F740-SDS Bachelor of Science in Statistical Data Science

PROGRAMME DETAILS
Programme Code: F740-SDS
Department: Actuarial Maths & Statistics
Main Award: BSCH - Bachelor of Science Honours
Full Award Title: Bachelor of Science in Statistical Data Science
Level: Undergraduate

LOCATION OF STUDY
Edinburgh Y Scottish Borders N Orkney N
Dubai N Malaysia Y Approved Learning Partner N
Independent Distance Learners N Collaborative Learning Partner N Other N

ASSOCIATED AWARDS
Programme Code | Award | Title
--- | --- | ---
F740-SDS | BSCH | Statistical Data Science
F740-ZZZ | BSCO | Bachelor of Science in Statistical Data Science Ordinary Degree

ACCREDITATION
The School plans to seek accreditation from the Royal Statistical Society (RSS) for this programme. It will also seek approval and accreditation from the MQA. Depending on the courses chosen from the available options and electives, students may also gain exemptions from some of the UK's Institute and Faculty of Actuaries professional examinations via the IoFA accreditation of courses on the BSc in Actuarial Science.

LEARNING OUTCOMES – SUBJECT MASTERY
Understanding, Knowledge and Cognitive Skills

On completion of the course, students will be able to:

- demonstrate knowledge that covers many of the principal areas of contemporary statistical data science
- demonstrate a critical understanding of the main theories and concepts at the heart of contemporary statistics
- demonstrate a detailed knowledge and understanding of some specialised areas of contemporary statistics, including data analysis, statistical inference, stochastic processes, linear and generalised linear models, Bayesian inference, survival modelling, time series analysis, statistical computing and simulation.
- demonstrate expertise in formulating statistical models and using them to analyse data and make inferences in a wide range of applications

Scholarship, Enquiry and Research (Research Informed Learning)

On completion of the course, students will be able to:
• demonstrate problem solving skills
• demonstrate statistical skills of critically evaluating, modelling and analysing data and drawing appropriate conclusions
• report findings in a precise and efficient manner and communicate them effectively to peers and non-specialists
• use a wide range of statistical skills required in the modern professional workplace
• identify, formulate and analyse problems of importance to industry, the economy and the scientific research community

LEARNING OUTCOMES – PERSONAL ABILITIES

Industrial, Commercial and Professional Practice

On completion of the course, students will have the knowledge and skills for the development, application and consequent analysis of suitable statistical models, as currently required in modern industrial sectors including the financial, medical, pharmaceutical and IT sector. They will be able to identify, analyse and solve problems, and discuss issues, at a professional level; they will also be able to critically review existing practices and will be in a strong position to move on to a professional environment, with sound knowledge, confidence and awareness of the nature of that environment and the demands it will make.

Autonomy, Accountability and Working With Others

On completion of the course students will be able to:

• plan and organise their own learning through self management and time management
• assess issues associated with working as part of a team
• communicate effectively at all levels and using a range of media
• interact effectively with professionals from a wide and diverse range of areas

Communication, Numeracy & Information and Communications Technology

On completion of the course, students will be able to make presentations on specialised topics and communicate well with peers and other colleagues. They will be in a position to make connections between practical problems and appropriate statistical methods of investigation. They will have extensive IT knowledge and skills and will be able to use them confidently. They will also have the necessary background and experience to enable them to be ready and able to communicate on technical and general matters with peers and senior colleagues.

APPROACHES TO TEACHING AND LEARNING

Course learning outcomes derive from the requirements of the wider economy for graduates with expertise in modern statistical and computational practices. Teaching on the programme is student-focussed, with students encouraged to take responsibility for their own learning and development.
Students have the opportunity to specialise in the fourth year of study in an area statistical application (e.g. ecology, financial statistics and time series analysis, risk analysis, applied probability, statistical computing).

Teaching approaches and techniques include traditional lectures and tutorial sessions, and innovative computer demonstrations and computer lab sessions. In addition, students learn through structured group work, collaborative student presentations, and independent study and technical project work.

EDUCATIONAL AIMS OF THE PROGRAMME

Statistical data science is at the core of modern data analytics that turn data into intelligence to inform decision-making and solve challenging problems.

The principal aims of the programme are to:

- provide intensive and high-quality education in an undergraduate context in a wide range of subjects in modern statistics and especially in statistical data science
- enable students to develop detailed knowledge and critical understanding of both theoretical and applied elements of statistics and probability
- provide students with training and practical experience of modelling, analysing and interpreting real data
- enable students to communicate and work effectively with peers and academic staff, demonstrating appropriate levels of autonomy, initiative, and responsibility
- provide students at the undergraduate level with the opportunity to plan and write a dissertation requiring detailed and critical understanding in an area of study related to statistical data science
- equip students with the statistical knowledge and data science skills, including expertise in R, required to tackle complex statistical problems that arise in research and industry.

ASSESSMENT POLICIES

The assessment for this programme incorporates a range of assessment methods and approaches to measuring student attainment of course and programme learning outcomes. For most courses, assessment is by a combination of continuous assessment and end of term summative assessment.
by examination. In all stages of the programme, understanding, knowledge, and discipline-specific skills in statistical computation and R programming are assessed by a combination of computer project work, assignments and written examinations. Online quizzes and midterm tests are also used, especially in Stage 1 and Stage 2, to provide formative feedback and to inform student learning. In Stages 3 and 4 there are also courses that are assessed wholly by project work, including a research-led dissertation in Stage 4. Students develop both written and oral communication skills via report writing and assessed student presentations.

Approaches to assessment are continually reviewed. Specific details about methods of assessment at the course level are provided in the appropriate course descriptors.

### PROGRAMME STRUCTURE

#### Mandatory Courses

<table>
<thead>
<tr>
<th>Edinburgh</th>
<th>SBC</th>
<th>Orkney</th>
<th>Dubai</th>
<th>HWUM</th>
<th>IDL</th>
<th>Coll. Partner</th>
<th>ALP</th>
<th>Other</th>
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<th>Course Title</th>
<th>SCQF Cr</th>
<th>SCQF Lvl</th>
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### Optional Courses

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<th>Dubai</th>
<th>HWUM</th>
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### Optional Courses (Edinburgh)

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<td>Derivative Markets and Discrete Time Finance</td>
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<td>Risk Management Techniques and Tools</td>
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### ELECTIVES (UG)

**Stage 1**

Any SCQF Level 7 course, which must be approved by the 1st Year Director.

**Stage 2**

**Edinburgh and Malaysia**

**Semester 2**
Students can choose:
• C18OP Operations Management (SCQF level 8) – HWU (15 credits).

**Stage 3**

**Edinburgh and Malaysia**

*Semester 1*

Students can choose:
• C18HM Human Resource Management (SCQF level 8) – HWU (15 credits)

**Stage 4**

**Edinburgh and Malaysia**

*Semester 1*

Students can choose:
• C19PT Project Management (SCQF level 9) – HWU (15 credits)

**Stage 5**

N/A

**COMPOSITION AND STAGE NOTES (UG)**

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<thead>
<tr>
<th>Stage 1</th>
<th>Edinburgh campus only</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>8 taught courses (6 mandatory &amp; 2 optional or elective)</td>
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<tr>
<td></td>
<td>Students wishing to choose an elective course in either Semester 1 or Semester 2 must have the elective course approved by the 1st Year Director.</td>
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<table>
<thead>
<tr>
<th></th>
<th>Mandatory Credits 1</th>
<th>90</th>
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<tr>
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<td>Optional Credits 1</td>
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<td>Total 1</td>
<td>120</td>
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</table>

**Stage 2**

8 taught courses (7 mandatory and 1 optional or elective).

**a. Edinburgh campus**

Note that C37FF is only available to direct entrants to Stage 2.

**b. Malaysia campus**

C37FF is available to all students.

|          | Mandatory Credits 2 | 105 |
Stage 3

**Edinburgh and Malaysia**

8 taught courses (6 mandatory & 2 optional or elective).

Option and elective course choices are subject to students satisfying the course pre-requisites.

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<thead>
<tr>
<th>Mandatory Credits</th>
<th>90</th>
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<tbody>
<tr>
<td>Optional Credits</td>
<td>30</td>
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<td>Elective Credits</td>
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<td>Total 3</td>
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</table>

Stage 4

**Edinburgh and Malaysia**

8 taught courses (5 mandatory & 3 optional/elective).

In Semester 1, students can choose 1 option or elective course.

**Edinburgh-based students**: If students wish to take to take the option F10AN in Semester 2, it is advisable to take the option F10AM in Semester 1. If students wish to take to take the option F10ND in Semester 2, it is advisable to take the option F10NC in Semester 1.

In Semester 2, students can choose 2 option courses.

Option and elective course choices are subject to students satisfying the course pre-requisites.

<table>
<thead>
<tr>
<th>Mandatory Credits</th>
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<td>Optional Credits</td>
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<td>Elective Credits</td>
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Stage 5

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<td>Elective Credits</td>
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<tr>
<td>Total 5</td>
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ASSESSMENT AND PROGRESSION (UG)

Reassessment Opportunities

1. A student who has been awarded a Grade E or a Grade F in a course may be re-assessed in that course.
2. A student shall be permitted only one re-assessment opportunity to be taken at the Resit diet of examination following the first assessment of the course.
3. A student shall not be re-assessed in any qualifying course taken in the final stage of a course of study.
4. The Progression Board may permit a student to be re-assessed in any qualifying course not taken in the final stage in order to gain credits for the course, provided that the mark or grade obtained in the first assessment of any such course is used in determining the classification of the degree to be awarded.

Progression Requirements

Part A. The minimum number of credits required to progress through each stage are as follows

<table>
<thead>
<tr>
<th>Stage</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1 to 2</td>
<td>120 SCQF credits</td>
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<tr>
<td>Stage 2 to 3</td>
<td>240 SCQF credits</td>
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<tr>
<td>Stage 3 to 4</td>
<td>360 SCQF credits</td>
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<td>Stage 4 to 5</td>
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Part B. The minimum grade of D is required in the following courses

<table>
<thead>
<tr>
<th>Stage</th>
<th>Requirements</th>
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<tbody>
<tr>
<td>Stage 1</td>
<td>Minimum of Grade D, at the first attempt, in all courses. The Board of Examiners has discretion to allow progression at each stage with 1 or 2 Grade Es in non-continuing subjects.</td>
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<tr>
<td>Stage 2</td>
<td>Minimum of Grade D, at the first attempt, in all courses. The Board of Examiners has discretion to allow progression at each stage with 1 or 2 Grade Es in non-continuing subjects.</td>
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<tr>
<td>Stage 3</td>
<td>Minimum of Grade D, at the first attempt, in all courses. The Board of Examiners has discretion to allow progression at each stage with up to 2 Grade Es in non-continuing subjects.</td>
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<tr>
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AWARDS, CREDITS AND LEVEL (UG)

Part A. Credit Requirements

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<th>Level</th>
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<td>600 SCQF credits including a minimum of 120 credit at Level 11</td>
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<tr>
<td>Honours Degree (inc.MA)</td>
<td>480</td>
<td>480 SCQF credits including a minimum of 180 credit at Level 9 and 10 of which at least 90 credits at Level 10</td>
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</table>
**F740-SDS Bachelor of Science in Statistical Data Science**

<table>
<thead>
<tr>
<th>Degree Type</th>
<th>Credit Points</th>
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<th>Minimum Credit at Level</th>
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<td>Ordinary or General Degree</td>
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<td>360</td>
<td>60 at Level 9</td>
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<td>Diploma of Higher Education</td>
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<td>240</td>
<td>90 at Level 8</td>
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<tr>
<td>Certificate of Higher Education</td>
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<td>120</td>
<td>90 at Level 7</td>
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**Part B. Mark/Grade Requirements**

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<th>Overall Mark</th>
<th>Overall Grade</th>
<th>Basis of Overall Mark/Grade</th>
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<td>Integrated Masters</td>
<td>&gt;=50%</td>
<td>C</td>
<td>Credit Weighted Average &gt;=50% over all qualifying courses at Grades A-D</td>
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</tbody>
</table>
| Honours Degree (inc.MA)            | >=40%        | D             | 1st: Credit Weighted Average >=70% over all qualifying courses at grades A-D.  
                                        |              |               | 2.1: Credit Weighted Average >=60% over all qualifying courses at grades A-D.              |
                                        |              |               | 2.2: Credit Weighted Average >=50% over all qualifying courses at grades A-D.              |
                                        |              |               | 3rd: Credit Weighted Average >=40% over all qualifying courses at grades A-D.              |
| Ordinary or General Degree         | >=40%        | D             | Minimum of grade D in all pre-requisite courses.                                           |
| Diploma of Higher Education        | >=40%        | D             | Minimum of grade D in all pre-requisite courses.                                           |
| Certificate of Higher Education    | >=40%        | D             | Minimum of grade D in all pre-requisite courses.                                           |

**DURATION OF STUDY**

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