PROGRAMME SPECIFICATION		![Newcastle University logo]

1	**Awarding Institution**	Newcastle University
2	**Teaching Institutions**	Newcastle University
3	**Final Award**	MSc/MRes
4	**Programme Title**	Sustainable Agriculture and Food Security
5	**UCAS/Programme Code**	5237F 5238P (MSc) & 4841F, 4861P (MRes)
6	**Programme Accreditation**	N/A
7	**QAA Subject Benchmark(s)**	none
8	**FHEQ Level**	7
9	**Last updated**	September 2021

10 Programme Aims

Given the (a) predicted increase of the global population to 9.5 billion by 2050, (b) increasing pressure on non-renewable or scarce resources (e.g. energy, minerals and water) and (c) need to increase food production while minimising resource use and negative impacts on the environment, food security will become a major focus for both scientific and commercial innovation development. The underlying aim of this programme is to develop the human resources needed by both academia and industry to address these challenges. This underlying aim will be achieved by fulfilling the following specific objectives:

1. to provide learning opportunities that will enable graduates to acquire the knowledge and understanding, skills and aptitude necessary to conduct applied and strategic research underpinning the development of strategies for improving the sustainability of agricultural food production and thereby maintain food security
2. to produce graduates capable of understanding and addressing the major issues affecting sustainability in farming and food security in different macroclimatic, agronomic and market contexts
3. to encourage abstract, creative and multi-disciplinary thinking and critical analysis
4. to equip graduates with a suite of key skills including the ability to communicate effectively, to employ IT and library resources appropriately, to prioritise work and meet deadlines, to use initiative and solve problems
5. to meet the expectation of the Framework for Higher Education Qualifications at Level 7

11   Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas.

Knowledge and Understanding

On completing the programme students will have acquired detailed knowledge and thorough understanding of the

A1 main challenges that need to be addressed to maintain/improve food security in the future

A2 technologies, approaches and strategies available to improve productivity, food quality and safety, resource use efficiency and environmental impacts in agricultural production systems and food supply chains

A3 challenges associated with reconciling/conflict decision making between productivity, food quality and safety, environmental/biodiversity, ethical and socio-economic gains/impacts of agricultural production and land use and

A4 potential impacts of global regulatory/policy frameworks on the sustainability of agricultural production and future food security

Teaching and Learning Methods

A1–A4 are achieved by lectures, seminars, practical classes and field trips. Under A2 field courses based at experimental and commercial farms are integrated into the curriculum to provide state-of-the-art agronomic knowledge and practical R&D skills (see also **B1-B5** below). In the cases of A1 and A2 lectures and seminars are also accompanied by practical sessions in data handling and quantitative statistical analyses. The teaching strategy for A1, A3 and A4 includes lectures to set out baseline knowledge, principles and standards, and small group discussions, group exercises and seminars where current knowledge and R&D outputs are presented and examined from a range of perspectives.

Students will acquire knowledge through team work, case studies, presentations, and independent study and research. Some modules include short problem solving exercises.

Assessment Strategy
Intended learning outcomes (see A1 to A4 above) regarding knowledge and understanding are assessed based on course work involving both written and oral communications at the individual or team level. This will include a variety of continuous forms of assessment including essays, problem-solving exercises, reports and case studies and provide both formative and summative assessment through relevant examples. The interactive learning environment, Blackboard, will be used for both formative and summative assessments.

A1, A3 and A4 For certain optional modules (optional for 4841F/4861P only; compulsory for 5237F/5238P) focused on A1, A3 and A4 examinations are a complementary means of assessing factual knowledge.

Intellectual Skills

On completing the programme students should be able to:
B1 synthesise key findings and knowledge from across natural and social sciences and engineering, in particular those relating to sustainable food production, processing and marketing systems and associated policy and regulatory frameworks
B2 critically evaluate the quality of data and information offered from different sources
B3 define and formulate applied and strategic R&D problems, questions and hypotheses
B4 plan and conduct applied and strategic R&D projects either individually or as a team and critically evaluate results
B5 develop technology transfer strategies aimed at improving the productivity, environmental and economic sustainability, food quality and safety and resource use efficiency in components of food production systems and supply chains based on R&D results

Teaching and Learning Methods

Intellectual skills (**B1-B5**) are developed progressively throughout the programme in modules containing seminars and case studies.

Throughout the programme, students will develop intellectual skills by participating in group discussions, case studies and science and technology workshops to enhance their **(a)** analytical and interpretative faculties and **(b)** ability to formulate objective and coherent arguments.

Field visits and associated team problem solving exercises are the main method used to enhance intellectual skills related to technology transfer capabilities.

Design, execution, statistical analysis and reporting of the final dissertation project enhance the learning of these skills in a focused manner.

Assessment Strategy

B1-B5 are assessed through individual and/or group R&D and technology transfer proposal preparation exercises and through individual dissertation proposals and theses
B1-B3 are also assessed via oral presentations and assessed essays, mainly in compulsory modules
B1 and B2 are also assessed in certain optional modules by closed book examinations
The interactive learning environment, Blackboard, will be used for both formative and summative assessments.

Practical Skills

On completing the programme students will be able to:
- **C1**   demonstrate bibliographic and key IT skills appropriate to R&D at Master's level
- **C2**   use a wide range of analytical laboratory methods (e.g. in the areas of soil, crop, livestock, environmental and food sciences and waste management and engineering)
- **C3**   collect data using a variety of methods and sources, including farmer and industry participatory approaches
- **C4**   manage and critically analyse data using appropriate spread sheet and statistical software

Teaching and Learning Methods

Practical Skills (**C1-C4**) are primarily obtained through course work, practical laboratory classes, assignments and the research project.

Bibliographic and IT skills (**C1**) will be transferred through specific components (data handling, statistical and computing skills practical classes) which are included in all compulsory and most optional modules.

Assessment Strategy

The assessment of practical skills (**C1-C4**) will be based on **(a)** bibliographies produced as part of essays, seminar presentations and the final project thesis and **(b)** data handling and analyses carried out as part of problem solving exercises and the project thesis.

Transferable/Key Skills

On completing the programme students should be able to:
- **D1**   communicate and present research findings (including those from their dissertation) to   academic and stakeholder/industry audiences
- **D2**   produce effective written communications and presentations using state-of-the-art software packages
- **D3**   manage R&D and technology transfer, including writing proposals, planning of projects and implementation
- **D4**   use effective time and resource management practices
- **D5**   work effectively as a member of teams both subject specific and multidisciplinary

Teaching and Learning Methods

Transferable/Key skills **D1-D5** are developed through the programme of course work, field visits, final dissertation and the industry and postgraduate workshops.

Assessment Strategy

Key skills are not independently assessed. However, **D1-D5** are indirectly assessed through coursework, team and individual presentations, research papers and the dissertation.

12   Programme Curriculum, Structure and Features
Basic structure of the programme
The programme curriculum will be delivered by **Newcastle University** and most modules will be taught exclusively in the teaching and laboratory facilities at the main Newcastle University campus in the city centre.

The programme runs for 12-months from late September, across 3 Semesters. It comprises 180 credits, including 120 credits taught (Semesters 1 and 2) with 60 credits allocated to the consultancy project (mostly undertaken during Semester 3). All modules are compulsory.

Modules are offered using a blocked teaching structure where usually only one 10 credit module is taught at a time during a two week teaching block or one 20 credit module during a four week teaching block.

During the summer semester students focus on their dissertation project.

Key features of the programme (including what makes the programme distinctive)

The programme allows an in depth specialisation in **Sustainable Food Production and Food Security.** Food security will become a major focus for both scientific and commercial innovation development, given the **(a)** predicted need to feed an additional 3 billion people by 2050, **(b)** increasing pressure on non-renewable or scarce resources (e.g. energy, minerals and water) and **(c)** need to increase food production while minimising resource use and negative impacts on the environment. The underlying aim of this programme is to provide a specialist MSc/MRes programme that develops the human resources needed by both academia and industry to address these challenges.

In line with the integrated/holistic approach needed to cover such a multidisciplinary topic area, the programme includes **two 10 credit compulsory modules** designed to provide a detailed overview of the most important issues/problems related to the sustainability of agricultural production and food security. This **problem/analysis -** focused backbone is supplemented by compulsory modules in soil and land resources, climate change, agricultural innovations, marketing, and sustainable crop and livestock management. Hands-on research and problem solving skills are refined in an 80-credit dissertation module (MRes) or 60-credit dissertation module (MSc).

MRes students <u>only</u> select 40 credits from modules covering the themes listed above.

The MSc and MRes will offer different experiences, and will therefore be appropriate for different sets of students. On the MSc, three quarters of the credits are gained through taught modules that offer an opportunity to learn about a wide range of problems in food security. This may be the most appropriate path for students who have an interest in the subject but are not sure which topic they want to specialise in, or students who simply wish to gain a broad knowledge in this area for their career objectives. In contrast, the MRes offers more credits from the dissertation module, i.e. self-directed research, supported by a smaller number of taught modules than are available on the MSc. This path is most suitable for students who have a strong interest in a particular topic area, and are confident that they wish to pursue a career in research.

Programme regulations (link to on-line version)

Degree of Master of Science in Sustainable Agriculture and Food Security – Code: 5237F
5237F 21-22 Programme Regulations

Degree of Master of Science in Sustainable Agriculture and Food Security – Code: 5238P
5238P 21-22 Programme Regulations

Master of Research in Sustainable Agriculture and Food Security Code: 4841F
4841F 21—22 Programme Regulations

Master of Research in Sustainable Agriculture and Food Security Code: 4861P
4861P 21-22 Programme Regulations

13   Support for Student Learning

Generic information regarding University provision is available at the following link.

https://www.ncl.ac.uk/ltds/assets/documents/qsh_progspec_generic_info.pdf

14 Methods for evaluating and improving the quality and standards of teaching and learning
Generic information regarding University provision is available at the following link. https://www.ncl.ac.uk/ltds/assets/documents/qsh_progspec_generic_info.pdf *Accreditation reports* • not applicable; *Additional mechanisms* An industry advisory panel has been established to advise the course management team on industry needs regarding the knowledge and skills transferred on the MSc/MRes programme*.*

15 Regulation of assessment
Generic information regarding University provision is available at the following link. https://www.ncl.ac.uk/ltds/assets/documents/qsh_progspec_generic_info.pdf

In addition, information relating to the programme is provided in:
The University Prospectus: http://www.ncl.ac.uk/postgraduate/courses/ The University Regulations: http://www.ncl.ac.uk/regulations/docs/

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

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