

FACULTY OF SCIENCES



**POSTGRADUATE STUDIES
IN
ACTUARIAL SCIENCE**

**2009/2010
HANDBOOK**

(covering the MSc and Postgraduate Diploma Programmes of Study)

KENT
UNIVERSITY OF KENT

**SCHOOL OF MATHEMATICS,
STATISTICS AND ACTUARIAL SCIENCE**

Postgraduate Diploma Actuarial Science Modules

Code	Module Title	Contact	Term	Page
MA319	Probability and Statistics for Actuarial Science	Prof. SG Walker	A	25
MA501	Statistics for Insurance	Dr DJ Cole	S	25
MA629	Probability and Inference	Dr OD Lyne	A	26
MA639	Time Series and Simulation	Dr A Kume	S	26/27
MA819	Economics for Actuaries	Mrs L van der Bijl	S	27
MA820	Financial Mathematics	Mr JD Millett	A	27/28
MA825	Survival Models	Mr M Heller	A	28
MA826	Finance and Financial Reporting	Mrs L van der Bijl	A	28/29
MA833	Contingencies	Prof MS Brown	A/S	29
MA834	Financial Economics	Mr A James	S	29/30
MA836	Stochastic Processes	Dr L Breuer	A	30
MA840	Financial Modelling	Mr JD Millett	S	30

MSc Actuarial Science Modules

Code	Module Title	Contact	Term	Page
MA909	Enterprise Risk Management	Ms C Bellis	A/S	33
MA912	Life Insurance	Mr PL Duffett	A/S	33
MA914	Pension & Other Benefits	Mr N Wood	A/S	34
MA915	Finance & Investment	Mrs V Srinivasan	A/S	34
MA916	Derivative Securities	Dr P Tapadar	A/S	34/35
MA917	General Insurance - Reserving and Capital Modelling	Mr A Jackson	A/S	35
MA918	General Insurance – Premium Rating	Mr R Bevan	A/S	35
MA921	Core Applications Concepts 1	Mr A Jackson	A	36
MA922	Core Applications Concepts 2	Mr PL Duffett	A/S	36
MA950	PROPHET 1	Prof MS Brown	A	36/37
MA951	PROPHET 2	Prof MS Brown	S	37
MA952	Financial Modelling	Mrs L van der Bijl	A	37
MA953	Communications	Mr PL Duffett	A/S	38

School of Mathematics, Statistics & Actuarial Science Handbook 2009-2010

How To Use This Handbook

Dear Student

Welcome to the School of Mathematics, Statistics and Actuarial Science.

This handbook contains important information on module choices for students taking either the Postgraduate Diploma in Actuarial Science programme or the MSc in Applied Actuarial Science programme at the School of Mathematics, Statistics and Actuarial Science (SMSAS). It contains most, but not necessarily all, of the information you require to make your choices for the academic year 2009-2010.

Whilst every effort is made to give full and accurate information in this booklet it is not always possible to achieve this at the time of going to press. You should continue to consult the School notice boards during the academic year in case changes are made to the information contained herein. If you discover information that appears to be wrong or inconsistent then please inform us. We wish you all the best with your studies next year!

Professor Malcolm Brown
Head of Department and Director of Actuarial Science

Dr Frank Sowrey (SMSAS Administrator)

September 2009

Further information on many topics may be found on University Web pages.

www.kent.ac.uk

2009-2010 Handbook

Modules offered to Postgraduate Diploma and MSc students	Inside Front Cover
Welcome	3
Contents Page	4
General Information	5 – 7
Assessment and the Credit Framework	8 - 16
European Credit Transfer System	18 - 19
Welfare	19 - 20
Complaints Procedure	20
Careers and Personal Development	19
Concessionary Evidence	20
Student Learning Advisory Service	21
Composition of the Postgraduate Diploma in Actuarial Science Programme	23
Description of Postgraduate Diploma Modules	23 - 30
Composition of the MSc in Applied Actuarial Science	31
Descriptions of MSc Modules	32 - 37
Aims and Objectives of The SMSAS	39 - 40
Dates of Terms and Teaching Weeks	41
Teaching Room Locations	42
SMSAS Teaching, Research and Administrative Staff	43

General Information

This handbook contains important information on module choices for either the Postgraduate Diploma in Actuarial Science programme or the MSc in Applied Actuarial Science programme.

Students should discuss their choice of modules with their tutor before filling in the Registration Form. Completed registration forms must be returned to the Maths General Office by the closing date on the form. If modules are under-subscribed they may be withdrawn in which case the students concerned will be notified

Postgraduate Diploma in Actuarial Science: Students registered for this programme must select modules so that the minimum total number of credits is 120 (with at least 90 credits at level M). For the Postgraduate Certificate in Actuarial Science programme, the minimum total number of credits is 60 (with at least 40 at level M). Details of the credit framework are covered later in this handbook.

MSc in Applied Actuarial Science: Students registered for this programme must select modules so that the total number of credits is 180 (with at least 150 credits at level M). For the Postgraduate Diploma in Applied Actuarial Science, the minimum total number of credits is 120 (with at least 90 at level M) and for the Postgraduate Certificate in Applied Actuarial Science, the minimum total number of credits is 60 (with at least 40 at level M). Details of the Credit framework are covered later in this handbook.

SMSAS Aims and Objectives

A list of the Aims and Objectives of the SMSAS may be found in an Appendix near the end of this booklet.

Registration for Examinations

All students are required to confirm that they have been correctly entered for end of year examinations. Information will be given to you at the appropriate time. Students should note that they may be required to sit examinations on Saturdays.

Communications

Students should check regularly for mail in the pigeonholes in the SMSAS foyer and those in their College. When staff need to communicate urgently with students they will place a notice on the SMSAS notice board in the foyer, or send an email. It is important that students check the pigeonholes, notice boards and their emails frequently, i.e. at least once a day. Where a student does not respond to messages from Kent University staff either by email or by letter, the matter will be reported to the Director of Studies for further action and may be taken as an indication of lack of diligence.

Term-Time Addresses

It is a requirement of the University that you ensure that we always have your current, term-time, address and telephone number. If you suspect that we might not have your current address or if you move please inform the SMSAS General Office (located on the ground floor of the Maths Building, telephone extension 7181) as soon as possible. It is also a requirement of the University that you reside within 25 miles of Canterbury; if you are experiencing difficulties with regard to this please contact your tutor without delay.

Withdrawal/Intermission

Students considering withdrawal from the University, or suspending their studies, should discuss the matter with their tutor in the first instance. The permission of the Senior Tutor will be required and you must make a formal written request through the Departmental Administrator.

It is important that you seek help if you are experiencing problems with your studies.

If you seek a period of intermission you are strongly advised to check the financial consequences with your sponsors. It is very important that your sponsor is consulted.

PLEASE NOTE THAT IF YOU HAVE NOT HAD PERMISSION TO INTERMIT, YOUR FEES WILL NOT BE ADJUSTED AND YOU WILL BE CHARGED FULL FEES FOR ACCOMMODATION AND TUITION.

Students take time out from their degree (known as intermitting) for a variety of reasons, mainly personal, but sometimes academic or financial. If you feel you need some time out, go and see your Tutor, your Senior Tutor or the University Counselling Service. Intermitting does not change the duration of your degree it just gives you the opportunity to take some time away from University should you need to. The University does not encourage people to take longer than normal to complete their studies but is willing to discuss this with you. Whatever is decided you will need to speak to your funding body to ensure that any funding you receive is not affected by intermission.

Intermission is normally given for a complete academic year, or occasionally part of an academic year. Your Departmental Senior Tutor will ultimately be responsible for authorising your period of intermission. **However, intermissions after the end of student examination registration will require the permission of the Dean of the Faculty.**

Possible reasons for leave to intermit are:

1. **Personal Grounds** - Family or personal reasons (other than illness) prevent you from continuing your studies
2. **Financial Grounds** - Where your financial situation prevents you from continuing your studies.
3. **Medical Grounds:**
 - (a) Absence from the University due to medical or emotional reasons, or other such extenuating circumstances.
 - (b) Illness or extenuating circumstances, which are having a negative impact on your studies.
 - (c) Illness or extenuating circumstances that have interrupted your studies

When the reason for intermitting is medical, then your Departmental Senior Tutor will request medical evidence. They will not ask for supervision reports. Before you return from intermission, you will be required to provide another medical certificate to testify that you are fit to return to your studies.

A few things to remember:

- Intermitting does not change the number of terms you will spend at the University, or your examination results.
- Intermitting is intended to relieve you of a disadvantage, not put you at an advantage to other students.
- If you intermit within 4 weeks of the start of full term (and you are privately funded) then you will be entitled to full return of your university fees for that term and for the remainder of the academic year. If you are LEA funded then 1 December is the cut-off date.
- If you subsequently want to change the period for which you have been permitted to intermit, you must seek approval from your Departmental Senior Tutor.
- If you have to go out of residence quickly for medical reasons, make sure you are seen by a doctor at the time so they can give you a medical certificate that reflects the severity of your condition.
- ***Make sure that your LEA is informed if you intermit***

If you wish to intermit you should discuss the matter with your tutor or departmental advisor in the first instance. Final permission will be granted by the Department Senior Tutor where there are good medical, financial or personal reasons, or where intermission can be shown to be in your academic interests. Further details can be obtained from the SMSAS Departmental Administrator.

Codes of Practice

There are specific codes of practice for postgraduate students of which you need to be aware, please access the codes for the Faculty of Science, Technology and Medical Studies through the following link: www.kent.ac.uk/stms

Coursework

Plagiarism and Duplication of Material

Plagiarism is the act of presenting the ideas or discoveries of another as one's own. To copy sentences, phrases or even striking expressions without acknowledgement in a manner which may deceive the reader as to the source is plagiarism; to paraphrase in a manner which may deceive the reader is also plagiarism.

A student must not reproduce in any work submitted for assessment (for example, examination answers, essays, project reports, dissertations or theses) any material derived from work authored by another without clearly acknowledging the source.

Duplication of material means the inclusion in coursework (including essays, projects and dissertations) of a significant amount of material which is identical or substantially similar to material which has already been submitted for the same or any other module at the University or elsewhere. A student must not reproduce in any work submitted for assessment any substantial amount of material used by that student in other work for assessment, either at this University or elsewhere, without acknowledging that such work has been so submitted.

The University does not accept plagiarism or duplication of material and imposes severe penalties if it occurs in coursework, dissertations, projects and examinations. If you need guidance on the correct use and presentation of quotations and source material, you should consult your tutor or supervisor.

Further information on plagiarism is contained in the University's Part II Examination Conventions which can be found at www.kent.ac.uk/registry/quality/ptllcons.html.

Coursework for SMSAS Modules

Details of assessed coursework will be found in the SMSAS module outlines elsewhere in this booklet. The deadlines for the submission of coursework for modules will be notified to students. The penalty for late or non-submission of coursework is that a mark of zero is awarded for the missing piece of work and the final mark for the module concerned is calculated accordingly, (see information on extensions below).

Extensions for Coursework in SMSAS Modules

Students are expected to submit all work by the date and time announced. Extensions will not be granted without good reason. Any extensions granted will be the minimum required to compensate the student for the misfortune which is the basis for the request.

For coursework associated with Lecture Modules

1. A student who considers that an extension is justified should request this from the convenor of the module or his/her deputy (e.g. the lecturer who set the work)
2. No extension will be allowed which enables a student to submit work after the time at which marked work is returned to other students or worked solutions are given (either in writing or orally) to the class.
3. In the case of assessed work contributing to the module mark, a proposed extension disallowed under rule 2, above, will result in the student being excused the work in question, and being allocated a mark equal to the weighted average of the remaining components of his/ her coursework mark.

Timetable and Teaching Hours

The timetable with related information including the location of teaching rooms will be displayed on the notice board in the School's foyer. Students should note that they may be required to attend lectures and seminars between the hours of 9.00am and 6.00pm (7.00pm on occasions) on Mondays, Tuesdays, Thursdays and Fridays, and between the hours of 9.00am and 1.00pm on Wednesdays. It is sometimes necessary for teaching to take place on Wednesday afternoons.

Assessment and the Credit Framework

1. Introduction

The Credit Framework for taught programmes, as described in this document, applies to all programmes of study taught at and by the University of Kent and its Associate Colleges and leading to awards of the University of Kent. It does not apply to programmes leading to the award of a research degree or to programmes at institutions which are accredited by the University or to programmes taught by the University but leading to awards by other bodies, for example by EDEXCEL. Programmes validated by the University may be permitted to opt into the Credit Framework provided that they satisfy certain conditions and are approved for this purpose. All University modules, even if not taken as part of a programme of study leading to an award of the University, are regarded as credit-bearing.

The Credit Framework is applicable to all students beginning such a taught programme of study in and after September 2002.

The information provided in this document is as approved by the Senate of the University on 28 November 2001 and includes all amendments approved by the Senate up to and including 25 June 2003. The Credit Framework will be reviewed from time to time by the University Learning & Teaching Board and the University reserves the right to modify the Framework in the light of such reviews.

This document is intended to provide information about the Credit Framework to students, teachers and examiners. Any queries should be addressed in the first instance to the appropriate Faculty Officer.

For information on quality assurance of programmes of study, see the University Code of Practice for Quality Assurance. For information about Meetings of Boards of Examiners and about the role and responsibilities of External Examiners, see Annex J and Annex K of the Code of Practice for Quality Assurance.

2. Outline of Credit Framework

In order to be eligible for an award of the University, a student must take an approved programme of study, obtain a specified number of credits, the number required depending on the award in question, and meet such other requirements as may be specified for the programme of study in question. Each programme of study comprises a number of modules, usually at different levels and each worth a specified number of credits. In order to be awarded the credits for a module, the student must normally demonstrate, via assessment, that he/she has achieved the learning outcomes specified for the module. Limited credit may also be awarded where assessment has been affected by illness or where the student has demonstrated in other modules that all programme learning outcomes have been achieved (see sections 6.2: Condonement and 6.3: Compensation).

Most programmes of study are divided into stages, usually equivalent to one year of full time study. A student must satisfy prescribed requirements for each stage of a programme before being permitted to proceed to the next stage.

Many programmes of study lead to 'classified' awards. For example, most undergraduate degrees are awarded with First Class, Upper Second Class, Lower Second Class or Third Class honours and Certificates may be awarded with Merit or with Distinction.

Example: a student taking a three year full time undergraduate honours degree programme is required to obtain a total of 360 credits of which at least 90 must be at level 'H' or above (final year modules are normally at level 'H') and at most 150 may be at level 'C' (first year modules are normally at level 'C'). Many three year full time honours degree programmes comprise 120 level C

credits in stage 1, 120 level I/H credits in stage 2 and 120 level H credits in stage 3. At least 90 credits must be obtained in stage 1 before the student is permitted to proceed to stage 2 and at least 90 credits must be obtained in stage 2 before the student is permitted to proceed to stage 3. The remainder of this document describes the Credit Framework in detail. A glossary of terms used may be found at Annex 1.

3. Programmes of Study

Each programme of study comprises an approved set or sets of modules and is divided into a number of stages. Each module is at a specified level and a student is awarded a specified number of credits at that level following successful completion of the module. The University defines these terms as follows:

Credits: one credit corresponds to approximately ten hours of 'learning time' (i.e. including all taught or supervised classes and all private study and research). Thus obtaining 120 credits in an academic year of 30 weeks requires 1200 hours of learning time, equivalent to 40 hours per week.

Module: a module is a self contained component of a programme or programmes of study with defined learning outcomes, teaching and learning methods and assessment requirements. The University has agreed that each module should normally correspond to a multiple of 15 credits i.e. to 15, 30, 45...credits but that this should not apply to taught postgraduate programmes where this was not the case prior to the introduction of the Credit Framework; and that Faculties should be authorised to approve exceptions where they are satisfied that there is good reason to do so.

Level: each module must be at one, and only one, of the following levels:

- F Foundation
- C Certificate
- I Intermediate
- H Honours
- M Masters
- D Doctoral

The level descriptors adopted by the University for these levels may be found in Annex 2. Where there are modules at different levels which have the same or similar curriculum, they may share some or all of their teaching but will normally have different learning outcomes and assessment.

Stage: Most programmes of study are divided into a number of stages and students must achieve specified requirements in each stage except the final stage before being permitted to progress to the next stage. For undergraduate honours degree programmes, a stage will normally consist of modules amounting to 120 credits. Programmes of study comprising 120 credits or less will normally consist of a single stage.

Awards: In order to be eligible for the award of a certificate, diploma or degree by the University, a student must obtain at least the minimum number of credits specified for that award at the specified levels. These requirements are set out in Annex 4. Individual programmes or groups of programmes will normally specify additional requirements which must be met for the award of the qualification in the subject concerned, for example by requiring the student to take and obtain credits for specified modules.

4. Award Titles

Single Subject Awards

Qualifications other than Honours degrees may be awarded in a single subject (e.g. Certificate in French) provided that at least 75% of the credits required for the award are in the subject concerned. Honours degrees may be awarded in a single subject provided that at least 75% of the credits used for determining the class of Honours are in the subject concerned.

Awards in Two Subjects

Qualifications other than Honours degrees may be awarded in two subjects (e.g. Certificate in French and German) provided that credits in each of the subjects contribute at least 37.5% of the credits required for the award. Honours degrees may be awarded in two subjects provided that

credits in each of the subjects contribute at least 37.5% of the credits used for determining the class of Honours.

Major/Minor Awards

Qualifications other than Honours degrees may be awarded in a major subject with a minor subject (e.g. Certificate in French with German) provided that credits in the major subject contribute at least 65% of the credits required for the award and credits in the minor subject contribute at least 25% of the credits required for the award.

Honours degrees may be awarded in a major subject with a minor subject provided that credits in the major subject contribute at least 65% of the credits used for determining the class of Honours and credits in the minor subject contribute at least 25% of the credits used for determining the class of Honours.

Major/Major/Minor Awards

Qualifications other than Honours degrees may be awarded in two major subjects with a minor subject (e.g. Certificate in French and Spanish with German) provided that credits in each of the major subjects contribute 37.5% of the credits required for the award and credits in the minor subject contribute 25% of the credits required for the award. Honours degrees may be awarded in two major subjects with a minor subject provided that credits in each of the major subjects contribute at least 90 of the credits used for determining the class of Honours and credits in the minor subject contribute at least 60 of the credits used for determining the class of Honours.

Other Awards: Where none of the above requirements are met or a programme of study covers more than three substantive subjects, awards should be in a generic subject area which includes the subjects in question, for example Physical Sciences or Social Sciences or Humanities, or in Combined Studies.

5. Time Limits

Programmes of Study

In order to remain eligible for an award, students must complete their programme of study within the time limits set out below. These time limits include any periods of intermission and any period of time in which a student is repeating part of the programme of study and apply to both full time and part time students. Programme specifications specify the normal period of time over which the programme will be completed.

Undergraduate Certificate or Diploma	6 years
Foundation Degree	6 years
Non-Honours Bachelors Degree	8 years
Bachelors Degree with Honours	8 years
Graduate Certificate or Diploma	4 years
Extended Masters Degree	8 years
Postgraduate Certificate	4 years
Postgraduate Diploma	6 years
Masters Degrees (graduate entry)	6 years

Modules

Credits awarded for successful completion of a module will remain eligible to contribute towards an award for a prescribed period and up to a maximum of 8 years from the date on which the credits are awarded. Module specifications, particularly in rapidly developing subjects, may specify that credit obtained will remain eligible to contribute towards an award for less than 8 years. Where the module specification does not specify any period of eligibility, this will be taken to be 8 years.

6. Award of Credits

Successful Completion of Module

A student who successfully demonstrates via assessment that he/she has achieved the specified learning outcomes for a module will be awarded the number and level of credits prescribed for the module. Assessment methods vary between modules and assessment is designed so that achievement of the pass mark or above will demonstrate achievement of learning outcomes. Module specifications will state the pass mark and whether this has to be achieved overall and/or in prescribed elements of assessment. Where a student has an overall mark for a module which is above the pass mark but has failed a component of the assessment which must be passed, the overall mark for the module will be recorded as one mark below the pass mark i.e. if the pass mark is 40, an overall mark of 39 will be recorded. In certain modules, assessment may be on a Pass/Fail or a Fail/Pass/Merit/Distinction basis and numerical marks will not be awarded. In all other cases, the pass mark will be 40% (i.e. for all modules at level F, C, I, H and M).

Condonement

Where a student fails a module or modules but claims that this was due to illness or other mitigating circumstances, the Board of Examiners may condone such failure and award credits for the module(s), up to a limit of 25% of each stage of a programme of study, provided that there is evidence to show that the student has achieved the programme learning outcomes and provided that the student has submitted written medical or other evidence to substantiate any claim of illness or other mitigating circumstances. The marks achieved for such modules will not be adjusted to take account of the mitigating circumstances but transcripts issued to the student will indicate modules for which credits have been awarded via condonement. Programme specifications specify modules in which failure cannot be condoned.

Note: The above does not preclude a Board of Examiners from adjusting a module mark where a student has failed to complete assessment requirements for good reason as described in Annex 6, paragraph 22.

Compensation

Where a student fails a module or modules but has marks for such modules which are within 10 percentage points of the pass mark (see note 1), the Board of Examiners may nevertheless award the student the credits for the module(s), up to a limit of 25% of each stage of a programme of study, provided that the student has an average mark for the state which is at or above the pass mark and provided that there is evidence to show that programme learning outcomes have been achieved. The marks achieved for such modules will not be adjusted but transcripts issued to the student will indicate modules for which credits have been awarded via compensation. Programme specifications specify modules in which failure cannot be compensated.

Note 1: i.e. the achievement of a mark in the range 30% - 39% where the pass mark is 40%, or in the range 40% - 49% where the pass mark is 50%.

Note 2: The above does not preclude a Board of Examiners from adjusting a module mark where a student has failed to complete assessment requirements for good reason as described in Annex 6, paragraph 22.

Concurrent Application of the Condonement, Compensation and Trailing Provisions

The application of condonement, compensation or trailing provisions is limited to a maximum cumulative total of 25% of the credit available for any stage.

Application of the Condonement, Compensation and Trailing Provisions

The provision allowed for the condonement or compensation of failure or for the trailing and retrieving of credit should only be applied with respect to students who fail modules amounting to 25% or less of the credit available for the stage.

7. Progression – Not applicable to the Postgraduate/MSc programmes

When a student has completed a stage of a programme of study other than the final stage, the appropriate Board of Examiners will decide whether the student may progress to the next stage of the programme of study, or to another programme of study.

The normal requirement for progression from one stage of a programme of study to the next is that the student should have obtained at least 75% of the credits for the stage and should have obtained credits for those modules which the programme specification indicates must be obtained before progression is permitted.

7.1 Where a Board of Examiners is satisfied that a candidate has attained the minimum learning outcomes for stage 1 of an undergraduate degree programme, it shall have discretion to award the necessary credits for progression notwithstanding the marks obtained on particular modules.

Note: This discretion will be used only in exceptional circumstances where a candidate has failed to obtain marks necessary to proceed on modules whose learning content is not central to the learning outcomes of the programme, where the marks on the failed modules are inconsistent with the overall performance of the candidate and where they have been able to demonstrate achievement of the minimum programme learning outcomes in other modules. The object of this discretion is to encourage interdisciplinary and experimental study and the take-up of modules outside a candidate's core programme, such as languages or interfaculty modules, and so as not unreasonably to penalise students who have elected to take such modules but through experience have found them particularly difficult and burdensome.

Referral

Where a student is not permitted to progress to the next stage of a programme, the Board of Examiners may permit the student to undertake further assessment in failed modules. The Board of Examiners will specify which elements of assessment the student is required to undertake. Except in cases where students have been informed in advance that alternative assessment will not be permitted, elements of assessment that are unrepeatabe, e.g. seminar contributions, should be substituted by other assignments testing the same learning outcomes. In cases where alternative assessment is not permitted, students failing unrepeatabe elements may only retrieve credit by repeating the entire module. Marks already obtained for elements of assessment which the student is not required to undertake again will be carried forward unless the Board of Examiners specifies otherwise. At most two such opportunities per module will be permitted, the first of these to be automatically permitted unless denied for disciplinary reasons and normally available during the long vacation following the initial failure.

A student who is so referred in a module may be required to, or may elect to, repeat the module, before progressing to the next stage of the programme, provided that it is being taught in the year in question, or may choose to take a different module provided that the requirements of the programme of study are still met, but must do so before progressing to the next stage of the programme. At most two such opportunities per module will be permitted, the first of these to be automatically permitted unless denied for disciplinary reasons and normally available during the long vacation following the initial failure.

Trailing and Retrieving Credit

Where a student is permitted to progress to the next stage of a programme but has not been awarded full credit for the previous stage, the student will still need to obtain credits for modules for which he/she has so far not been awarded credit in order to meet requirements for the award of the certificate, diploma or degree for which he/she is registered. The student will be permitted to 'retrieve' such credits, up to a maximum of 25% of the credits for the stage, in one of two ways as follows:

- by undertaking further assessment, for example a resit examination, before the start of the next academic year. A student who is permitted to retrieve credit in this way may elect to repeat the

module, provided that it is being taught in the year in question, or may choose to take a different module, provided that the requirements of the programme of study are still met.

- by progressing to the next stage of the programme and simultaneously undertaking such further requirements as the Board of Examiners specifies in relation to the failed modules. This is known as trailing credit. Where credit is trailed, the Board of Examiners may permit the student to repeat the failed module(s) provided it/they are available and the timetable permits or to take an alternative module as permitted by the programme specification or may specify assessment to be undertaken satisfactorily for the award of the credits in question. Where a student trails credit in this way and again fails to obtain the credits, the credit may not be trailed to the next stage of the programme e.g. a student will not be permitted to progress to stage 3 of a programme unless he/she has obtained all stage 1 credits and met the minimum progression requirements in stage 2.
- At most two such retrieval opportunities per module will be permitted, the first of these to be automatically permitted unless denied for disciplinary reasons and normally available during the long vacation following the initial failure.

Deferral

Where a student has been unable to complete assessment requirements or performance has been affected by circumstances such as illness, and where there is written evidence to support this, the Board of Examiners may permit the student to undertake some or all of the assessment for some or all of the modules comprising the stage at a later date and as for the first time. Where the student has met requirements for progression to the next stage of the programme, he/she may be permitted to 'trail' the deferred assessment i.e. to proceed to the next stage and simultaneously undertake the deferred assessment as for the first time (see 7.4.2 above).

8. Interim Awards

The University does not award interim qualifications. Thus, for example, a student who is taking a programme of study leading to an Honours degree will not automatically be awarded a Certificate when the credits required for a Certificate have been obtained. However, in some programmes, students register initially on a Certificate programme, may then proceed to a Diploma programme and may then proceed to a degree programme. In these circumstances, successful students are awarded all three qualifications. See also 9: Fallback Awards.

9. Fallback Awards

A student who successfully completes one or more stages of an Honours degree programme but who does not successfully complete the whole programme will be eligible for a 'fallback award' i.e. for award of a Certificate, Diploma or non-Honours degree as appropriate. A student who obtains 120 credits at Level C or above but who does not obtain sufficient Level I/H credit for award of a Diploma or non-Honours degree will be awarded a Certificate. For each Honours degree programme, there will be either a corresponding Diploma programme or a corresponding non-Honours degree programme and students who do not meet the requirements for award of an Honours degree will be awarded a Diploma or non-Honours degree provided that they meet the requirements of such a Diploma or non-Honours degree programme. Fallback awards may also be available in other programmes of study.

10. Credit Transfer

A student who can provide evidence of previous relevant successful learning, either at this University or elsewhere, may, within specified limits, be exempted from part of a programme of study. Annex 3 sets out, for each award, the minimum number and levels of credits which must be obtained by taking part of the programme of study leading to the award concerned.

Admissions Officers, in consultation with appropriate Directors of Studies, are authorised to approve requests for credit transfer within the limits specified in Annex 3 which are supported by official transcripts or equivalent provided that they are satisfied that the applicant has achieved learning outcomes equivalent to those of the stage(s) or module(s) from which exemption is to be granted. The level and volume of credits from which the applicant is granted exemption may be less than those on which the application is based.

Where a student is granted exemption from part of a programme of study on the basis of credit transfer, the marks obtained by the student for such prior learning will not be used for classification purposes i.e. for determining an Honours classification or in deciding whether an award should be made with Merit or with Distinction except where it is agreed as part of an inter-institutional agreement that they should be so used.

11. Conventions for Award and Classification of Qualifications

Award of Certificates, Diplomas and Degrees

A student may only be recommended for the award by the University of a Certificate, Diploma or Degree in a specified subject if:

1. he/she meets the minimum requirements in terms of the number and levels of credits for the award in question as set out in Annex 4, except where the student has been granted limited exemption from these requirements through credit transfer, accreditation of prior learning or accreditation of prior experiential learning , and
2. he/she meets the requirements of the programme of study which has been approved as leading to the award in question, except where the student has been granted limited exemption from these requirements through credit transfer, accreditation of prior learning or accreditation of prior experiential learning.

Referral

Where a student, on completion of a programme of study leading to a named award, fails to meet the requirements for that award, the Board of Examiners may permit the student to undertake further assessment in failed modules. The Board of Examiners will specify which elements of assessment the student is required to undertake. Except in cases where students have been informed in advance that alternative assessment will not be permitted, elements of assessment that are unrepeatable, e.g. seminar contributions, should be substituted by other assignments testing the same learning outcomes. In cases where alternative assessment is not permitted, students failing unrepeatable elements may only retrieve credit by repeating the entire module. Marks already obtained for elements of assessment which the student is not required to undertake again will be carried forward unless the Board of Examiners specifies otherwise.

A student who is so referred in a module may be required to, or may elect to, repeat the module, provided that it is being taught in the year in question, or may choose to take a different module provided that the requirements of the programme of study are still met. At most two such opportunities per module will be permitted, the first of these to be automatically permitted unless denied for disciplinary reasons and normally available during the long vacation following the initial failure. Marks for modules in which a student has been referred or which a student has repeated or in which a student has attempted to retrieve an initial failure should be treated as set out in Annex 7.

Deferral

Where a student has been unable to complete assessment requirements or performance has been affected by circumstances such as illness, and where there is written evidence to support this, the Board of Examiners may permit the student to undertake some or all of the assessment for some or all of the modules concerned at a later date and as for the first time.

Classification of Awards

Students who successfully complete an Honours degree programme will be awarded a degree with First Class, Upper Second Class, Lower Second Class or Third Class honours. Students who successfully complete a programme of study leading to the award of a Certificate or Diploma may be awarded a Certificate or a Diploma with Merit or with Distinction. Students who successfully complete some programmes of study leading to the award of a Foundation Degree or Masters degree may be awarded the degree with Distinction or with Merit or with Distinction. The requirements for such awards are set out below.

General Requirements

1. For the MSc in Applied Actuarial Science marks obtained for obtained for all modules taken as part of the programme of study will contribute to the classification of an award. For the Postgraduate Diploma in Actuarial Science classification will be based on the highest scoring modules as described on page 18.

2. The volume of credit to be awarded for the successful completion of student placement years, whether taken in industry or in academic institutions overseas as part of an approved undergraduate programme, will be 120 credits. The level of the credits will be stated in programme specifications. While such credits will contribute to the total volume of credits required for an award, they should not be included in any calculations undertaken for the purpose of determining fields of study for joint awards, major/minor awards or major/major/minor awards.
3. For the purpose of classification, modules and/or stages may have different weightings as approved by Faculty Board.
4. While modules taken on a pass/fail basis contribute towards the volume of credit required for an award, they should be discounted when calculating overall average marks.
5. Where a student is exempted from part of the programme of study on the basis of credit transfer, marks obtained for such prior learning will not be used for classification purposes except where it is agreed as part of an inter-institutional agreement that they should be so used.
6. Where a student is awarded credit through condonement or compensation, the mark to be used for classification will be the mark awarded for the module which will not be adjusted to take account of the circumstances leading to such condonement or compensation.
7. Where a student fails a module at the first attempt and subsequently passes the module, or takes and passes an alternative module in place of a module which has been failed, the minimum pass mark will be used for classification.
8. Boards of Examiners may recommend the award of a higher classification than that indicated by the marks obtained provided that the student would have qualified for a higher classification if he/she had obtained two more marks for each module and provided that the Board of Examiners is satisfied that there is substantial evidence that the marks obtained do not fully reflect the candidate's overall achievement. Such evidence should normally take one or more of the forms stated below. The marks obtained should not be changed.
 - Documented evidence of significant medical or personal problems or of unexpected hardship.
 - Evidence obtained from a viva voce examination.
 - The views of an external examiner on the quality of work of the candidate
 - Significant improvement in final stage performance.
 - Note: This factor should not be taken into account where final stage marks are weighted more heavily than marks obtained in earlier stages.
 - Performance in one module substantially below that on other modules.
 - Evidence of achievement commensurate with the higher classification. Such evidence might include a significant number of answers to individual questions which are of appropriate quality or, in appropriate subjects, evidence of problem solving ability.

Credit may not be awarded through this means.

9. Boards of Examiners have discretion to make recommendations notwithstanding the Conventions in exceptional cases provided that such recommendations do not lower the classification arising on the application of the Conventions and provided always that the student has obtained at least seven eighths of the credits normally required for the award of the qualification in question (including credits awarded via condonement and/or compensation).
10. Aegrotat Awards: Where a student has obtained sufficient credit for the award of a qualification which can be classified but, as a result of illness or other misfortune, the Board of Examiners has insufficient evidence to enable it to determine a classification, the Board of Examiners may recommend that the student be offered an Aegrotat qualification. In such circumstances, the student may decline to accept the offer of an Aegrotat qualification and elect to undertake further assessment in the modules in which assessment was affected by illness or misfortune with a view to qualifying for a classified award.
11. The views of the External Examiner(s) shall be particularly influential in the case of disagreement on the final classification for a particular candidate.
12. The signature of all the External Examiners present shall be appended to the final list of results as evidence that they approve the classifications.

Classification of Awards other than HNC/Ds or Honours Degrees and of Stage 1 of Honours Degrees

The following classification rules apply to all Certificates and Diplomas, including Certificates and Diplomas of Higher Education, Graduate Certificates and Diplomas and Postgraduate Certificates and Diplomas, to Foundation Degrees and Masters* degrees other than 'Extended Masters'

degrees (which are awarded with Honours following successful completion of an extended undergraduate Honours degree programme) and to Stage 1 of Honours degree programmes.

**Some programmes leading to the award of a Masters degree do not make provision for the award to be made 'with Merit' or 'with Distinction' while others make provision for the degree to be awarded 'with Distinction' but not 'with Merit'.*

Each Faculty Board may decide or may authorise Departments in the Faculty to decide whether the award of Merit and Distinction will be based on:

either the **'average'** method,
or the **'preponderance'** method
or both the **'average'** and the **'preponderance'** methods.

If a Faculty Board fails to agree on the classification method to be used then both methods should be used. Where a Department is authorised to decide which method is to be used for programmes of study specified as within its area of responsibility, the Department shall have authority to do so on a programme by programme basis.

'Average' Method of Classification

'with Merit': an average mark of 60 or above but less than 70

'with Distinction': an average mark of 70 or above

'Preponderance' Method of Classification

'with Merit': an average mark over all contributing modules of 57 or above and a mark of 60 or above for 55% or more of the credits obtained

'with Distinction': an average mark over all contributing modules of 65 or above and a mark of 70 or above for 50% or more of the credits obtained

'Average' and 'Preponderance' Methods of Classification

Where both methods of classification are used, in the event of a difference in the classification derived for a particular student, the higher of the two classifications will be awarded

Classification of Honours Degrees

Each Faculty Board may decide or may authorise Departments in the Faculty to decide whether Honours degrees will be awarded on the basis of:

either the **'average'** method,
or the **'preponderance'** method
or both the **'average'** and the **'preponderance'** methods.

If a Faculty Board fails to agree on the classification method to be used then both methods should be used. Where a Department is authorised to decide which method is to be used for classification of degrees specified as within its area of responsibility, the Department shall have authority to do so on a programme by programme basis.

Both Methods of Classification

Where the class of degree is awarded on the basis of both the 'average' and 'preponderance' methods of classification, in the event of a difference in the classification derived for a particular student, the higher of the two classes will be awarded.

'Average' Method of Classification

A candidate who has met the requirements for the award of an Honours degree will be placed in an Honours class based on the average mark, with modules weighted as agreed by the Faculty Board and calculated to one decimal place, over all modules in stages 2, 3 and, where relevant, 4 of the programme of study according to the following table:

First Class Honours	70 and above
Upper Second Class Honours	60-69.9
Lower Second Class Honours	50-59.9
Third Class Honours	Below 50

Note: Although credits are normally awarded for a mark of 40 or above in a module, a student might obtain the credits required for award of an Honours degree but have an average mark of less than 40 where some credits have been obtained via compensation and/or condonement.

'Preponderance' Method of Classification

A candidate who has met the requirements for award of an Honours degree will be placed in an Honours class on the attainment of: at least the following number of credits in that class or above AND at least the following average mark over the examination as a whole:

For degrees with 240 contributing credits:

Class	Number of Credits in class or above	Average mark over all contributing modules
First Class	120	65
Upper Second Class	135	57
Lower Second Class	150	48
Third Class	240*	Not Applicable

For degrees with 360 contributing credits:

Class	Number of Credits in class or above	Average mark over all contributing modules
First Class	180	65
Upper Second Class	195	57
Lower Second Class	225	48
Third Class	360*	Not Applicable

For degrees/students with contributing credits other than above:

Class	% of Credits in class or above	Average mark over all contributing modules
First Class	50%	65
Upper Second Class	55%	57
Lower Second Class	62.5%	48
Third Class	100%	Not Applicable

* where credits have been awarded via compensation or condonement for a module mark of less than 40, the credits should be treated as being in the Third class category.

Note: Although credits are normally awarded for a mark of 40 or above in a module, a student might obtain the credits required for award of an Honours degree but have an average mark of less than 40 where some credits have been obtained via compensation and/or condonement.

European Credit Transfer System

The University has adopted the European Credit Transfer System (ECTS) in the context of our participation in the Socrates-Erasmus programme and other European connections and activities.

What is ECTS?

ECTS, the European Credit Transfer System, was developed by the Commission of the European Communities in order to provide common procedures to guarantee academic recognition of studies abroad. It provides a way of measuring and comparing learning achievements, and transferring them from one institution to another.

ECTS credits

ECTS credits are a value allocated to module units to describe the **student workload** required to complete them. They reflect the **quantity** of work each module requires **in relation to** the total quantity of work required to complete a full year of academic study at the institution, that is, lectures, practical

work, seminars, private work - in the library or at home - and examinations or other assessment activities. ECTS credits express a **relative value**.

In ECTS, 60 credits represent the workload of a year of study; normally 30 credits are given for a semester and 20 credits for a term. It is important that no special courses are set up for ECTS purposes, but that all ECTS courses are mainstream courses of the participating institutions, as followed by home students under normal regulations.

It is up to the participating institutions to subdivide the credits for the different courses. Practical placements and optional courses which form an integral part of the course of study also receive academic credit. Practical placements and optional courses which do not form an integral part of the course of study do not receive academic credit. Non-credit courses may, however, be mentioned in the transcript of records.

Credits are awarded only when the course has been completed and all required examinations have been successfully taken.

ECTS students

The students participating in ECTS will receive full credit for all academic work successfully carried out at an ECTS partner institution and they will be able to transfer these academic credits from one participating institution to another on the basis of prior agreement on the content of study programmes abroad between students and the institutions involved.

The ECTS Grading Scale

Examination and assessment results are usually expressed in grades. However, many different grading systems co-exist in Europe. Interpretation of grades varies considerably from one country to another, if not from one institution to another.

The ECTS grading scale has thus been developed in order to help institutions translate the grades awarded by host institutions to ECTS students. It provides information on the student's performance additional to that provided by the institution's grade; it **does not replace the local grade**. Higher education institutions make their own decisions on how to apply the ECTS grading scale to their own system.

1. Each institution awards marks/grades on the basis of its normal procedures and system and these marks form part of the student transcript.
2. The ECTS scale is designed as a "facilitating scale" to improve transparency but not to interfere with the normal process of awarding marks within each institution or attempt to impose uniformity. The ECTS grading scale ranks the students on a statistical basis.
3. Within the broad parameters set out below each institution makes its own decision on the precise application of the scale. #

ECTS GRADING SYSTEM	
ECTS Grade	% of successful students normally achieving the grade
A	10
B	25
C	30
D	25
E	10
FX F	A distinction is made between the grades FX and F that are used for unsuccessful students. FX means: "fail - some more work required to pass" and F means: "fail – considerable further work required".

Examinations

Examinations for all modules in the Postgraduate Diploma in Actuarial Science programme are held during the Summer Term. Examinations for modules in the MSc in Applied Actuarial Science programme are held during or after the Summer Term.

Resit Opportunities and Resit Marks

If you are unable to pass examinations at the first attempt you will generally have two further opportunities to sit the examination although no exemption from the corresponding actuarial professional examination is available from a resit. You will also have the right to repeat any failed module provided the module is being taught in the year in question and a place is available. Students wishing to repeat will be required to pay tuition fees on a module by module basis. In exceptional circumstances the Dean may give a student permission to repeat modules that have already been passed.

You should note that if you receive a mandatory award you are unlikely to receive funding for a repeat period of study. You will need to consider your financial situation carefully. Part-time students are unlikely to be eligible to live in University owned accommodation and may not receive Council Tax relief.

If you are an overseas student and are considering repeating failed modules you will need to determine, as a matter of priority and before leaving the country, how your immigration status may be affected by part-time study.

Classification of Postgraduate Diploma

The award of the Postgraduate Diploma in Actuarial Science is based on the overall average mark. For the purpose of calculating the average mark, the highest scoring modules (totaling 120 credits with at least 90 credits at level M) will be used.

- a) A candidate will be awarded the Diploma on attainment of an average of at least 40.
- b) A candidate will be awarded the Diploma with 'Merit' on attainment of an average mark of at least 60.
- c) A candidate will be awarded the Diploma with 'Distinction' on attainment of an average mark of at least 70.

Classification of MSc

The award of the MSc in Applied Actuarial Science is based on the overall average mark.

- (a) A candidate will be awarded an MSc on attainment of an average mark of at least 40.
- (b) A candidate will be awarded an MSc with 'Merit' on attainment of an average mark of at least 60.
- (c) A candidate will be awarded an MSc with 'Distinction' on attainment of an average mark of at least 70.

Welfare

If you have any academic, personal or financial problems your Tutor will be very willing to advise you and help in any way within their competence. If they cannot help you themselves they should know to whom you should turn for more expert advice. Alternatively you may prefer to talk to one of the people teaching you, to the Director of Studies or to the School Welfare Officer. In some cases you may not wish to confide in anyone within the academic structure. The University provides funds for a completely confidential professional counselling service. The counsellors have rooms in Darwin College and you can make an appointment by telephoning extension 3206.

Depending on what you want to talk about, other sources of help are also available: the Assistant Registrar responsible for Admissions Welfare, Mrs Anderson, in the Registry (extension 3383), the Chaplains, the Careers Officers, the Accommodation Office as well as the Welfare, Rights and Women's Officers of the Student Union. (If you have just arrived at the University you will find additional information about Surgery Opening Hours, the Chaplaincy Centre and other services in your Admissions Booklet, on the University website and also on the various campus Notices.) It is unlikely that you will meet a problem that has not arisen before; there should be someone who can offer you support and understanding.

Complaints Procedure

As a student you are entitled to receive competent teaching on all modules you take. The module questionnaire you fill in at the end of the module will enable your teachers to pick up suggestions for improvement, and in many cases you will be able to sort out any problems on the spot by talking them through with the teacher(s) of the module. But it does occasionally happen that there are serious grounds for dissatisfaction, which can be dealt with only by someone other than the teacher(s) concerned.

The Convenor of a module is the person who will normally consider any complaint. You may, however, if you wish, take a complaint in the first instance to your tutor, who can advise you about further steps, or to the Department Administrator.

If you, as an individual or as a group of students, feel that the basic requirements of good teaching are not being met, or that there are other issues to do with the module or its teacher(s) which give grounds for complaint, you should raise the matter immediately. You may want to talk first to your Tutor or your student representative, and ask him or her to convey the complaint to the Convenor, the Director of Studies or the Dean.

If there are grounds for complaint, you may wish, at the end of the module, to make a case that the inadequacies of the teaching have affected your performance. It is important that you should have raised any complaint you may have about a module or about a teacher immediately it becomes a matter of concern to you.

Attendance and Diligence

Students are expected to attend all lectures and other classes designated for the modules for which they are registered and to submit all work required by lecturers, whether or not this coursework contributes to the final mark for the module. If a student is unable to attend classes or submit required work because of illness or other reasonable cause, he or she must inform the module convenor without delay.

Any student whose record of work or attendance becomes unsatisfactory will be interviewed by the Director of Studies. In the worst cases, and where no sufficient mitigating circumstances are discovered, the Director of Studies will issue a formal warning letter to the student. If the student's work and attendance remain unsatisfactory after such a formal warning letter has been issued, the Director of Studies may recommend to the Board of the Faculty that the student should be required to withdraw immediately from the University.

Concessionary Evidence

If you are ill during the examination period or there are serious circumstances impairing your examination performance, you may make written representations, with supporting evidence, for the consideration of the Board of Examiners. Such representations must be made **within 5** days of the examination concerned and submitted to the Departmental Administrator. Students are strongly advised to keep their tutor informed throughout the year of any problems they may be experiencing.

Calculators

In teaching and examining modules involving the use of calculators it will be assumed that each student possesses a calculator having, in addition to the four basic arithmetic functions, at least one memory, facilities for square roots and logarithmic, exponential and trigonometric functions and a sum/sum of squares facility.

While students may wish to acquire a calculator with more advanced facilities, the range of types permitted for use in examinations is limited. The approved types for examinations are the Casio fx-83 models and fx-85 models (all variants). Only these will be allowed in the examinations.

Careers and Personal Development

The Careers Advisory Service is always happy to offer advice and help both in choosing a career and in making applications, refer to their web pages for details. In particular they have designed and



produced a Personal Development Workbook which assists you in constructing and maintaining a Personal Development Statement. This is intended to help you in producing CVs or completing an application form for employment. It would also be something you could give to your tutor or another member of staff from whom you are requesting a reference.

Copies of the booklet are available from the University of Kent Careers Advisory Service and further information is available from the Careers Service Web Pages (particularly the file otherfac.htm and carguide.htm which have details of other sources of Careers information). If you are using the PC-network then look for Career Guide under packages, install it if necessary, and view (it is a hypertext document). The Careers Advisory Service Web pages are at URL, <http://www.kent.ac.uk/careers/>

Student Learning Advisory Service

This Service is part of the Unit for the Enhancement of Learning and Teaching. The Service provides information and advice for students from all faculties and colleges who are interested in strengthening their study skills or who wish to discuss a specific study problem. This is provided in addition to the subject-based support available within Departments.

Topics explored include time management, essay and report writing, effective reading and note-taking, revision and exam techniques, organisational skills and issues such as motivation and concentration. Resources include books, videos, audio tapes, leaflets on a wide range of themes, including on-line advice pages; friendly, impartial advice in a relaxed environment and a series of 'workshops' on study techniques (watch out for publicity at the beginning of each term). Everyone is welcome. Whether you want help in organising your workload as a new student, or advice on planning your first research project, the Student Learning Advisory Service has information to offer and ideas to share. The Student Learning Advisory Service can be found at both the Canterbury and Medway Campuses. For further information, get in touch:

Contact Information				
	Canterbury	Medway		
 Where:	UCLT (between the banks and the Grimond Building)	Horsted Centre: UCLT Office, room 936, Block 9	Bridge Wardens College: Help-Desk in the Bridge Café	Pembroke: Details to be confirmed.
 Open:	Mon–Fri 9.00am–5.00pm	Mon–Thur 9.30am–1.30pm, and at other times by appointment	Wed. 2pm–4.30pm, and at other times by appointment	Watch out for publicity; if in doubt please get in touch.
 Phone:	Ext. 4016 or direct line 01227 824016	01634 830633 ext 2305		
 Email:	learning@kent.ac.uk	C.Macallister@kent.ac.uk		
 Web:	http://www.kent.ac.uk/uelt/			

Please note that the Student Learning Advisory Service is a wheelchair accessible venue, and this applies to all events we run. If you have any queries about making full use of our resources and services, please contact us; we will be glad to help.

Of the many books on study techniques that are available, you may wish to buy or borrow one or more of the following to help you off to a good start:

- P Creme & M Lea *Writing at University, a Guide for Students*. Buckingham: Open University, 1997
- S Cottrell *The Study Skills Handbook*. London: Palgrave, 1999 (useful for all Students; mature studies and dyslexic students will find this especially useful).
- B Greetham *How to Write Better Essays*. Basingstoke: Palgrave, 2001
- A Northedge *The Good Study Guide*. Milton Keynes: Open University, 1990 (for all Social Sciences students, but note alternative, above, for Management students)
- J Peck & M Coyle *The Student's Guide to Writing, Grammar, Punctuation and Spelling*. London: Macmillan, 1999
- E Tracy *The Student's Guide to Exam Success*. Buckingham: Open University, 2002

English Language Unit

The English Language unit at the university offers regular listening/speaking and writing classes in the English language. These are free of charge to registered students.

If you are interested, contact the English Language Unit (room G34, telephone extension 7648) between 2.00 - 4.00 pm Monday to Friday.

There are specific codes of practice for postgraduate students of which you need to be aware.
Please access the codes through the following link:

Faculty of Science, Technology and Medical Studies: www.kent.ac.uk/stms

Composition of the Postgraduate Diploma in Actuarial Science Programme

For the Postgraduate Diploma in Actuarial Science, all students must select modules so that the minimum total number of credits is 120 (with at least 90 at level M). For the Postgraduate Certificate in Actuarial Science, the minimum total number of credits is 60 (with at least 40 at level M). Particular attention should be paid to any prerequisite of modules offered.

During the academic year students do have the option to drop modules from their original module choice. To do this, students must submit a completed module change form by 4.00 pm on Friday 26 February 2010 to the Maths General Office. After this date, all selected modules will count towards the average that is used to determine whether a student has achieved the required mark in order to obtain exemptions from the professional actuarial exams under the university's accreditation agreement.

Students can select modules from the following:-

Module Code	Module Title	Credit Level	Credits	
MA319	Probability & Statistics for Actuarial Science	C	15	(CT3)
MA501	Statistics for Insurance	I	15	(CT6)
MA629	Probability & Inference	I	15	(CT3)
MA639	Time Series & Simulation	H	15	(CT6)
MA819	Economics for Actuaries	M	15	(CT7)
MA820	Financial Mathematics	M	15	(CT1)
MA825	Survival Models	M	15	(CT4)
MA826	Finance & Financial Reporting	M	15	(CT2)
MA833	Contingencies	M	30	(CT5)
MA834	Financial Economics	M	30	(CT8)
MA836	Stochastic Processes	M	15	(CT4)
MA840	Financial Modelling	M	15	(-)

The corresponding CT subject of the Actuarial Profession is denoted in brackets in the final column of the table above. Exemptions from the corresponding professional examinations are based on performance of combined examinations for subjects CT3, CT4, and CT6.

Descriptions of Modules

Descriptions of all the modules offered by the SMSAS for the Postgraduate Diploma in Actuarial Science appear in this section. The description for each module comprises a header and four parts. The header consists of: the module title, the name of a contact (the convenor, if known at the time of going to press), the term(s) in which it is delivered, the module code and its weight in credits. In certain cases a description will be included even if it is not available in the current academic year. This fact will also be noted in the header.

The four main parts are:

An informal description of or introduction to, the subject matter of the module together with an outline syllabus. A more detailed syllabus should be supplied by the convenor at the start of the module.

A reading list consisting of up to three items. In some cases there is a brief indication of the purpose of the references and in other cases the following codes may be used for individual books:

E = Essential Reading

R = Recommended Reading

B = Background Reading

For further information on an individual reading list consult the named contact. If in doubt about purchasing a book you are advised to wait until the start of the module when you should consult the lecturers.

Prerequisite and Dependent Modules. Students should use this information when planning a programme of choices and should consult the convenors of modules in cases where they are unclear about prerequisites.

Teaching and Assessment Methods: the former consists of a rough indication of the number and type of class hours involved, especially any computing requirements. The latter chiefly gives the relative weights of coursework and examination assessment.

MA319 Probability and Statistics for Actuarial Science	Term Taught: Autumn
Prof. Stephen Walker	Level: C Credits: 15 ECTS Credits: 7.5

The module will introduce the student to the basic concepts of probability and statistics, with applications to a variety of topics; the material will be related to real data at every stage. MINITAB will be used to provide statistical computing facilities. After dealing with probability theory, the module will cover descriptive statistics. This will be followed by elementary statistical inference and applications, mostly based on the Normal, t, χ^2 and F distributions.

The syllabus will include the following topics. Concepts and axioms of probability, marginal, conditional and joint probabilities; Bayes' theorem; discrete and continuous random variables; common distributions. Graphical representation of data; numerical summaries of data. Sampling distributions. Point estimation, interval estimation and hypothesis tests, all based on Normal samples. Association between variables. Goodness of fit.

Reading List:

S Ross	<i>A first course in Probability.</i> (4 th ed. Prentice Hall, 1994)
J Devore and R Peck	<i>Introductory Statistics.</i> (West, 1990) (especially recommended for students who have not done any statistics before)
F Daly et al	<i>Elements of Statistics.</i> (Open University, 1995) (B)
GM Clarke & D Cooke	<i>A Basic Course in Statistics.</i> (5 th ed. Arnold, 2004) (B)
DV Lindley & WF Scott	<i>New Cambridge Statistical Tables.</i> (2 nd ed. C.U.P., 1995) (E)

Contact Hours: There will be approximately 36 hours of formal lectures. There will also be about 12 hours of supervised exercise classes for all students. Some of these classes will be in the form of computer workshops, based on MINITAB.

Assessment Methods: A 2-hour examination in the summer term (90%) and coursework (10%)

MA501 Statistics for Insurance	Term Taught: Spring
Dr Diana Cole	Level: I Credits: 15 ECTS Credits: 7.5

This module covers aspects of Statistics which are particularly relevant to insurance. Some topics (such as risk theory and credibility theory) have been developed specifically for actuarial use. Other areas (such as Bayesian Statistics) have been developed in other contexts but now find applications in actuarial fields. Stochastic processes of events such as accidents, together with the financial flow of their payouts underpin much of the work. Since the earliest games of chance, the probability of ruin has been a topic of interest.

Outline Syllabus includes: Decision Theory; Loss Distributions; Aggregate Claims; Risk Models; Ruin Probabilities; Bayesian Statistics; Credibility Theory; Experience Rating Systems; Run-off Triangles; Generalised Linear Models

Reading List: Students are recommended to purchase the relevant study notes published by the Actuarial Education Company, and also the Formulae and Tables for Actuarial Examinations.. Arrangements will be made for students to purchase these through SMSAS at a competitive rate. The following may be consulted for background.

PJ Boland	<i>Statistical and Probabilistic Methods in Actuarial Science</i> (Chapman & Hall, 2007) (R)
N Bowers et al.	<i>Actuarial Mathematics.</i> (Society of Actuaries, 1986). (B)
IB Hossack, JH Pollard, & B Zehnirith	<i>Introductory Statistics with Applications in General Insurance.</i> (CUP 1983)(B)

Prerequisite Modules: MA629 *Probability and Inference*

Contact Hours: 36 hours of lectures

Assessment Method: 90% by a 3-hour written examination at the end of the year, and 10% coursework.

This module develops the techniques introduced in the first year Probability and Statistics modules, and lays the foundation for several third year Statistics modules. The probability component of the module is mainly concerned with how to find probability distributions of functions of random variables, an essential skill in proving standard statistical results and in applying probability and statistics in novel situations. The study of sampling distributions, which underpin much of statistical inference, provides a bridge to the statistical part of the module. Statistical inference may be divided into point estimation, interval estimation and hypothesis testing. All of these have been introduced in the first year Statistics module. The present module extends the range of examples, and provides some theoretical justification for the choice of particular techniques in particular cases.

Syllabus: Probability; joint distributions of two or more discrete or continuous random variables, marginal and conditional distributions, properties of expectations, variance, covariance and correlation. Generating functions: moment generating functions, probability generating functions, cumulant generating functions etc. The Poisson process. Methods for obtaining distributions of functions of one or more random variables. Approximate methods for transformations of random variables. Random number simulation. Sampling distributions related to the Normal distribution. Principles of statistical inference. Point estimation; properties of point estimators (unbiasedness, consistency, efficiency). Methods of estimation; maximum likelihood estimators, methods of moments. Hypothesis testing; Neyman-Pearson lemma, power function, uniformly most powerful tests, relative efficiency, likelihood ratio test. Interval estimation; construction of confidence intervals, pivotal functions.

Reading list:

- I Miller & M Miller *John E Freund's Mathematical Statistics with Applications*, 7th ed., Pearson Education, Prentice Hall, New Jersey, 2003 (QA276).(R)
- RV Hogg, JW McKean & AT Craig *Introduction to Mathematical Statistics*, 6th ed., Prentice Hall, 2003 (QA276) (B)
- HJ Larson *Introduction to Probability Theory and Statistical Inference*. (3rd ed., Wiley, 1982) (HA29)(B)

Co-requisite Modules:

Contact Hours:

Assessment Method:

MA319 *Probability and Statistics for Actuarial Science*
Approximately 36 hours of lectures supplemented by classes.
90% by a 2-hour written examination at the end of the year and 10% coursework.

A time series is a collection of observations made sequentially in time. Examples occur in a variety of fields, ranging from economics to engineering, and methods of analysing time series constitute an important area of statistics. After a quick introduction to the simple linear regression the module focuses on various time series models, including some recent developments, and provides modern statistical tools for their analysis. The other part of the module covers extensively simulation methods. These methods are becoming increasingly important tools as simulation models can be easily designed and run on modern PCs. Various practical examples are considered so as to help the students tackle the analysis of real data.

The syllabus includes: Difference equations, Stationary Time Series: ARMA process. Nonstationary Processes: ARIMA Model Building and Testing: Estimation, Box Jenkins, Criteria for choosing between models, Diagnostic tests.

Forecasting: Box-Jenkins, Prediction bounds. Testing for Trends and Unit Roots: Dickey-Fuller, ADF, Structural change, Trend-stationarity vs difference stationarity. Seasonality and Volatility: ARCH, GARCH, ML estimation. Multiequation Time Series Models: Spectral Analysis. Generation of pseudo – random numbers, simulation methods: inverse transform and acceptance-rejection, design issues and sensitivity analysis.

Reading List: The students are recommended to purchase the relevant study notes published by the Actuarial Education Company. Arrangements will be made by SMSAS to purchase these directly from the publisher at a competitive price. The following may be consulted for background.

PJ Brockwell & RA Davis *Introduction to Time Series and Forecasting.* (Springer. 2nd.ed.2002) (R)

W Enders *Applied Econometric Time Series* (Wiley. 2nd Ed., 2004) (R)

BJT Morgan *Elements of Simulation*, Chapman and Hall, 1984

NR Draper & H Smith *Applied Regression Analysis*, Wiley, New York, 1998

Prerequisite Modules: MA629 *Probability and Inference*. No dependent modules.

Contact Hours: Approximately 34 hours of lectures, 2 1-hour exercise sessions.

Assessment Method: Assignment contributes 10% of the final mark; examination in Summer term contributes 90% of the final mark.

MA819 Economics for Actuaries

Mrs Loba van der Bijl

Term Taught: Spring

Level: M Credits: 15 ECTS Credits: 7.5

This module provides an introduction to the basic economic principles and methods and is suitable for mathematicians. It is designed for students who have not studied economics before. The coverage is aimed at being sufficient to enable students to gain exemption from the professional examinations, whilst also giving a coherent coverage of the material suitable for students of other degree programmes where understanding economic concept and principles is beneficial.

Topics in the syllabus are as follows: The interaction between supply and demand in the provision of a product, and the way in which equilibrium in market prices is determined. Elasticity of supply and demand. Utility maximisation and consumer choice. Insurance systems to reduce financial impact of uncertain events. Opportunity cost. Profit maximisation. Short run and long run production choices. Competition and monopolies and the effects on supply and demand. Structure of the public sector finances of an industrialised society. GDP, GNP and NNP. The effect of saving/consumption on the economy. Impact of government intervention on the economy. Exchange rates and international trade. Factors affecting the rate of inflation, interest rates, rate of economic growth, and the theory of economic growth.

Reading List: The students are recommended to purchase the relevant study notes published by the Actuarial Education Company. Arrangements will be made by SMSAS to purchase these directly from the publisher at a competitive price. For a more thorough treatment of the topics the following are recommended:

David Begg, Stanley Fischer and Rudiger Dirnbusch *Economics* (McGraw Hill)

David Begg and Peter Smith *Economics Workbook* (McGraw Hill)

Paul Samuelson and William Norhaus *Economics* (McGraw Hill)

Contact Hours: The module consists of 48 hours of classes, comprising lectures, and examples classes.

Assessment Methods: The module is assessed by 2 assessments (25% of the final module mark), and a 3-hour written examination (75% of the final module mark) at the end of the year.

MA820 Financial Mathematics

Mr John Millett

Term Taught: Autumn

Level: M Credits: 15 ECTS Credits: 7.5

The idea of interest, which may be regarded as a price for the use of money, is fundamental to all long-term financial contracts. Interest is said to be compound if interest is payable on the interest previously earned. This module deals with accumulation of past payments and the discounting of future payments at fixed and varying rates of interest; it is fundamental to the financial aspects of Actuarial Science.

The syllabus will cover: Generalised cashflow models, the time value of money, real and money interest rates, discounting and accumulating, compound interest functions, equations of value, loan schedules, project appraisal, investments, elementary compound interest problems, the “no arbitrage” assumption and forward contracts, term structure of interest rates, stochastic interest rate models

Reading List:

The students are recommended to purchase the relevant study notes published by the Actuarial Education Company. Arrangements will be made by SMSAS to purchase these directly from the publisher at a competitive price. The following may be consulted for background.

JJ McCutcheon & WF Scott *An introduction to the Mathematics of Finance.* (Heinemann. 1986) (B)
 Bowers, L Newton et al *Actuarial Mathematics.* (Society of Actuaries 1997) (B)
 MV Butcher, Nesbitt, J Cecil *Mathematics of Compound Interest* (Ulrich’s Books 1971) (B)
 Ingersoll, E Jonathan *Theory of financial decision making.* (Rowman & Littlefield 1987) (B)
 Kellinson, G Stephen *The theory of interest.* (Irwin 1991) (B)

Dependent Module: MA833 *Contingencies*

Contact Hours: 48 hours of Lectures and Examples classes.

Assessment Methods: Assessment is by 75% final 3-hour examination and 25% coursework.

MA825 Survival Models	Term Taught: Autumn
Mr Mark Heller	Level: M Credits: 15 ECTS Credits: 7.5

Calculations in clinical trials, pensions and life and health insurance require reliable estimates of transition intensities/survival rates. This model covers the estimation of these intensities.

The syllabus includes the following: Concepts underlying actuarial modelling; Distribution and density functions of the random future lifetime, the survival function and the force of hazard. Estimation procedures for lifetime distributions including censoring, Kaplan-Meier estimate, Nelson-Aalen estimate and Cox model. Statistical models of transfers between multiple states. Maximum likelihood estimators for the transition intensities. Binomial and Poisson models of mortality. Estimation of age-dependent transition intensities. The graduation process. Testing of graduations. Measuring the exposed-to-risk.

Reading List:

Students are recommended to purchase the relevant study notes published by the Actuarial Education Company. Arrangements will be made for students to purchase these through SMSAS at a competitive rate.

Co-requisite Modules: MA833 *Contingencies*

Contact Hours: 36 hours comprising lectures and group work on exercises.

Assessment Method: 70% by a 3-hour written examination at the end of the year and 30% coursework.

MA826 Finance and Financial Reporting	Term Taught: Autumn
Mrs Loba van der Bijl	Level: M Credits: 15 ECTS Credits:7.5

This module provides an introduction to the principles of corporate finance and financial reporting. It is intended for students of Actuarial Science and is available to students in other programmes where a basic knowledge of financial markets, financial accounting and reporting is needed.

The syllabus introduces and develops the concepts and elements of corporate finance including a knowledge of the instruments used by companies to raise finance and manage financial risk, introduces the concepts and techniques of financial accounting and enables students to understand and interpret critically financial reports of companies and financial institutions including financial statements used by pension funds and insurance companies.

Reading List:

The students are recommended to purchase the relevant study notes published by the Actuarial Education Company. Arrangements will be made for students to purchase these directly from the publisher at a competitive price. The following may be consulted for background.

Richard A Brealey	<i>Principles of Corporate Finance</i>
JM Samuels, FM Wilkes, RE Brayshaw	<i>Management of Company Finance</i>
Geoffrey Holmes, Alan Sugden	<i>Interpreting Company Reports and Accounts</i>
JR Edwards, HJ Mellet	<i>Introduction to Accounting</i>

Pre-requisite Modules: None

Contact Hours: 48 hours - 3 lectures and one class each week

Assessment Method: 75% by a 3-hour written examination and 25% by coursework.

MA833 Contingencies	Terms Taught: Autumn & Spring
Professor Malcolm Brown	Level: M Credits: 30 ECTS Credits: 15

The first part of this module introduces the life table, the oldest actuarial model for contingencies (e.g. survival, death, sickness) relating to human life. This is then combined with the financial mathematics learned in module MA820 in order to calculate values for annuities, life assurance policies. As well as the traditional deterministic life table, we also consider the stochastic model recognising the random variation in individual lifetimes.

The syllabus will cover: survival models and the life table including select mortality functions; international actuarial notation; formulae for means and variances of assurances and annuities; commutation functions; curtate/complete life functions; premiums; net premiums; reserves. Simple annuities and assurances involving two lives. Contingent and reversionary benefits.

The second part of this module will apply actuarial techniques to a wide-range of products. In addition, expenses and profitability models for calculating gross premiums will be introduced. Population/selection techniques will also be covered.

The syllabus will cover: Variable benefits & with profit policies. Gross premiums & provisions for fixed & variable benefit contracts. Profit testing. Determining provisions using profit testing. Competing risks, Multiple decrement tables. Pension funds. Mortality, selection & standardisation.

Reading List:

Students are recommended to purchase the relevant study notes published by the Actuarial Education Company. Arrangements will be made for students to purchase these through SMSAS at a competitive rate.

Pre-requisite Modules: MA820 Financial Mathematics
MA319 Probability and Statistics for Actuarial Science

Contact Hours: 76 hours of lectures and example classes

Assessment Method: 75% by two 3-hour written examinations and 25% by coursework.

MA834 Financial Economics	Terms Taught: Spring
Dr Pradip Tapadar	Level: M Credits: 30 ECTS Credits: 15

This module will examine current theories on portfolio management, understanding and evaluating options and derivatives, and developing asset models to protect assurance companies and other investors as interest rates change.

Syllabus Topics: Efficient market hypothesis, measures of investment risk, portfolio theory, models of asset returns, asset pricing models, stochastic calculus and Itô processes, stochastic models of security prices, Brownian motion and martingales, an introduction to derivatives, the Greeks, the binomial model, Black-Scholes option pricing formula, the martingale representation theorem, arbitrage-free pricing, interest rate models, credit risk.

Reading Lists:

The students are recommended to purchase the relevant study notes published by the Actuarial Education Company. Arrangements will be made for students to purchase these directly from the publisher at a competitive price

Prerequisite Modules: MA639 *Time Series and Simulation*

Co-requisite Modules: MA836 *Stochastic Processes*

Contact Hours: 72 hours lectures.

Assessment Method: 75% by a 3-hour written examination and 25% coursework.

MA836 Stochastic Processes**Term Taught: Autumn****Dr Lothar Breuer****Level: M Credits: 15 ECTS Credits: 7.5**

A stochastic process is a process developing in time according to probability rules; for example, models for reserves in insurance companies, queue formation, the behaviour of a population of bacteria, and the persistence (or otherwise) of an unusual surname through successive generations.

The syllabus will include coverage of a wide variety of stochastic processes and their applications; random walk; Markov chains; processes in continuous-time such as the Poisson process, the birth and death process; renewal processes; queues.

Reading List: The students are recommended to purchase the relevant study notes published by the Actuarial Education Company. Arrangements will be made by SMSAS to purchase these directly from the publisher at a competitive price. The following may be consulted for background.

Ross, S M *Stochastic Processes.* (Wiley, 1996)

Çinlar, E. *Introduction to Stochastic Processes.* Englewood Cliffs, Prentice-Hall (1975)

Karlin, S. and Taylor, H. *A First Course in Stochastic Processes.* New York, Academic Press (1975)

Breuer, L and Baum, D *An introduction to Queueing Theory.* Heidelberg, Springer (2005)

Rolski, T., Schmidli, H., Schmidt, V & Teugels, J. *Stochastic Processes for Insurance and Finance.* New York, Wiley. (1999)

Co-requisite Module: MA319 Probability and Statistics for Actuarial Science and MA629 Probability and Inference or equivalent

Pre-requisite Module: None

Contact Hours: Approximately 36 hours of lectures and classes.

Assessment Method: 75% by a 2-hour written examination at the end of the year and 25% by assessment of certain exercises.

MA840 Financial Modelling**Term Taught: Spring****Mr John Millett****Level: M Credits: 15 ECTS Credits: 7.5**

This module will introduce financial models and shows how to analyse and summarise data, develop a model with an audit trail and develop the ability to apply the results.

This module also gives students practical experience of working with the financial model, PROPHET, which is used by commercial companies worldwide for profit testing, valuation and model office work.

Pre-requisite Module: None

Contact Hours: 36 hours comprising terminal sessions, example classes and some lectures.

Assessment Method: 100% coursework.

Composition of the MSc in Applied Actuarial Science Programme

For the MSc in Applied Actuarial Science, all students must select modules so that the total number of credits is 180 (with at least 150 at level M). For the Postgraduate Diploma in Applied Actuarial Science, the minimum total number of credits is 120 (with at least 90 at level M) and for the Postgraduate Certificate in Applied Actuarial Science, the minimum total number of credits is 60 (with at least 40 at level M).

Students can select modules from the following (with MA921, MA922 and MA953 being compulsory):-

Modules Offered to MSc Students

Code	Module Title	Credit Level	Credits	
MA909	Enterprise Risk Management	M	30	(ST7)
MA912	Life Insurance	M	30	(ST2)
MA914	Pension & Other Benefits	M	30	(ST4)
MA915	Finance & Investment	M	30	(ST5)
MA916	Derivative Securities	M	30	(ST6)
MA917	General Insurance – Reserving and Capital Modelling	M	30	(ST8)
MA918	General Insurance – Premium Rating			(ST9)
MA921 *	Core Applications Concepts 1	M	30	(CA1)
MA922 *	Core Applications Concepts 2	M	30	(CA1)
MA950	PROPHET 1	M	15	-
MA951	PROPHET 2	M	15	-
MA952	Financial Modelling	M	15	(CA2)
MA953 *	Mr M Heller	M	15	(CA3)

The corresponding subjects of the Actuarial Profession are denoted in brackets in the table above.

*** denotes modules that are compulsory**

Further details of SMSAS degree programmes in the form of Programme Descriptions and Learning Outcomes by Module are available at:

<http://www.kent.ac.uk/stms-local/2002-committees/faculty-It/departmental-programme-specifications/>

Descriptions of Modules

Descriptions of all the modules offered by the SMSAS for the MSc in Applied Actuarial Science appear in this section. The description for each module comprises a header and four parts. The header consists of: the module title, the name of a contact (the convenor, if known at the time of going to press), the term(s) in which it is delivered, the module code and its weight in credits. In certain cases a description will be included even if it is not available in the current academic year. This fact will also be noted in the header.

The four main parts are:

1. An informal description of, or introduction to, the subject matter of the module together with an outline syllabus. A more detailed syllabus should be supplied by the convenor at the start of the module.
2. A reading list consisting of up to three items. In some cases there is a brief indication of the purpose of the references and in other cases the following codes may be used for individual books:

E = Essential Reading
R = Recommended Reading
B = Background Reading

For further information on an individual reading list consult the named contact. If in doubt about purchasing a book you are advised to wait until the start of the module when you should consult the lecturers.

3. Prerequisite and Dependent Modules. Students should use this information when planning a programme of choices and should consult the convenors of modules in cases where they are unclear about prerequisites.
4. Teaching and Assessment Methods: the former consists of a rough indication of the number and type of class hours involved, especially any computing requirements. The latter chiefly gives the relative weights of coursework and examination assessment.

Further Information

Further details of Modules are being prepared for publication on the web. The latest Module Specifications contain details of Aims and Learning Outcomes. Where these are not yet available there will be links to Tables which give Learning Outcomes. To access this information follow links from the URL

<http://www.kent.ac.uk/SMSAS/teaching/modules/index.htm>

The aim of this module is to develop the student's ability to apply the knowledge and understanding of Enterprise Risk Management (ERM) within an organisation including governance and process as well as quantitative aspects of risk management and modelling.

The syllabus includes: ERM concept and framework; ERM process; risk categories and classification; risk modelling and aggregation of risks; risk measurement and assessment; risk management tools and techniques; economic capital.

Reading List: The students are provided with study notes published by the Actuarial Education Company. The following textbooks are also required, and arrangements will be made for students to purchase these for a total of £130, a substantial discount on the normal price.
R J Chapman: Simple tools and techniques for enterprise risk management (Wiley 2006) 9E
J Lam: Enterprise Risk Management: From Incentives to Controls (Wiley 2006) (E)
A J McNeil, R Frey & P Embrechts: Quantitative Risk Management (Princeton University Press 2005) (E)

Teaching and 72 lecture hours over 24 weeks.

Assessment Methods: Assessment: 80% by a three-hour written examination and 20% by coursework.

The aim of this module is to develop student's ability to apply the principles of actuarial planning and control, and mathematical and economic techniques, relevant to life insurance companies. The student should gain the ability to apply the knowledge and understanding, in simple situations, to the operation, on sound financial lines, of life insurance companies.

The syllabus includes: Life insurance products; with profit surplus distribution; general business environment; risk; Unit pricing; actuarial funding; models; product design; setting assumptions; supervisory reserves; surrender values; alterations; cost of guarantees and options; reinsurance; underwriting; policy data checks; investment; further risk management and monitoring experience.

Reading List: The students are provided with study notes published by the Actuarial Education Company.

Teaching and 72 lecture hours over 24 weeks.

Assessment Methods: Assessment: 80% by a three-hour written examination and 20% by coursework.

MA914 Pensions and Other Benefits
Mr Nick Wood

Terms Taught: Autumn & Spring
Level: M Credits: 30 ECTS Credits: 15

The aim of this module is to develop student's ability to apply, in simple situations, the mathematical and economic techniques and the principles of actuarial planning and control needed for the operation on sound financial lines of providers of pensions or other employee benefits.

The syllabus includes: providers of pensions and other benefits, meeting the needs of interested parties; environment in which benefits are provided; scheme design; risk and uncertainties; financing benefits; investment; actuarial valuations – use of models; asset and benefit valuation models; funding methods; assumptions; discontinuance; valuation data; the need for valuations; options and guarantees; asset liability matching; insurance; sources of surplus; analysis of experience.

Reading List: The students are provided with study notes published by the Actuarial Education Company

Teaching and 72 lecture hours over 24 weeks.

Assessment Methods: Assessment: 80% by a three-hour written examination and 20% by coursework.

MA915 Finance and Investment
Mrs Vaishnavi Srinivasan

Terms Taught: Autumn & Spring
Level: M Credits: 30 ECTS Credits: 15

The aim of this module is to develop student's ability to apply the principles of actuarial planning and control to the appraisal of investments, and to the selection and management of investments appropriate to the needs of investors.

The syllabus includes: Taxation; financial statements; specialist asset classes; environmental influences; theory of finance; regulation of financial services; applications of the legislative & regulatory framework; fundamental share analysis; valuation of investments; industry classification; investment indices; performance measurement; overall risk control; actuarial techniques; portfolio management; derivatives.

Reading List: The students are provided with study notes published by the Actuarial Education Company

Teaching and 72 lecture hours over 24 weeks.

Assessment Methods: Assessment: 80% by a three-hour written examination and 20% by coursework

MA916 Derivative Securities
Dr Pradip Tapadar

Terms Taught: Autumn & Spring
Level: M Credits: 30 ECTS Credits: 15

The aim of this module is to develop student's ability to value financial derivatives, to assess and manage the risks associated with a portfolio of derivatives, including credit derivatives and to value credit derivatives using simple models for credit risk.

The syllabus includes: Basic characteristics of the derivatives markets, forward and future prices, the role of futures in hedging, traded derivative contracts, interest rates and interest-rate derivatives, exotic equity and foreign exchange derivatives, factors affecting option prices, the mathematics underpinning the pricing and hedging of derivative instruments, hedging individual derivatives and portfolios of derivatives, the Black model, models of the term structure of interest rates, structured derivatives and synthetic securities, credit risks and market risks that arise in the use of derivatives.

Reading List: The students are provided with study notes published by the Actuarial Education Company. The following may be consulted for background.
6th Edition (Prentice Hall 2006) (E)
M Baxter & A Rennie: *Financial Calculus: An introduction to derivative pricing*. (Cambridge University Press 1996) (E)

Teaching and Assessment Methods: 72 lecture hours over 24 weeks.
Assessment: 80% by a three-hour written examination and 20% by coursework.

MA917 General Insurance – Reserving and Capital Modelling	Terms Taught: Autumn & Spring
Mr Andrew Jackson	Level: M Credits: 30 ECTS Credits 15

The aim of this module is to develop the student's ability to apply, in simple situations, the mathematical and economic techniques and the principles of reserving and capital modelling needed for the operation on sound financial lines of general insurers.

The syllabus includes: Insurance products; reinsurance products; the business environment; Lloyd's; risk and uncertainty, data; actuarial investigations; reserving by triangulation methods; reserving bases; stochastic claims reserving; assessment of reserving results; use of ranges and best estimates in reserving; investment principles and asset liability matching; capital modelling; determining appropriate reinsurance; reserving of reinsurance; accounting principles; interpreting accounts, regulation.

Reading List: The students are provided with study notes published by the Actuarial Education Company

Teaching and Assessment Methods: 72 lecture hours over 24 weeks.
Assessment: 80% by a three-hour written examination and 20% by coursework

MA918 General Insurance – Premium Rating	Terms Taught: Autumn & Spring
Mr Roger Bevan	Level: M Credits: 30 ECTS Credits 15

The aim of this module is to develop the student's ability to apply, in simple situations, the mathematical and economic techniques and the principles of premium rating needed for the operation on sound financial lines of general insurance.

The syllabus includes: Insurance products; reinsurance products; the business environment; risk and uncertainty, data; actuarial investigations; risk models; introduction to rating methodologies and bases; rating using frequency-severity and burning cost approaches; rating using original loss curves; generalised linear modelling; use of multivariate analysis in pricing; credibility theory; rate monitoring, pricing of reinsurance; use of catastrophe models.

Reading List: The students are provided with study notes published by the Actuarial Education Company

Teaching and Assessment Methods: 72 lecture hours over 24 weeks.
Assessment: 80% by a three-hour written examination and 20% by coursework

MA921 Core Applications Concepts 1
Mr Andrew Jackson

Term Taught: Autumn
Level: M Credits: 30 ECTS Credits: 15

The aim of this module is to develop student's ability to apply a wide range of key actuarial concepts in simple traditional and non-traditional situations.

The syllabus includes: Stakeholders; providers of benefits; managing risks; marketing; life & general insurance products; regulatory regimes; external environment; project management; capital project appraisal; cashflows of simple products; money, bond, equity & property markets; futures & options, collective investment vehicles; overseas markets; economic influences on investment markets; other influences on investment markets; other factors affecting relative valuation; relationship between returns on asset classes; investment strategy for institutions and individuals; meeting investor needs – institutions; valuation of individual investments; valuation of asset classes & portfolios; developing an investment strategy; credit risk & credit ratings.

Reading list: The students are provided with study notes published by the Actuarial Education Company

Teaching and 72 lecture hours over 24 weeks.

Assessment Methods: Assessment: 80% by a three-hour written examination and 20% by coursework.

MA922 Core Applications Concepts 2
Mr Peter Duffett

Terms Taught: Autumn & Spring
Level: M Credits: 30 ECTS Credits: 15

The aim of this module is to develop student's ability to apply a wide range of key actuarial concepts in simple traditional and non-traditional situations.

The syllabus includes: How to do a professional job; contract design; modelling; data; setting assumptions; expenses, pricing and financial strategies; discontinuance, valuing liabilities, accounting and disclosure; surplus and surplus management; sources of risks; risks in benefit schemes; pricing and insuring risks; the risk management process; risk management tools; capital management and monitoring experience.

Reading list: The students are provided with study notes published by the Actuarial Education Company. The following is recommended for background: Bellis C, Shepherd J & Lyon R: *Understanding Actuarial Management: the actuarial control cycle* (Institute of Actuaries of Australia 2003)

Teaching and 72 lecture hours over 24 weeks.

Assessment Methods: Assessment: 80% by a three-hour written examination and 20% by coursework.

MA950 PROPHET 1
Professor Malcolm Brown

Term Taught: Autumn
Level: M Credits: 15 ECTS Credits: 7.5

This module gives students practical experience of working with the financial model, PROPHET, which is used by commercial companies worldwide for profit testing, valuation and model office work.

A synopsis of the syllabus:

Overview of the uses and applications of PROPHET; Introduction on how to use the software package (including security implications); Using Example Model Office, perform and check the results (for reasonableness) on new business profit tests on a various products using the edit facility on the model point file; Creation of a new product on PROPHET using an empty workspace and selecting the appropriate indicators and variables for that product, setting up a model point file, parameter file and global file for the product. Setting up a run setting and run structure for the product. Performing a profit test for the product on one in force model point and one new business

model point and check the cash flow results obtained. Performing a number of sensitivity tests on a series of new business model points to achieve a given profit criteria. Reporting on dependencies in Diagram view, Updating the library and product. Using the re-scan and regeneration of products facilities; Using Example Model Office, perform and check the results (for reasonableness) on Model Office runs using multiple products and the total business summary file including when changes have been made to the assumptions to the global file and using the Model Office run view to analyse the effect that changes to the input data has had on the model; Running Model Office with products from the Example Model Office and creating reports on model office runs summarising the results obtained.

Contact Hours: 36 hours comprising terminal sessions, example classes and some lectures.

Assessment Method: 100% coursework

MA951 PROPHET 2	Term Taught: Spring
Professor Malcolm Brown	Level: M Credits: 15 ECTS Credits: 7.5

This module builds on the knowledge of the use of PROPHET introduced to students in MA950 – PROPHET 1.

A synopsis of the syllabus:

Use of PROPHET “goal seek” capability to find a premium rate that achieves a desired level of profitability (PVFNP as % of AP) for a new business model point; Use of PROPHET “goal seek” capability to find a premium rate that achieves a desired level of profitability for a new business model point using 3 further measures of profitability (Internal Rate of Return, Break Even Month and Profit Margin); Use of PROPHET Data Conversion System to read an input file in ASCII format to i) perform a number of calculations on the individual policy data and then produce output files for use by PROPHET system, ii) add validation checks and correction rules to the programme and iii) group the data so that grouped model point file rather than individual model point file data is produced; Calculation of the valuation reserves for a number of policies on several valuation bases for a Term Assurance product and check the results using a spreadsheet; Calculation the sterling reserves for a number of policies on several bases for a unit linked contract and check the results using a spreadsheet

Pre-requisite Module: MA950 PROPHET 1

Contact Hours: 36 hours comprising terminal sessions; example classes and some lectures

Assessment Method: 100% Coursework

MA952 Financial Modelling	Term Taught: Autumn
Mrs L van der Bijl	Level: M Credits: 15 ECTS Credits: 7.5

This module will introduce financial modelling techniques on spreadsheets and will focus on documenting the process of model design and communicating the model’s results. The module builds on students’ knowledge of actuarial mathematical techniques gained in the Core Technical (CT) subjects and enables the students to analyse, summarise and prepare data, develop simple actuarial spreadsheet models to solve actuarial problems, and apply, interpret and communicate the results of such models.

Reading List: The students are provided with study notes published by the Actuarial Education Company

Contact Hours: 36 hours comprising terminal sessions, and some lectures.

Assessment Method: 100% coursework

The aim of this module is to develop students' ability to communicate effectively. Students will learn to present fundamental actuarial concepts to non-actuaries through a variety of different media, including letters, reports and presentation slides. The module also offers students the opportunity to develop their presentation skills.

The syllabus includes	Communicating effectively; the drafting process; planning and structure, style and tone; accuracy; forms of communication such as letter, reports, other types of documents; presentations and using communication skills more widely.
Reading List:	The students are provided with study notes published by the Actuarial Education Company
Contact Hours:	36 hours comprising lectures and example classes
Assessment Method:	Assessment: 80% by a three-hour written examination and 20% by coursework in the form of individual and group presentation.

AIMS AND OBJECTIVES OF THE SMSAS

Our aims contribute to the University Mission to provide higher education of excellent quality characterised by flexibility and interdisciplinarity, informed by research and scholarship, and meeting the life-long needs of a diversity of students.

Our general teaching aims are as follows:

- A1** to equip students with the technical appreciation, knowledge and skills appropriate to graduates in mathematical subjects,
- A2** to develop students' faculties of rigorous reasoning and precise expression in a mathematical, statistical or actuarial context,
- A3** to develop students' capacities to formulate and solve problems.

Specific aims for particular components of our teaching programme:

- A4** *Foundation Year*: to widen access to the University by providing students lacking normal entry requirements with the opportunity to achieve an Honours degree.
- A5** *Mathematics-based programmes*: to give students a broad knowledge of the subject, together with the opportunity to study a particular branch or particular topics in depth.
- A6** *Joint Honours degree programmes*: to give students competence in each of two subjects.
- A7** *BSc, Graduate Diploma and MSc programmes in Actuarial Science*: to prepare these students for the appropriate professional careers.
- A8** *Placement and exchange programmes*: to enhance the learning experience of students through participation in a placement in industry or through study at a university abroad.

In support of its aims, the SMSAS provides a stimulating, research-active environment for students, and has teaching objectives as follows.

- O1** Students successfully completing the Foundation Year will have gained the knowledge and skills to cope with a degree programme in Mathematics or other subjects requiring a broad mathematical preparation.
- O2** By the end of a first year undergraduate programme, students' understanding of basic mathematics and statistics will be consolidated, and a broad foundation in those branches of the subjects appropriate to a student's degree programme will have been laid.
- O3** Students successfully completing an Honours degree programme in a mathematics-based subject:
 - will have attended courses establishing a framework of core material relevant to the degree programme, and have had the opportunity to build their studies consistent with their developing academic interests, becoming knowledgeable and proficient in the subjects of that programme;
 - will have some appreciation of recent developments in their subjects, and of the links between the theory of the subjects and their current applications in research, or in their practical application in industry;
 - will have developed a logical, mathematical approach to solving problems;
 - will have enhanced capability for independent thought and work;
 - will be competent in the use of information technology, and will be familiar with computers, together with the relevant software;

- will have had opportunities to study advanced topics, engage in research at some level, and develop communication and personal skills.
- O4** Students successfully completing the postgraduate Statistics course will have a broad knowledge of the subject, sufficient to enter careers as professional statisticians. They will also have conducted an extended independent research project.
- O5** Students on a programme involving a year in industry will have gained awareness of the application of technical concepts in the workplace.
- O6** Students on a programme involving a year in continental Europe should be able to communicate effectively in the language of the country, and will have gained additional maturity and perspective.
- O7** Students successfully completing the BSc Actuarial Science and MSc Statistics programmes at appropriate levels will be eligible for exemptions from the examinations of the corresponding professional bodies.

Students successfully completing joint degree programmes will have a level of understanding and competence in each of their subjects comparable to that of a single honours degree, but over a narrower range of topics in each subject.

Dates of Terms and Teaching Weeks

Term Name	Week No	Teaching Weeks		
AUTUMN 2009	Week 1	Begins on	Monday	28 September
	Week 2	Begins on	Monday	5 October
	Week 3	Begins on	Monday	12 October
	Week 4	Begins on	Monday	19 October
	Week 5	Begins on	Monday	26 October
	Week 6	Begins on	Monday	2 November
	Week 7	Begins on	Monday	9 November
	Week 8	Begins on	Monday	16 November
	Week 9	Begins on	Monday	23 November
	Week 10	Begins on	Monday	30 November
	Week 11	Begins on	Monday	7 December
	Week 12	Begins on	Monday	14 December
SPRING 2010	Week 13	Begins on	Monday	18 January
	Week 14	Begins on	Monday	25 January
	Week 15	Begins on	Monday	1 February
	Week 16	Begins on	Monday	8 February
	Week 17	Begins on	Monday	15 February
	Week 18	Begins on	Monday	22 February
	Week 19	Begins on	Monday	1 March
	Week 20	Begins on	Monday	8 March
	Week 21	Begins on	Monday	15 March
	Week 22	Begins on	Monday	22 March
	Week 23	Begins on	Monday	29 March
	Week 24	Begins on	Monday	5 April
SUMMER 2010	Week 25	Begins on	Monday	10 May
	Week 26	Begins on	Monday	17 May
	Week 27	Begins on	Monday	24 May
	Week 28	Begins on	Monday	31 May
	Week 29	Begins on	Monday	7 June
	Week 30	Begins on	Monday	14 June
Please note:	Good Friday, 2 April Easter Monday, 5 April May-Day Monday, 3 May Spring Bank Holiday, 31 May			

Notes for Staff and Students

TEACHING begins at 5 minutes past the hour and ends at 5 minutes to the hour. Be courteous: be prompt.

TEACHING HOURS Students should note that they may be required to attend lectures, seminars or classes at this University between the hours of 9.00 a.m. and 6.00 p.m. on Mondays to Fridays

NO SMOKING, EATING OR DRINKING is allowed in any teaching room.

Teaching Room Locations

LABS	COLLEGES		COLLEGES/OTHER LOCATIONS	
Biosciences:	Darwin	Keynes	Woolf	Grimond Building
BLT 1 -	DLT1	(cont)	W-LT	GLT1
BLT2 -	DLT2	KSA1	W1-SR1	GLT2
	DLT3	KS1	W1-SR2	GLT3
Computing:	DS1	KS2	W1SR3	GS3
COLT2	DS2	KS3	W1-SR4	GS5
CC01	DS7	KLSR4	W1-SR5	GS6
CC02	DS8	KS5	W1-SR6	GS7
CC03	DS9	KS6		
CC04	DS10	KS7	Cornwallis/	GS8
	DS11	KS11	Gulbenkian	
Electronics:	DS12	KS12	Cinema(was	Marlowe Building
(JENNISON)	DS14	KS13	CoLT1)	
JLT	D.Tower room	KS14	CGU2	
JS1	Peter Brown room	KS15	CGU3	MarLT1
JS2		KS16	CGU4	MarLT2
JS3		KS17		
		KS20	Cornwallis -	
		KS21	North East	
		KS22	CNE08	
		KS23	Cornwallis -	
		KS24	North West	
I316	Eliot	KS25	CNWsem1	
PSLT	ELT2		CNWsem2	
	ECT1	Rutherford	CNWsem3	
	E.Chilver room	RLT1	CNWsem4	
	E.Holland room	RLT2	CNWsem5	
	R.Lyons room	RS4	CNWsem6	
Mathematics	E.Peter Bird room	RS5	CNWsem7	
MathsLT	E.Pollard room	RS6	CNWsem8	
	ES1	RS7	CNWsem9	
	ES2	R.CI.15	CNWsem10	
	ES3	R.CI.16	CNWsem11	
	EX7	R.CI.17	CNWsem12	
	EX8	R.CL.19	MMLab 1	
	EX9	R.CI.20		
	E.BCsem 16	RX9	Giles Lane	
	E.BCsem17	RX10	Teaching	
	ES3	RX11	Annexe	
		RX12	HA Studio	
	Keynes			
	KLT1			
	KLT2			
	KLT3			
	KLT5			
	KLT6			

Please see <http://www.kent.ac.uk/ettoffice/rooms/index.htm> for precise location and accessibility.

SMSAS Teaching, Research and Administrative Staff

Actuarial Science Teaching Staff

Professor Senior Lecturer	Malcolm Brown, BSc (Kent) FIA, M.S.Brown@kent.ac.uk
Lecturers	John Millett, BSc (Nottingham), FIA, J.D.Millett@kent.ac.uk Clare Bellis, BA (Macq), MA (Camb), FIAA Roger Bevan, FIA, R.Bevan@kent.ac.uk Peter Duffett, MA (Oxford), FIA, P.L.Duffett@kent.ac.uk Esther Glover, BSc (Kent), FIA, E.J.Glover@kent.ac.uk Mark Heller, BSc (Sussex) FIA, M.Heller@kent.ac.uk Andrew Jackson, MA (Oxford), MSc (Oxford), FIA, A.L.Jackson@kent.ac.uk Andrew James, BA (York), MA (Leeds), FIA, A.James@kent.ac.uk Vaishnavi Srinivasan, MSc (Madras), FFA, FASI, V.Srinivasan@kent.ac.uk Dr. Pradip Tapadar, Mstat (Calcutta), PhD, FFA, FASI, P.Tapadar@kent.ac.uk Loba Van der Bijl, BSc (London), MSc (LSE) AMIA, L.Van-Der-Bijl@kent.ac.uk Nick Wood, BSc (Manchester), FIA, N.C.Wood@kent.ac.uk
Visiting Actuary	Ken Hazell MA (Oxford), FIA, K.Hazell@kent.ac.uk

Mathematics Teaching Staff

Professors	Peter A Clarkson, MA, DPhil (Oxford), P.A.Clarkson@kent.ac.uk Peter Fleischmann, Diplom (Erlangen), PhD (Essen), P.Fleischmann@kent.ac.uk Elizabeth L Mansfield, BSc, MSc, PhD (Sydney), E.L.Mansfield@kent.ac.uk
Readers	Dr R James Shank, BSc (Simon Fraser), MSc, PhD (Toronto), R.J.Shank@kent.ac.uk Dr Andrew N Hone, BA (Oxford) PhD (Edinburgh), A.N.W.Hone@kent.ac.uk
Senior Lecturers	Dr Chris F Woodcock, MA, DPhil (Oxford), C.F.Woodcock@kent.ac.uk Dr Gavin D Brown, BSc (Warwick), Part III (Cambridge), PhD (Warwick), G.D.Brown@kent.ac.uk
Lecturers	Dr T Clare Dunning, BSc (Bath), PhD (Durham), T.C.Dunning@kent.ac.uk Dr John R Merriman, MA, DPhil (Oxford), J.R.Merriman@kent.ac.uk Dr Rowena Paget, MMath, DPhil (Oxford) R.E.Paget@kent.ac.uk Dr Jing Ping Wang, BSc, MSc (Beijing), PhD (Wiskunde), J.Wang@kent.ac.uk Dr Steffen Krusch, Part III (Cambridge), PhD (Cambridge) S.Krusch@kent.ac.uk Dr Stéphane Launois, PhD (Rheims) S.Launois@kent.ac.uk

Statistics Teaching Staff

Professors	Philip J Brown, BSc (Leicester), MSc (Wales), PhD (London), Philip.J.Brown@kent.ac.uk Byron J T Morgan, BSc (London), PhD (Cambridge), B.J.T.Morgan@kent.ac.uk Martin Ridout, MSc (Reading), M.S.Ridout@kent.ac.uk Stephen G. Walker, BSc (Oxford) PhD (Imperial), S.G.Walker@kent.ac.uk
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Lecturers	Dr Efang Kong, BSc (Shanghai), PhD (Singapore), E.Kong@kent.ac.uk Dr Alfred Kume, Dip.Maths (Tirana), PhD (Nottingham), A.Kume@kent.ac.uk Dr Owen Lyne, BA, DipStat (Cambridge), PhD (Bath) O.D.Lyne@kent.ac.uk Dr Alexa Laurence BSc, MSc, PhD (Kent) A.F.Laurence@kent.ac.uk Dr Xue Wang, BSc, MSc (China), PhD (Nottingham) X.Wang@kent.ac.uk Dr Jim Griffin, BSc (Warwick), PhD (Imperial) J.E.Griffin-28@kent.ac.uk Dr Diana Cole, BSc (Kent), PhD (Kent) D.J.Cole@kent.ac.uk

Administration Staff

School Administration Manager	Dr Frank Sowrey, BSc (Leeds), PhD (UEA), F.E.Sowrey@kent.ac.uk
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Clerical Assistant	Miss Kendall Roissetter, K.C.Roissetter@kent.ac.uk
Secretary	Mrs Vivienne Argent, V.C.Argent@kent.ac.uk
Secretary	Mrs Christine Seale, C.S.Seale@kent.ac.uk

Please read the following important information

General Office opening hours are: 09:30 to 12:30 (10.00) on Wednesdays and
14:30 to 16:00

General Office Telephone Number: 01227 827181
Email address: imsadmin@kent.ac.uk

Coursework: Can only be handed in between these times and a receipt must be obtained which should be retained by the student.

Deadlines: The deadline for the submission of all coursework is **12:00 noon** on the date specified, any coursework handed in after this time will be time marked and date stamped – it is the policy of the Department that any work submitted after this deadline will be awarded a mark of zero.

The Student Reception area is open from 9.00 to 5.00 for the collection of marked coursework, forms etc.

The Graduate School

Location Cornwallis South East Octagon (E3 on University's interactive Map
www.kent.ac.uk/maps/canterbury/index.html) - Contact Tel. (01227) 82 7838
Email: graduateschool@kent.ac.uk - Web: www.kent.ac.uk/graduateschool

The Graduate School works across the University to enhance the quality of the graduate student experience at all our campuses in order to create a vibrant postgraduate community at Kent. The School aims to ensure that the academic and social interests of graduate students, both taught and research, are appropriately provided for within the University.

The transferable skills training programme for graduate students is coordinated by the Graduate School. Transferable skills are those skills which when developed, give graduates a clear edge in the job market and make graduate researchers more effective and efficient in their work. The School offers a broad range of sessions that are designed to hone competencies such as communication, presentation, networking, team working, career management and time management skills. Find out more about transferable skills training at: www.kent.ac.uk/graduateschool/skills/index.html

The Graduate School aspires to be the hub of graduate activity at Kent. The School provides opportunities for graduate students to meet and socialise and is especially keen to support student driven initiatives such as workshops and conferences. Take a look at what's on offer at: www.kent.ac.uk/graduateschol/community

The development of The GradPost, a graduate newsletter written and edited by our own graduate students, has been supported by the Graduate School. The Graduate School encourages students to submit articles and become members of The GradPost editorial team as this is an excellent opportunity to make new friends and develop further skills. For more information see: www.kent.ac.uk/graduateschool/news/gradpost.html

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