

LOUGHBOROUGH UNIVERSITY

Regulations for the Honours Degree Programmes in MPhys Physics, BSc Physics, MPhys Engineering Physics, BSc Engineering Physics

These programme regulations refer to the conduct of these programmes 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 degree programmes are structured as follows:

(i) The BSc programmes

The programmes lead to the award of BSc.

The duration of each programme is either six semesters or eight 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 awards of the Diploma in International Studies or the Diploma in Industrial Studies respectively in accordance with Senate Regulation XI.

(ii) The MPhys programmes

The programmes lead to the award of MPhys.

The duration of each programme is either eight semesters or ten 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 awards 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****Semester A1****(i) COMPULSORY CORE MODULES (total modular weight 50)**

Code	Title	Modular Weight
MAA108	Mathematics for Physics 1	10
PHA101	Mechanics	10
PHA102	Electricity & Magnetism	10
PHA181	Physics Laboratory 1	10
PHA190	Information Skills	10

(ii) ADDITIONAL MODULES (total modular weight 10)

Code	Title	Modular Weight
PHA170	Astronomy	10

Choose either PHA170 or another module, of modular weight 10, from the University's undergraduate module catalogue.

Semester A2**(i) COMPULSORY CORE MODULES (total modular weight 50)**

Code	Title	Modular Weight
MAA208	Mathematics for Physics 2	10
PHA201	Atomic & Thermal Physics	10
PHA202	Light	10
PHA282	Physics Laboratory 2	10
PHA290	Computing	10

(ii) ADDITIONAL MODULES (total modular weight 10)

Code	Title	Modular Weight
PHA210	History and Philosophy of Science	10

Choose either PHA210 or another module, of modular weight 10, from the University's undergraduate module catalogue.

(2) Part B - Degree Modules**Semester B1****(i) COMPULSORY CORE MODULES (total modular weight 50)**

Code	Title	Modular Weight
MAB108	Mathematics for Physics 3	10
PHB101	Waves	10
PHB106	Nuclear Physics	10
PHB110	Solid State Physics	10
PHB180	Physics Laboratory 3	10

(ii) ADDITIONAL MODULES (total modular weight 10)

Code	Title	Modular Weight
MMB300	Engineering Computation (runs over Semester 1 and Semester 2)	10

Choose either MMB300 or another degree level module, of modular weight 10, from the University's undergraduate module catalogue.

Semester B2**(i) COMPULSORY CORE MODULES (total modular weight 50)**

Code	Title	Modular Weight
PHB201	Fields	10
PHB202	Quantum Mechanics 1	10
PHB203	Thermal Physics	10
PHB207	Electronics	10
PHB280	Electrical Measurements Laboratory	10

(ii) ADDITIONAL MODULES (total modular weight 10)

Code	Title	Modular Weight
PHB230	Science of the Internet and Networks in Nature and Society	10
PHB250	Business Skills for Scientists	10
MAB208	Mathematics for Physics 4	10

For *MPhys Physics* students, MAB208 is compulsory. BSc students can choose a module from this list or a degree level module, of modular weight 10, from the University's undergraduate module catalogue.

(3) **Part I of the BSc and MPhys programmes**

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 programmes - Degree Modules****Semester C1**(i) **COMPULSORY CORE MODULES (total modular weight 30)**

Code	Title	Modular Weight
PHC388	Physics Project (<i>continues into semester 2</i>)	30

The project workload can be split between semesters in the ratio 20:10 or 10:20; students should choose the ratio which gives them an equal overall amount of work in each semester.

(ii) **ADDITIONAL MODULES***(a) BSc Physics*

Code	Title	Modular Weight
PHC214	Condensed Matter Physics (continues in Semester 2)	10 of 20
PHC108	Modern Optics	10
PHC112	Quantum Physics	20
PHC118	Electromagnetism	10
PHC120	Surfaces, Thin Films and High Vacuum	10
PHC130	Fundamentals of Quantum Information	10
PHD102	Cosmology	10
PHD105	Classical Mechanics	10
MAC150	Inviscid Fluid Mechanics	10
MAC196	Special Relativity	10

Choose additional modules from this list, and from degree level modules in the University's undergraduate module catalogue, to make up a total modular weight of 40 or 50. In Part C, students must take a total modular weight of 120 which may include up to a total modular weight of 20 in degree level modules not specifically listed in these regulations as available in Part C of the BSc Physics programme, and no more than 30 credits of Part B modules.

(b) BSc Engineering Physics

Choose modules from the BSc Physics list above, and from available engineering modules, to give a total modular weight of 40 or 50. In Part C, students must take a total modular weight of 120 which must include a combination of engineering modules, totalling a modular weight of at least 40. Students may choose no more than 30 credits of Part B

modules in part C. An “engineering module” will normally be a module offered by a department in the Faculty of Engineering or by the Department of Materials.

Semester C2

(i) COMPULSORY CORE MODULES

Code	Title	Modular Weight
PHC388	Physics Project (<i>continued from semester 1</i>)	

(ii) ADDITIONAL MODULES

(a) BSc Physics

Code	Title	Modular Weight
PHC214	Condensed Matter Physics (continued from Semester 1)	10 of 20
PHC207	Climate Physics	10
PHC213	Statistical and Low Temperature Physics	20
PHD205	Elementary Particle Physics	10
PHD230	Quantum Computing	10
DSC023	Studies in Science and Mathematics Education	10

Choose modules from this list, and from degree level modules in the University's undergraduate module catalogue, to make up a total modular weight of 40 or 50. In Part C, students must take a total modular weight of 120 which may include up to a total modular weight of 20 in degree level modules not specifically listed in these regulations as available in Part C of the BSc Physics programme. Students may take no more than 30 credits of Part B modules in Part C.

(b) BSc Engineering Physics

Choose modules from the BSc Physics list above, and from available engineering modules, to give a total modular weight of 40 or 50. In Part C, students must take a total modular weight of 120, which must include a combination of engineering modules totalling a modular weight of at least 40. Students may take no more than 30 credits of Part B modules in Part C.

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

Semester 1

(i) COMPULSORY MODULES (total modular weight 40)

Code	Title	Modular Weight
PHC214	Condensed Matter Physics (Continues in Semester 2)	10 of 20
PHC112	Quantum Physics	20
PHD180	Advanced Physics Laboratory	20

(ii) ADDITIONAL MODULES

Code	Title	Modular Weight
MAB160	Numerical Methods 1	10

Choose modules to make up a total modular weight of 10, 20 or 30 from MAB160, from the Additional Modules available in Part C of BSc Physics, and from other degree level modules in the University's undergraduate module catalogue. In Part C, students must take a total modular weight of 120 which may include up to a total modular weight of 20 in degree level modules not specifically listed in these regulations as Additional Modules available in Part C of the MPhys Physics or BSc Physics programmes.

Semester 2

(i) COMPULSORY MODULES (total modular weight 40)

Code	Title	Modular Weight
PHC214	Condensed Matter Physics (Continued from Semester 1)	10 of 20
PHC213	Statistical and Low Temperature Physics	20

(ii) ADDITIONAL MODULES

Code	Title	Modular Weight
MAB260	Numerical Methods 2	10
MAB250	ODEs and Calculus of Variations	10

Choose modules to make up a total modular weight of 10, 20 or 30 from those listed here or from other degree level modules in the University's undergraduate module catalogue. In Part C, students must take a total modular weight of 120 which may include up to a total modular weight of 20 in degree level modules not specifically listed in these regulations as Additional Modules available in Part C of the MPhys Physics or BSc Physics programmes.

(6) **Part C of the MPhys Engineering Physics programme - Degree Modules****Semester 1**

(i) COMPULSORY MODULES (total modular weight 20)

Code	Title	Modular Weight
PHD180	Advanced Physics Laboratory	20

(ii) Choose a total modular weight of 40 from available engineering modules and from the Additional Modules lists for Part C BSc Physics and Part C MPhys Physics. Students who do not take PHC112 in Part C must take it in Part D. In Part C, students must take a total modular weight of 120, which must include a combination of engineering modules totalling a modular weight of at least 40. An "engineering module" will normally be a module offered by a department in the Faculty of Engineering or by the Department of Materials.

Semester 2

(i) COMPULSORY MODULE

There are no compulsory modules in this semester

- (ii) Choose a total modular weight of 60 from available engineering modules and from the Additional Modules lists for Part C BSc Physics and Part C MPhys Physics. In Part C, students must take a total modular weight of 120, which must include a combination of engineering modules totalling a modular weight of at least 40. An “engineering module” will normally be a module offered by a department in the Faculty of Engineering or by the Department of Materials.

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

(i) COMPULSORY MODULES (total modular weight 60)

Code	Title	Modular Weight
PHD188	Physics Research Project (continues into semester 2)	60

(ii) ADDITIONAL MODULES

Code	Title	Modular Weight
PHD401	Applied Superconductivity and Nanoscience	10
PHD170	Literature Project	10
PHD104	Modern Magnetism	10
PHD105	Classical Mechanics	10
PHP175	Econophysics	20

Semester 2

(i) COMPULSORY MODULES

Code	Title	Modular Weight
PHD188	Physics Research Project (continued from semester 1)	

(ii) ADDITIONAL MODULES

Code	Title	Modular Weight
PHD219	Quantum Theory of Solids	10
PHD204	Superconductivity and Colossal Magnetoresistance Materials	10
MAC295	Order and Chaos	10
MAC297	Mathematical Biology	10

PHD170 Literature Project

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

Over the four semesters of Parts C and D, students must take a modular weight 120 of D and P code modules. Modules may be taken from the BSc Part C or MPhys Part D list. With the approval of the Programme Tutor, up to a modular weight of 20 may be chosen from other degree level modules listed in the undergraduate module catalogue. Students should take at least a modular weight 20 of options in each semester and balance the overall amount of work they have to do in each semester by splitting their project work accordingly. Exceptionally, the Programme Tutor may give permission for a more uneven division of options between semesters. At least 60 credits of PH modules must be taken.

(8) **Part D of the MPhys Engineering Physics programme - Degree Modules**

Semester 1

COMPULSORY MODULES (total modular weight 60)

Code	Title	Modular Weight
PHD188	Physics Research Project (continues into semester 2)	60

Semester 2

COMPULSORY MODULES

Code	Title	Modular Weight
PHD188	Physics Research Project (continued from semester 1)	

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

Over the four semesters of Parts C and D, students must take a modular weight 120 of D and P code from modules listed anywhere in Parts C and D of these regulations and from available engineering modules. In Part D at least a modular weight of 30 should come from engineering modules. **Students must take at least 60 credits of Physics modules in Part D.**

Students should take at least a modular weight 20 of options in each semester and balance the overall amount of work they have to do in each semester by splitting their project work accordingly. Exceptionally, the Programme Tutor may give permission for a more uneven division of options between semesters.

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, all candidates must also achieve a minimum mark of 30% in all modules listed as compulsory modules.

MPhys candidates must, in addition, satisfy the following criteria:

- (1) In order to progress from Part B to Part C, a mark of at least 30% must be achieved in all modules and the overall average mark must be at least 50%.
- (2) In order to progress from Part C to Part D, a mark of at least 30% must be achieved 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 and C (and D for MPhys candidates), in accordance with the scheme set out in Regulation XX. The average percentage marks for each Part will be combined in the ratio specified in the following table

BSc candidates	Part B : Part C	40 : 60
MPhys candidates	Part B : Part C : Part D	20 : 40 : 40

to determine the overall average percentage mark for the Programme (the Programme Mark).

Re-assessment

Provision will be made in accordance with Regulation XX for those candidates who have the right of re-assessment in Part A or Part B of these programmes to undergo re-assessment in the University's special assessment period. The same provision will be made for candidates who have the right of re-assessment in Part C of the MPhys programmes.

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 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.