

Faculty of Science, Technology, Engineering and Mathematics

I GENERAL FACULTY REGULATIONS¹

Degrees

1 The faculty provides courses leading to the following degrees:

(a) COMPUTER SCIENCE AND STATISTICS

Bachelor in Arts (Moderatorships in Computer Science, Linguistics and a Language, and in Management Science and Information Systems Studies (B.A. with honours)), Bachelor in Arts (Moderatorship in Computer Science (B.A. with honours)), Bachelor in Arts (Ordinary B.A. degree), and Master in Computer Science (M.C.S.), see II below.

(b) ENGINEERING SCIENCE

Bachelor in Arts (B.A.), Bachelor in Engineering (B.A.I.) and Master in Engineering (Studies) (M.A.I. (St.)), Bachelor in Science (Engineering) (B.Sc. (Ing.)) and Master in Engineering (Studies) (M.A.I. (St.)) in Engineering with Management, see III below.

(c) MATHEMATICS

Bachelor in Arts (Moderatorships in Mathematics, and in Theoretical Physics (B.A. with honours)), Bachelor in Arts (Ordinary B.A. degree), see IV below.

(d) SCIENCE

Bachelor in Arts (Moderatorships in Science (in one of the following subjects: biochemistry, botany, chemistry, chemistry with biosciences, chemistry with molecular modelling, environmental sciences, genetics, geography, geoscience, human genetics, immunology, medicinal chemistry, microbiology, molecular medicine, nanoscience, neuroscience, physics, physics and astrophysics, physiology, zoology (B.A. with honours))), see V below.

(e) E3 ENVIRONMENTAL SCIENCE AND ENGINEERING

Bachelor in Science (Environmental Engineering) and Master in Engineering (Studies) (M.A.I. (St.)), Bachelor in Science (Applied Environmental Science) and Master in Applied Environmental Science, see VI below.

2 In addition to the above, the faculty provides programme pathways within the Trinity joint honours programme leading to Moderatorships in Computer Science, in Mathematics or in Geography, which may be combined with one other subject or, in the cases of Mathematics and in Geography, which may be conferred as single honours. For regulations see COMMON ARCHITECTURE and TRINITY JOINT HONOURS PROGRAMME. A minor degree pathway is provided in Statistics, see II and IV below.

II COURSES IN COMPUTER SCIENCE AND STATISTICS

In addition to the programmes listed in this section, computer science may also be studied as a subject within the Trinity joint honours programme (see TRINITY JOINT HONOURS PROGRAMME) or as a constituent part of the Moderatorship in Computer Science, Linguistics and a Language (see FACULTY OF ARTS, HUMANITIES AND SOCIAL SCIENCES).

¹These regulations should be read in conjunction with GENERAL REGULATIONS AND INFORMATION.

MODERATORSHIP IN COMPUTER SCIENCE AND MASTER IN COMPUTER SCIENCE (M.C.S.)

Introduction/overview

1 The programme will normally last for four or five years and will lead to the degrees of B.A. (Moderatorship) (after four years) and Master in Computer Science (after five years).

2 The programme is concerned with the study of the theoretical underpinnings and practical applications of computers. The first two years provide an introduction to fundamentals including mathematics, programming, computer systems, digital logic, telecommunications, information management and the relationship between computers and society. Later years provide specialisation in a broad range of topics through core and elective modules.

3 Students participating in the Master in Computer Science course will be required to engage in a one semester internship in industry or in a university research laboratory in fourth year. In the fifth year students will undertake a significant project with a substantial element of independent research leading to a dissertation.

4 Students on the four-year programme leading to the B.A. (Moderatorship) degree complete a substantial capstone project in fourth year.

Regulations

5 For assessment and academic progress regulations, please refer to GENERAL REGULATIONS AND INFORMATION. Each course year carries 60 ECTS credits.

6 The pass mark in the first, second, third and fourth years of this programme is 40 per cent. The pass mark in fifth year (the master's year) of this programme is 50 per cent.

7 Students must achieve an average of at least 60 per cent at the first attempt of their third year examinations to be eligible to participate in the master's internship in fourth year. Students who have passed the third year but who do not choose to proceed to the fourth year of the five-year master's programme, or are ineligible to participate in the master's internship, may instead proceed to the final year of the four-year programme, leading to the B.A. (Moderatorship) degree.

8 Students who pass the fourth year of the five year master's course may (i) progress to the fifth year or (ii) exit the course according to the regulations in §9. Students who fail the fourth year of the master's course may repeat the fourth year as provided by the General Regulations but may only do so to exit the course with the B.A. (Moderatorship) degree, taking the modules required for students intending to exit after four years in place of the internship.

Moderatorship degree

9 Students who have passed fourth year and completed a capstone project exit with a B.A. (Moderatorship) degree. Students who have not completed a capstone project may (i) have the degree of ordinary B.A. conferred or (ii) if they have passed all other fourth year requirements, apply to complete a deferred capstone project to be eligible to be conferred with a B.A. (Moderatorship) degree. Students who are eligible and choose to proceed to the fifth year of the programme will be awarded a classified B.A. (Moderatorship) degree on completion of fifth year, subject to achieving a passing mark in the fifth year dissertation.

Moderatorship, Part I

10 The results of the Junior Sophister year constitute Moderatorship, Part I and contribute 30 per cent toward the final award.

Moderatorship, Part II

11 The results of the Senior Sophister year constitute Moderatorship, Part II and contribute 70 per cent toward the final award.

12 Students who entered prior to 2019-20 and have repeated one or more years, or have spent time off-books, will normally have their degree result calculated as above.

Award

13 Bachelor in Arts (Moderatorship).

Master in Computer Science degree

14 Successful candidates at the fifth year examinations will be awarded the degree of Master in Computer Science or Master in Computer Science with distinction. A distinction shall require at least 70 per cent in the dissertation and at least 70 per cent in the final credit-weighted average mark.

MODERATORSHIP IN COMPUTER SCIENCE, LINGUISTICS AND A LANGUAGE²

15 For details see FACULTY OF ARTS, HUMANITIES AND SOCIAL SCIENCES.

MODERATORSHIP IN MANAGEMENT SCIENCE AND INFORMATION SYSTEMS STUDIES

Introduction/overview

16 This is a four year programme and will lead to the degree of B.A. (Moderatorship) in Management Science and Information Systems Studies.

17 This course is concerned with the application of computers, mathematical techniques and information systems to problem-solving, decision-making and planning in the management of business and industry. Its aim is to provide a practical training founded on a solid theoretical base, which will enable its graduates to be immediately effective while remaining adaptable to new developments in business and information technology.

Regulations

18 Please refer to GENERAL REGULATIONS AND INFORMATION. Each course year carries 60 ECTS credits.

19 The pass mark in each year of the course is 40 per cent.

Moderatorship, Part I

20 The results of the Junior Sophister year constitute Moderatorship, Part I and contribute 30 per cent toward the final award.

Moderatorship, Part II

21 The results of the Senior Sophister year constitute Moderatorship, Part II and contribute 70 per cent toward the final award.

22 Students who entered prior to 2019-20 and have repeated one or more years, or have spent time off-books, will normally have their degree result calculated as above.

Award

23 Bachelor in Arts (Moderatorship).

STATISTICS

Introduction/overview

24 The study of statistics leading to a minor degree award is available to students entering the second year of the moderatorship in mathematics. The minor pathway includes instruction in theoretical and applied statistics (Bayesian and frequentist methods, asymptotics, model building and fitting, clustering and classification, simulation) using mathematical and computational techniques. Material is delivered through lectures, tutorials and computing labs.

²For entrants prior to 2021-22, this course is called Computer Science and Language.

Regulations

25 See GENERAL REGULATIONS AND INFORMATION and handbook of the School of Computer Science and Statistics for information on regulations and available modules. The pass mark is 40 per cent.

Award

26 Depending upon student choices made within the mathematics programme, it may be possible to be conferred with a Bachelor in Arts (Moderatorship) award with a major in mathematics and a minor in statistics. See entry for the MODERATORSHIP IN MATHEMATICS.

III COURSES IN ENGINEERING SCIENCE

DEGREES OF BACHELOR IN ENGINEERING AND MASTER IN ENGINEERING (STUDIES) (B.A., B.A.I.) or (B.A., M.A.I. (St.))

Introduction/overview

1 Students complete a four-year course and may elect to complete an additional year of study leading to a M.A.I. (St.) degree. There is provision for an abridgement of the course to three years.

2 During the first two years a programme of basic modules in engineering is provided. Following completion of the first two years of the course, students elect to study specialised programmes in one of the following strands:

- civil, structural and environmental engineering
- mechanical and manufacturing engineering
- biomedical engineering
- electronic engineering
- computer engineering
- electronic and computer engineering (combined programme)

Following completion of the fourth year of the engineering degree course, eligible students may elect to complete one further year of study in their chosen strand leading to a M.A.I. (St.) degree.

3 While every effort is made to allow students to study the strand/specialism they choose, the Engineering School Curriculum Committee reserves the right to allocate the available places. In some departments the number of places for students of any one year may be limited. Timetable constraints may also reduce the number of module options available.

4 A number of additional options to study abroad with approved partner institutions are available as an integrated part of the teaching programme for students following the M.A.I. course. These options may be taken in the fourth year and include Erasmus (including CLUSTER), UNITECH (including internship) and non-E.U. exchange. Full details of available options are available from the Engineering School Office and on the [website](#).

5 Students are encouraged to gain relevant industrial experience during the vacation periods. Formal industrial partnerships/internships with approved industry partners are also available as an integrated part of the teaching programme for students following the M.A.I. course. This option may be taken in the fourth year.

Regulations

6 As per College's GENERAL REGULATIONS AND INFORMATION, with the following additions for the Engineering and Engineering with Management courses:

Each year of the course carries 60 ECTS credits.

The pass mark in the first, second, third and fourth years of this programme is 40 per cent. The pass mark in fifth year (the master's year) of this programme is 50 per cent.

(a) Students must achieve a minimum of II.1 at the first attempt (no reassessments to take) at the Junior Sophister assessment to be eligible to take the internship or study abroad in the Senior Sophister year.

(b) Senior Sophister students who are exiting with a B.A.I./B.Sc. degree must complete a capstone project. In exceptional circumstances, where the Director of Undergraduate Teaching and Learning and the relevant stream co-ordinator are satisfied that a specific internship project has demonstrated the equivalent learning outcomes to a capstone project, the internship project may be deemed equivalent to capstone project.

(c) To be eligible to proceed to the fifth year of the M.A.I. programme, students in the Senior Sophister year must achieve a minimum overall B.A.I./B.Sc. mark of 60 per cent for the combined Junior Sophister and Senior Sophister years (on a 30:70³ basis) at the annual assessment session of the B.A.I./B.Sc. degree year.

(d) The B.A.I./B.Sc. degree result, where awarded, will be calculated as a weighted average of the overall result achieved in the Junior Sophister year, contributing 30 per cent, and the Senior Sophister year, contributing 70 per cent.³

(e) Successful candidates at the M.A.I. examinations are awarded the degree of M.A.I. (St.) or of M.A.I. (St.) with distinction. A distinction shall require at least 70 per cent in both the examinations and the dissertation and at least 70 per cent in the final credit-weighted average mark.

(f) Students who have failed at the first attempt of the M.A.I. assessments may present at the reassessment session, or if they fail at the reassessment session, repeat the year in full.

Conferring of degrees

7 Students who exit the course having obtained credit for years one to four are entitled to the degrees of ordinary B.A. and B.A.I. Students admitted in 2016-17 onwards and who have obtained credit for all five years of the course are entitled to the degrees of ordinary B.A. and M.A.I. (St.). Students admitted prior to 2016-17 who have obtained credit for all five years of the course are entitled to be conferred with the degrees of ordinary B.A., B.A.I. and M.A.I. (St.). The degrees in each instance must be conferred at the same Commencements.

DEGREES IN ENGINEERING WITH MANAGEMENT (B.Sc. (Ing.) or M.A.I. (St.))

Introduction/overview

8 Students complete a four-year course leading to a B.Sc. (Ing.) degree, and may elect to complete an additional year of study leading to a M.A.I. (St.) degree. There is provision for an abridgement of the course to three years.

9 Following completion of the fourth year of the engineering with management degree course, eligible students may elect to complete one further year of study leading to a M.A.I. (St.) degree.

10 A number of additional options to study abroad with approved partner institutions are available as an integrated part of the teaching programme for students following the M.A.I. course. These options may be taken in the fourth year and include Erasmus (including CLUSTER), UNITECH (including internship) and non-E.U. exchange. Full details of available options are available from the Course Director and the website.

11 Students are encouraged to gain relevant industrial experience during vacation periods. Formal project internships with approved industry partners may also be available as an integrated part of the teaching programme for students following the M.A.I. course. This option may be taken in the fourth year.

³For entrants prior to 2018-19 the combined mark from the Junior Sophister and Senior Sophister years was calculated on a 20:80 basis. Students who are required to repeat one or more years, or go off-books for one or more years, will normally have this mark calculated as a weighted average of the result of the Junior Sophister year, contributing 30 per cent, and the Senior Sophister year, contributing 70 per cent. This calculation is similarly applicable to the B.A.I./B.Sc. degree result, where awarded.

Regulations

12 As §6 above.

13 Successful candidates at the M.A.I. examinations are awarded the degree of M.A.I. (St.) or of M.A.I. (St.) with distinction. Except by special recommendation of the court of examiners, the M.A.I. (St.) degree is awarded on the results of a student's end-of-semester fifth year M.A.I. examinations only. A distinction shall require at least 70 per cent in both the examinations and the dissertation and at least 70 per cent in the final credit-weighted average mark.

Conferring of degrees

14 Students who have obtained credit for years one to four are entitled to the degree of B.Sc. (Ing.). Students who have obtained credit for the fifth year are additionally entitled to the degree of M.A.I. (St.). All degrees must be conferred at the same Commencements.

INTERNATIONAL ENGINEERING PROGRAMME (IN PARTNERSHIP WITH THAPAR INSTITUTE OF ENGINEERING AND TECHNOLOGY)

15 Students admitted to the International Engineering Programme (IEP) will have successfully completed two years undergraduate study in Civil, Mechanical, Electronic and Electrical, Computer Engineering, or Electronic and Computer Engineering disciplines at the Thapar Institute of Engineering and Technology (TIET). Students follow the Junior Sophister and Senior Sophister degree years as prescribed in the School of Engineering undergraduate handbook. Progression rules for students in the Sophister years of the degree programme are the same as for students who enter the programme via the TR032 entry stream. On passing the Junior and Senior Sophister years, students will receive a B.A.I. in Engineering. Upon successful completion of this four year course of study, students may be eligible to pursue the fifth year integrated pathway and receive an M.A.I. degree, provided they meet the strict entry eligibility requirements.

Admission

16 Students enrolled in the engineering degree course at TIET who have successfully completed the first two years of study and satisfied other requirements are eligible to apply for admission. The application procedure and all entry requirements stipulated by the articulation agreement between TIET and Trinity College Dublin are described in the School of Engineering undergraduate handbook and on its website.

PARTNERSHIP WITH UNIVERSITY OF MICHIGAN-SHANGHAI JIAO TONG UNIVERSITY JOINT INSTITUTE (UM-SJTU JOINT INSTITUTE)

17 UM-SJTU Joint Institute students who have successfully completed three years in UM-SJTU Joint Institute, have completed specified pre-requisites, and have secured a CGPA of at least 3.3 or equivalent over three years, and have an IELTS score of at least 6.5, with no individual band of less than 6.0, or TOEFL IBT scores: 88 internet-based, 570 paper-based, 230 computer-based or equivalent, are eligible for consideration for advanced entry into the Senior Sophister year of the mechanical and manufacturing or electronic/computer engineering streams.

Students follow the Senior Sophister and M.A.I. degree years as prescribed in the School of Engineering undergraduate handbook, returning to UM-SJTU Joint Institute for a semester in the summer preceeding the M.A.I. The M.A.I. progression rules for UM-SJTU Joint Institute students are the same as for students who enter the programme via the TR032 entry stream.

On successful completion of the Senior Sophister and M.A.I. years, the student will be awarded the M.A.I. (St.). Students will also be awarded the B.Sc. in Mechanical Engineering or the B.Sc. in Electrical and Computer Engineering, as appropriate, provided they successfully complete all requirements of the UM-SJTU Joint Institute programme (the B.Sc. award is solely the responsibility of UM-SJTU Joint Institute).

Admission

18 Students who have successfully completed three years in UM-SJTU Joint Institute and have satisfied other requirements are eligible to apply for admission. The application procedure and all entry requirements stipulated by the articulation agreement between UM-SJTU Joint Institute and Trinity College Dublin are described in the School of Engineering undergraduate handbook and on its website.

PARTNERSHIP WITH MANIPAL UNIVERSITY, INTERNATIONAL CENTRE FOR APPLIED SCIENCES

19 Manipal University, International Centre for Applied Sciences (ICAS) students who have successfully completed two years in ICAS, have completed specified pre-requisites, and have secured a CGPA of at least 3.2 or equivalent over two years are eligible for consideration for advanced entry into the engineering programme at Trinity College Dublin. English language requirements are waived for ICAS students. Students who are deemed eligible under the terms of this agreement will enter into year 3 of the civil, structural and environmental engineering or mechanical and manufacturing engineering or electronic engineering or electronic and computer engineering or computer engineering strands of the engineering programme at Trinity College Dublin. On successful completion of years 3 and 4 of the Trinity engineering programme, students will be eligible for the ordinary B.A. and B.A.I. awards from Trinity College Dublin, The University of Dublin, if they leave at that point. On successful progression into and completion of year 5 of the Trinity engineering programme, the student will instead be eligible for the ordinary B.A. and M.A.I. (St.) awards from Trinity College Dublin, The University of Dublin. Those awarded the M.A.I. (St.) are not eligible to receive the B.A.I. All ICAS students who gain entry to year 3 of the programme are subject to the progression requirements and the general regulations of Trinity College Dublin, the University of Dublin, as standard.

Admission

20 Students who have successfully completed the first two years of study in ICAS and have satisfied other requirements are eligible to apply for admission. The application procedure and all entry requirements stipulated by the articulation agreement between ICAS and Trinity College Dublin are described in the School of Engineering undergraduate handbook and on its website.

IV SCHOOL OF MATHEMATICS

1 The School of Mathematics offers a degree course in mathematics. This programme consists of lectures and tutorials in mathematics and its applications.

2 The School of Mathematics in conjunction with the [School of Physics](#) offers a degree course in theoretical physics. This is an integrated programme of study consisting of lectures and tutorials in mathematics and physics together with experimental work in physics.

3 For students entering prior to 2019-20, mathematics may also be studied as a component of a two-subject moderatorship course in combination with another subject.

4 For students entering from 2019-20, mathematics may also be studied as a component of the Trinity joint honours programme.

Rowe Fund Library

5 Members of the Dublin University Mathematical Society have the use of a mathematical library in the society's rooms in addition to the College library.

MODERATORSHIP IN MATHEMATICS

Introduction/overview

6 The moderatorship in mathematics offers instruction in pure mathematics (algebra, analysis, geometry) and applications of mathematics, including those to theoretical physics and statistics. The material is delivered through lectures and tutorials. In the Fresh years, students are taught core topics in mathematics and its applications. In the Sophister years, students take modules in advanced topics, and also undertake an independent research project.

Regulations

7 See GENERAL REGULATIONS AND INFORMATION and handbook of the School of Mathematics for information on regulations and available modules. Each course year carries 60 ECTS credits. The pass mark for this course is 40 per cent.

Moderatorship, Part I

8 The results of the Junior Sophister year constitute Moderatorship, Part I and contribute 30 per cent toward the final award.

Moderatorship, Part II

9 The results of the Senior Sophister year constitute Moderatorship, Part II and contribute 70 per cent toward the final award.

10 Students who entered prior to 2019-20 and have repeated one or more years, or have spent time off-books, will normally have their degree result calculated as above.

Award

11 Depending upon student choices made within their programme of study it is possible to confer with a Bachelor in Arts (Moderatorship) award in one of the following categories:

Single honours

Major with minor

MODERATORSHIP IN THEORETICAL PHYSICS

Introduction/overview

12 The moderatorship in theoretical physics is taught jointly by the School of Mathematics and the School of Physics, and is professionally accredited by the Institute of Physics. Students study the core concepts of physics and mathematics, including mechanics, quantum physics, electrodynamics, elementary particle physics, and gravitation. The programme consists of classroom lectures, tutorials and laboratory work.

In Junior Fresh year, students are taught some of the core topics of the course; they take 40 credits of modules taught by the School of Mathematics and 20 credits of modules taught by the School of Physics. In Senior Fresh year, students take further modules in core topics of theoretical physics. In Sophister years, students take modules in advanced topics, and also undertake an independent research project in one of the schools.

Regulations

13 See GENERAL REGULATIONS AND INFORMATION and handbooks of the School of Mathematics and the School of Physics for information on regulations and available modules. Each course year carries 60 ECTS credits. The pass mark for this course is 40 per cent.

Moderatorship, Part I

14 The results of the Junior Sophister year constitute Moderatorship, Part I and contribute 30 per cent toward the final award.

Moderatorship, Part II

15 The results of the Senior Sophister year constitute Moderatorship, Part II and contribute 70 per cent toward the final award.

16 Students who entered prior to 2019-20 and have repeated one or more years, or have spent time off-books, will normally have their degree result calculated as above.

Award

17 Bachelor in Arts (Moderatorship).

Transfer of course

18 Students may apply through their tutor to transfer from the honour course in theoretical physics to the honour course in mathematics not later than the beginning of the Senior Sophister year.

Sophister students in theoretical physics may apply through their tutor to transfer to the honour course in physics (see COURSES IN SCIENCE, section V), not later than the beginning of the Senior Sophister year.

Each request to transfer is considered by the heads of school concerned, who will then make recommendations to the Senior Lecturer. All transfers are subject to general College regulations (see GENERAL REGULATIONS AND INFORMATION).

MODERATORSHIP IN MATHEMATICS (DUAL B.A. DEGREE PROGRAMME WITH COLUMBIA UNIVERSITY)

Introduction/overview

19 The dual B.A. programme combines the course in mathematics at Trinity College Dublin with the liberal arts programme offered by the School of General Studies at Columbia University, New York.

20 Students register with both institutions in all four years of the course. In the first two years, students are bound by Trinity's regulations, policies and procedures and in the final two years, by those applicable in Columbia. Trinity's regulations, policies and procedures will also apply to the additional Sophister modules (30 ECTS) required by Trinity in the final two years. Students are required to familiarise themselves with both institutions' regulations.

21 Specific modules completed at Trinity may also be eligible for the fulfilment of Columbia core or major requirements upon review by the appropriate department, provided that students achieve a minimum mark as set by Columbia. Columbia recognises the credits gained by students in the first two years at Trinity and will award students 60 credits towards the 124-credit minimum requirement for the B.A. degree at Columbia.

22 Trinity recognises 64 credits (equivalent approx. to 120 ECTS) gained by students during their final two years at Columbia aligned with their course requirements as counting towards the B.A. degree when combined with the further Sophister modules (30 ECTS) taken for Trinity.

23 The ECTS value of each year of the course is as follows: Junior Fresh 60 ECTS credits; Senior Fresh 60 ECTS credits; Junior Sophister and Senior Sophister 30 ECTS credits; at Columbia students must complete a minimum of 64 credits (equivalent approx. to 120 ECTS).

Assessment and progression regulations

24 See GENERAL REGULATIONS AND INFORMATION and the programme handbook for information.

Moderatorship

25 For the award of the dual B.A., students must satisfy the regulations of both Trinity College and Columbia University.

26 The degree classification at Trinity is calculated by combining the aggregate mark from the period of registration at Columbia with the aggregate mark from the additional Sophister modules, required by Trinity (30 ECTS), on an equal basis.

Award

27 Bachelor in Arts (Moderatorship) will be conferred with:
Single honours

V COURSES IN SCIENCE

1 The following courses are available:

TR060 Biological and biomedical sciences

TR061 Chemical sciences

TR062 Geography and geoscience

TR063 Physical sciences

TR031 Mathematics (see SCHOOL OF MATHEMATICS, section IV, §6)

TR035 Theoretical physics (see SCHOOL OF MATHEMATICS, section IV, §12)

TR060 Biological and biomedical sciences

Introduction/overview

2 This course is the pathway for entry into the biological and biomedical sciences, leading to moderatorships in biochemistry, botany, environmental sciences, genetics, human genetics, immunology, microbiology, molecular medicine, neuroscience, physiology and zoology.

TR061 Chemical sciences

Introduction/overview

3 In the chemical sciences course, students will study the core concepts that are fundamental to all of chemistry including topics in physical, organic and inorganic chemistry. Moderatorship subjects will be available in chemistry, chemistry with biosciences, chemistry with molecular modelling, medicinal chemistry and nanoscience.

TR062 Geography and geoscience

Introduction/overview

4 The geography and geoscience degree programme is the pathway for entry to the study of geography, geology and geoscience (geology and physical geography). Moderatorship subjects will be available in geography and geoscience.

TR063 Physical sciences

Introduction/overview

5 In the physical sciences course, students will study the core concepts that are fundamental to all of physics with the opportunity to choose between the available moderatorship subjects of physics, physics and astrophysics, and nanoscience. Students wishing to specialise in nanoscience are required to select chemistry (20 credits) as approved options.

MODERATORSHIPS IN SCIENCE

6 Moderatorship options in TR060 are as listed in §2 above; in TR061 are as listed in §3 above, in TR062 as listed in §4 above and in TR063 are as listed in §5 above.

7 The Fresh modules are intended to provide both a training in general science and an introduction to the moderatorship subject. In the Junior Sophister year students will work primarily

in the moderatorship subject but can take a selection of related modules offered by other schools or departments. All students wishing to proceed to moderatorship in any one of the subjects specified in §2, §3, §4 and §5 above are required to complete satisfactorily the Fresh modules in science except by decision of the Associate Dean of Undergraduate Science Education.⁴

Regulations

8 See GENERAL REGULATIONS AND INFORMATION. Each course year carries 60 ECTS credits. The pass mark for these courses is 40 per cent.

9 After the publication of Senior Fresh examination results each year, all successful students compete for moderatorship places. Admission to each moderatorship is based on overall Senior Fresh examination results in rank order and are limited by a quota established annually by reference to the teaching resources available to each school or department. To be qualified for a given moderatorship, students must have completed satisfactorily both Fresh years and must have read the stated prerequisite modules as set out in the programme handbook for any moderatorship for which they wish to be considered. Students who have not completed the prerequisites for a given moderatorship may still be considered for that moderatorship if places are available.

Moderatorship examination

10 The Junior and Senior Sophister examinations constitute part I and part II of the moderatorship examination.

11 The final moderatorship result is calculated by aggregating the Junior and Senior Sophister examination results as per Table I.

12 From 2024-25, a cap (maximum mark) of 60 per cent will apply to:

- all reassessed components for core Junior Fresh and Senior Fresh physics modules delivered as part of the physical sciences and theoretical physics courses (and available to students in the chemical sciences course as open modules) and all modules in the Sophister years (except Trinity electives) within the four accredited programmes of physics, physics and astrophysics, nanoscience, and theoretical physics;

13 From 2025-26, a cap (maximum mark) of 40 per cent will apply to:

- all reassessed components for the core Junior Fresh and Senior Fresh chemistry modules delivered as part of the chemical sciences course TR061 (and available to students in the physical sciences (nanoscience) TR063 and geoscience TR062 courses as open modules), and to *all* modules in the Sophister years (except Trinity electives) within the programmes of chemistry, medicinal chemistry, chemistry with molecular modelling, and chemistry with biosciences.

Reassessment capping does not apply to a deferred first attempt during the reassessment session.

Further information is available at www.tcd.ie/teaching-learning/academic-affairs/ug-prog-award-regs/derogations.

⁴See GENERAL REGULATIONS AND INFORMATION, 'Advanced entry'.

TABLE I — CALCULATION OF MODERATORSHIP RESULTS

TR060	Biological and biomedical sciences
Moderatorship	
Biochemistry	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Botany	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Environmental sciences	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Genetics	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Human genetics	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Immunology	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Microbiology	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Molecular medicine	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Neuroscience	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Physiology	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Zoology	Junior Sophister 30 per cent, Senior Sophister 70 per cent

TR061	Chemical sciences
Moderatorship	
Chemistry	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Chemistry with biosciences	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Chemistry with molecular modelling	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Medicinal chemistry	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Nanoscience	Junior Sophister 30 per cent, Senior Sophister 70 per cent

TR062	Geography and geoscience
Moderatorship	
Geography	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Geoscience	Junior Sophister 30 per cent, Senior Sophister 70 per cent

TR063	Physical sciences
Moderatorship	
Nanoscience	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Physics	Junior Sophister 30 per cent, Senior Sophister 70 per cent
Physics and astrophysics	Junior Sophister 30 per cent, Senior Sophister 70 per cent

Sophister courses

14 Sophister courses in science are organised so that students follow a continuous programme of study over two years leading to a moderatorship in a particular subject. Students will be required to take modules carrying 60 credits in each year.

A '*Sophister course programme*' is published annually and is available to students in Hilary term each year from the [Science Course Office](#).

TR060 moderatorships

BIOCHEMISTRY

Biochemistry is a moderatorship course offered by the [School of Biochemistry and Immunology](#). The focus is on understanding how living cells function at a molecular and cellular level. It encompasses a wide range of topics such as cancer biology, stem cell biology, immunology, neurobiology, developmental biology and drug discovery.

BOTANY

Teaching in botany is research led and focuses on the areas of ecology, systematics and conservation and whole plant physiology. Extensive use is made of the notable departmental herbarium and the College Botanic Garden. In the Junior Sophister year, subject to resources being available, one of the field courses will take place in the Canary Islands. The moderatorship aims to produce graduates equipped with a range of subject-specific and transferable skills

ENVIRONMENTAL SCIENCES

Environmental sciences is a multidisciplinary subject which focuses on understanding and mitigating the impact of human populations on natural systems and processes. This requires the integration of physical and life sciences, engineering, economics and social sciences. The moderatorship course at Trinity College Dublin adopts this multidisciplinary ethos. The course is delivered through the collaboration of all disciplines in the [School of Natural Sciences](#) (Botany, Geography, Geology, and Zoology), the [School of Engineering](#) and other participating disciplines.

GENETICS

The teaching and research activities of the Genetics Department are in the areas of molecular, human, population and quantitative genetics and evolution. The Junior Sophister modules are designed to prepare for, and to introduce, advanced material from these and other related areas of genetics. Central genetics modules cover the basic processes of inheritance and gene expression, and genome structure and evolution, in man and other animals, plants, bacteria and viruses. The modules in molecular genetics depend heavily on the theory and techniques of genetic engineering while those in molecular evolution, population and quantitative genetics introduce students to computing and computer programming.

HUMAN GENETICS

Students may opt to take a moderatorship in human genetics offered by the School of Genetics and Microbiology. Human genetics is a rapidly growing field that has been revolutionised by genetic engineering, genome sequencing, transgenic techniques and gene editing, among other technologies. Data emerging from the Human Genome Project and other large initiatives has resulted in an explosion in knowledge of medical genetics including the molecular basis of many inherited disorders, the explanation of some cancers as acquired genetic diseases, study of molecular evolution and the genetic history of humans, and application of DNA identification in forensic science, among others. Modules cover core concepts required for human genetics.

IMMUNOLOGY

A moderatorship in immunology is offered by the [School of Biochemistry and Immunology](#). Junior Sophister modules include core concepts in immunology and cover areas such as immunology and transplantation, immunology and infectious diseases (including bacterial, viral and parasitic diseases), autoimmune diseases, allergy, asthma and cancer.

MICROBIOLOGY

Microbiology is the branch of biological science that deals with microorganisms – bacteria, protozoa, fungi (moulds and yeasts), and viruses. Microbiology is central to modern biomedical science, the agri-food industry and to studies of the environment. It is also an emerging force in bioenergy and systems biology. Students are introduced to the microbial sciences in their Fresh microbiology modules before specialising in microbiology in the Sophister years.

MOLECULAR MEDICINE

Molecular medicine is a moderatorship run jointly by the [School of Biochemistry and Immunology](#) and the [School of Medicine](#). This option has been introduced to recognise the revolutionary advances in disease diagnosis, therapy and prevention brought about by bio-molecular research and aims to demonstrate how basic science is translated into clinical treatment.

NEUROSCIENCE

Neuroscience is an interdisciplinary degree devoted to the scientific study of the nervous system in health and disease, and is taught by members of all three faculties in Trinity. It comprises study of the nature and functioning of the nervous system at all levels, from the molecules that make up individual nerve cells, to the complexities of how behaviour, thoughts and emotions are produced. Neuroscience is a multidisciplinary area of investigation that makes use of a variety of methods and approaches from a wide range of traditional disciplines including biochemistry, physiology, genetics, neuroimmunology, pharmacology, anatomy and psychology.

PHYSIOLOGY

Physiology is the study of how cells work, how they co-operate in organs like the heart or brain and how the operation of these organs is integrated. The moderatorship in physiology provides students with an in-depth understanding of mammalian body function from the molecular level to that of the whole organism, with especial emphasis on human physiology in health and disease.

To be eligible to enter the physiology moderatorship, students must have successfully completed the prerequisite Senior Fresh modules, which provide an introduction to the nervous (brain and spinal cord), cardiovascular (blood circulation), respiratory (lungs), gastrointestinal (digestion), excretory (kidneys) and endocrine (hormones) systems, as well as fundamentals of biochemistry and genetics. The Sophister years build on this introduction to provide a detailed functional understanding of cells and of organ systems, together with training in scientific methodology, experimental design and data analysis. Areas of physiology which reflect major research interests of the department include cell physiology, neuroscience and exercise physiology.

ZOOLOGY

Zoology offers Sophister students training in many areas of the biology of animals emphasising particularly those aspects that relate to ecology, conservation and wildlife biology, comparative physiology, marine biology, developmental biology and behaviour. The Junior Sophister course highlights the major concerns of modern zoology and introduces the student to the full range of zoological interests, from the evolutionary origins of biodiversity and ecological system services to the genetic basis of development in embryos. The Senior Sophister course offers choices of tutorial module topics to allow the student to tailor their course to their interests and complement their research project.

TR061 moderatorships

CHEMISTRY

Sophisters take modules in organic, inorganic, physical, analytical and biological/polymer chemistry and those on the chemistry with biosciences course will also take several relevant

biosciences modules. Further topics, including computational and medicinal chemistry may be provided in an optional module. The modules provided cover topics such as organic mechanisms and synthetic methods, heterocyclics, organometallic C-C couplings, pericyclic reactions, organoheteroatom chemistry, physical organic chemistry, retrosynthesis, bio-organic chemistry including natural products, amino acids and peptides, organic and inorganic polymers, group theory, spectroscopy and other physical methods, quantum chemistry and statistical mechanics, advanced thermodynamics and kinetics, coordination chemistry, solid state chemistry, structural inorganic chemistry and related characterisation techniques, properties of soft matter, bio-inorganic chemistry, organometallics, catalysis and surface chemistry, electrochemistry, analytical chemistry, metal compounds in the environment, drug design and clusters. Lectures are complemented by practical classes in inorganic, organic, physical and computational chemistry; and by an introduction to advanced preparative methods and instrumental techniques, including computer-controlled equipment.

CHEMISTRY WITH BIOSCIENCES

The moderatorship in chemistry with biosciences allows students to obtain a core chemistry degree with a solid grounding in biology, allowing them to work at the interface of these disciplines addressing global issues in areas such as drug development and safety, biomedicine, biotechnology and clinical operations. Graduates of this moderatorship will be prepared for careers as professional chemists, or in the biological sciences, including the biomedical, biotechnology, and pharmaceutical industries. Biologics, including antibody-drug conjugates, peptide, protein and siRNA therapies have increased steadily to forty per cent of new drug approvals in recent years. Students with a deep understanding of chemistry and knowledge of biosciences will be ideally placed to work in this key growth industry. This unique multidisciplinary moderatorship will also prepare students excellently for postgraduate studies in frontier areas of chemistry and biology and careers in teaching in chemistry and biology. The degree is awarded under the regulations of the science course.

CHEMISTRY WITH MOLECULAR MODELLING

The moderatorship in chemistry with molecular modelling allows students to obtain a core chemistry degree while specialising in the theoretical and applied aspects of molecular modelling, from materials chemistry to computational drug design. The degree is awarded under the regulations of the science course.

MEDICINAL CHEMISTRY

The moderatorship in medicinal chemistry is especially attuned to the development of the creative talent needed by the major enterprise that is the modern pharmaceutical industry, one of the largest and fastest-growing business sectors in the modern world. The medicinal chemistry degree provides a sound general grounding in chemistry but focuses on, and extends into, topics of relevance to the design, synthesis and biological evaluation of new medicinal compounds. The degree is awarded under the regulations of the science course.

NANOSCIENCE

The moderatorship course in nanoscience allows students to specialise in nanoscience at an advanced level during their undergraduate careers due to the combination of modules and practical experience offered by the Schools of Physics and Chemistry.

The course shares many lectures with those given for the moderatorships in chemistry and in physics, and also provides some specialist advanced nanoscience and materials laboratory practicals that emphasise nanoscience.

Nanotechnology is being used to develop smaller and more powerful electronic devices, lasers and other photonic devices, medical diagnostics and materials with new properties. The interdisciplinary nature of the moderatorship in nanoscience, which involves both the physics and chemistry of advanced materials, gives graduates a broad scientific education that is ideal for

careers in the nano- and information-technology sectors as well as an excellent starting point for higher degrees in nanomaterials research.

The degree is awarded under the regulations of the science course.

TR062 moderatorships

GEOGRAPHY

Geography explores the natural world and our place within it. Interdisciplinary by nature, geography students investigate how natural systems function, how they change through time, how a changing environment impacts on communities and societies and how the latter, in turn, impact on the environment. Geographers integrate the wider natural sciences to explore the causes and consequences of phenomena such as climate change, natural hazards, shifting land use, and changing sea levels, critical topics in a fast-changing world. The geography moderatorship provides students with a wide array of practical skills, strengthening their ability to think critically and to apply their experiences to solve real-world problems.

GEOSCIENCE

Geoscience is the science of how the Earth works. It combines topics in physical geography and geology to develop a holistic understanding of the processes that have shaped our planet from its formation to the present day. Sophister students study subjects drawn from across the School of Natural Sciences including: biogeoscience; climate (past, present and future); energy and resources; geomorphology; geochemistry, mineralogy, petrology and volcanology; natural hazards; ocean science; stratigraphy, sedimentology and palaeontology; soil system science; tectonics and structural geology. In addition to classroom lectures, students receive hands-on practical experience in the laboratory, as well as participating in residential field courses. Full details of the Junior Sophister and Senior Sophister years can be found in the TR062 sophister course handbook.

TR063 moderatorships

PHYSICS

The moderatorship in physics is taught within the School of Physics and is professionally accredited by the Institute of Physics. Students study the core concepts of physics, as well as advanced physics topics drawn from research areas within the School. Tuition will consist of lectures, practical work, tutorials and seminars in advanced physics and includes a capstone research project in the Senior Sophister year.

Full details of the Junior Sophister and Senior Sophister years can be found in the Physical Sciences course handbook and/or the School of Physics undergraduate handbook.

PHYSICS AND ASTROPHYSICS

The moderatorship in physics and astrophysics is taught within the School of Physics and is professionally accredited by the Institute of Physics. Students study the core concepts of physics and astrophysics, covering the basic physics curriculum as well as advanced topics in astrophysics. Tuition will consist of lectures, practical work, tutorials and seminars in advanced physics and astrophysics and includes a capstone research project in the Senior Sophister year.

Full details of the Junior Sophister and Senior Sophister years can be found in the Physical Sciences course handbook and/or the School of Physics undergraduate handbook.

NANOSCIENCE

The moderatorship course in nanoscience allows students to specialise in nanoscience at an advanced level during their undergraduate careers due to the combination of modules and practical experience offered by the Schools of Physics and Chemistry.

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The degree is awarded under the regulations of the science course.

MODERATORSHIP IN PHYSICS

(IN CONJUNCTION WITH THE UNIVERSITY OF SCIENCE AND TECHNOLOGY BEIJING)

15 Students admitted to this degree programme will have successfully completed the first two years of undergraduate study in physics at the University of Science and Technology Beijing (USTB) and enter the Junior Sophister year of the physics degree programme in Trinity College Dublin. Students follow the Junior and Senior Sophister years of the physics degree as prescribed in the School of Physics undergraduate handbook. Progression rules for students in the Sophister years of the degree programme are the same as for students who enter the programme via the TR063 entry stream.

Moderatorship, Part I

16 The results of the Junior Sophister year constitute Moderatorship, Part I and contribute 30 per cent toward the final award.

Moderatorship, Part II

17 The results of the Senior Sophister year constitute Moderatorship, Part II and contribute 70 per cent toward the final award.

Award

18 Bachelor in Arts (Moderatorship).

MODERATORSHIP IN GEOSCIENCE

(DUAL B.A. DEGREE PROGRAMME WITH COLUMBIA UNIVERSITY)

Introduction/overview

19 The dual B.A. programme combines the course in geoscience at Trinity College Dublin with the liberal arts programme offered by the School of General Studies at Columbia University, New York.

20 Students register with both institutions in all four years of the course. In the first two years, students are bound by Trinity's regulations, policies and procedures and in the final two years, by those applicable in Columbia. Trinity's regulations, policies and procedures will also apply to the additional Sophister modules (30 ECTS) required by Trinity in the final two years. Students are required to familiarise themselves with both institutions' regulations.

21 Specific modules completed at Trinity may also be eligible for the fulfilment of Columbia core or major requirements upon review by the appropriate department, provided that students achieve a minimum mark as set by Columbia. Columbia recognises the credits gained by students in the first two years at Trinity and will award students 60 credits towards the 124-credit minimum requirement for the B.A. degree at Columbia.

22 Trinity recognises 64 credits (equivalent approx. to 120 ECTS) gained by students during their final two years at Columbia aligned with their course requirements as counting towards the B.A. degree when combined with the further Sophister modules (30 ECTS) taken for Trinity.

23 The ECTS value of each year of the course is as follows: Junior Fresh 60 ECTS credits; Senior Fresh 60 ECTS credits; Junior Sophister and Senior Sophister 30 ECTS credits; at Columbia students must complete a minimum of 64 credits (equivalent approx. to 120 ECTS).

Attendance

24 Students at all levels must attend all the lectures, tutorial and laboratory classes.

Assessment and progression regulations

25 See GENERAL REGULATIONS AND INFORMATION and the programme handbook for information.

Moderatorship

26 For the award of the dual B.A., students must satisfy the regulations of both Trinity College and Columbia University.

27 The degree classification at Trinity is calculated by combining the aggregate mark from the period of registration at Columbia with the aggregate mark from the additional Sophister modules, required by Trinity (30 ECTS), on an equal basis.

Award

28 Bachelor in Arts (Moderatorship).

MODERATORSHIP IN NEUROSCIENCE (DUAL B.A. DEGREE PROGRAMME WITH COLUMBIA UNIVERSITY)

Introduction/overview

29 The dual B.A. programme combines the course in neuroscience at Trinity College Dublin with the liberal arts programme offered by the School of General Studies at Columbia University, New York.

30 Students register with both institutions in all four years of the course. In the first two years, students are bound by Trinity's regulations, policies and procedures and in the final two years, by those applicable in Columbia. Trinity's regulations, policies and procedures will also apply to the additional Sophister modules (30 ECTS) required by Trinity in the final two years. Students are required to familiarise themselves with both institutions' regulations.

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37 The degree classification at Trinity is calculated by combining the aggregate mark from the period of registration at Columbia with the aggregate mark from the additional Sophister modules, required by Trinity (30 ECTS), on an equal basis.

Award

38 Bachelor in Arts (Moderatorship).

BACHELOR IN SCIENCE (HUMAN HEALTH AND DISEASE)

39 For details see FACULTY OF HEALTH SCIENCES.

VI E3⁵ COURSE IN ENVIRONMENTAL SCIENCE AND ENGINEERING

DEGREES OF BACHELOR IN SCIENCE (ENVIRONMENTAL ENGINEERING) AND MASTER IN ENGINEERING (STUDIES) (M.A.I. (St.)) or BACHELOR IN SCIENCE (APPLIED ENVIRONMENTAL SCIENCE) and MASTER IN APPLIED ENVIRONMENTAL SCIENCE

Introduction/overview

1 Environmental science and engineering is an inter-disciplinary course that bridges the disciplines of engineering and the natural sciences (botany, geology, geography and zoology). It provides a critical foundation for understanding environmental challenges from the global to local scale and focuses on developing solutions which will enable human populations to live and use Earth's resources more sustainably. The environmental science and engineering course integrates modules from the Schools of Natural Sciences and Engineering. It includes laboratory, lecture and field teaching.

2 Students complete an integrated five-year course consisting of four years leading to the appropriate B.Sc. degree plus an additional year of study leading to a M.A.I. (St.) or Master in Applied Environmental Science.

3 During the first three years a balanced and integrated programme of modules in environmental science and engineering is provided. Following completion of the first three years of the course, students elect to study specialised programmes in one of the following strands:

Environmental engineering

This strand of the environmental science and engineering course places stronger emphasis on modules and project work in the discipline of engineering in years 4 and 5.

Applied environmental science

This strand of the environmental science and engineering course places stronger emphasis on modules and project work in the discipline of environmental sciences in years 4 and 5.

Following completion of the fourth year of the environmental science and engineering degree course, eligible students may elect to complete one further year of study in their chosen strand leading to a M.A.I. (St.) or Master in Applied Environmental Science degree.

4 While every effort is made to allow students to study the strand/specialism they choose, the course committee reserves the right to allocate the available places. Timetable constraints may also reduce the number of module options available.

The rules for streaming (into environmental engineering or applied environmental science) are as follows:

In year 3: two out of the three optional modules available must be modules associated with the student's chosen stream.

⁵Engineering, Environment and Emerging Technologies.

In year 4: if taking the 30 ECTS credit industry internship or international exchange, this must be in the chosen stream. If spending the full year in Trinity, students must take the capstone project module which aligns with their chosen stream, in addition to at least two optional modules associated with their chosen stream.

Year 5: students must take the independent research project module which aligns with their chosen stream in addition to at least three optional modules associated with their chosen stream.

5 Outbound Trinity College students: Students who successfully complete the third year of their environmental science and engineering course in Trinity College Dublin and meet the selection criteria may enroll to study abroad with approved partner institutions as an integrated part of the teaching programme for students who are following the full five-year course. These options may be taken in the fourth year and include Erasmus, UNITECH (as a paid industrial partnership) and CLUSTER. Full details of available options are available from the School of Engineering and School of Natural Sciences offices and on their websites.

6 Students are encouraged to gain relevant work experience during the vacation periods. Formal industrial partnerships/internships with approved industry, government and environmental policy partners are also available as an integrated part of the teaching programme for students who are following the full five-year course. This option may be taken in the fourth year.

7 A capstone project is undertaken by all students who spend all of year 4 in Trinity College.

8 An independent research project is conducted in year 5 by all students.

Regulations

9 As per College's GENERAL REGULATIONS AND INFORMATION, with the following additions for the environmental science and engineering course:

(a) Students must achieve a minimum of 60 per cent at the first attempt at the Junior Sophister assessment in order to be eligible to take the internship or study abroad in the Senior Sophister year.

(b) Senior Sophister students who are exiting with a B.Sc. degree must complete a capstone project.

(c) Students who have failed at the first attempt of the Senior Sophister assessment may present at the reassessment session or, if they fail at the reassessment session, repeat the year in order to be eligible for the relevant B.Sc. degree.

(d) To be eligible to proceed to the fifth year of the programme, students must achieve a minimum overall mark of 60 per cent for the combined Junior Sophister and Senior Sophister years (on a 30:70 basis) at the annual assessment session of the Senior Sophister year.

(e) Successful candidates at the end of the fifth year are awarded the degree of M.A.I. (St.)/Master in Applied Environmental Science or of M.A.I. (St.)/Master in Applied Environmental Science with distinction, as applicable. The M.A.I. (St.)/Master in Applied Environmental Science degree is awarded on the results of a student's end-of-semester fifth year continuous assessment and examinations. A distinction shall require at least 70 per cent in both the examinations and the dissertation and at least 70 per cent in the final credit-weighted average mark.