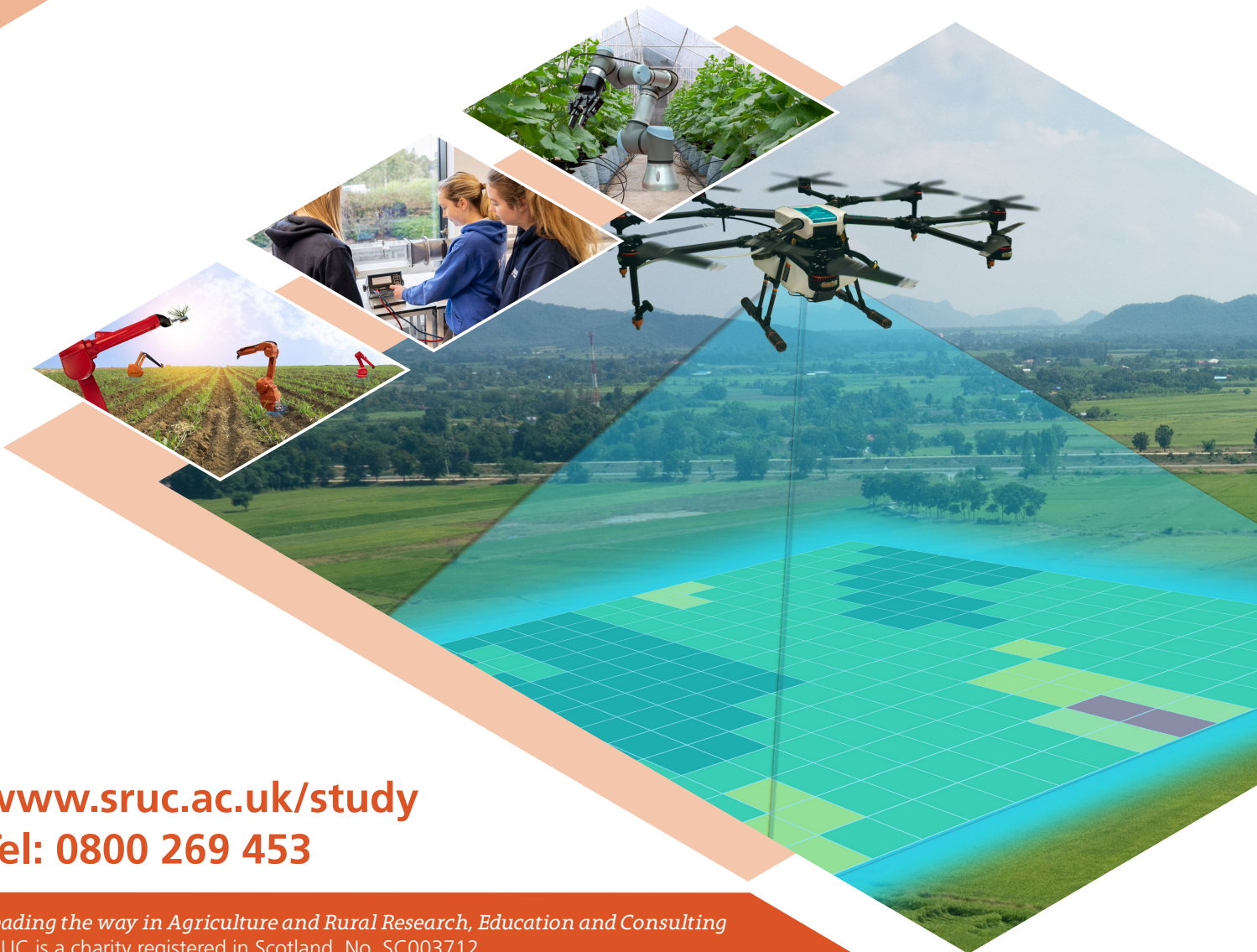




SRUC



Agricultural Technology



www.sruc.ac.uk/study

Tel: 0800 269 453

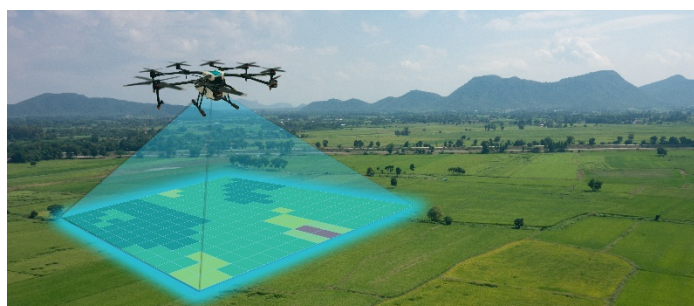
Leading the way in Agriculture and Rural Research, Education and Consulting
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Agricultural Technology

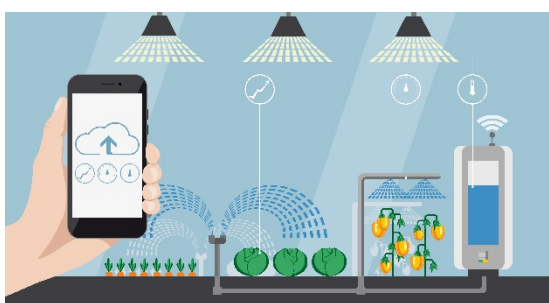
Why Agricultural Technology at SRUC?

The aim of the programme is to develop the knowledge and understanding in agricultural technology: engineering and mechanisation (maintaining a focus on land-based engineering, built environment and renewable energy); electronics, computing and control systems; soils and crop; livestock husbandry and management.

In very broad terms an Honours graduate with this degree should be able to develop and build a comprehensive Precision Farming system in any agricultural system through an understanding of; what he is measuring, how he is measuring it, what data he is generating, and how the consequent data flow can be translated into a useful management tool. (Effectively years 1,2,3 and 4 of the degree)



There is a very high demand for technical graduates in the agricultural technology sector. The sector is rapidly expanding and currently draws employees from other non-agricultural industry sectors. Employees then have to go through the process of understanding the industry to which they are going apply their technologies. Graduates from the Agricultural Technology Programme will understand both the technology and industry those technologies are applied to.



Innovations in our agricultural systems can reduce the carbon footprint of our food supply, whilst advances in technologies can improve the management of wastes and control of pollution.

Reductions in greenhouse gas emissions can be achieved by reducing resource use, through the application of inputs in precise amounts and exact locations.

Agricultural technologies will improve the carbon footprint of the agricultural industry by applying precision in every part of the farming process.

Which Courses Where?

	Aberdeen	Ayr	Barony	Edinburgh	Elmwood	Oatridge
BSc/BSc (Hons) Agricultural Technology			✓			

Course Content

BSc/BSc Agricultural Technology Year 1

The first year of the course introduces students to the fundamentals of agricultural science and explores soils, crop and livestock science. The basic building blocks of Agri-Tech are also introduced in the form of robotics, and computer programming skills. Classes will also develop your technical and laboratory practical skills as well as relevant transferable skills such as IT, numeracy, written communication, planning and problem-solving.

Module Title	Nominal contact hours	Core (c) / Elective (E)	SCQF Level	SCQF points
Chemistry and Physics for Agricultural Technology	60	C	7	15
Computing planning, programming and assembly language	60	C	7	15
Crop and Soil Science*	60	C	7	15
Digital and Financial Data in Rural Business*	60	C	7	15
Introduction to Robotics, Animatronics and Mechatronics	60	C	7	15
Livestock Science*	60	C	7	15
Principles of Mechanisation 1*	60	C	7	15
Renewable Energy Systems 1	60	C	7	15
Total for BSc (year 1)	480			120

Example of a first year module:

Introduction to Robotics, Animatronics and Mechatronics



Robotics and mechatronics are being introduced into every facet of agriculture rapidly and successfully. This module gives the student the underpinning knowledge necessary to understand how various mechatronic systems are being used in the agricultural industry.

The module is designed as an introduction to enable candidates to develop knowledge and understanding of Robotics and Animatronics as an application area within Mechatronics.

Mechatronics is multi-disciplinary understanding of the relationship between mechanical, electronics and computer engineering. Robotics can be considered as part of Mechatronics as it involves these mechanical, electronics and computer engineering fields. The main



difference is inputs are "provided" to mechatronics systems whereas robotics systems "acquire" inputs by their own.

The Module provides candidates with the understanding of the use of sensors, control and actuators to perform functions as part of a robotic or animatronic system.

This module is designed to enable candidates to develop knowledge and understanding of a range of Mechatronic Systems.

The purpose of this module is to give candidates an understanding of interfacing electronic circuits, which includes choice of components, problems to be overcome and the application of this knowledge to a multi-stage circuit.

Course Content

BSc. Agricultural Technology Year 2

The second year continues to build upon the first principles established in the 1st year. Mapping and map systems are introduced as one begins to start applying the data gathered to a comprehensive precision management system.

Course Content – Year 2:

Module Title (SCQF level 8)	Core/ Elective	Nominal hours	SCQF credits
Applying Precision Farming Data to Rural Business Decision Making	C	30	7.5
Computing Practice and Development	C	60	15
Environmental Management	C	30	7.5
Land Surveying and Geographic Information Systems	C	60	15
Mathematics and Statistics for Agricultural Technology	C	60	15
Mechanisation 2 (Buildings)	C	60	15
Renewable Energy Systems 2	C	60	15
Robotics, Animatronics and Mechatronics	C	60	15
Rural Business Financial Accounting	C	60	15

Example Second Year module; Land Surveying and Geographic Information Systems

This unit is designed to provide candidates with an understanding of the basic processes of land surveying and Geographic Information Systems. The unit will include grid co-ordinate systems, linear and area field measurement, levelling techniques (line and area), contour plans, traverse surveys and mapping, in particular Digital Mapping. Emphasis will be given to fieldwork in order to develop practical skills.



Course Content

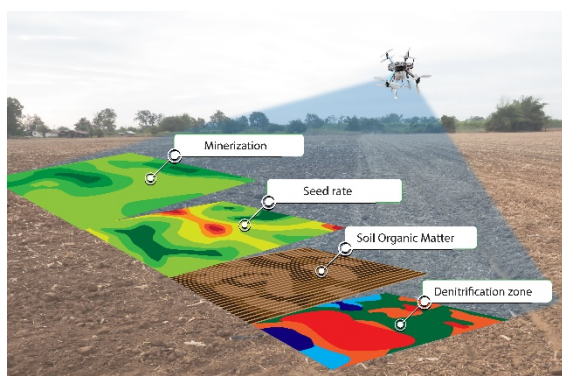
BSc Agricultural Technology Year 3

To prepare students for professional employment, the third year is designed to further develop your depth of understanding, knowledge and skills in Agricultural Technologies, as well as your skills in project management, research, data handling, communication and team-working that are so important in the workplace.

An important module in the third year is the Agricultural Technology Case Study where you will work as a team to introduce Agricultural Technology into a real farm and the farmer will become your client. Your job will be to find appropriate technologies, work out how they are going to be applied and create a business plan to offer these technologies as a comprehensive “out of the box” management solution to your client.

Module Title	Core / Elective	Nominal contact hours	SCQF level	SCQF credits
Advanced Robotics in Agriculture	C	40	9	15
Advanced Sensor Systems in Agriculture	C	40	9	15
Agricultural Machinery Resource Management*	C	40	9	15
Agricultural Technology Case Study	C	40	9	15
GIS and Remote Sensing*	C	40	9	15
Project Management	C	40	9	15
Renewables Technology	C	40	9	15
Research Skills and Data Analysis*	C	80	9	30
TOTAL	8	360		120

Example third year module: Advanced Sensor Systems in Agriculture



An introduction to the operation detail and applications of a broader range of sensors and actuators: for example, devices, such as, proximity, humidity, pressure, current, gas, flow etc., and specialist sensors for agricultural application, for example, gait sensors, heat detectors and for crops; soil conductance and resistance probes.

An Evaluation of the system hardware architecture of mobile devices, such as phones and tablet devices and how these may be used to monitor sensors. Using knowledge of the operating characteristics of a range of sensor and actuator devices to applications in mobile systems.

Using appropriate tools and programming techniques to develop application software for mobile devices with particular focus on sensor technologies.

Course Content

BSc (Hons) Agricultural Technology Year 4

In your fourth year you will undertake an extensive individual research project, investigating a topic of your choice under the supervision of a tutor. Conducting your own research project will allow you to develop advanced level, specialist knowledge in a particular field of interest, and this can be very useful for subsequently gaining employment or a postgraduate research position in that subject area. While working on your research project you will also develop a wealth of skills, from practical and investigational skills to planning and time management which are also very relevant to future employment or postgraduate study.

Course Content – Year 4

Module Title (SCQF level 10)	Core/ Elective	Nominal hours	SCQF credits
Honours Project (3 credits)	C	120	45
Artificial Intelligence Application on Agricultural Systems	C	40	15
Energy supply infrastructure	C	40	15
Agriculture Precision Technology	C	40	15
Hydrology Engineering	C	40	15
Choice of elective modules (choose 1)			
Advanced Financial Management and Taxation	E	40	15
Urban Agriculture	E	40	15

Example fourth year module:

Artificial Intelligence Application on Agricultural Systems



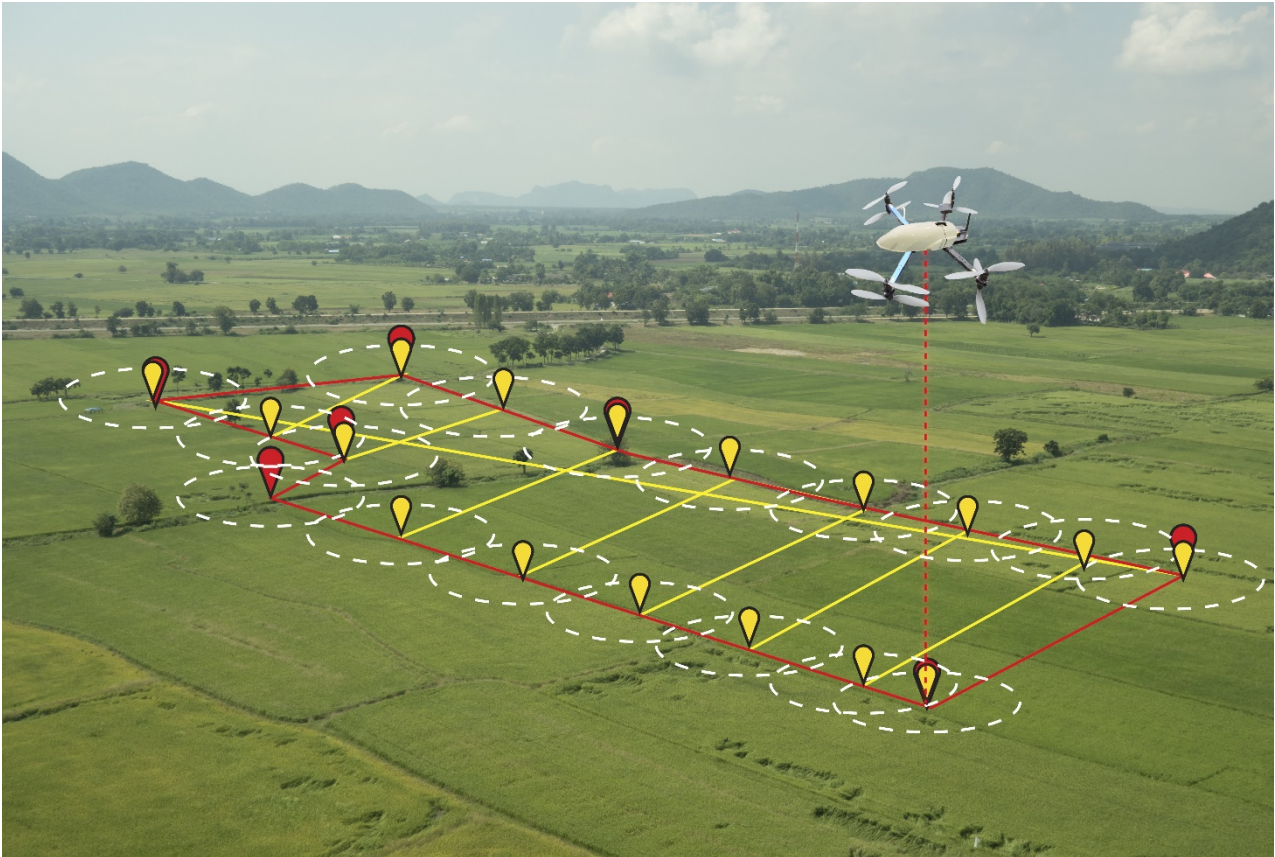
Farms produce hundreds of thousands of data points on the ground daily. With the help of AI, farmers can now analyse a this data in real time such as weather conditions, temperature, water use or soil conditions to better inform their decisions.

Agriculture is rapidly becoming digital and AI in agriculture is emerging in three major categories, (i) agricultural robotics, (ii) soil and crop monitoring, and (iii) predictive analytics. Farmers are increasingly using sensors and soil sampling to gather data. This data is stored on

farm management systems that allows for better processing and analysis. The availability of this data and other related data is paving a way to deploy AI in agriculture.

This module covers foundational knowledge of Artificial Intelligence (AI). The module gives an overview of AI and its philosophy. It covers fundamental principles in AI: logical reasoning, reasoning in the presence of uncertainty, and machine learning. It shows how search is used to solve a variety of problems in AI. Notions such as agency and uncertainty in AI are covered.

What's the Course Like?



Agricultural Technology is a broad-based programme, preparing graduates for employment in the rapidly expanding and evolving Agricultural Technology Sector.

Classroom work is interactive, encouraging debate and critical thinking and includes practical laboratory, building design and engineering workshop exercises to help students to really understand the concepts and topics studied.

Not only will you learn about environmental issues and a range of agricultural technologies, but you will also develop an understanding of project management and the regulatory, business and financial aspects of deploying agricultural technologies.

Throughout the course you will also develop other skills for the workplace, e.g. in IT, data handling, problem-solving and communication.

Teaching isn't confined to the classroom. Case studies, study tours, conferences and visits to relevant development sites, research institutes and commercial companies further demonstrate the implementation and latest applications of the technologies studied.

To further prepare you for employment, you will undertake real case studies involving the development of specific sites. The third year case study involves working as a group to investigate a problem and deliver recommendations to an external client as both an oral presentation and a written report.

In the fourth year you will undertake a supervised individual research project in a relevant topic of your choice. This allows you to develop skills and specialist knowledge in a particular area of interest, to help prepare you for employment in that field.



Career Prospects

Much discussion is taking place with the Industry relating to this review and also of the skills level education provision. National Farmers Union (NFU) LANTRA, Skills Development Scotland (SDS) and SRUC are all very keen to come together and drive the provision of agricultural education at all levels within Scotland to that required by the industry, while attracting a greater diversity of individuals into it. The degree is part of that discussion and every effort is being made to ensure this programme is seen as an integral part of agriculture education provision across Scotland.

Whilst some of the 4th agricultural revolution will come from animal and crop science innovation, the largest, most quickly industry adopted part of the 4th agricultural revolution is and will continue to be engineering technology.

In ten years the industry will be unrecognisable from today and it is the duty of SRUC to meet the technology challenge by providing graduates skilled at implementing and innovating technology in the agricultural industry.

“There has never been a better time for young people to consider working in agriculture and the agri-tech sector,” says David Nunn, vice chairman of the Suffolk Agricultural Association.

“Agri-tech is crying out for bright, young people” Chief executive of Fram Farmers Richard Anscombe says. The Agri-Tech industry offers many career opportunities in particular to those from outside the agricultural industry who may not traditionally have viewed agriculture as a potential career path

Business analyst Fang Wang, from NFU Mutual’s strategy team, has studied global agricultural technological developments to understand the opportunities and challenges for the UK’s farmers. The Fourth Industrial Revolution is bringing forth rapid and large-scale technological transformation to the agriculture industry.

In 2018 we saw the total value of agri-tech investment worldwide skyrocket to \$17 billion – an increase of 40 per cent on the previous year.

Contact Us

For more specific course information, please feel free to contact our lecturing staff:



SRUC Ayr and Barony Campus:		
Jeremy Taylor	e: Jeremy.taylor@sruc.ac.uk	t: 01292 886159



Entry Requirements

Minimum entry requirements for the BSc/BSc (Hons) Agricultural Technology:

Typically four Scottish Highers/Irish Leaving Certificate subjects at Higher level (BBCC) or three A-Levels (BCC), to include a science subject or geography.

Advanced entry into Year 2 or 3 may be possible with a highly relevant HNC/D, Foundation Degree or similar qualification.

How to Apply

Application for full-time study on HND and degree (BA/BSc) courses is through UCAS (www.ucas.ac.uk). Please consult our website or prospectus for further details.

UCAS

Codes for UCAS application are as follows:

Institution code name:	Course Codes		Campus Codes	
SRUC				
Institution code: S01	BSc/BSc (Hons) Agricultural Technology	057F	B	Barony

Those wishing to study part-time will need to contact SRUC directly or apply on-line via the SRUC website at www.sruc.ac.uk/courses.

The BSc/BSc (Hons) Agricultural Technology degree is awarded by the University of Glasgow.

Out and About

Study Visits

Study visits are an integral part of the course, showing students the relevance and practical applications of the technologies studied in class. Site visits are particularly important for the second and third year case studies, which are based on real scenarios involving particular sites.

Each year, students are invited to one of a number of Agri-Tech conferences and exhibitions, at which they can attend seminars on cutting edge technological advances as well as visit trade stands to gather up to date technical information and begin networking to make contacts for future employment.

Study Tour

In the third year of the course you will have the opportunity to undertake a study tour, with a varied programme of visits demonstrating a wide range of agricultural technologies.



Timetable

First and second years are broad and varied. You will study 8 “modules” (different subjects) each year. Each module normally has half a day of contact-time per week for a 12 week term. Some of this contact time will be lectures and some will be group work, visiting speakers, site visits, lab work, presentations, seminars, etc. You will, of course, have coursework and assignments to do outside the contact time as well.

In your 3rd and 4th year you will also study 8 modules per year. Modules in degree years are divided between 2 semesters, so you will study half a day per week for 12 weeks for each module and will have an examination at the end of the semester. During the degree years there is an even greater emphasis on self-study and you will be given assignments to undertake in your own time, outside of the contact hours.

Modes of Study

This course can be studied full-time or part-time. Part time study usually involves studying at half the pace of full-time, making it possible to juggle work or other commitments at the same time as studying.



► For more information about open days, visit our website:
www.sruc.ac.uk/opendays

If you are unable to attend one of the scheduled Open Days, please contact us so that we can make alternative arrangements for you to visit. Further information is available from the local campus Marketing and Student Recruitment Office.



About Scotland's Rural College (SRUC)

2012 saw the merger of Scotland's four land-based institutions: Barony, Elmwood and Oatridge Colleges and the Scottish Agricultural College. They now form Scotland's Rural College (SRUC) – the largest institution of its kind in Europe.

SRUC is an unusual organisation. Like a University, we have expertise in the areas of Education and Research, but in addition we also offer unrivalled links with industry through our Consultancy division and business services. We don't just offer undergraduate and postgraduate degree courses but we offer a full range of programmes at all levels from access courses and vocational studies through to PhDs.

We try to offer opportunities to study at whatever level is appropriate for you to join us at, and hope that you will stay with us, seamlessly progressing through educational levels and qualifications, until you have reached or exceeded your educational goal. You will find we offer courses which all link to the ways in which we make use of the land and natural resources around us – from agriculture and food production, the science that supports those industries, the way we interact with and support the environment around us, the business and industry which relies on these resources, to how we use outdoor space and the countryside in our recreation and leisure time.



SRUC comprises 6 campuses in locations around Scotland:

Aberdeen

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Craibstone Estate
ABERDEEN AB21 9YA
T: (01224) 711189
E: aberdeen@sruc.ac.uk

Ayr

SRUC Ayr
Riverside Campus, University
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E: ayr@sruc.ac.uk

Barony

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E: barony@sruc.ac.uk

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