

LOUGHBOROUGH UNIVERSITY

DEPARTMENT OF PHYSICS

PROGRAMME HANDBOOK

for

MPhys/BSc Physics and Mathematics

This document is for guidance purposes only. Students should always consult the current version of the Programme Regulations.

2011/12

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1. Introduction

We welcome you to the University and give you our best wishes for a rewarding time here.

This document tells you the minimum you need to know, as a first year student, about the degree content of the *Physics and Mathematics* (PMA) *degree programmes*. The *BSc programme, Physics and Mathematics*, is of three years' duration, or four with industrial training or study abroad. The *MPhys programme Physics and Mathematics (Extended)* is of four years duration, or five with industrial training or study abroad. This document will be updated each year; the current version can be downloaded from

<http://www.lboro.ac.uk/departments/ph/teaching/docs.html>.

The Department of Physics is responsible for the administration of this programme, which is taught jointly by the Department of Physics (PH) and the Mathematical Sciences department (MA). In the next few pages you will find a list of those people most concerned with the administration of the programmes our *Aims and Intended Learning Outcomes* (what we hope you will get out of your time here) and a brief description of the content of each year. The *Programme Regulations* define the structure and content of the programme, and the *Module Specifications* describe the content of each module in more detail.

2. Sources of information

You will either be given the following, or will be able to access them through the Physics department web site <http://www.lboro.ac.uk/departments/ph/> Bookmark them now!

Your Programme Handbook

This is the current document. It tells you about your programme.

The Physics Department Handbook

This was given to you at induction. It gives information that is of common interest to students on all the Department's programmes.

The above two documents can be accessed from the Physics web site at

<http://www.lboro.ac.uk/departments/ph/teaching/docs.html>

"Welcome to Loughborough University" Booklet

This was sent to you before you arrived at Loughborough.

Programme Regulations

These specify the requirements for all years of the degree programme: which modules are compulsory, which options are available, what you need to do to pass, etc. The details (such as option choices) will change from year to year, and the current version is accessible from the Physics web site.

Programme specifications

These have further information about each degree programme and how the knowledge and skills you will acquire are delivered.

Module specifications ("modspecs")

These give the content for each module, the intended learning outcomes (what we expect you will get out of the module), a partial reading list and other useful information. You have the modspecs for the modules you will be taking this year in your folder. You can consult the full list of the University's modules at <http://lusi.lboro.ac.uk/epublic/wp5015.main>

The Learn server

Resources for many of your modules are on the web at <http://learn.lboro.ac.uk/>, or will be placed there as the semester progresses.

The Student Handbook

This is on the web at <http://www.lboro.ac.uk/admin/ar/student/handbook/index.htm>. It covers the University's facilities, regulations and policies. You will need to look at this.

The Study Guide

This is produced by Professional Development. It is available on the web at

http://www.lboro.ac.uk/service/ltd/st_guide.htm.

The Web

The University and the Physics Department have put a lot of useful information for students on the Web. The two most useful places to start are

<http://www.lboro.ac.uk/students/index.html> (for University information)

<http://www.lboro.ac.uk/departments/ph> (for Department information)

Networked PCs are available in W2.75, the library and, 24 hours a day, in various other places around campus.

3. Communication between staff and students

It's good to talk

A good time to catch members of staff is at the end of one of their lectures or in a teaching laboratory. If that is not convenient, then go and knock on their office doors and discuss your question or make an appointment; if they are not in, and leave a message by email, under the office door or in the General Office (W212). Staff timetables are often placed on staff office doors and will also be in the General Office.

Electronic Mail

This is often the easiest means of communication (unless your question requires a long discussion at the blackboard). Do check your e-mail frequently, preferably every day. For security and privacy reasons, we will only contact you through your [@student.lboro.ac.uk](mailto:student.lboro.ac.uk) address and not any other address you may have. All Physics staff check their email at frequent intervals; their addresses are listed in the Departmental handbook.

The Physics Department Noticeboards

The main noticeboards that you need to keep an eye on are the Part A Noticeboard outside the First Year Laboratory (W2.21) and the General Noticeboard outside the Second Year Laboratory (W2.24). You should check these frequently.

The Physics Department Pigeon Holes

These are outside the First Year Laboratory and should be checked frequently, as letters to you may be delivered there.

4. Staff

The people listed here have administrative responsibility for the programme. The complete Physics staff list is in the Physics Department Handbook. We are all here to help you; please don't hesitate to ask if you have any problems.

Responsibility	Name Email	Room Phone
<i>Head of Department of Physics</i>	Prof Feo Kusmartsev F.Kusmartsev@lboro.ac.uk	W215 223316
<i>Programme Tutor</i> Overall responsibility for programmes Advice on module choices	Dr Boris Chesca B.Chesca@lboro.ac.uk	W217 223985
<i>Administrator</i> Timetables, module registrations, etc	Mrs Meredith Coney M.R.Coney@lboro.ac.uk	W184 222880
<i>Industrial Tutor</i> Industrial placements	Dr Cyril Alekseev K.Alekseev2@lboro.ac.uk	W138 223311
<i>European Mobility Coordinator</i> Study abroad	Dr Klaus Neumann K.U.Neumann@lboro.ac.uk	W1.48 223310

5. Aims and Objectives

5.1. The Aims

The University's mission is "education, academic enquiry and the advancement of knowledge, to provide the highest quality of educational experience and the widest opportunities for students, to advance industry and the professions, and to benefit society".

Within the context of this Mission Statement, the Department aims:

1. To communicate to students the laws and phenomena that comprise the world view of the physicist.
2. To educate students as physicists in preparation for employment in industry, public service or academic research: to provide the knowledge, competence and skills expected of a physicist, many of which are transferable to other fields of employment.
3. To provide an environment that gives students opportunities to develop their own interests, self-reliance and career aspirations.

5.2. Intended Learning Outcomes

The following learning experiences and outcomes have been set as objectives for the students on undergraduate programmes in the Department of Physics.

Core Objectives in Physics

Upon successful completion of a programme in the Department, students will have, at a level appropriate to their programme:

1. A broad knowledge and understanding of the basic principles of physics and an ability to apply that knowledge and understanding to the solution of physical problems and to express their ideas clearly and cogently in both written and verbal form. The breadth and depth of knowledge will vary according to programme, being greatest in the MPhys Physics programme.
2. Enhanced skills in mathematics; problem solving; experimental techniques; scientific report writing; collecting, analysing and presenting information; use of information technology; self-education.
3. Increased self-reliance, confidence and ability to work constructively.
4. Upon graduating with the appropriate level of Honours, an education sufficient to qualify them for associate membership of the Institute of Physics.

Additional Programme Specific Objective

In addition to the core objectives for single subject physics, graduates will have achieved the following specific objective for the Physics and Mathematics (MPhys/BSc) programmes:

5. A broad knowledge and understanding of applied mathematics related to physical science.

6. Programme Content

6.1. Introduction

Your programme of study (i.e. your degree course), consists of a series of modules (individual subjects). At the beginning of each academic year you will register for all the modules you will be taking that year. The *Programme Regulations* contain the module codes and subject titles. These regulations and the range of modules offered can change from year to year. You will be supplied with updated regulations as needed.

The first two letters of a module code indicate the Department responsible, e.g. PH for Physics, and MA for Mathematical Sciences. The third letter refers to the Part for which the module is intended: letter A refers to an *Introductory Module*, taught in Part A (the first year); letters B, C and D, refer to *Degree Modules* taught in the following academic years of the programme. Modules taken in the first year do not contribute to your degree classification. After Part A, all the modules mentioned in the Programme Regulations count towards your degree classification.

In each year of your programme you are required to take modules having a total modular weight of 120. Parts A and B consist entirely of *Compulsory Modules* (which you must take) that cover a range of essential physics and mathematics subjects (core modules). Parts C and D contain *Compulsory Modules*, and *Optional Modules* (which are chosen by you). You will be given a form on which to express your choice of Optional Modules (covering both semesters) before the start of the first semester of each year.

6.2. Part A (Year 1)

All the modules are *Compulsory Modules* and are as given in the Programme Regulations. These Compulsory Modules cover a range of essential Physics and Mathematics subjects (“core” modules).

As indicated in the Departmental Handbook, Part A students have weekly small-group Physics tutorials that are related to the topics in the Physics modules. A list of groups will be posted at the beginning of each semester. You should contact your *Academic Tutor* (the member of staff you will meet for tutorials) to arrange a mutually convenient time for these tutorials. Most lecture modules also include one problem class for every four lectures.

If you wish to transfer from BSc to MPhys or from a non-sandwich to a sandwich programme, you should contact your *Programme Tutor* for advice. You should inform your Local Education Authority of any change before the start of your second year.

6.3. Part B (Year 2)

The Modules are as given in the *Programme Regulations*. There are *no Optional Modules* in part B. The Compulsory Modules cover a range of essential Physics and Mathematics subjects (core modules). As in Part A, most lecture modules also include one problem class for every four lectures.

6.4. Part I (Industrial Training/European Mobility)

In the sandwich programmes (4-year BSc and 5-year MPhys), you spend a year between Part B and C either in industry or in a research establishment (in the UK or elsewhere) or at a university in Australia, Austria, France, Germany, Poland, Spain or the USA. You should consult the relevant pages in the *Departmental Handbook* and contact the *Industrial Tutor* or *European Mobility Coordinator* early in your second year. If you are registered on the non-sandwich programme and wish to transfer to the sandwich programme, you should inform your Local Education Authority by the end of your first year. On successful completion, you will be awarded a Diploma in Industrial Studies or a Diploma in International Studies on graduation.

6.5. Part C (Final Year BSc, penultimate year MPhys)

6.5.1. Part C BSc programme

The *Project* is a *Compulsory Module*, and it is spread over both semesters. You can choose either a 30-credit module (Physics Project) or a 20-credit module (Mathematics Project). There is a wide choice of Physics and Mathematics *Optional Modules* in each semester. Your choice of Optional Modules must include at least a modular weight 40 of PH options and at least a modular weight 40 of MA options. You will be given a form on which to express your choice of Optional Modules before the start of the first semester. You are advised to consult with Mrs Coney and the Programme Tutor before making your choice of Optional Modules.

6.5.2. Part C MPhys programme

In semester 1 Quantum Physics which has modular weight of 20 is compulsory. You need to make up a total modular weight of 60 for the semester. This can be done by choosing from 4 Mathematics and 6 Physics optional modules. In semester 2 there are no compulsory modules. In Part C your choice of Optional Modules must include at least a modular weight 40 of PH options and at least a modular weight 40 of MA options. You will be given a form on which to express your choice of Optional Modules before the start of the first semester. You are advised to consult with Mrs McKenzie and the Programme Tutor before making your choice of Optional Modules. You should bear your modules for Part D in mind when choosing options for part C. You must take at least 120 credits in D or P code modules (fourth year or postgraduate) over parts C and D.

6.6. Part D (Final Year MPhys)

You can choose either a *Physics Research Project* of modular weight 60 or a *Mathematics Research Project* of modular weight 30. If the *Mathematics Research Project* is chosen then a total of 60 credits must be made up by choosing from a variety of Mathematics and Physics optional modules. The *Project* extends over two semesters. There are no other compulsory modules. In Part D, you must take MA modules to a modular weight of at least 20 and PH modules to a modular weight of at least 60 (including the project).

7. Examinations

Written examinations are held in weeks 13, 14, and possibly 15, of the semesters in which the modules are taken. The general criteria for progression from Part A to Part B etc, and for the degree award, are given in University Regulations. The Programme Regulations give any special conditions which must be satisfied and the relative weightings of the Parts of the Programmes. Your first year grades will not contribute to your degree classification.

As described previously, each year you will take modules having a total modular weight of 120. *For each module the pass mark is 40%. If you pass a module of modular weight 10, say, you accumulate 10 credits.*

8. Progression

8.1. Part A to Part B

In order for you to progress from Part A (i.e. the first year) to Part B (the second year), you need to satisfy the following:

- (i) You have to accumulate at least 100 credits.

- (ii) You need to get a mark of at least 30% in all modules.

If you *fail* Part A, you will have to take resit examinations in all modules in which you achieved less than 30%. In addition to getting a minimum resit mark of 30% in these modules, you must also accumulate a total of at least 100 credits for Part A (including the credits obtained first time).

As an example, if you passed 8 modules (i.e. gained 80 credits) first time, and got less than 30% in each of the other 4 failed modules, then you would have to take resit examinations in all 4 failed modules and get a minimum resit mark of 30% in each of these. Also, you would need a mark of at least 40% in two of these modules to obtain the required extra 20 credits for passing Part A. If you had got less than 30% in just 1 of the 4 failed modules, then you would have to resit that module together with one or at most two of the other 3 failed modules. You would need a minimum resit mark of 40% for both of the resit modules in order to try to get the extra 20 credits required for passing Part A. *You are only allowed to take sufficient resit examinations to bring your credit total to 100 and to gain the minimum level of performance in all modules.*

If you fail a module, you are allowed to resit the examinations once only. The re-assessment of any modules must take place entirely in the University's special assessment period (SAP in August-September) or in the next academic year. You are not permitted to resit in the SAP if you have achieved fewer than 60 credits.

However, *if you get a mark of less than 30% in PHA285 (Physics Laboratory) you will not be allowed to resit this module, or consequently any other module, in the special assessment period.* You will then have to attend the Laboratory sessions in the *following academic year* and achieve a mark of at least 30% in the Laboratory module before progress to Part B is possible.

8.2. Part B to Part C

In order for you to progress from Part B to Part C, you have to accumulate at least 100 credits in Part B and obtain a minimum mark of 30% in all modules. However, if you fail by achieving less than 100 credits you will be given the opportunity to repeat sufficient failed Module Assessments to bring your possible credit total for this Part of the programme to 100 credits after re-assessment.

As in Part A, you can take resit examinations once only. The re-assessment of any failed modules must take place entirely in the University's special assessment period or in the next academic year. Note that *if you get a mark of less than 30% in the lab module PHB185 (Joint Physics Laboratory), then you will not be allowed to re-take this module in the special assessment period.*

To progress from Part B to Part C of the MPhys programme, candidates must, in addition to the above requirements, achieve a mark of 50% averaged over 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.

Any candidate who has successfully completed Part C of the MPhys programme but fails to complete Part D may at the discretion of the Programme Board be awarded the degree of BSc in

Physics and Mathematics. The relative weightings of Parts B and C in the degree mark will be the same as in the BSc programme.

8.3. Re-assessments

If you undergo re-assessments, the percentage marks obtained from the re-assessments will supersede those received for earlier assessments for the purpose of determining Module Marks. However, in the case of degree level modules, Module Marks awarded following re-assessment will be capped at 40% for the purpose of calculating the Programme Mark and determining the degree classification. The next section explains how the degree classification is determined.

9. Degree Classification

To achieve a degree you need to accumulate a total of at least 300 credits (out of a maximum of 360), including a minimum of 100 credits from Part C. If you do so, then your honours classification is calculated as follows. For each Part, your average mark is calculated (after weighting each module mark by its modular weight). The overall degree mark is:

$$0.4 \times (\text{Part B mark}) + 0.6 \times (\text{Part C mark}).$$

MPhys programme: The average percentage marks for each Part will be combined in the ratio

$$0.2 \times (\text{Part B mark}) + 0.4 \times (\text{Part C mark}) + 0.4 \times (\text{Part D Mark})$$

Candidates who have enough credits are then awarded honours as follows:

<i>Honours classification</i>	<i>Threshold mark</i>
First class	70%
Second class, upper division	60%
Second class, lower division	50%
Third class	40%

Module Marks below 40% for degree level modules will be included in the calculation, even though no modular credit has been awarded for these modules. The classification thresholds may be lowered by up to 3% at the discretion of the final-year Programme Board, which meets to

determine degree classifications after the exams have been marked. Some students (often those just below a borderline) may be called to a viva voce examination. A good performance here can bring you above the borderline.

If you have sufficient modular credit for the award of a degree but have a Programme Mark of less than 40%, you will be awarded a Pass (unclassified) degree.

If you fail to achieve a Module Mark of 40% in any modules in the final Part of your programme, *and have not qualified for the award of a degree*, you are allowed to repeat assessments in all of those modules. However, the re-assessment regulations summarised in Section 8.3 above will then apply, and there is no special University re-assessment period.

More details are provided in the University Student Handbook.

10. Feedback

The feedback arrangements are as described in the Physics Departmental Handbook in the sections on the Department's Coursework Code Of Practice and the Department's Approach To Quality Assurance. There is a PHM representative for each year of the programme on the Physics Staff-Student Committee.

11. Accreditation by the Institute of Physics

These programmes have been accredited by the Institute of Physics <http://www.iop.org/>, the professional body for British physicists. This means that they are recognised as part of the necessary qualifications for becoming a Chartered Physicist (CPhys) and Member of the Institute of Physics (MInstP).