

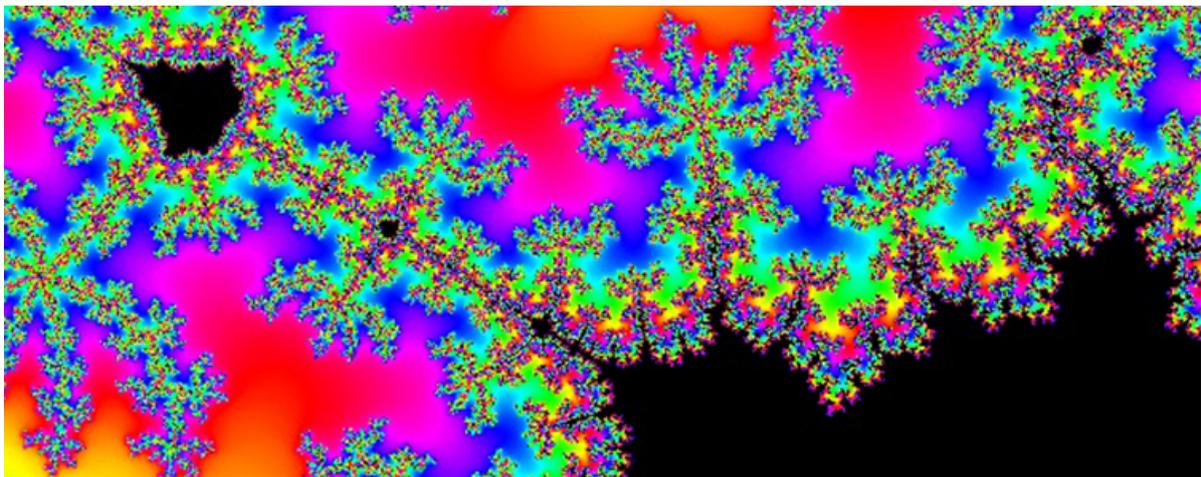
Student Handbook

BSc (Hons) Mathematics and MMath (Hons) Mathematics

2015/16 (published 24/07/2015)

Course Leader: Dr Kevin Bowman

School of Physical Sciences and Computing



All course materials, including lecture notes and other additional materials related to your course and provided to you, whether electronically or in hard copy, as part of your study, are the property of (or licensed to) UCLan and MUST not be distributed, sold, published, made available to others or copied other than for your personal study use unless you have gained written permission to do so from the Dean of School. This applies to the materials in their entirety and to any part of the materials.

UCLan Mission statement

WE PROMOTE ACCESS TO EXCELLENCE ENABLING YOU TO DEVELOP YOUR POTENTIAL

We value and practise equality of opportunity, transparency and tolerance.

We strive for excellence in all we do: locally regionally, nationally and internationally.

We work in partnership with business, the community and other educators.

We encourage and promote research innovation and creativity.

Student Charter

The Student Charter has been developed by the University and the Students' Union so that students gain the maximum from their UCLan experience. It is a two-way commitment or 'contract' between the University and each individual student. It acts as a means of establishing in black and white what students can expect from the University and the Union in terms of support, and in return what we expect from our students. [Read the full Student Charter](#)

Supporting Diversity at UCLan

UCLan recognises and values individual difference and has a public duty to promote equality and remove discrimination in relation to race, gender, disability, religion or belief, sexual orientation and age. During your time at UCLan we expect you to be able to

- experience "an integrated community based on mutual respect and tolerance where all staff and students can feel safe, valued and supported."
- contribute to creating a positive environment where discriminatory practices and discrimination no longer happen.

Please review the UCLan [Equality and Diversity Policy](#) for further information.

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1. Introduction to the course

1.1 Welcome to the course

The mathematics course team welcomes you to the university as you are about to embark on your continuing study of mathematics. We hope that you will enjoy your studies and we want this to be a positive learning experience. The work is interesting and challenging. We believe you can succeed and we want you to succeed. Good luck!

1.2 Rationale, aims and learning outcomes of the course

The aims of the mathematics course are as follows:

- To provide a good grounding in pure and applied mathematics.
- To provide a grounding in numerical solutions of mathematical problems.
- To provide sufficient in-depth subject knowledge to enable students to embark on further study or research either in an academic or industrial environment.
- To provide experience in a variety of working styles such as group, collaborative and independent working essential for the modern workplace.
- To provide the opportunity to develop skills and techniques found in mathematics which have wider applications.

Detailed learning outcomes are listed in the programme specifications given in appendix 1 of this document.

Both the BSc (Hons) and MMath (Hons) Mathematics degrees at UCLan have been accredited by the Institute of Mathematics and Its Applications (IMA). The MMath (Hons) programme is accredited to meet the educational requirements of the Chartered Mathematician designation, while the BSc (Hons) programme is likewise accredited, when followed by subsequent training and experience in employment.

1.3 Course Team

The mathematics degree is delivered by a range of teaching staff from the mathematics course team, who you will meet throughout your studies. Certain staff members have roles which particularly concern student support, and whom you will deal with regularly. The course leader oversees the delivery and assessment of taught modules, and approves progression through the programmes, while the year tutors are the first point-of-contact for students with any academic issues. Year tutors monitor attendance and academic performance across their year. The academic lead oversees academic quality, programme structure, module specifications, and academic discipline.

- Course Leader: Dr Kevin Bowman, email kbowman@uclan.ac.uk
- First-Year Tutor: Dr Sylvy Anscombe, email
- Second-Year Tutor: Dr Davide Penazzi, email dpenazzi@uclan.ac.uk
- Third-Year Tutor: Dr Christopher Powles, email cpowles@uclan.ac.uk
- Academic Lead: Mr Ian Butchart, email ibutchart@uclan.ac.uk

1.4 Academic advisor

You will be assigned an academic advisor during induction week who is your primary contact for advice on general academic matters. It is important that you make and stay in contact with your academic advisor throughout your course. Use this space to make a record of their name and details:

Academic advisor	Room	e-mail
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1.5 Administration details

The Administrative Hub is based in the C&T Building room 235.

Campus Admin Services provides academic administration support for students and staff and are located at C and T Building and is open from 8.45am until 5.15pm Monday to Thursday and until 4.00pm on Fridays. The hub can provide general assistance and advice regarding specific processes such as extenuating circumstances, extensions and appeals. Course specific information is also available via school blackboard sites.

The hub telephone number is 01772 891994/891995.

The hub email contact is CandTHub@uclan.ac.uk

1.6 Communication

The University expects you to use your UCLan email address and check regularly for messages from staff. If you send us email messages from other addresses they risk being filtered out as potential spam and discarded unread.

Throughout the course of the year, your module tutors, academic advisor, year tutor or course leader may require your attendance at meetings to discuss your progress. You will be notified of these meetings by email. In addition, any changes to the timetable will also be communicated by email. For these reasons, it is a requirement that you check your email regularly (daily if possible). Details of meetings will also be posted on the mathematics student noticeboard, on the ground floor of Leighton building.

1.7 External Examiner

The University has appointed an External Examiner to your course who helps to ensure that the standards of your course are comparable to those provided at other higher education institutions in the UK. The name of this person, their position and home institution can be found below. If you wish to make contact with your External Examiner, you should do this through your Course Leader and not directly. External Examiner reports will be made available to you electronically. The School will also send a sample of student coursework to the external examiner(s) for external moderation purposes, once it has been marked and internally moderated by the course tutors. The sample will include work awarded the highest and lowest marks and awarded marks in the middle range.

The external examiner for mathematics degrees at UCLan is Prof H Dugald MacPherson, Professor of Pure Mathematics at the University of Leeds. Electronic copies of the external examiner's reports are available on the mathematics eLearn site.

2. Structure of the course

2.1 Overall structure

The mathematics degrees are composed of a number of modules. A module is a coherent unit of subject material with its own learning outcomes and assessments. Each module in the mathematics course is worth 20 credits.

To complete the BSc (Hons) degree, you must accumulate a total of 360 credits, which is equivalent to 18 modules. To complete the MMath (Hons) degree, you must accumulate a total of 480 credits, which is equivalent to 24 modules. If you are studying full time, it is expected that you will complete six modules in each year of study, so the BSc (Hons) degree will normally take three years to complete, and the MMath (Hons) degree will normally take four years. Both degrees are also available for study part-time, in which case the time required to complete a degree will vary.

Each module has a level which reflects the depth of material covered. Level 4 corresponds to the usual academic level of first-year modules on a three-year honours degree, while level 5 corresponds to the usual modules on the second year of such a course, and level 6 corresponds to the usual modules on the third year of such a course. Level 7 modules correspond to the academic level of fourth-year modules on a four-year undergraduate master's degree (these are sometimes called the "MMath modules", as they are only available to students studying the MMath (Hons) degree).

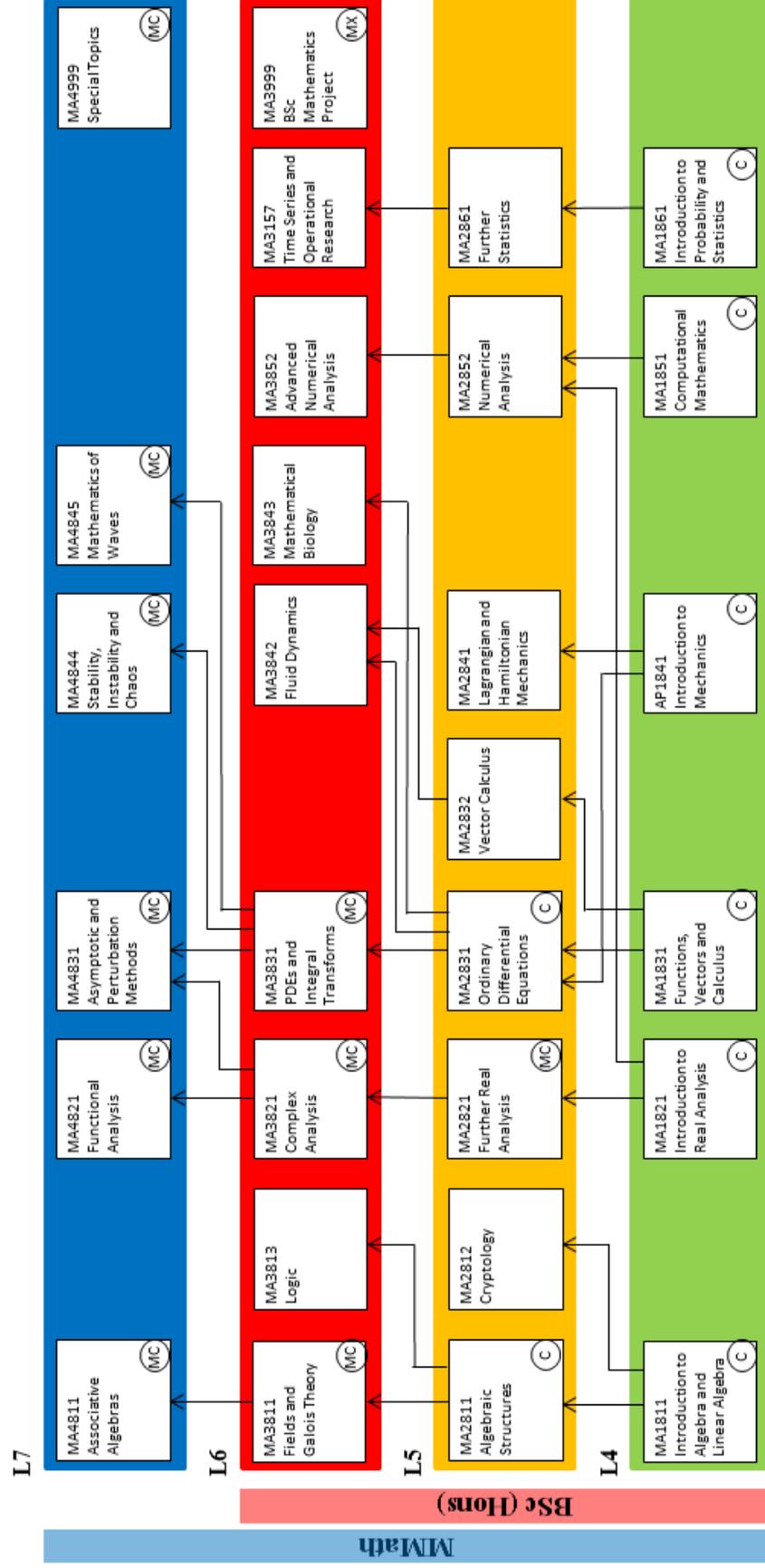
Some modules within the degrees are compulsory, while others are optional. Compulsory modules contain fundamental material which is essential for understanding a wide range of mathematical ideas, while optional modules are more specialised. Students must complete ALL of the compulsory modules for their chosen degree (details below), and can then choose from the optional modules to make up the required number of modules each year. Note that there are some level 5 and level 6 modules which are compulsory for students studying towards the MMath (Hons) degree, but are optional for students studying towards the BSc (Hons) degree.

A module, at any level, corresponds to 200 hours of study. This includes all the time you spend in class and also your private study time. A breakdown of what is expected for each module can be found in the module descriptor for the module (these are available on the mathematics eLearn site).

A flow-chart of all the modules offered on the mathematics degrees is given overleaf. Arrows on the chart indicate pre-requisites. As an example, the arrow from the box labelled MA1821 (Introduction to Real Analysis) to the box labelled MA2821 (Further Real Analysis) means that you must complete MA1821 before you will be allowed to study MA2821.

All mathematics modules are year-long: this means that their delivery starts in September and ends (including all assessment) by the end of the exam period, which is the end of May. Results are released in June, and reassessments take place in August. All modules are taught on the Preston campus.

Mathematics MMath (Hons) and BSc (Hons) degree schemes



All information in this document is provisional, and subject to staffing resources.

2.2 Modules available

In the mathematics degrees, there are six compulsory modules at level 4: these provide you with a common set of mathematical tools that you will use throughout the rest of your course. Further compulsory modules at higher levels develop key mathematical skills and techniques in the important fields of algebra, calculus, and (for MMath students) analysis.

Compulsory level 4 modules (year 1 for full-time students):

- MA1811 Introduction to Algebra and Linear Algebra
 Algebra concerns the study of number systems and their properties;
 linear algebra concerns matrices, eigenvalues and eigenvectors.
- MA1821 Introduction to Real Analysis
 Analysis starts with the study of proof, and then rigorously treats
 sequences and series of numbers, and continuous functions.
- MA1831 Functions, Vectors, and Calculus
 This module builds on A-level calculus knowledge, and extends this to
 consider functions of several independent variables.
- AP1841 Introduction to Mechanics
 In this module physical ideas concerning force and energy motivate the
 study of differential equations.
- MA1851 Computational Mathematics
 Here you will learn to use a mathematical software package, and apply
 this to mathematical modelling problems.
- MA1861 Introductory Statistics
 Statistics concerns the proper uses of data, and the study of probability.

Compulsory level 5 modules (year 2 for full-time students):

- MA2811 Algebraic Structures (Compulsory for BSc and MMath)
- MA2821 Further Real Analysis (Compulsory for MMath only)
- MA2831 Ordinary Differential Equations (Compulsory for BSc and MMath)

Compulsory level 6 modules (year 3 for full-time students):

- MA3811 Fields and Galois Theory (Compulsory for MMath only)
- MA3821 Complex Analysis (Compulsory for MMath only)
- MA3831 Partial Differential Equations (Compulsory for MMath only)

At level 7 in the MMath degree, there are six compulsory modules. These modules are not available to students on the BSc (Hons) degree.

Compulsory level 7 modules (year 4 for full-time MMath students):

MA4811	Associative Algebras
MA4821	Functional Analysis
MA4831	Asymptotic and Perturbation Methods
MA4844	Stability, Instability and Chaos
MA4845	Waves
MA4999	Special Topics

A range of optional modules are available at levels 5 and 6. These allow you to develop your own particular interests, and to prepare for specific careers.

Optional level 5 modules (year 2 for full-time students):

MA2812	Cryptology
MA2821	Further Real Analysis (optional for BSc)
MA2832	Vector Calculus
MA2841	Lagrangian and Hamiltonian Mechanics
MA2852	Numerical Analysis
MA2861	Further Statistics

Optional level 6 modules (year 3 for full-time students):

MA3813	Logic
MA3821	Complex Analysis (optional for BSc)
MA3842	Fluid Mechanics
MA3843	Mathematical Biology
MA3852	Advanced Numerical Analysis
MA3157	Time Series and Operational Research
MA3999	Mathematics Project (not allowed for MMath students)

Usually all of these options are run every year, but if demand for a particular option is very low in any given year, that option may be withdrawn. You should be careful to check the prerequisites for any modules you particularly wish to study, especially at level 6. Students wishing to study a project at level 6 (MA3999) will be offered a range of different topics. Projects at level 6 will only be offered to students who achieve a sufficiently high average percentage mark at level 5 (65%).

2.2.1 Progression

Discussions about your progression through the course normally take place in February each year. There will be a special timetabled lecture about progression, where the course leader and other tutors will explain all of the options available to you. This is an opportunity for you to make plans for your study over the next academic year. The course team will tell you about the various modules/combinations available and you will both agree on the most appropriate (and legal) course of study for you.

At the end of the second year of full-time study (or part-time equivalent), students studying towards the BSc (Hons) degree will have the option of transferring to the MMath degree providing that they satisfy two conditions: (i) they must have passed the optional module MA2821 (Further Real Analysis) as well as the compulsory second-year modules, and (ii) they must achieve an average percentage mark (APM) in their second year modules of at least 65%.

Students may transfer from the MMath degree to the BSc (Hons) degree at any time. If at the end of the second year of full-time study, students studying towards the MMath degree do not achieve an APM in their second-year modules of at least 65%, they will automatically transfer to the BSc (Hons) degree.

2.3 Study Time

2.3.1 Weekly timetable

Your complete timetable is available on-line via the student portal at:

<https://www.uclan.ac.uk/students/study/timetabling.php>

You can check the times and locations of all your classes for each week. The timetable also lists which member of staff will be in charge of the session.

2.3.2 Expected hours of study

The normal amount of work involved in achieving a successful outcome to your studies is to study for 10 hours per each credit you need to achieve – this includes attendance at UCLan and time spent in private study.

You are therefore expected to spend a total of 200 hours on each module. It is important that you allocate time reasonably equally to all modules constantly throughout the academic year if you want to gain a good honours degree.

Each week you will have a range of timetabled classes, but you will also be expected to spend a large amount of time studying outside the timetabled hours. On most level four modules you will have three timetabled hours a week, which may be used as lectures, examples classes, computer labs, etc., depending on the requirements of the individual module. At level five and above, each module will have two timetabled hours per week (except projects, for which you have a 30 minute meeting with your supervisor each week). Outside of timetabled hours, you should spend time studying your lecture notes, working on tutorial problems and assignments, reading books from the supplied reading lists, and so on.

Broadly, you should spend six to seven hours each week on each module that you are studying. We know that students who spend more time studying generally do better.

2.3.3 Attendance Requirements

You are required to attend all timetabled learning activities for each module. Notification of illness or exceptional requests for leave of absence must be made to your year tutor (details given in section 1.3) in a timely fashion.

All UCLan students are monitored on the Student Attendance Monitoring (SAM) system. In mathematics, each student's attendance is reviewed weekly. If you miss classes you may be asked to discuss your progress and commitment with the Course Leader. If you are unable to explain your absences you may be asked to see the Academic Lead. You may wish to check your attendance record through my UCLan.

If you have not gained the required authorisation for leave of absence, do not respond to communications from the University, and if you are absent for four weeks or more, you may be deemed to have withdrawn from the course. If this is the case, then the date of withdrawal will be recorded as the last day of attendance.

Some international students will have their attendance at specific classes monitored closely. If you are in this category under the UK Border Agency (UKBA), Points Based System (PBS) you **MUST** attend your course of study regularly; under PBS, UCLan is obliged to tell UKBA if you withdraw from a course, defer or suspend your studies, or if you fail to attend the course regularly.

Each time you are asked to enter your details on SAM you must remember that the University has a responsibility to keep information up to date and that **you must only enter your own details on the system**. To enter any other names would result in inaccurate records and be dishonest. Any student who is found to make false entries can be disciplined under the student guide to regulations.

2.4 Data Protection

All of the personal information obtained from you and other sources in connection with your studies at the University will be held securely and will be used by the University both during your course and after you leave the University for a variety of purposes. These are all explained during the enrolment process at the commencement of your studies. If you would like a more detailed explanation of the University's policy on the use and disclosure of personal information, please contact the Information Governance Officer, Clark to the Board Service, University of Central Lancashire, Preston, PR1 2HE or email DPFOIA@uclan.ac.uk.

3. Approaches to teaching and learning

3.1 Expertise of staff

Staff in the mathematics teaching team are all qualified to postgraduate level, and have a wealth of teaching and research experience. In applied mathematics, staff in the course team have worked at NASA in the USA, and developed industrial prediction tools in collaboration with Rolls-Royce and Airbus. In pure mathematics, members of the course team comprise one of the largest model-theory research groups in the UK. Much of the research conducted within the department is reflected within the mathematics course. Particular areas of interest of the mathematics course team include:

- Cryptology
- Groups, Lie algebras, and Galois theory
- Logic and model theory
- Analytical and numerical solutions of differential equations
- Mathematical biology
- Electromagnetic and acoustic wave phenomena
- Fluid mechanics: from turbulence to galaxies
- Image processing

For information about particular research areas, please refer to the maths webpages at www.uclan.ac.uk/maths

3.2 Learning and teaching methods

Throughout the mathematics course you will encounter a range of teaching methods. This may include traditional “chalk and talk” style lectures, small group tutorials and problem workshops, and sessions in computer laboratories, depending on the module studied. For some modules, you will be expected to use the university’s online learning environment (eLearn) to access course materials. In many modules, problem sheets will be given out, which you are expected to work through in order to reinforce your knowledge of the material taught in lectures. It is expected that as you progress through the course, your independent learning skills should develop, so that you can study with less intervention from module tutors.

3.3 Study skills

General study skills are taught early in the degree: you will be taught how to take advantage of the resources available through the library, including a huge array of online materials. Specific study skills relevant to mathematics are taught throughout the degrees. For example, training in how to write formal reports and give oral presentations is given in the compulsory first-year module MA1851. Further study skills are taught within the context of relevant individual modules.

For general study skills, there are a variety of services to support students; these include:

WISER [https://portal.uclan.ac.uk/webapps/portal/frameset.jsp?tab_group_id= 33 1](https://portal.uclan.ac.uk/webapps/portal/frameset.jsp?tab_group_id=33_1)

LIS [https://portal.uclan.ac.uk/webapps/portal/frameset.jsp?tab_group_id= 25 1](https://portal.uclan.ac.uk/webapps/portal/frameset.jsp?tab_group_id=25_1)

3.4 Learning resources

3.4.1 Learning Information Services (LIS)

Extensive [resources](#) are available to support your studies provided by LIS – library and IT staff. Take advantage of the free training sessions designed to enable you to gain all the skills you need for your research and study.

For mathematics students, LIS provides access to the mathematical software package MAPLE. This is freely available on the university campuses, and a version for use on student's home computers can be purchased from LIS for a very low price.

3.4.2 Electronic Resources

LIS provide access to a huge range of electronic resources – e-journals and databases, e-books, images and texts.

Most module tutors will make material relevant to their modules available on eLearn, the University's online learning platform. This material could include lecture notes, tutorial examples and solutions, past exam papers, links to online resources, and so on.

3.5 Personal development planning

Personal Development Planning (PDP) is 'a structured and supported process undertaken by an individual to reflect upon their own learning, performance and/or achievement and to plan for their personal, educational and career development'.

By structured we mean designed and intended. By supported we mean that it is valued and facilitated by tutors and other professionals who promote and support your learning. By personal, educational and career development we mean the development of the whole person.

The primary object of PDP is to help you learn more effectively. By this we mean being able to:

- Be more effective in planning your work and time
- Meet deadlines for completing academic work
- Consider your strengths and needs in relation to studying
- Review your own progress and take responsibility for your own learning
- Access support from within the University
- Prepare for employment.

PDP is intended to support the development of your skills, allow you to plan the development of your own learning and to encourage the development of employability skills.

You will find useful information in the Student Organiser to help you think about PDP whilst at University.

PDP is embedded within the mathematics programme and also in the academic advisor system. We will help you develop a range of skills that will be of use when seeking employment. In various modules students are required to participate in group work, develop report writing skills and are assessed on oral presentations and poster presentations. The BSc project is an extended research/project module, which further develops students' report writing and independent working skills. In addition, separate short courses are available in

basic IT skills for mathematicians, for example in using Microsoft Office products. Additional support is available through the academic advisor system.

3.6 Preparing for your career

Your future is important to us, so to make sure that you achieve your full potential whilst at university and beyond, your course has been designed with employability learning integrated into it. This is not extra to your degree, but an important part of it which will help you to show future employers just how valuable your degree is. These “Employability Essentials” take you on a journey of development that will help you to write your own personal story of your time at university:

- To begin with, you will explore your identity, your likes and dislikes, the things that are important to you and what you want to get out of life.
- Later, you will investigate a range of options including jobs and work experience, postgraduate study and self-employment,
- You will then be ready to learn how to successfully tackle the recruitment process.

You will be able to record your journey using Pebblepad, the university’s e-portfolio system, which will leave you with a permanent record of all the fantastic things you have achieved during your time at UCLan.

It’s your future: take charge of it!

[Careers](#) offers a range of support for you including:-

- career and employability advice and guidance appointments
- support to find work placements, internships, voluntary opportunities, part-time employment and live projects
- workshops, seminars, modules, certificates and events to develop your skills

Daily drop in service available from 09:00-17:00 for CV checks and initial careers information. For more information come along and visit the team (in Foster building near the main entrance) or access our careers and employability resources via the Student Portal.

The mathematics course will help you to develop a range of important skills that will make you attractive to employers. These include:

- Analytical Skills
- Communication Skills
- Investigative Skills
- Learning Skills
- Problem-solving skills
- Self Management
- Team work

At the end of the mathematics course, you will be ready for a career in any one of a vast range of industries, including

- Finance, Banking and Insurance
- Business Consultancy and Operational Research
- Defence and Military Industries
- Space Science and Astronomy
- Natural and Life Sciences, Medicine and Health

- IT industries, Computing and Engineering
- Education
- Art, Design & Music

In the past few years, graduates from the UCLan mathematics course have pursued postgraduate qualifications including

- PGCE teacher training
- Masters degrees
- Ph.D. degrees

and careers including

- Trainee Actuary
- Acquisition Analyst
- NHS management
- Investment Analyst

We support our students in their interactions with the Futures careers service, and are happy to advise you on choices you can make throughout your study that may help you in pursuing particular careers.

4. Student support, guidance and conduct

Your primary contact for advice on general academic matters is your academic advisor. They will advise you on matters like progression, choosing modules, and so on. They also have a role in pastoral care, and can advise you on who to talk to in the university about a range of problems. In addition, there is the general advice desk for students called 'The i' – this is described below.

4.1 Academic advisors

Your academic advisor is there to offer pastoral care and general academic advice. You will meet your academic advisor in the first week of your studies, and then will have other meetings as often as you and the tutor feel they are needed. When your academic advisor asks for a meeting with you, you should prepare by thinking about how things are going – are there any problems you want to talk about or any questions you need to ask?

4.2 Student Support

[The 'i'](#) is a central Student Information Centre and your first point of contact. You can obtain information on a wide range of topics including Council Tax Exemption Certificates, Bank and Confirmation of Study Letters, Portable Financial Credits, (continuing students only), Printing and Printer Credit, UCLan Cards, the 'i' shop and UCLan Financial Support Bursary (first year students only).

4.3 Students with disabilities

If you have a disability that may affect your studies, please either contact the Disability Advisory Service - disability@uclan.ac.uk - or let one of the course team know as soon as possible. With your agreement information will be passed on to the Disability Advisory Service. The University will make reasonable adjustments to accommodate your needs and to provide appropriate support for you to complete your study successfully. Where necessary, you will be asked for evidence to help identify appropriate adjustments.

Assessment arrangements for students with a disability

Arrangements are made for students who have a disability/learning difficulty for which valid supporting evidence can be made available. Contact the Disability Adviser for advice and information, disability@uclan.ac.uk

4.4 Health and Safety

As a student of the University you are responsible for the safety of yourself and for that of others around you. You must understand and follow all the regulations and safety codes necessary for a safe campus environment. Please help to keep it safe by reporting any incidents, accidents or potentially unsafe situations to a member of staff as soon as possible.

Safety assessments have been undertaken for each module of your course and you will be advised of all applicable safety codes and any specific safety issues during the induction to your course and modules. You must ensure that you understand and apply all necessary safety codes. These form an essential element of your personal development and contribute to the safety of others.

4.5 Conduct

You will be expected to abide by the [Regulations for the Conduct of Students](#) in the University. UCLan expects you to behave in a respectful manner demonstrated by using

appropriate language in class, and switching mobile phones / other devices off prior to attending classes.

If your behaviour is considered to be unacceptable, any member of staff is able to issue an informal oral warning and the University will support staff by invoking formal procedures where necessary. You can read more about UCLan expectations in the regulations for the Conduct of Students.

4.6 Students' Union

The Students' Union is the representative body for all UCLan students. The organisation exists separately from the University and is led by the elected officers of the Student Affairs Committee (SAC) as well as representatives on the Students' Council. The Students' Union building is located at the heart of the Preston campus, and is the hub for all student activities.

Representation and campaigning for students' rights is at the core of what we do and is encompassed by our tag line of, *Making Life Better for Students*. Should you wish to make a change to any aspect of your student experience, whether it be academically related or not, then the Union is where your voice can be heard, actions taken, or campaigns launched.

Your Union is also the home to a fantastic range of student-led [societies](#), [sports teams](#) and multitudes of volunteering opportunities. You can also receive help in finding part-time work, whilst you study. Not sure where to go pop into the [Opportunities Centre](#) on the ground floor of the Students' Union building and someone will point you in the right direction.

We hope your time at University is trouble free, but should you come into difficulties around anything from academic appeals, to issues with housing, benefits or debt, then our dedicated staff team in the [Advice and Representation Centre](#) are on hand to help. As we are independently run from the university, we can offer truly impartial advice.

More information on all these things, as well as details about all our (not-for-profit) commercial services, including our student supermarket (Essentials) and student-bar (Source) can be found at <http://www.uclansu.co.uk/>.

The Opportunities Centre is the Union's One Stop Shop to find employment or volunteering whilst you study. With thousands of jobs and voluntary positions advertised, agency work through the Bridge and information on over 2000 volunteer positions within the Union.

5. Assessment

Please note that all modules will be assessed. You are expected to attempt all required assessments for each module for which you are registered, and to do so at the times scheduled unless authorised extensions, special arrangements for disability, or extenuating circumstances allow you to defer your assessment.

5.1 Assessment Strategy

Assessment is inescapable in formal education, but we don't want it to be a nightmare for you. Assessment can be used not only to *grade* your understanding of a topic, but also to give you and us *feedback* about how you're doing.

Part of that process requires you to develop your skills at *self-assessment*. *You* will always be in a position to judge how much you know and have achieved, and it's important that you accept that responsibility. During the course, you must be able to judge how you're doing in order to know when you've done enough work, and when you're having difficulty. Learning doesn't stop once you leave a classroom.

A variety of techniques of assessment will be used, some of it being of a continuous nature. Below, we'll briefly introduce you to the nature of these assessments.

Don't be 'afraid' to reveal your difficulties. We're here to help, and *nobody* gets it right all the time. The only person who never makes mistakes is the person who never tries anything. You will learn by *overcoming* mistakes and misunderstandings, not by avoiding or ignoring them.

In fact, reflecting on why you can't solve a problem may lead you to identify misunderstandings that you're not aware of. Don't worry about making mistakes, because we all do. It's an *essential* part of learning and trying something new.

Each module on which you enrol will have a number of **learning outcomes**. These are the things that you will be capable of doing when you have successfully completed the module. In order to determine whether or not you have achieved these outcomes we devise an **assessment strategy**. Because some outcomes are more easily assessed by coursework and others are more easily assessed by examination you will meet a wide variety of assessment methods throughout your programme in mathematics. This is because we always try to select the most appropriate assessment method for the particular learning outcome(s) that we are trying to assess at each stage.

5.2 Notification of assignments and examination arrangements

Because different modules will be assessed in different ways, there is no central rule for when or how assessments should be submitted. Some may be short pieces of handwritten work to be completed in class, some may be short projects to be typed up as formal reports and submitted online, and so on. For each module, when there is an assessed piece of work to be done the module tutor will give you a problem specification which tells you what, when and how to submit the resulting work. The tutor should also give you some indication of how the work will be marked – for example, they may tell you what you need to do to achieve a mark of 40%, what to do for 60%, and so on.

5.3 Referencing

When you have to refer to textbooks or other written materials in your assignments, you must include proper references to the materials. Guidance will be given in the module MA1851, where you will be issued with a guide to writing formal reports, which discusses proper referencing.

5.4 Confidential material

Within your course you are unlikely to have access to confidential information during the course. However, if you do, it is important to respect confidentiality. Any students who have to deal with confidential material will be briefed on this by their tutor at the time.

5.5 Dealing with difficulties in meeting assessment deadlines

Assignments must be submitted no later than the date on your assignment instructions / brief. If you anticipate that you will have difficulty in meeting assessment deadlines or you have missed or are likely to miss in-semester tests you must report this at the earliest possible opportunity to your year tutor (details in section 1.3).

Authorisation of the late submission of work requires written permission. Your School is authorised to give permission for **one extension period of between 1 and 10 working days** where appropriate evidence of good reason has been accepted and where submission within this timescale would be reasonable taking into account your circumstances ([Academic Regulations](#)).

You should complete and submit an [extension request form](#), with any supporting evidence, to your Administrative Hub (see section 1.5 for contact details). Further information is available on the Student Portal at:

https://www.uclan.ac.uk/students/study/examinations_and_awards/extenuating_circumstances.php

We aim to let you know if the extension has been granted within 1 working day of the receipt of the request.

If you are unable to submit work within 10 working days after the submission date due to verifiable extenuating circumstances, you may submit a case for consideration in accordance with the University's Policies and Procedures on Extenuating Circumstances ([Academic Regulations](#) and [Assessment Handbook](#)).

5.5.1 Extenuating circumstances

Some students face significant events in their personal life that occur after their course has started, which have a greater impact on their students than can be solved by the use of an extension. If this applies to you, the University is ready to support you both with regard to your course and your personal wellbeing through a process called Extenuating Circumstances (see [Academic Regulations](#) and [Assessment Handbook](#)).

Normally extenuating circumstances will relate to a change in your circumstances since you commenced your course, which have had a significant, adverse effect on your studies. Everyday occurrences such as colds or known conditions such as hay-fever will not qualify unless the effects are unusually severe and this is corroborated by a medical note. The University does not look sympathetically on absences or delays caused by holiday commitments or by work commitments in the case of full-time students. The normal work commitments of part-time students would not constitute an extenuating circumstance. A

disability or learning difficulty does not constitute an extenuating circumstance (see [Academic Regulations](#)).

Further information is available on the Student Portal at:

https://www.uclan.ac.uk/students/study/examinations_and_awards/extenuating_circumstances.php

You can apply for extenuating circumstances online via myUCLan. You must apply no later than 3 days after any examination or assessment submission date. Do not wait until you receive your assessment results to submit a claim. It is in your own interests to submit the claim as soon as possible. All evidence that is provided relating to extenuating circumstances will be treated in a sensitive and confidential manner. Supporting evidence will not be kept for longer than is necessary and will be destroyed shortly after the end of the current academic year.

You will be expected to re-submit claims for extenuating circumstances for each semester. All evidence that is provided relating to the extenuating circumstances will be treated in a sensitive and confidential manner. Supporting evidence will not be kept for longer than is necessary and will be destroyed shortly after the end of the current academic year.

Further information about the submission process is available at:

https://www.uclan.ac.uk/students/study/examinations_and_awards/extenuating_circumstances_submission.php

In determining assessment recommendations, Assessment Boards will consider properly submitted claims from students who believe their performance has been adversely affected by extenuating circumstances. N.B. Assessment Boards are not permitted to alter individual assessment marks to take account of extenuating circumstances ([Academic Regulations](#) and [Assessment Handbook](#)).

5.5.2 Late submissions

If you submit work late and unauthorised, a universal penalty will be applied in relation to your work:

- If you submit work within 5 working days following the published submission date you will obtain the minimum pass mark for that element of assessment.
- Work submitted later than 5 working days after the published submission date will be awarded a mark of 0% for that element of assessment.
- Unauthorised late submission at resubmission will automatically be awarded a mark of 0% for that element of assessment.

5.6 Feedback Following Assessments

UCLan is committed to giving you clear, legible and informative feedback for all your assessments ([Academic Regulations](#)). You are expected to review and reflect on your feedback and learn from each experience to improve your performance as you progress through the course.

You will be provided with generic feedback for in-module formative and summative elements of assessment which contribute to a module within 15 working days of the scheduled submission or examination date. Generic feedback on end of module assessment and

dissertations will be made available within 15 days of publication of results. Feedback may be oral, written, posted on a website or other.

5.7 Cheating, plagiarism, collusion or re-presentation

You are required to sign a declaration indicating that individual work submitted for an assessment is your own.

If you attempt to influence the standard of the award you obtain through cheating, plagiarism or collusion, it will be considered as a serious academic and disciplinary offence as described within the [Academic Regulations](#) and the [Assessment Handbook](#) .

- Cheating is any deliberate attempt to deceive and covers a range of offences described in the [Assessment Handbook](#).
- Plagiarism describes copying from the works of another person without suitably attributing the published or unpublished works of others. This means that all quotes, ideas, opinions, music and images should be acknowledged and referenced within your assignments.
- Collusion is an attempt to deceive the examiners by disguising the true authorship of an assignment by copying, or imitating in close detail another student's work - this includes with the other student's consent and also when 2 or more students divide the elements of an assignment amongst themselves and copy one another's answers. It does not include the normal situation in which you learn from your peers and share ideas, as this generates the knowledge and understanding necessary for each individual to independently undertake an assignment; nor should it be confused with group work on an assignment which is specifically authorised in the assignment brief.
- Re-presentation is an attempt to gain credit twice for the same piece of work.

The process of investigation and penalties which will be applied can be reviewed in the [Assessment Handbook](#). If an allegation is found to be proven then the appropriate penalty will be implemented:

In the case of a single offence of cheating, plagiarism, collusion or re-presentation:

- the penalty will be 0% for the element of assessment, and an overall fail for the module.
- the plagiarised element of assessment must be resubmitted to the required standard and the mark for the module following resubmission will be restricted to the minimum pass mark.
- when it is detected for the first time on a resubmission for an already failed module, no further resubmission for the module will be permitted, and the appropriate fail grade will be awarded.

In the event of a repeat offence of cheating, plagiarism, collusion or re-presentation (irrespective of whether the repeat offence involves the same form of unfair means) on the same or any other module within the course:

- the appropriate penalty will be 0% for the module with no opportunity for re-assessment. This penalty does not preclude you being able to retake the module in a subsequent year.

The penalties will apply if you transfer from one UCLan course to another during your period of study and module credits gained on the former course are transferred to the current course.

Contact the [Students' Union Advice and Representation Centre](#) by emailing: suadvice@uclan.ac.uk for support and guidance.

5.8 Appeals against assessment board decisions

If you consider that you have a reason to appeal against an assessment board decision, please bear in mind that your reasons must fall within the grounds specified in the University [Academic Regulations](#): Section I. You cannot appeal simply because you disagree with the mark given. The specified grounds for appeal are:

1. that an Assessment Board has given insufficient weight to extenuating circumstances;
2. that the student's academic performance has been adversely affected by extenuating circumstances which the student has, **for good reason**, been unable to make known to the Assessment Board;
3. that there has been a material administrative error at a stage of the examining process, or that some material irregularities have occurred;
4. that the assessment procedure and/or examinations have not been conducted in accordance with the approved regulations.

If you want to appeal, then you must do so within 14 days of your results being published. The onus is on you to find out your results and submit your appeal on time. Contact the [Students' Union Advice and Representation Centre](#) by emailing: suadvice@uclan.ac.uk for support and guidance.

You can find term dates and dates for the publication of results online by following the link: http://www.uclan.ac.uk/students/study/academic_calendar.php

6. Course regulations

6.1 Course requirements

You will be aiming for one of two degree awards offered in mathematics at UCLan: the Bachelor Degree (three years of full-time study) or the Integrated Masters Degree (four years of full-time study).

Master of Mathematics (Honours) Degree

MMath (Hons) Mathematics

Requires 480 credits including a minimum of 120 at level 7 or above, 220 credits at level 6 or above, and 360 at level 5 or above.

Bachelor of Science in Mathematics (Honours) Degree

BSc (Hons) Mathematics

Requires 360 credits, including a minimum of 100 at level 6 or above, 220 credits at level 5 or above.

If you do not meet the requirements for either of the above awards, you may qualify for one of the lower awards listed below:

Bachelor of Science in Mathematics Degree

BSc Mathematics

Requires 320 credits including a minimum of 60 at level 6 or above and 160 at Level 5 or above.

Diploma of Higher Education

DipHE Mathematics

Requires 240 credits, including a minimum of 100 at Level 5 or above.

Certificate of Higher Education

CertHE Mathematics

Requires 120 credits at Level 4 or above.

6.2 Classification of Awards

The University publishes the principles underpinning the way in which awards and results are decided in [Academic Regulations](#). Decisions about the overall classification of awards are made by Assessment Boards through the application of the academic and relevant course regulations.

7. Student voice

You can play an important part in the process of improving the quality of this course through the feedback you give. In addition to the on-going discussion with the course team throughout the year, there are a range of mechanisms for you to feedback about your experience of teaching and learning. We aim to respond to your feedback and let you know of our plans for improvement.

The Students Union can support you in voicing your opinion, provide on-going advice and support, and encourage your involvement in all feedback opportunities. They will be requesting that you complete the National Student Survey (during semester 2 for students in their final year of study) or the UCLan Student Survey (all other students).

The Students' Union and University work closely together to ensure that the student voice is heard in all matters of student-life. We encourage students to provide constructive feedback throughout their time at university, through course reps, surveys and any other appropriate means,

The Union's Student Affairs Committee (SAC), members of Students' Council and School Presidents each have particular representative responsibilities, and are involved with decision making committees as high as the University Board. Therefore it is very important students engage with the democratic processes of the Students' Union and elect the students they see as most able to represent them.

Students are welcomed to voice their opinion on matters relevant to the mathematics degrees throughout their studies. Twice per year there are meetings of the Student-Staff Liaison Committee (SSLC), as discussed below. Also, if and when any problems arise with specific modules, the module tutor will be happy to discuss the issues with individual students, and if problems arise which affect multiple modules, this can be raised by students with their year tutor or the course leader.

7.1 Course Representatives and School Presidents

A course representative is a student who represents their fellow students' views and opinions to the course team, school, university and students' union. Course representatives work proactively and diplomatically to improve the academic and non-academic experiences of students.

The role of a course representative is extremely beneficial to both students on your course and the university. It enables students to have ownership of their student experience and voice their opinions and share positive practice with the course team, primarily the Student Staff Liaison Committee Meetings (see below).

Course representatives will be elected every year either in April or September. Alongside receiving recognition, support and respect being a course representative is a great opportunity to enhance your employability skills. If you are interested in becoming a course representative and wish to find out more about the role visit the [Students' Union](#) website or by emailing: coursereps@uclan.ac.uk.

School Presidents meanwhile are annually elected representatives who voice the opinions of students within each school. They communicate and engage with students in their school to gain feedback and work in partnership with senior management to create positive change. They are also trained to support and signpost course representatives where needed. If you wish to find out who is your School President or more about the role visit the [Students' Union website](#) or email: coursereps@uclan.ac.uk

7.2 Student Staff Liaison Committee Meetings (SSLC)

The purpose of a SSLC meeting is to provide the opportunity for course representatives to feedback to staff about the course, the overall student experience and to inform developments which will improve future courses. These meetings are normally scheduled once per semester.

Your Course Leader will facilitate the meetings using guidelines and provide a record of the meeting with any decisions and / or responses made and / or actions taken as a result of the discussions held. The meetings include discussion of items forwarded by course representatives, normally related to the following agenda items (dependent on time of year).

The course team encourage student feedback in all areas and recognise that additional items for discussion may also be raised at the meeting

- Update on actions completed since the last meeting
- Feedback about the previous year – discussion of external examiner's report; outcomes of National /UCLan student surveys.
- Review of enrolment / induction experience;
- Course organisation and management (from each individual year group, and the course overall);
- Experience of modules - teaching, assessment, feedback;
- Experience of academic support which may include e.g. Personal Development Planning, academic advisor arrangements and The Card;
- Other aspects of University life relevant to student experience e.g. learning resources, IT, library;
- Any other issues raised by students or staff.

Course representatives are volunteers. If you wish to be considered as a course representative, please contact the course leader.

The dates of SSLC meetings are posted in the mathematics noticeboard on the ground floor of Leighton building; minutes of the meetings are made available through the mathematics eLearn site.

7.3 Complaints

The University recognises that there may be occasions when you have cause for complaint about the service you have received, when this happens, the complaints procedure is intended to provide an accessible, fair and straightforward system which ensures as effective, prompt and appropriate response. Click on this link for more information [Complaints Procedure](#)

8. Appendices

8.1 Programme Specification

UNIVERSITY OF CENTRAL LANCASHIRE

Programme Specification

This Programme Specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided.

Sources of information on the programme can be found in Section 17

1. Awarding Institution / Body	University of Central Lancashire
2. Teaching Institution and Location of Delivery	University of Central Lancashire, Preston Campus
3. University School/Centre	Computing, Engineering and Physical Sciences (CEPS)
4. External Accreditation	IMA approval
5. Title of Final Award	BSc/BSc (Hons) Mathematics
6. Modes of Attendance offered	Full-time/Part-time

7. UCAS Code	G100
8. Relevant Subject Benchmarking Group(s)	Mathematics
9. Other external influences	National STEM projects
10. Date of production/revision of this form	UCLan Validation: 12 April 2011
11. Aims of the Programme	
<ul style="list-style-type: none"> • To provide a good grounding in pure and applied mathematics. 	
<ul style="list-style-type: none"> • To provide a grounding in numerical solutions of mathematical problems. 	
<ul style="list-style-type: none"> • To provide sufficient in-depth subject knowledge to enable students to embark on further study or research either in an academic or industrial environment. 	
<ul style="list-style-type: none"> • To provide experience in a variety of working styles such as group, collaborative and independent working essential for the modern workplace. 	
<ul style="list-style-type: none"> • To provide the opportunity to develop skills and techniques found in mathematics which have wider applications 	

12. Learning Outcomes, Teaching, Learning and Assessment Methods**A. Knowledge and Understanding**

- A1. Use appropriate mathematical techniques in pure mathematics
- A2. Use mathematical methods to solve problems in applied mathematics.
- A3. Use mathematics to describe a system/situation.
- A4. Use a range of numerical methods and algorithms to find solutions to mathematical problems.

Teaching and Learning Methods

Lectures, workshops, tutorials and (PC) laboratory classes.
Unassessed exercises, worked examples.
Feedback on assessed and unassessed work

Assessment methods

Examinations, tests and coursework

B. Subject-specific skills

- B1. to be able to provide a coherent logical mathematical argument (e.g. proof)
- B2. Use mathematics to model systems
- B3. to be able to recognise the limitations and scope of particular mathematical techniques
- B4. generalise and extend areas of mathematics

Teaching and Learning Methods

Lecture, tutorials and workshops
Feedback on assessed and unassessed work

Assessment methods

Coursework and Examinations.

C. Thinking Skills

- C1. Analyse a given (mathematical) problem and apply appropriate maths to find a solution
- C2. To use mathematics to model a process or series of events
- C3. To analyse a math problem and find alternative representations

Teaching and Learning Methods

Lectures, tutorials and workshops
Feedback on assessed and unassessed work

Assessment methods

Coursework and examinations

D. Other skills relevant to employability and personal development

- D1. Manage own learning, making optimum use of appropriate texts and learning materials
- D2. Work in small groups towards a common aim
- D3. Use appropriate ICT and mathematical software tools.
- D4. Develop and deliver a presentation for peers and general consumption.

Teaching and Learning Methods

Lectures, tutorials, exercises and examples
Feedback on assessed and unassessed work

Assessment methods

Meeting deadlines. Word processed reports. Presentations
Feedback on assessed and unassessed work

13. Programme Structures				14. Awards and Credits
Level	Module Code	Module Title	Credit rating	
Level 6	MA3999	Mathematics BSc(Hons) Project	20	Bachelor Honours Degree Requires 360 credits including a minimum of 120 at Level 5 or above and 100 at Level 6 Bachelor Degree Requires 320 credits including a minimum of 100 at Level 5 or above and 60 at Level 6
	MA3157	Time Series and Op' Research	20	
	MA3811	Fields and Galois Theory	20	
	MA3812	Advanced Cryptology	20	
	MA3813	Logic	20	
	MA3821	Complex Analysis	20	
	MA3831	Partial Differential Equations and Integral Transforms	20	
	MA3842	Fluid Dynamics	20	
	MA3843	Mathematical Biology	20	
	MA3852	Advanced Numerical Analysis	20	
Level 5	MA2811	Algebraic Structures	20	Diploma of Higher Education Requires 240 credits including a minimum of 100 at Level 5 or above.
	MA2812	Cryptology	20	
	MA2821	Further Real Analysis	20	
	MA2831	Ordinary Differential Equations	20	
	MA2832	Vector Calculus	20	
	MA2841	Lagrangian and Hamiltonian Mechanics	20	

	MA2852 MA2861	Numerical Analysis Further Statistics	20 20	
Level 4	MA1811 MA1821 MA1831 AP1841 MA1851 MA1861	Introduction to Algebra and Linear Algebra Introduction to Real Analysis Functions, Vectors and Calculus Introduction to Mechanics Computational Mathematics Introduction to Probability and Statistics	20 20 20 20 20 20	Certificate of Higher Education Requires 120 credits at Level 4 or above.
15. Personal Development Planning				
<p>PDP is embedded within the programme and also in the academic advisor system.</p> <p>Talks and seminars are available to assist students in planning their careers.</p>				
16. Admissions criteria				

<p>For the uclan main campus: UCAS (A2) points normally in the range is 280-320 and Mathematics A-level (A2) at grade B or the equivalent.</p> <p>For Runshaw College (campus code R): UCAS points from 240 and Mathematics A-level (A2) at grade B or equivalent.</p>
17. Key sources of information about the programme
<ul style="list-style-type: none">• Student Handbook
<ul style="list-style-type: none">• Mathematics Module Catalogue
<ul style="list-style-type: none">• Web: Factsheets
<ul style="list-style-type: none">•

18. Curriculum Skills Map

Please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

Level	Module Code	Module Title	Core (C), Compulsory (COMP) or Option (O)	Programme Learning Outcomes															
				Knowledge and understanding				Subject-specific Skills				Thinking Skills				Other skills relevant to employability and personal development			

				A1	A2	A3	A4	B1	B2	B3	B4		C1	C2	C3	D1	D2	D3	D4
e.g. LEVEL 6	MA3999	Maths BSc Project	O			✓	✓	✓	✓	✓			✓	✓	✓	✓		✓	✓
	MA3157	Time Series & Op' Research	O		✓	✓	✓		✓				✓	✓		✓			
	MA3811	Fields and Galois Theory	O	✓				✓				✓	✓		✓	✓			
	MA3812	Advanced Cryptology	O	✓		✓	✓	✓				✓	✓		✓	✓			
	MA3813	Logic	O	✓		✓	✓	✓				✓	✓		✓	✓			
	MA3821	Complex Analysis	O	✓	✓			✓			✓	✓		✓		✓	✓		

e.g. LEVEL 4	MA1811	Introduction to Algebra and Linear Algebra	COMP	✓				✓					✓		✓	✓		✓	
	MA1821	Introduction to Real Analysis	COMP	✓				✓			✓		✓		✓	✓			
	MA1831	Functions, Vectors and Calculus	COMP		✓	✓	✓	✓	✓				✓	✓	✓	✓		✓	
	AP1841	Introduction to Mechanics	COMP		✓	✓	✓		✓				✓	✓		✓		✓	
	MA1851	Computational Mathematics	COMP	✓	✓	✓	✓		✓	✓			✓	✓		✓	✓	✓	✓
	MA1861	Introduction to Probability and Statistics	O		✓	✓			✓				✓	✓		✓			

Note: Mapping to other external frameworks, e.g. professional/statutory bodies, will be included with

UNIVERSITY OF CENTRAL LANCASHIRE

Programme Specification

This Programme Specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided.

Sources of information on the programme can be found in Section 17

13. Awarding Institution / Body	University of Central Lancashire
14. Teaching Institution and Location of Delivery	University of Central Lancashire
15. University School/Centre	Computing, Engineering and Physical Sciences (Preston)
16. External Accreditation	Institute of Mathematics and its Applications (IMA) accreditation pending
17. Title of Final Award	Master of Mathematics (MMath)
18. Modes of Attendance offered	Full-time/Part-time
19. UCAS Code	To be confirmed

20. Relevant Subject Benchmarking Group(s)	Mathematics
21. Other external influences	UK STEM projects
22. Date of production/revision of this form	May 2013
23. Aims of the Programme	
<ul style="list-style-type: none"> • To provide a good grounding in pure and applied mathematics. 	
<ul style="list-style-type: none"> • To provide a grounding in numerical solutions of mathematical problems. 	
<ul style="list-style-type: none"> • To provide sufficient in-depth subject knowledge to enable students to embark on further study or research either in an academic or industrial environment. 	
<ul style="list-style-type: none"> • To provide experience in a variety of working styles such as group, collaborative and independent working essential for the modern workplace. 	
<ul style="list-style-type: none"> • To provide the opportunity to develop skills and techniques found in mathematics which has wider applications. 	
<ul style="list-style-type: none"> • To develop more independent learning skills 	

24. Learning Outcomes, Teaching, Learning and Assessment Methods

A. Knowledge and Understanding

- A1. Use appropriate mathematical techniques in pure mathematics.
- A2. Use mathematical methods to solve problems in applied mathematics.
- A3. Use mathematics to describe a system/situation.
- A4. Use a range of numerical methods and algorithms to find solutions to mathematical problems.

Teaching and Learning Methods

Lectures, workshops, tutorials and (PC) laboratory classes.
Non-assessed exercises, worked examples.
Feedback on assessed and non-assessed work.

Assessment methods

Examinations, tests and coursework.

B. Subject-specific skills

- B1. Provide a coherent logical mathematical argument (e.g. proof).
- B2. Use mathematics to model systems.
- B3. Recognise the limitations and scope of particular mathematical techniques.
- B4. Generalise and extend areas of mathematics.

Teaching and Learning Methods

Lecture, tutorials and workshops.
Feedback on assessed and non-assessed work.

Assessment methods

Coursework and Examinations.

C. Thinking Skills

- C1. Analyse a given (mathematical) problem and apply appropriate maths to find a solution.
- C2. Use mathematics to model a process or series of events.
- C3. Analyse a math problem and find alternative representations.

Teaching and Learning Methods

Lectures, tutorials and workshops.
Feedback on assessed and non-assessed work.

Assessment methods

Coursework and examinations.

D. Other skills relevant to employability and personal development

D1. Manage own learning, making optimum use of appropriate texts and learning materials.

D2. Work in small groups towards a common aim.

D3. Use appropriate ICT and mathematical software tools.

D4. Develop and deliver a presentation for peers and general consumption.

Teaching and Learning Methods

Lectures, tutorials, exercises and examples.

Feedback on assessed and non-assessed work.

Assessment methods

Word processed reports. Presentations.

Feedback on assessed and non-assessed work.

13. Programme Structures				14. Awards and Credits
Level	Module Code	Module Title	Credit rating	
Level 7		Compulsory modules		Master of Mathematics Degree MMath Requires 480 credits of which a minimum of: 120 credits must be at level 7 or above, 220 credits at level 6 or above, 360 at level 5 or above
	MA4811	Associative Algebras	20	
	MA4821	Functional Analysis	20	
	MA4831	Asymptotic and Perturbation Methods	20	
	MA4844	Stability, Instability and Chaos	20	
	MA4845	Mathematics of Waves	20	
	MA4999	Special Mathematics Topics	20	
Level 6		Compulsory modules		Bachelor Honours Degree BSc (Hons) Mathematics Requires 360 credits of which a minimum of: 100 credits must be at level 6 or above, 220 credits at level 5 or above Bachelor Degree BSc Mathematics Requires 320 credits of which a minimum of: 60 credits must be at level 6 or above, 180 credits at level 5 or above
	MA3811	Fields and Galois Theory	20	
	MA3821	Complex Analysis	20	
	MA3831	PDEs and Integral Transforms	20	
		Optional modules		
	MA3852	Applied Numerical Analysis	20	
	MA3005	Vectors and Tensors	20	
	MA3157	Time Series and Operational Research	20	
	MA3812	Advanced Cryptology	20	
	MA3842	Fluid Dynamics	20	
	MA3843	Mathematical Biology	20	
Level 5		Compulsory modules:		Diploma of Higher Education Dip HE Mathematics
	MA2811	Algebraic Structures	20 20	

	MA2831 MA2821	Ordinary Differential Equations Further Real Analysis	20	Requires 240 credits of which a minimum of: 100 credits must be at level 5 or above
		Optional modules:	20	
	MA2812 MA2841	Cryptology Lagrangian and Hamiltonian Mechanics	20 20	
	MA2851	Numerical Analysis	20	
	MA2861	Further Statistics	20	
	MA2832	Vector Calculus		
Level 4		Compulsory modules		
	MA1811	Introduction to Algebra and Linear Algebra	20	
	MA1821 MA1831	Introduction to Real Analysis Functions, Vectors and Calculus	20 20	
	AP1841	Introduction to Mechanics	20	
	MA1851 MA1861	Computational Mathematics Introductory Statistics	20 20	

15. Personal Development Planning

PDP is embedded within the programme and also in the academic advisor system. PDP begins at level 4, and continues throughout the course. In MA1851 students are required to participate in group work, develop report writing skills and are assessed on an oral presentation. One of the assessments in MA3843 is a poster presentation. The Special Mathematics Topics module, which will further develop students' report writing and independent working skills. In addition, separate short courses will be delivered in basic IT skills for mathematicians, for example in using Microsoft Office products. Additional support will be available to individual students through the academic advisor system.

16. Admissions criteria

For entry to year 1 of the programme, the normal requirement is ABB or above at A Level with an A in Mathematics.

Students would be considered for entry directly into the final year of the MMath provided they had a BSc (Hons) in Mathematics upper second or higher and there was a sufficient match between passed modules in the students degree and the compulsory level 6 modules of the MMath (ie the student had passed all the required prerequisite material for year 4 level 7 modules)

Applications from individuals with non-standard qualifications, relevant work or life experience, and from those who can demonstrate the ability to cope with, and benefit from, degree level studies are welcome to apply and will be considered on an individual basis.

17. Key sources of information about the programme

- Student Handbook
- Mathematics Module Catalogue
- Web: Factsheets

18. Curriculum Skills Map

Please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

Level	Module Code	Module Title	Core (C), Compulsory (COMP) or Option (O)	Programme Learning Outcomes															
				Knowledge and understanding				Subject-specific Skills				Thinking Skills				Other skills relevant to employability and personal development			

				A1	A2	A3	A4	B1	B2	B3	B4		C1	C2	C3	D1	D2	D3	D4
LEVEL 7	MA4999	Special Mathematics Topics	COMP	✓	✓	✓	✓	✓	✓		✓		✓	✓	✓	✓		✓	✓
	MA4811	Associative Algebras	COMP	✓		✓		✓			✓		✓		✓	✓			
	MA4821	Functional Analysis	COMP	✓		✓		✓			✓		✓		✓	✓			
	MA4831	Asymptotic and Perturbation Methods	COMP		✓	✓	✓		✓	✓	✓			✓	✓		✓		✓
	MA4844	Stability, Instability and Chaos	COMP		✓	✓	✓		✓	✓		✓		✓	✓		✓		✓
	MA4845	Mathematics of Waves	COMP		✓	✓	✓		✓	✓	✓			✓	✓		✓		✓
LEV EL 6	MA3157	Time Series and Operational Research	O		✓	✓	✓		✓				✓	✓		✓			

	MA3005	Vectors and Tensors	O		✓	✓		✓					✓			✓			
	MA3811	Fields and Galois Theory	COMP	✓				✓			✓		✓		✓	✓			
	MA3812	Advanced Cryptology	O	✓		✓	✓	✓			✓		✓		✓	✓			
	MA3821	Complex Analysis	COMP	✓	✓			✓		✓	✓		✓		✓	✓			
	MA3831	PDEs and Integral Transforms	COMP		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓			
	MA3843	Mathematical Biology	O		✓	✓	✓		✓				✓	✓		✓	✓	✓	✓
	MA3852	Applied Numerical Analysis	O		✓	✓	✓	✓	✓	✓	✓		✓	✓		✓		✓	
	MA3842	Fluid Dynamics	O																
LEVEL 5	MA2811	Algebraic Structures	COMP	✓				✓					✓		✓	✓			
	MA2812	Cryptology	O	✓		✓	✓	✓					✓		✓	✓			
	MA2821	Further Real Analysis	COMP	✓				✓		✓	✓		✓		✓	✓			
	MA2831	ODE	COMP		✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓
	MA2841	Lagrangian & Hamiltonian Mechanics	O		✓	✓	✓		✓				✓	✓	✓	✓			
	MA2851	Numerical Analysis	O			✓	✓	✓	✓	✓	✓		✓	✓		✓		✓	
	MA2861	Further Statistics	O		✓								✓	✓		✓			
	MA2832	Vector Calculus	O		✓	✓		✓					✓						

LEVEL 4	MA1811	Introduction to Algebra and Linear Algebra	COMP	✓				✓					✓		✓	✓		✓		
	MA1821	Introduction to Real Analysis	COMP	✓				✓			✓		✓		✓	✓				
	MA1831	Functions, Vectors and Calculus	COMP		✓	✓	✓	✓	✓				✓	✓	✓	✓			✓	
	AP1841	Introduction to Mechanics	COMP		✓	✓	✓		✓				✓	✓		✓			✓	
	MA1851	Computational Mathematics	COMP	✓	✓	✓	✓		✓	✓			✓	✓		✓	✓	✓	✓	✓
	MA1861	Introductory Statistics	COMP		✓	✓			✓				✓	✓		✓				

Note: Mapping to other external frameworks, e.g. professional/statutory bodies, will be included within Student Course Handbooks

Tuition fees:

Your tuition fees include:

- Scheduled course tuition, academic, technical and administrative support, use of course equipment and facilities.
- Course related induction activities.
- Placement year academic support (where the course includes a placement year).
- Course assessment and awards.
- Access to the university's library and online resources, including on-campus wifi, networked and remote access to the university's virtual learning environment,
- Use of the university's estate and resources for scheduled activities and learning support
- Dissertation, project and/or thesis printing and binding where the submission of printed and bound documents is a requirement for assessment of the module.
- Use of the university's technical equipment and materials identified by the course teaching team as essential for the completion of the course.
- The extra items listed against your course in Table One below.

Table One: Course	Additional items included in the tuition fees for your course
BSc (Hons) Robotics Engineering BSc (Hons) Electronic Engineering	IET Membership
BSc (Hons) Mathematics years 1 2 and 3 BSc (Hons) Physics years 1 2 and 3	Frontier Education events
BSc (Hons) Motorsports Engineering years 1 2 and 3	Imech E Student Registration Formula Student
BSc (Hons) Forensic Computing years 1 2 and 3	Bond Solon Training
BSc (Hons) Mathematics years 1 2 and 3	Compulsory text books
BSc (Hons) Mathematics	Calculator Maple software
MPhys (Hons) Astrophysics BEng (Hons) Computer Aided Engineering BSc (Hons) Computer Network Technology BSc (Hons) Computer Games Development BSc (Hons) Computing BSc (Hons) Electronic Engineering BSc (Hons) Information Systems	Compulsory text books in year one

BSc (Hons) Multi Media Development	
BSc (Hons) Mathematics	
BSc (Hons) Mechanical Engineering	
BSc (Hons) Motorsports Engineering	
BSc (Hons) Multimedia and Mobile Development	
BSc (Hons) Physics	
BSc (Hons) Robotics Engineering	
BSc (Hons) Software Engineering	

Living costs:

Living costs are not included in your tuition fees. You will need to budget for these separately. Below is an indication of some typical living costs, but everyone is different and you are strongly advised to plan your own budget.

Typical items	Estimated weekly costs lower range	Estimated weekly costs higher range
Accommodation: University Halls of Residence based on a 42 week contract. Private Halls of Residence (Living at home may reduce your accommodation costs)	£79.03 £70 (£0)	£107.83 £110
Food	£20	£30
Internet connection (free wifi on campus, in university halls of residence and in some private accommodation)	£0	£12
Toiletries/Laundry	£5	£15
Gas/electricity/water (included within university halls of residence costs and some private accommodation – check your contract)	£0	£20
Printing, copying, stationery.	£2.50	£10
Travel expenses (varies by method & distance travelled e.g. on foot, bicycle, bus, train or car. If using bus or train check travel card / season ticket rates for savings).	£0	£40

University halls of residence and a good selection of private accommodation are situated on campus or a short walk from campus.		
Mobile phone or landline	£2.50	£10
Books	£5	£10
Leisure	£5	£25
Total per week	£110	£282
Total for 42 weeks (typical halls of residence contract)	£4,620	£11,844
Total for 52 weeks	£5,720	£14,664

You may also need to budget for 'one off' or irregular costs

Typical items	Notes
Bedding	From £20
Clothes	Costs vary depending on your needs
TV licence	£145.50 per year
Insurances	Costs vary depending on your needs.
Computer/laptop/telephone	You will have access to University computers or laptops for your studies or you may have your own you wish to bring. If you are acquiring one to come to university the cost varies depending on model and whether it is new or refurbished.
Furniture, crockery etc.	Furnished accommodation may include all your needs. Check your accommodation to see what is included.

Additional costs.

The costs below are incurred by some but not all students and are **not** included within the Tuition Fees.

Optional items – all courses	Estimated costs
Travel to course related work placements, work experience, voluntary work, or site visits (for example costs of petrol, business level motor insurance cover, taxis, train fares, bus fares etc.).	Variable depending on the distance travelled and the method of transport chosen.
Library fines & charges	On time £0.00 0-8 days overdue £0.10-0.50 per day 9+ days overdue £0.50-£1.00 per day

<i>Avoid these by returning on time or renewing books!</i>	40+ days replacement cost and administrative charges/account suspension
Costs of obtaining medical or other evidence to support applications for extenuating circumstance applications relating to assessments.	For example a medical certificate may cost from £10.
Fees for arranging and invigilating course examination(s) off campus are payable by the student (Note this only applies where permitted by course regulations and approved by course leaders)	£300
Printing of electronic books, journals etc. You are strongly recommended to access these electronically.	Estimated £0.10 per copy sheet
Printing of reports, course materials and other course documents, which have been supplied or are available electronically or in hard copy in the library.	Estimated £0.10 per copy sheet