The Royal Agricultural University

Programme Specification:

MSc Agricultural Technology and Innovation (January start)

2024-25

PROGRAMME SPECIFICATION [ACADEMIC YEAR 2024/25]

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

Validating body	The Royal Agricultural University
Teaching Institution	The Royal Agricultural University
Subject Area	Agriculture, Food and Environment
Entry Award(s)	MSc Agricultural Technology and Innovation
Final Award and exit route(s)	MSc Agricultural Technology and Innovation Postgraduate Diploma Agricultural Technology and Innovation Postgraduate Certificate Agricultural Technology
Programme title	MSc Agricultural Technology and Innovation
Location(s) of study	Royal Agricultural University, Cirencester with some visits or case study demonstrations off site
Full time study	1 year
Part-time study	2 years
Language of study	English
Programme start month	January
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)	An Undergraduate Honours Degree (2:2 or above) from a UK university or overseas equivalent, or a professional qualification and/or experience considered to be equivalent to the above. For information on international qualifications, please, see our country specific pages. For countries not listed please contact admissions@rau.ac.uk
Non-standard application	We welcome applications from applicants with non-standard qualifications who are able to demonstrate knowledge, experience and skills developed in the workplace or elsewhere and which are relevant to the programme of study. Applicants will need to use their personal statement to provide further details supported by a CV. All non-standard applications will be considered by the Programme Manager on a case-by-case basis and applicants can expect that an interview may be required as part of the admissions process.
English language	If English is not your first language, you will need to reach the requirements outlined in our English language requirements for the level of study. For postgraduate taught programmes this is IELTS Academic min. overall 6.5 with no element below 5.5(or equivalent). English language tests usually have a validity of 2 years from the date the test is taken.
Interviews	Interviews are usually required for non-standard applications.
UCAS Code	N/A
Quercus Code	ATSM
HECoS Code	101006 - Agricultural Technology

QAA Subject Benchmark Statement(s) and other reference points	Agriculture, Rural Environmental Sciences, Animal Studies, Consumer Science, Forestry, Food, Horticulture and Human Nutrition (April 2024).
Academic level on Framework for Higher Education Qualifications (FHEQ)	Level 7
Approval at AQSC	Academic Board 02 June 2021
	V1 – July 2021: module codes updated V2 – July 2022 AQSC: add elective 4250, remove 4415 V3 – January 2024: replace 4724 and 4725 with 4755 (core); module code 4744 replaces 4278

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 through the assessment of programme elements as detailed below:

Module code	Module title	Level	Credit value	Core/ Elective	Semester
Level 7					
4233	Computing and IT In Precision Agriculture	7	15	Core	Spring (semester 2)
4726	Livestock Production Technology and Innovation	7	15	Core	Spring (semester 2)
4723	Crop Production Technology and Innovation	7	15	Core	Spring (semester 2)
4413B	Research Skills	7	15	Core	Spring (semester 2)
4727	Managing Global Soils in a Changing Climate	7	15	Elective	Spring (semester 2)
4722	Climate Change and Sustainability	7	15	Elective	Spring (semester 2)
4203	Small Scale Farming and Local Food Supply	7	15	Elective	Spring (semester 2)
4261	Leadership and Personal development	7	15	Elective	Spring (semester 2)
4409B	Facing the Global Challenges in Food and Agriculture	7	15	Elective	Spring (semester 2)
4038A	Integrated Agricultural Systems	7	15	Core	Autumn

Module code	Module title	Level	Credit value	Core/Elective	Semester
					(semester 1)
4263	Entrepreneurship and Business Planning	7	15	Core	Autumn (semester 1)
4755	Environmental Science and Technology in Agriculture	7	15	Core	Autumn (semester 1)
4414 Winter	Dissertation	7	45	Core	Autumn (semester 1)
4250	International Rural Development	7	15	Elective	Autumn (semester 1)
4744	Organic and Regenerative Systems	7	15	Elective	Autumn (semester 1)
	Total credits: MSc Agricultural Technology and Innovation		**180**		

PG Diploma in Agricultural Technology and Innovation (120 credits)
The accumulation of 120 credits (or more) at level 7 through the assessment of programme elements as detailed below:

Module code	Module title	Level	Credit value	Core/ Elective	Semester
Level 7					
4233	Computing and IT In Precision Agriculture	7	15	Core	Spring (semester 2)
4726	Livestock Production Technology and Innovation	7	15	Core	Spring (semester 2)
4723	Crop Production Technology and Innovation	7	15	Core	Spring (semester 2)
4727	Managing Global Soils in a Changing Climate	7	15	Elective	Spring (semester 2)
4722	Climate Change and Sustainability	7	15	Elective	Spring (semester 2)
4203	Small Scale Farming and Local Food Supply	7	15	Elective	Spring (semester 2)
4261	Leadership and Personal development	7	15	Elective	Spring (semester 2)
4409B	Facing the Global Challenges in Food and Agriculture	7	15	Elective	Spring (semester 2)
4038A	Integrated Agricultural Systems	7	15	Core	Autumn (semester 1)
4263	Entrepreneurship and Business Planning	7	15	Core	Autumn (semester 1)
4755	Environmental Science and Technology in Agriculture	7	15	Core	Autumn (semester 1)
4250	International Rural Development	7	15	Elective	Autumn (semester 1)
4744	Organic and Regenerative Systems	7	15	Elective	Autumn (semester 1)
	Total Credits: PG Diploma in Agricultural Technology and Innovation		**120**		

PG Certificate in Agricultural Technology and Innovation (60 credits)

The accumulation of 60 credits (or more) at level 7 through the assessment of programme elements as detailed below:

Module code	Module title	Level	Credit value	Core/ Elective	Semester
Level 7					
4726	Livestock Production Technology and Innovation	7	15	Core	Spring (semester 2)
4723	Crop Production Technology and Innovation	7	15	Core	Spring (semester 2)
4038A	Integrated Agricultural Systems	7	15	Core	Autumn (semester 1)
4755	Environmental Science and Technology in Agriculture	7	15	Core	Autumn (semester 1)
	Total Credits: PG Certificate in Agricultural Technology and Innovation		**60**		

Students studying the programme part-time will study modules in the following order:

Module code	Module title	Level	Credit value	Core/ Elective	Semester
Year 1 – Semester 1 (January)					
4233	Computing and IT in Precision Agriculture	7	15	Core	Spring (semester 2)
4723	Crop Production Technology and Innovation	7	15	Core	Spring (semester 2)
4727	Managing Global Soils in a Changing Climate	7	15	Elective	Spring (semester 2)
4722	Climate Change and Sustainability	7	15	Elective	Spring (semester 2)
4203	Small-scale Farming and Local Food Supply	7	15	Elective	Spring (semester 2)
4261	Leadership and Personal development	7	15	Elective	Spring (semester 2)
4409B	Facing the Global Challenges in Food and Agriculture	7	15	Elective	Spring (semester 2)
Year 1 – Semester 2 (September)					
4038A	Integrated Agricultural Systems	7	15	Core	Autumn (semester 1)
4263	Entrepreneurship and Business Planning	7	15	Core	Autumn (semester 1)
4250	International Rural Development	7	15	Elective	Autumn (semester 1)
4744	Organic and Regenerative Systems	7	15	Elective	Autumn (semester 1)

Year 2 – Semester 3 (January)					
Module code	**Module title**	**Level**	**Credit value**	**Core/ Elective**	**Semester**
4413B	Research Skills	7	15	Core	Spring (semester 2)
4726	Livestock Production Technology and Innovation	7	15	Core	Spring (semester 2)
4727	Managing Global Soils in a Changing Climate	7	15	Elective	Spring (semester 2)
4722	Climate Change and Sustainability	7	15	Elective	Spring (semester 2)
4203	Small-scale Farming and Local Food Supply	7	15	Elective	Spring (semester 2)
4261	Leadership and Personal development	7	15	Elective	Spring (semester 2)
4409B	Facing the Global Challenges in Food and Agriculture	7	15	Elective	Spring (semester 2)
Year 2 – Semester 4 (September)					
Module code	**Module title**	**Level**	**Credit value**	**Core/ Elective**	**Semester**
4414 Winter	Dissertation	7	45	Core	Autumn (semester 1)
4755	Environmental Science and Technology in Agriculture	7	15	Core	Autumn (semester 1)
4250	International Rural Development	7	15	Elective	Autumn (semester 1)
4744	Organic and Regenerative Systems	7	15	Elective	Autumn (semester 1)
	Total credits: MSc Agricultural Technology and Innovation		**180**		

Section 3 – Programme overview and Programme Aims

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 Sustainability

To align with Sustainable Development Goals, the industry must adopt sustainable farming practices, reduce food waste, promote fair trade, and leverage technology.

Our program covers how Artificial Intelligence, blockchain, cloud computing, and IoT are make an impact in and revolutionizing food and agricultural systems globally. Precision agriculture, which is covered in our program covers how AI can increases farming's resource efficiency and productivity. Blockchain systems combined with IoT can improves supply chain traceability. Alternative proteins can lessen conventional meat production's environmental impact. All this addresses various SDGs including, Zero Hunger, Zero Poverty, Improved Infrastructure, Good Health and Well Being.

Section 5 – Programme intended learning outcomes and learning, teaching and assessment methods

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.*

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, 4755
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	4755, 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, 4755 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, 4755 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, 4755
2.	Show creativity and manage the creative process	4038A, 4755 4723, 4263 4413B, 4414W 4203, 4409 4727, 4722 4755, 4250
3.	Identify and solve complex problems holistically by evaluating issues and options, and implementing and reviewing decisions	4038A, 4233 4723, 4263 4414W, 4261
4.	Devise and sustain an argument supported by valid and significant evidence.	4233, 4263 4414W, 4261 4727, 4722 4755, 4250
5.	Manage time and resources appropriately in both individual and team situations to enable successful project delivery	4726, 4755 4723, 4413B 4414W, 4203 4261, 4409 4727, 4722 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.	Undertake project management for agricultural technology and innovation assessments, analyse and report results effectively and appropriately	4723, 4414 4203, 4727 4250
2.	Communicate through a variety of mediums on topics relating to agricultural technology and innovation to wide range of audiences	4038A, 4755 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	4413B, 4414W
4.	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, 4413B 4261, 4409 4250

Section 6 – Approach to Learning and Teaching delivery

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.

Here at the RAU we are always looking for ways to support our students. We recognise that a number of our UK domiciled students may be working or have caring responsibilities alongside studying which can sometimes make it difficult to attend all lectures in person. As such we have the ability for you to join lectures and seminars through a live stream, and if you are unable to do this recordings of lectures will be available after they have been held. Please note that this type of study participation is only available to registered UK based students due to UKVI visa restrictions due to UKVI visa restrictions.

Section 7 – Approach to Assessment

Assessments are designed to appraise individual capabilities fairly and consistently. We use clear, descriptive assessment guidelines (made available to students) to grade coursework and examinations and to aid classification. Lecturers communicate their expectations clearly to students and use explicit schema to facilitate consistency of marking within and between modules and to ensure good feedback on individual performance. All examinations and coursework assessments that contribute to degree classifications are subject to scrutiny by the External Examiners.

Assessments are designed to test analytical and other cognitive capabilities in relation to particular module aims and content. Coursework assignments such as individual essays, reports, case study analyses, individual and group-based reports, presentations, and various technique- oriented assessments are used to test these skills.
The Dissertation is the capstone demonstration of postgraduate skills, requiring students to conceive, justify, design in detail and execute a substantial piece of academic research. For the most able postgraduate students, the Dissertation can generate work of a standard appropriate for submission to practitioner and academic journals in business and management.

In every module, we place high value on students being able to demonstrate effective communication in its various forms. This priority is reflected not only in how assignments are specified, but also in how they are marked - good command of written and spoken English is vital for work-based projects and for graduate employment.

Some modules have a teamwork requirement and in some, there are group assignments, assessed via presentations and reports. All group assignments allow for an element of individual assessment, in order to recognise differences in individual performance where appropriate. Peer feedback can also play a significant part in team activities and is encouraged.

Overall, the programme is taught and assessed through*:

	Learning and Teaching			Assessment		
	Directed	Independent	Placement	Exam	Practical	Coursework
Year 1	19.00%	81.00%	0.00%	0.00%	7.70%	92.30%

*based on 4744, 4261, 4250

Section 8 – 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% and above
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, tutors provide written feedback for all assessments which normally includes the strengths and weaknesses of the piece as well as advice about improving the work. Individual feedback is provided within 20-working days of the deadline for submission. 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 9 - Progression

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 10 – Student support, wellbeing and counselling

The University is offering a wide range of support to all RAU students including practical advice & guidance as well as emotional support.

Disability & neurodiversity support

We support students with a range of disabilities, learning difficulties, and other health and mental health conditions, helping them to access funding via the Disabled Students Allowance .

When you tell us about a disability, you will be offered support based on your specific needs which can include:

- **Alternative exam arrangements** such as extra time, rest breaks, or a smaller room.
- **Access to support workers** such as study skills tutors, specialist mentors, readers and scribes.

Mental health Support

We are also here to support students with the ups and downs of university life, offering drop-in sessions, providing expert advice and support for students in crisis or with more

complex needs, and together the team runs events and campaigns throughout the year to encourage positive wellbeing.

We also can help students to access external counselling sessions and these are generally delivered in collaboration with our long-term partners at Cotswold Counselling.

Academic Support Tutor Programme

Students have access to the Academic Support Tutor (AST) programme which provides high quality academic support for students. ATS provide timetabled group tutorials, and individual support for students most at risk. Group tutorials focus on providing high quality academic support at the appropriate academic level; advice and guidance in relation to the course; and advice about making study choices on the course (commensurate with the supporting AST Handbook). Individual support focus on student continuation (commensurate with The Team around the RAU Student spheres of integration student retention model) and may be in person or online.

Section 11 – 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 Reports
- Key statistics including data on retention and achievement
- Results of the Student Satisfaction Surveys
- Feedback from Student Delegates from programme committees
- Feedback from Student-Staff Liaison committees
- Annual Programme Monitoring