The Royal Agricultural University

Programme Specification:

MSc Agricultural Technology and Innovation

2022-23

PROGRAMME SPECIFICATION [ACADEMIC YEAR 2022/23]

This Programme Specification is designed for prospective students, current students, academic staff and potential employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the teaching, learning and assessment methods, learning outcomes and content of each module can be found in the Module descriptors.

Section 1 – Material Programme Information	
Quercus code	*ATSM*
Validating body	The Royal Agricultural University
Teaching Institution	The Royal Agricultural University
School	Agriculture, Food and Environment
Entry Award(s)	MSc Agricultural Technology and Innovation
Final Award and exit route(s)	Postgraduate Certificate Agricultural Technology Postgraduate Diploma Agricultural Technology and Innovation MSc Agricultural Technology and Innovation
Programme title	MSc Agricultural Technology and Innovation
Location(s) of study	Royal Agricultural University, Cirencester Campus with some visits or case study demonstrations off site.
Mode of study	Full time / 1 year / Part-time / Two years
Language of study	English
Programme start month	September
Period of validation	September 2021 to August 2028
Name of Professional, Statutory or Regulatory Body	Not applicable
Type of Accreditation	Not applicable
Accreditation due for renewal	Not applicable
Entry requirements (this should be the standard University entry requirements unless otherwise approved by the Academic Board, and include UCAS entry profile for UG programmes and IELTS)	Honours degree at upper second level. Mature candidates with significant relevant work experience and lower academic qualifications may also be considered for entry, following interview with the course manager. IELTS: For students whose first language is not English, the University will accept International English Language Test (IELTS) with a minimum overall score of 6.5 average with no element below 5.5. Students with other qualifications, including overseas awards and alternative English language qualifications, are advised to contact Admissions to discuss the suitability of their award
UCAS Code	N/A
QAA Subject Benchmark Statement(s) and other reference points	https://www.qaa.ac.uk/quality-code/subject-benchmark-statements Subject Benchmark Statement Agriculture, Horticulture, Forestry, Food, Nutrition and Consumer Sciences October 2019
Academic level on Framework for Higher Education Qualifications (FHEQ)	Level 7
Approval at AQSC	Academic Board 02 June 2021
Version	V1 – July 2021: module codes updated

	V2 – July 2022 AQSC: add elective 4250, remove 4415

Section 2 – Programme structure

The structure of all University awards complies with the University's Academic Regulations for Taught Programmes which includes information about the:
- Rules for progression between the stages of a programme;
- Consequences of failure for referrals, compensation and exist awards;
- Calculation and classification of awards.

MSc Agricultural Technology and Innovation (180 credits)
The accumulation of 180 credits (or more) of which at least 60 must be achieved from research focused modules: either Masters dissertation or agreed equivalent research-based project or a combination of a research methods module and a Masters dissertation or agreed relevant research-based project).

Module code	Module title	Level	Credit value	Core/ Elective	Semester
Level 7					
4038a	Integrated Agricultural Systems	7	15	Core	1
4725	Environmental Technology and Innovation	7	15	Core	1
4263	Entrepreneurship and Business Planning	7	15	Core	1
4413	Research Skills	7	15	Core	1
4233	Computing and IT In Precision Agriculture	7	15	Core	2
4726	Livestock Production Technology and Innovation	7	15	Core	2
4723	Crop Production Technology and Innovation	7	15	Core	2
4414	Dissertation (45 credits)	7	45	Core	Summer
Plus 2 electives from:					
4409	Facing the Global Challenges in Food and Agriculture	7	15	Elective	1
4724	Environmental Science in Agriculture	7	15	Elective	1
4250	International Rural Development	7	15	Elective	1
4727	Managing Global Soils in a Changing Climate	7	15	Elective	2
4722	Climate Change and Sustainability	7	15	Elective	2
4203	Small Scale Farming and Local Food Supply	7	15	Elective	2
4261	Leadership and Personal development	7	15	Elective	2
	Total credits: MSc Agricultural Technology and Innovation		**180**		

Section 3 – Programme overview and Programme Aims

The aims and objectives of the programme are to support the RAU's: **Vision**, *A world where all communities thrive in harmony with nature*; **Mission**, *equipping a new generation to thrive through change*; and **Purpose**, *To cultivate care for the land and all who depend on it*. The MSc Agricultural Technology and Innovation programme benefits from research-led teaching from key members of the following RAU's research groups: S*ustainable and regenerative agriculture, Livestock health and welfare, Food safety, quality and security, Environment and soil health.*

Advances in the agricultural sector, and the way in which growers are now changing their mentality to crops growth, has created a growing demand for new intellectual and technological skill set. Developments in sensors, robotics, automation, analytics and telematics are enabling new and sophisticated ways of managing agricultural practices. Precision agriculture technology and the "Digital Ag age" is swiftly gaining popularity among UK farmers as well as the world's farming community and its primary producers; due to the increasing need of optimum production with the given resources. The need for adoption of these new and innovative systems have been developed over the recent decades to help mitigate the changing weather patterns due to increasing global warming, and so, have necessitated the adoption of advanced technologies to enhance the productivity and crop yield.

These technologies such as real-time farm monitoring, weather forecasting, optimal field requirements and other innovative technologies enable growers to increase the yield with minimum human efforts and wastage. Moreover, the technology enables the farmers to manage their resources as well as access real time information through their smartphones, thereby offering greater mobility and ease of operation. However, major restraints of the market are affordability and accessibility of the technology, and lack of awareness about the benefits of precision agriculture among farmers, particularly in the developing countries. There are escalating issues over the sustainable supply of production resources such as water, soil and fertilisers. Increased precision and more adaptable management of these has the potential to make a positive contribution in conserving such essential inputs, whilst minimising the expenditure of carbon The capture of environmental data and its rapid and accurate interpretation may also provide opportunities for more effective and timely management of natural land, wild and undeveloped area.

The combination of scale and precision will reduce the requirements of unskilled labour and will increase the demand for highly skilled specialists in the field of digital agriculture. Forward looking businesses will need talented, well-educated and skilful recruits capable of making effective contributions to business projects from the outset of their careers.

This course is suitable for students from a variety of academic and professional backgrounds, including agriculture, business management, engineering/agricultural engineering or software development.

The aims of this programme are to produce graduates that
- Have a comprehensive understanding of the new and innovative technologies being applied in sustainable agriculture and for the sustainable management of the natural environment.

- Have the ability to use their knowledge and skills to develop innovative solutions to novel problems, generate new ideas, and develop innovative new technologies and adapt and update established methods, techniques and procedures.
- Are technically adept, accomplished, and fluent with technical aspects of the capture, processing, interpretation and application of digital data.
- Understand the principles and practice of agricultural and horticultural production and a full awareness of the potential applications and benefits of new technologies.
- Have an applied management, enterprise and entrepreneur skill set in a range of agricultural technology systems contexts
- Are able to communicate in appropriate ways at all levels, and to clearly and effectively present concepts and research findings to interested individuals, groups, businesses and other commercial organisations, and government agencies and institutions.
- Are committed to the improvement of agriculture, horticulture, and the care of the natural environment.
- Are responsible and considerate of the ethical issues in their work.
- Are competent researchers with the ability of research planning and design, synthesis and critical analysis
- Are lifelong learners, with motivation to sustain their personal, professional and career development

Section 4 – Programme intended learning outcomes and learning, teaching and assessment methods

This programme allows students to gain the necessary skills to:

Knowledge and Understanding

LO no.	On successful completion of the named award, students will be able to:	Module Code/s
1.	Understand and differentiate between types of agricultural production systems (both large- and small-scale) and critically evaluate their contribution to sustainable agriculture.	4038A, 4409 4727, 4724
2.	Explain, appraise and critically evaluate a range of technical systems, devices and innovations used in digital agriculture related to livestock and crop production.	4626, 4723 4203
3.	Explain, appraise and critically evaluate a range of environmental technologies and innovative practices used for the sustainable management of the environment and natural resources and understand the impact of climate change on natural resources	4725, 4723 4409, 4727 4722
4.	Explain, appraise and critically evaluate a range of environmental technologies and innovative practices used for the sustainable management of the environment and natural resources and understand the impact of climate change on natural resources	4726, 4725 4203, 4261
5.	Understand the role of entrepreneurs in the creation of business ventures and recognise, assess and articulate start up opportunities using a business plan and pitch.	4263

6.	Critically evaluate and analyse agricultural technology products and systems with respect to a range of management requirements	4726, 4725 4723, 4203
7.	Create and assess hardware and software and obtain an understanding how IT professionals design and build technology	4233

Intellectual, Professional, Key skills

LO no.	On successful completion of the named award, students will be able to:	Module Code/s
1.	Develop lifelong skills which enable the synthesis and critical analysis of data and information from a wide range of sources to support and evaluate solutions to practical and real world problems	4038A, 4409 4727, 4724
2.	Show creativity and manage the creative process	4038A, 4725 4723, 4263 4413, 4414 4203, 4409 4727, 4722 4724, 4250
3.	Identify and solve complex problems holistically by evaluating issues and options, and implementing and reviewing decisions	4038A, 4233 4723, 4263 4414, 4261
4.	Devise and sustain an argument supported by valid and significant evidence.	4233, 4263 4414, 4261 4727, 4722 4724, 4250
5.	To manage time and resources appropriately in both individual and team situations to enable successful project delivery	4726, 4725 4723, 4413 4414, 4203 4261, 4409 4727, 4722 4724, 4250
6.	Citing and referencing sources of data and information with academic integrity in an appropriate manner whilst ensuring the avoidance of plagiarism.	All modules

Programme specific skills

LO no.	On successful completion of the named award, students will be able to:	Module Code/s
1.	To undertake project management for agricultural technology and innovation assessments, analyse and report results effectively and appropriately	4723, 4414 4203, 4727 4250
2.	To communicate through a variety of mediums on topics relating to agricultural technology and innovation to wide range of audiences	4038A, 4725 4723, 4263 4261, 4250
3.	Conduct research into digital agriculture and agricultural technology systems and management issues either individually or as part of a team through research design, hypothesis creation, data collection, analysis, synthesis and reporting	4413, 4414

4.	To understand the role of self-reflection and critical analysis in one's own personal attributes for a range of situations including resilience, open-mindedness, reflection, motivation, professional behaviours, and employability.	4263, 4413 4261, 4409 4250

Section 5 – Learning and Teaching Strategy

This programme is primarily delivered face-to-face on the RAU Cirencester campus and will also incorporate some elements of online learning. Teaching approaches are supported by a range of learning materials and activities presented on the RAU VLE. The programme is available over 1-year full time or 2 years part-time.

The delivery is through a combination of lectures, seminars, speakers, case studies, workshops and with activities presented through the Virtual Learning Environment (VLE) which is also used to host other supporting material including videos, webinars, quizzes, podcasts and other relevant presentations.

Teaching will include group discussions, tutorials, facilitated discussions, workshops, guided independent study and a research project. Assessment will be a balance between individual and group work and will consist of a range of critical reports, written examinations, poster presentations, oral presentations, critical reflections and dissertation / applied project. Each module is supported by a comprehensive resources list that is maintained through the RAU Library Talis system.

Section 6 – Assessment Strategy

Module learning outcomes are assessed by a wide range of methods, (see below). Using a range of assessment methods gives students more latitude to demonstrate their knowledge and skills across a range of contexts. By adopting a wider repertoire of assessments, learners who may for one reason or another be disadvantaged by the extensive use of particular assessment formats, will not be disadvantaged.

	Level 7
Coursework	100%
Exam	0%
Practical	0%

Section 7 - Course work grading and Feedback

Assessment is an integral part of the learning experience of students. All University programmes are assessed by a range of assessment activities, each developed to provide the most appropriate means of demonstrating the student's achievement of a specified learning outcome. An assessment may assess more than one learning outcome.

The University operates standard pass criteria which can be found in the RAU Academic Regulations; (paragraphs 137 – 153).

The normal basis for awards will be the overall average score in the final assessment, graded as follows:

Distinction weighted average of	70%
Merit weighted average of	60% - 69%
Pass weighted average of	40% - 59%
Fail average	0% - 39%

In addition to assigning a percentage mark to the work, the tutor adds comments; usually about the strengths and weaknesses of the piece as well as advice about improving the work. All assessment decisions are subject to internal moderation and external scrutiny by the programme's External Examiners. Students must ensure they retain all coursework in case the External Examiner(s) wishes to see it.

Section 8 – Employability

A combination of a comprehensive appreciation of the wide range of new and innovative technologies in digital agriculture together with an understanding of the demands of commerce and business will ensure graduates of this course are fully equipped to make effective contributions to the field of digital agriculture. Graduates are likely to be in demand as new companies form and established organisations and enterprises move into this new and dynamic sector.

This course is designed to allow graduates to develop their skills and abilities to a level commensurate with starting a career across a range of opportunities and obtain employment in:

- The high-tech agricultural and environmental sectors
- Industries allied to crop and animal production
- Technical consultancy
- Government and international agencies
- The development of new companies through entrepreneurial initiatives
- Research institutions

Potential employment opportunities include:

- Agricultural and horticultural engineering
- Information technology
- Resource appraisal
- Agronomy
- Farm management

The course has a strong academic foundation, including a period of independent study that provides an opportunity to engage with sector specialists in a professional capacity. The course has a well-qualified team involved in its delivery, with academic excellence and strong industry contributions from experienced leaders from a variety of agri-technology based businesses.

Section 9 – Enhancing the Quality of Learning and Teaching

The programme is subject to the University's rigorous quality assurance procedures which involve subject specialist and internal peer review of the course at periodic intervals, normally of 6 years. This process ensures that the programme engages with the applicable national Subject Benchmarks and references the Framework for Higher Education Qualifications.

All programmes are monitored on an annual basis where consideration is given to:
- External Examiner's Reports
- Key statistics including data on retention and achievement
- Results of the Student Satisfaction Surveys
- Feedback from Student Course Representatives
- Annual Programme Monitoring