULES

Code	Title	Modular Weight
MAC300	BSc Mathematics Project (<i>continues into semester 2</i>)	20
Or		
PHC388	Physics Project (<i>continues into semester 2</i>)	30
PHB106	Nuclear Physics (if not taken in Part B)	10

(ii) OPTIONAL MODULES

Code	Title	Modular Weight
MAB170	Probability Theory	10
MAC148	Introduction to Dynamical Systems	10
MAC150	Inviscid Fluid Mechanics	10
MAC175	Operational Research	10
MAC196	Special Relativity	10
MAC197	Introduction to Differential Geometry	10
PHC108	Modern Optics	10
PHC214	Condensed Matter Physics (Continues in Semester 2)	10 of 20
PHC112	Quantum Physics	20
PHC118	Electromagnetism	10
PHC120	Surface Physics, Thin Films and High Vacuum	10
PHC130	Fundamentals of Quantum Information	10
PHD102	Cosmology	10
PHD105	Classical Mechanics	10

Choose options of total modular weight either 40 or 50 from this list
You may take no more than a total of 30 credits of Part B modules in Part C.

Semester 2

Code	Title	Modular Weight
MAC300	BSc Mathematics Project (<i>continued from semester 1</i>)	20
Or		
PHC388	Physics Project (<i>continued from semester 1</i>)	30

(ii) OPTIONAL MODULES

Code	Title	Modular Weight
MAB250	ODEs and Calculus of Variations	10
MAB270	Statistical Modelling	10

MAC249	Linear Differential Equations	10
MAC251	Vibrations and Waves	10
MAC272	Random Processes and Time Series Analysis	10
MAC297	Mathematical Biology	10
MAC298	Elements of Topology	10
PHC207	Climate Physics	10
PHC213	Statistical and Low Temperature Physics	20
PHC214	Condensed Matter Physics (Continued from Semester 1)	10 of 20
PHD203	Disorder	10
PHD205	Elementary Particle Physics	10
PHD230	Quantum Computing	10
DSC023	Studies in Science and Mathematics Education	10

Choose options of total modular weight either 40 or 50 from this list.

In Part C, students must take a total modular weight of 120 of which at least a modular weight 40 must be MA options and at least a modular weight 40 must be PH options **and no more than three Part B modules.**

(4) **Part C of the MPhys programme - Degree Modules**

Semester 1

(i) COMPULSORY MODULE (total modular weight 30)

Code	Title	Modular Weight
PHB106	Nuclear Physics (if not taken in Part B)	10
PHC112	Quantum Physics	20

(ii) OPTIONAL MODULES

Code	Title	Modular Weight
MAB170	Probability Theory	10
MAC145	Linear Differential Equations	10
MAC150	Inviscid Fluid Mechanics	10
MAC175	Operational Research	10
MAC196	Special Relativity	10
PHC108	Modern Optics	10
PHC120	Surfaces, Thin Films and High Vacuum	10
PHC130	Fundamentals of Quantum Information	10
PHD102	Cosmology	10
PHC214	Condensed Matter Physics (Continues in Semester 2)	10 of 20

Choose options from this list to make up a total modular weight of 60.

Semester 2

(i) COMPULSORY MODULES

NONE

(ii) OPTIONAL MODULES

Code	Title	Modular Weight
MAB270	Statistical Modelling	10
MAB260	Numerical Methods 2	10
MAC297	Mathematical Biology	10
PHC207	Climate Physics	10
PHC213	Statistical and Low Temperature Physics	20
PHC214	Condensed Matter Physics (Continued from Semester 1)	10 of 20
PHD205	Elementary Particle Physics	10
PHD230	Quantum Computing	10
DSC010	Studies in Science and Mathematics Education	10

Choose options from this list to make up a total modular weight of 60.

In Part C, students must take MA modules to a modular weight of at least 40 and PH modules to a modular weight of at least 40. Students may not choose modules that they have already taken in Part B. Students may also choose modules of weight not more than 20 from the University module catalogue. The modules chosen are subject to the approval of the Programme Tutor.

(4) **Part D of the MPhys programme - Degree Modules****Semester 1**

COMPULSORY MODULE

Code	Title	Modular Weight
PHD188	Physics Research Project (continues into semester 2)	60
Or		
MAD300	Mathematics Research Project (continues into semester 2)	30

OPTIONAL MODULES

Code	Title	Modular Weight
MAD102	Regular and Chaotic Dynamics	15
MAP102	Programming and Numerical Methods	15
MAP111	Mathematical Modelling of Industrial Problems 1	15
PHD102	Cosmology	10
PHD401	Applied Superconductivity and Nanoscience	10
PHD170	Literature Project	10
PHD104	Modern Magnetism	10

Semester 2

COMPULSORY MODULE

Code	Title	Modular Weight
PHD188	Physics Research Project (continued from semester 1)	
Or		
MAD300	Mathematics Research Project (continued from sem. 1)	

OPTIONAL MODULES

Code	Title	Modular Weight
PHD219	Quantum Theory of Solids	10
PHD170	Literature Project	10
PHD204	Superconductivity and Colossal Magnetoresistance Materials	10
MAP202	Static and Dynamic Optimisation	15
MAP211	Mathematical Modelling of Industrial Problems 2	15
MAP213	Fluid Mechanics	15

PHD170 may be taken in EITHER Semester 1 or Semester 2 (not both).

Choose PHD188 or MAD300. In Part D students must take modules giving a total modular weight of 120, including at least modular weight 100 of D and P code modules, at least 20 of MA modules and at least 20 of PH modules. Students taking PHD188 should take at least a modular weight 20 of options in each semester; those taking MAD300 should take at least a modular weight 40 of options in each semester. **Students must take at least 60 credits of PH modules in Part D.** Exceptionally the Programme Tutor may give permission for a division of options between semesters that falls outside these limits. Students should balance the overall amount of work they have to do in each semester by splitting their project work accordingly.

3. Assessment

Criteria for Progression and Degree Award

Candidates must achieve the minimum credit requirements set out in Regulation XX in order to progress through the programme and qualify for the award of the degree.

To progress from Part A to Part B, candidates must also achieve a mark of at least 30% in all modules.

To progress from Part B to Part C of the MPhys programme, candidates must achieve a mark of 50% averaged over all modules and a minimum mark of 30% in all modules. A candidate who fails to achieve this, after any reassessment, but who has achieved 100 credits in Part B may progress to Part C of the BSc programme.

To progress from Part C to Part D MPhys candidates must achieve a mark of at least 30% in all modules.

Relative Weighting of Parts of the Programme for the purposes of Final Degree Classification

Candidates' final degree classification will be determined on the basis of their performance in degree level Module Assessments in Parts B, C and D, in accordance with the scheme set out in Regulation XX.

BSc programme: The average percentage marks for each Part will be combined in the ratio Part B 40 : Part C 60 to determine the Programme Mark.

MPhys programme: The average percentage marks for each Part will be combined in the ratio Part B 20 : Part C 40 : Part D 40 to determine the Programme Mark.

Re-assessment

Provision will be made in accordance with Regulation XX for candidates who have the right of re-assessment in Part A or Part B of the BSc programme or Parts A, B or C of the MPhys programme to undergo re-assessment in the University's special assessment period.

MPhys candidates who fail, after any re-assessment, at the end of Part C or Part D

At the discretion of the Programme Board any such candidate who has satisfied the credit requirements for BSc Physics and Mathematics may be awarded that degree, the classification being based on the average marks obtained in Parts B and C in exactly the same way as for the BSc degree.