Royal Holloway, University of London
Course specification for an undergraduate award
BSC MATHEMATICS (FOUR YEAR PROGRAMME WITH FOUNDATION YEAR) (G10F)

Section 1 – Introduction to your course

This course specification is a formal document, which provides a summary of the main features of your course and the learning outcomes that you might reasonably be expected to achieve and demonstrate if you take full advantage of the learning opportunities that are provided. Further information is contained in the University prospectus, and in various handbooks, all of which you will be able to access online. Alternatively, further information on the University's academic regulations and policies can be found here. Further information on the University's Admissions Policy can be found here.

Your degree course in BSc Mathematics with an integrated Foundation Year is delivered in four stages each of which comprises one year of full-time study during which you must follow courses to the value of 120 credits.

The Foundation Year prepares you for university study by offering a rigorous introduction to university level study methods and skills transitioning from FHEQ level 3 to FHEQ level 4. It provides progressive structures in which you are able to gain ever-wider knowledge and understanding of approaches to scientific study and your chosen degree subject, together with embedded practice and study skills, leading towards increasingly discipline specific activities in the practical laboratories or individual project modules which facilitate greater levels of specialisation and individual choice. All modules are mandatory for the foundation year, but subject to good academic performance will allow transfer to other Engineering, Physical and Mathematical Science foundation years. The modules are to provide a strong foundation in mathematics, computing and practical skills to succeed in later years of the degree programme. The mathematics and physics taught modules are primarily assessed by examinations which will allow to practice key skills and exam techniques. The laboratory and project modules are assessed by lab-reports and project reports respectively.

Upon progressing to the first year of your degree programme, in stage one you must take eight courses. In the eight mandatory courses it seeks to provide a broadly based introduction to mathematics, which will develop manipulative skills, understanding of the key concepts and the ability to construct logical arguments. In stage two, you must take eight courses, which continue their study of abstract pure mathematics and its applications. In stage three, you choose eight courses. You are advised on appropriate combinations and pathways depending on your interests, stage one and two options, and possible future career paths. You may choose to undertake an extended project. During your degree programme you will broaden your knowledge and understanding, and be able to develop appropriate skills in Mathematics enabling you to graduate ready for employment in industry

While Royal Holloway keeps all the information made available under review, courses and the availability of individual modules, especially optional modules are necessarily subject to change at any time, and you are therefore advised to seek confirmation of any factors which might affect your decision to follow a specific course. In turn, Royal Holloway will inform you as soon as is practicable of any significant changes which might affect your studies.

The following is a brief description for some of the most important terminology for understanding the content of this document:

Degree course – May also be referred to as 'degree programme' or simply 'programme', these terms refer to the qualification you will be awarded upon successful completion of your studies.
Module – May also be referred to as 'course', this refers to the individual units you will study each year to complete your degree course. Undergraduate degrees at Royal Holloway comprise a combination of modules in multiples of 15 credits to the value of 120 credits per year. On some degree courses a certain number of optional modules must be passed for a particular degree title.

Section 2 – Course details			
Date of specification update	March 2025	**Location of study**	Egham Campus
Course award and title	BSc Mathematics with Integrated Foundation Year	**Level of study**	Undergraduate
Course code	3453	**UCAS code**	G10F
Year of entry	2026/27		
Awarding body	Royal Holloway, University of London		
Department or school	Mathematics	**Other departments or schools involved in teaching the course**	N/A
Mode(s) of attendance	Full-time	**Duration of the course**	4 years
Accrediting Professional, Statutory or Regulatory Body requirement(s)	Accredited by the Institute of Mathematics and its Applications (IMA) for the purpose of meeting in part the educational requirement for chartered status. Successful completion of this programme enables students to meet the requirements of the Chartered Mathematician designation when followed by subsequent training and experience in employment to obtain equivalent competences to those specified by the Quality Assurance Agency (QAA) for taught masters degrees.		
Link to Coursefinder for further information:	https://www.royalholloway.ac.uk/studying-here/	**For queries on admissions:**	https://royalholloway.ac.uk/applicationquery

Section 3 – Degree course structure					
3.1 Mandatory module information **The following table summarises the mandatory modules which students must take in each year of study**					
Year	**Module code**	**Module title**	**Credits**	**FHEQ level**	**Module status (Mandatory Condonable MC or Mandatory Non-Condonable MNC**
0	FY0020	Foundation Physical Sciences	15	HE level 0	MC
0	FY0016	Foundation Physical Sciences II	15	HE level 0	MC
0	FY0018	Engineering Society	15	HE level 0	MC
0	FY0030	Foundation Mathematics I	15	HE level 0	MNC
0	FY0022	Foundation Programming	15	HE level 0	MC
0	FY0031	Foundation Mathematics II	15	HE level 0	MNC
0	MT0001	Foundation Mathematics	30	HE level 0	MC
1	MT1100	Introduction to Geometry	15	4	MC
1	MT1210	Introduction to Applied Maths	15	4	MC
1	MT1300	Statistical Methods I	15	4	MC
1	MT1710	Calculus I	15	4	MC
1	MT1720	Calculus II	15	4	MC
1	MT1810	Introduction to Pure Mathematics	15	4	MC
1	MT1820	Linear Algebra I	15	4	MC
1	MT1940	Real Analysis I	15	4	MC
2	MT2320	Probability Theory	15	5	MC

2	MT2500	Scientific Programming	15	5	MC
2	MT2800	Linear Algebra II	15	5	MC
3	MT3050	Advanced Skills	15	6	MC

This table sets out the most important information for the mandatory modules on your degree course. These modules are central to achieving your learning outcomes, so they are compulsory, and all students on your degree course will be required to take them. You will be automatically registered for these modules each year. Mandatory modules fall into two categories: 'condonable' or 'non-condonable'.

In the case of mandatory 'non-condonable' (MNC) modules, you must pass the module before you can proceed to the next year of your course, or to successfully graduate with a particular degree title. In the case of mandatory 'condonable' (MC) modules, these must be taken but you can still progress or graduate even if you do not pass them. Please note that although Royal Holloway will keep changes to a minimum, changes to your degree course may be made where reasonable and necessary due to unexpected events. For example: where requirements of relevant Professional, Statutory or Regulatory Bodies have changed and course requirements must change accordingly, or where changes are deemed necessary on the basis of student feedback and/or the advice of external advisors, to enhance academic provision.

3.2 Optional modules

In addition to mandatory modules, there will be a number of optional modules available during the course of your degree. Although Royal Holloway will keep changes to a minimum, new options may be offered or existing ones may be withdrawn. For example, where reasonable and necessary due to unexpected events, where requirements of relevant Professional, Statutory or Regulatory Bodies (PSRBs) have changed and course requirements must change accordingly, or where changes are deemed necessary on the basis of student feedback and/or the advice of External Advisors, to enhance academic provision. There may be additional requirements around option selection; please contact the Department for further information.
There are no optional modules in Stage 0 (Foundation Year) and Stage one.

At Stage two, you must take options to the value of 75 credits from a list of Stage two courses offered by the department.
With permission from the department a student may take 15 credits from either stage one or stage three modules offered by the department in place of a stage two option.

At Stage three, you must take options to the value of 105 credits from a list of Stage three courses offered by the Department. At Stage three you may also choose options from the Stage four list if you wish. With permission from the department a student may take 15 credits from stage two modules offered by the department in place of a stage three option. You are advised on appropriate combinations and pathways depending on your interests, stage one and two options, and possible future career paths. You may choose to undertake an extended project as MT3000.

Section 4 - Progressing through each year of your degree course

For further information on the progression and award requirements for your degree, please refer to Royal Holloway's Academic Regulations.

There is flexibility within the Foundation Year for you to take your Individual Project in one of the other departments in the School of Engineering, Physical and Mathematical Sciences offering a Foundation Year, although please note that if you wish to take your Individual Project in Mathematics or pursue an undergraduate degree with the Department of Mathematics you must take MT1998. The degree programme you choose to take after progression is likely to depend on the individual project you select during the foundation year.

Progression throughout the year/s is monitored through performance in summative or formative coursework assignments. Please note that if you hold a Student Visa and you choose to leave (or are required to leave because of non-progression) or complete early (before the course end date stated on your CAS), then this will be reported to UKVI.

All first year undergraduate students are required to take and pass the non-credit bearing Moodle-based Academic Integrity module SS1001 in order to progress into the second year of study (unless their course includes the alternative mandatory SS1000 module). The pass mark for the module assessment is stated in the on-line Academic Integrity Moodle module. Students may attempt the assessment as often as they wish with no penalties or capping. Students who meet the requirements for progression as stipulated in the Academic Taught Regulations but fail to pass the Moodle-based Academic Integrity module will not be permitted to progress into their second year of academic study.

Section 5 – Educational aims of the course

The aims of this course are:

For the Foundation Year:

- to develop the required skills in mathematical concepts and techniques to serve as a foundation for learning higher mathematical concepts
- to equip you with the basic computing techniques and programming required for a mathematics degree;
- to start the process of independent project work in mathematics with support of expert academics;
- to put in context scientific knowledge and developments into a wider context of history, society and globalisation.

Following on to aims for the BSc:

- to provide students with technical manipulative skills, the ability to read and write in the compressed language of mathematics, and the ability to distil a problem into a mathematical description of its essential detail;
- to ensure that students gain an appreciation of, and interest in, the logical structure of mathematics, and its use as an analytical and predictive tool in applications;
- to offer a wide range of optional course units to suit students' interests and strengths;
- to provide access to personal, academic and pastoral support;
- to enable students, on graduation, to compete effectively in employment or postgraduate study.

Section 6 - Course learning outcomes

In general terms, the courses provide opportunities for students to develop and demonstrate the following learning outcomes. (*Categories – Knowledge and understanding (K), Skills and other attributes (S), and Transferable skills (*)*)

Course learning outcome	Level 3	Level 4	Level 5	Level 6
1: Gain knowledge and understanding of mathematical concepts, mathematical methods, and abstract mathematical structures.	Ability to comfortably manipulate and apply level 3 mathematics.	1.4.1: Develop knowledge and understanding of mathematical methods. 1.4.2: Gain knowledge and understanding of mathematical concepts such as number and function. 1.4.3: Develop spatial awareness in two and three dimensions. 1.4.4: Start to develop knowledge and understanding of abstract structures such as groups, matrices, and fields.	1.5.1: Embed knowledge and understanding of mathematical methods. 1.5.2 Embed knowledge of the abstract theory of matrices.	1.6.1: Extend knowledge and understanding of mathematical methods. 1.6.2 Extend knowledge of abstract structures such as groups.
2: Grow an understanding of results from a range of areas of mathematics, how these are interlinked, and how mathematics is key to some applications.	Appreciation of how to formulate problems in the appropriate level 3 mathematical language and notation.	2.4.1: Develop the ability to take theoretical knowledge gained in one area and apply it elsewhere.	2.5.1: Develop knowledge and understanding of some results from a range of major areas of mathematics, statistics, or operational research.	2.6.1: Develop knowledge and understanding of at least one major area of applications in which the mathematics is used in a serious manner and is essential for proper understanding.
3: Develop skills of numeracy, manipulation of mathematical expressions, and the analytic approach to solving problems.	Working knowledge of a least one high level programming language	3.4.1: Apply a high level of numeracy. 3.4.2: Develop the ability to manipulate and analyse complex mathematical expressions accurately.	3.5.1: Grow the ability to manipulate and analyse complex mathematical expressions accurately. 3.5.2: Develop a general ethos of numeracy and of analytical approaches to problem solving.	3.6.1: Develop the ability to provide accurate analysis of a situation, the factors involved and possible approaches to solution.

4: Develop the ability to argue logically, and to understand the role of formal proofs.	Understanding of applying fundamental physics concepts to simple problems	4.4.1: Develop the ability to make a sequence of logical steps and reflect on the result.	4.5.1: Develop the ability to understand the role of logical mathematical argument and deductive reasoning, including formal proof.	4.6.1: Embed the ability to understand the role of logical mathematical argument and deductive reasoning, including formal proof.
5: Develop the ability to formulate problems mathematically, to solve the resulting mathematical problems, and to interpret the results.	Start to take responsibility and developing the individual learning, communication and research skills.	5.4.1: Begin to develop the ability to formulate problems in mathematical or statistical form using appropriate notation. 5.4.2: Begin to develop the ability to solve equations or inequalities arising from a problem analytically or numerically, and to interpret the results.	5.5.1: Develop the ability to formulate problems in mathematical or statistical form using appropriate notation. 5.5.2: Develop the ability to solve equations or inequalities arising from a problem analytically or numerically, and to interpret the results.	5.6.1: Grow the ability to formulate problems in mathematical or statistical form using appropriate notation. 5.6.2: Grow the ability to solve equations or inequalities arising from a problem analytically or numerically, and to interpret the results.
6: Gain the ability to work as a team, and to communicate mathematical results clearly to others.		6.4.1: Start the journey towards gaining the ability to communicate mathematical results clearly. 6.4.2: Contribute to discussions. 6.4.3: Work together with others as a team.	6.5.1: Develop the ability to communicate mathematical results clearly. 6.5.2: Develop good written and oral communication skills, which enable them to write coherently and contribute to discussions. 6.5.3: Continue to work together with others as a team.	6.6.1: Extend the ability to communicate mathematical results clearly, to both mathematicians and lay persons. 6.6.2: Continue to develop good written and oral communication skills, which enable them to write coherently, turn a rough draft into a convincing argument and contribute to discussions. 6.6.3: Extend team-working skills.
7: Gain and apply skills of time-management and develop a career plan.		7.4.1: Learn and apply general skills of time-management and organization.	7.5.1: Develop general skills of time-management and organization.	7.6.1: Further develop general skills of time-management and organization.

		7.4.2: Develop the skill of personal motivation and start the process of planning a career path.	7.5.2: Develop employability skills, including personal motivation and the planning of a career path.	7.6.2: Continue to improve employability skills, and the planning of a career path.
8: Gain familiarity with computer methods in mathematics, and develop IT skills, including word-processing and use of the internet.		8.4.1: Introduce computer methods in mathematics and statistics. 8.4.2: Develop IT skills, including word-processing and use of the internet.	8.5.1: Gain familiarity with computer methods in mathematics and statistics. 8.5.2: Embed IT skills, including word-processing and use of the internet.	8.6.1: Extend the use of computer methods in mathematics and statistics. 8.6.2: Extend IT skills, including mathematical word-processing and use of the internet.
9: Develop the skill to work independently, using a variety of resources.		9.4.1 Develop the ability to learn independently, using a variety of media including books, and online resources.	9.5.1 Grow the skill to learn independently, using a variety of media including books, learned journals, the internet, and so on.	9.6.1 Extend the skill to work independently with persistence and patience, pursuing the solution of problems to their conclusion.

Section 7 - Teaching, learning and assessment
Teaching and learning on your course is closely informed by the active research of staff, particularly in the areas of Mathematics. In general terms, the course provides an opportunity for you to develop and demonstrate the learning outcomes detailed herein. Teaching and learning is mostly by means of lectures, small group tutorials, problem-solving workshop sessions, written and oral feedback on coursework, practical sessions in statistics and computational mathematics, guided independent study and oral presentations. Assessment of knowledge and understanding is typically by formal examinations, coursework, examined essays, exercises, online tests and exercises, oral presentations and the dissertation or long essay. In addition, students may be involved in workshops and may produce various forms of creative work. Contact hours come in various forms and may take the form of time spent with a member of staff in a lecture or seminar with other students. Contact hours may also be laboratory or, studio-based sessions, project supervision with a member of staff, or discussion through a virtual learning environment (VLE). These contact hours may be with a lecturer or teaching assistant, but they may also be with a technician, or specialist support staff. The way in which each module on your degree course is assessed will also vary. Assessments designated as 'summative' will receive a mark which will count towards your overall mark for the module, and potentially your degree classification, depending on your year of study. On successful completion of the module you will gain the credits listed. More detailed information on modules, including teaching and learning methods, and methods of assessment, can be found via the online Royal Holloway Curriculum Catalogue. The accuracy of the information contained in this document is reviewed regularly by the university, and may also be checked routinely by external agencies.

Section 8 – Additional costs
There are no single associated costs greater than £50 per item on this degree course.
These estimated costs relate to studying this particular degree course at Royal Holloway. General costs such as accommodation, food, books and other learning materials and printing etc., have not been included, but further information is available on our website.

Section 9 – Indicators of quality and standards	
QAA Framework for Higher Education Qualifications (FHEQ) Level	4-6
Your course is designed in accordance with the FHEQ to ensure your qualification is awarded on the basis of nationally established standards of achievement, for both outcomes and attainment. The qualification descriptors within the FHEQ set out the generic outcomes and attributes expected for the award of individual qualifications. The qualification descriptors contained in the FHEQ exemplify the outcomes and attributes expected of learning that results in the award of higher education qualifications. These outcomes represent the integration of various learning experiences resulting from designated and coherent courses of study.	
QAA Subject benchmark statement(s)	http://www.qaa.ac.uk/quality-code/subject-benchmark-statements
Subject benchmark statements provide a means for the academic community to describe the nature and characteristics of courses in a specific subject or subject area. They also represent general expectations about standards for the award of qualifications at a given level in terms of the attributes and capabilities that those possessing qualifications should have demonstrated.	

Section 10– Intermediate exit awards (where available)		
You may be eligible for an intermediate exit award if you complete part of the course as detailed in this document. Any additional criteria (e.g. mandatory modules, credit requirements) for intermediate awards is outlined in the sections below.		
Award	**Criteria**	**Awarding body**
Diploma in Higher Education (DipHE)	Pass in 210 credits of which at least 90 must be at or above FHEQ Level 4 and at least 120 of which must be at or above FHEQ Level 5	Royal Holloway and Bedford New College
Certificate in Higher Education (CertHE)	Pass in 120 credits of which at least 90 must be at or above FHEQ Level 4	Royal Holloway and Bedford New College