1872 PRIFYSGOL ABERYSTWYTH UNIVERSITY

The Institute of Biological, Environmental and Rural Sciences

Postgraduate studies in

Biological, Environmental and Rural Sciences

Contents

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TEF Gold Teaching Excellence Framework

Important information

The programme information published in this brochure was correct at time of going to print (May 2021) and may be subject to change. Prospective students are advised to check the definitive programme information, including entry requirements, that is available on our website before making an application, to ensure that the programme meets their needs.

Welcome

Welcome to the Institute of Biological, Environmental, and Rural Sciences (IBERS).

We are delighted that you are considering IBERS as the place to study your postgraduate degree. We are a world-class institute whose research makes a significant contribution towards solving world issues such as the prevention of deadly diseases, food security and crop growth in drought-prone soil, developing sustainable and environmentally friendly fuels, and studying the effects of climate change on our ecosystem.

We offer a wide range of taught Masters and distance learning courses, and welcome research students on projects allied to our specialisms. We provide an excellent learning environment for both your academic and personal development, and we pride ourselves on delivering the highest quality teaching and learning experience to help you attain your goals.

Our state-of-the-art research facilities include:

- the UK's National Plant Phenomics Centre, plant breeding programmes that underpin commercial seed production, a seed biobank that is part of the UK Plant Genetic Resources Group, hydroponic crop research facilities, biofuel crop research programmes and the BEACON Biorefining Centre
- university farms that are home to a 350 cow dairy herd being milked through robotic parlours, 1000 ewes, including a flock of pedigree Texel sheep, and commercial arable and forage crops and grassland
- livestock science, production and health facilities that include the Small Ruminant (Sheep) Platform of the UK's Centre for Innovation Excellence in Livestock, the VetHub1 Bovine Tuberculosis Research Facility, Veterinary Parasitology facilities and a close working relationship with the Wales Veterinary Science Centre
- the Pwllpeiran Upland Research Station, which is a centre for the study of upland farmed ecosystems with an extensive range of vegetation types covering a continuum from intensively-managed improved swards to mountain pasture; this diversity enables the impact of different management scenarios to be tested on a range of vegetation types at a single site, minimising confounding with climatic and other environmental factors
- AberInnovation, the Aberystwyth Innovation and Enterprise Campus, home to the Future Foods Centre which is a food grade environment for the testing, validation and improvement of existing and novel materials as foods, and an Advanced Analysis Centre, supporting analytical needs for food intervention studies.

Aberystwyth is a vibrant and cosmopolitan seaside town, with lots to offer our students. Situated in a stunning landscape including sea, beach, wooded valleys and rolling hills it is a unique place to live and study. Read through this brochure to discover more about our postgraduate courses - we warmly invite you to join our lively community of postgraduate students and staff.

Professor Iain Donnison
Head of Department

Our courses

Taught degrees

Distance Learning

Research degrees

Animal Science

MSc

With a strong emphasis on student-centered study, this degree will enable you to pursue your own interests in animal science, whilst also acquiring the knowledge and skills needed for a successful career across the breadth of animal sciences.

On this course, you will study animal science and its application to nutrition, breeding and animal management. This will enable you to be ideally placed to ensure that the demands of production and welfare are appropriately balanced, through the development and implementation of innovative management practices and dissemination of knowledge and advice to practitioners.

Specialist opportunities for Animal Science students at Aberystwyth include:

- the opportunity to interact with internationally renowned researchers, helping you make contacts for your future career
- being taught by staff with an internationally renowned reputation for teaching and research in the animal sciences
- teaching supported by 1000 ha of farmland, a 350 cow dairy unit, upland and lowland sheep flocks, and an equine teaching and research yard
- access to a range of world-leading first-class modern laboratories.

Employability

This degree provides you with the knowledge and skills required to pursue a leading career in animal research and development, nutrition and welfare, academia, training and teaching, public and private commercial enterprise, advisory and consultancy work, government agencies and non-government organisations throughout the world. Many of our graduates have also progressed to PhD and Veterinary Medicine.

Modules

Core modules that you may study on this course include:

- Animal Breeding and Genetics
- Infection and Immunity
- Research Methods in the Biosciences
- Dissertation.

Animal Breeding and Genetics

Studies the potential for genetic improvement for economic and/or performance traits using Mendelian and molecular genetics.

Infection and Immunity

Studies the role of immunology, bacteriology, virology and parasitology at a molecular and applied level in animal disease.

Research Methods in the Biosciences

Will prepare you for your dissertation.

Dissertation

Provides you with an opportunity to carry out a considerable in-depth investigative study in an area of your choice.

You will also choose from a selection of optional modules, which currently include:

- Equine Nutrition
- Livestock Nutrition
- Grassland Science
- Equine Reproductive Physiology and Breeding Technology
- Livestock Production Science
- Understanding Equine Action from Anatomy to Behaviour.

For more details and the latest information on our modules, see our website.

Key Facts

Degree type: MSc

Course code: D310

Duration: 1 year (full-time) or 2 years (part-time)

Animal Science

MRes

The MRes degree differs from MSc Animal Science in that it places a much greater emphasis on research than taught elements. Providing you with a high level of research training, the MRes is an ideal stepping-stone for those considering a PhD in animal science or the wider field of animal/veterinary/biological science as well as careers in research and development.

Working under the supervision of active researchers with expertise in the field, you will develop a year-long animal science research project in the areas of production, reproduction, parasitology, nutrition, cognition or behaviour. You will be mentored in hypothesis-driven experimental design and will receive training in analytical techniques, statistical analysis and the interpretation of results. You will also explore other areas of animal science by studying two optional modules from a selection available.

Specialist opportunities for Animal Science students at Aberystwyth include:

- the opportunity to interact with internationally renowned researchers, helping you make contacts for your future career
- being taught by staff with an internationally renowned reputation for teaching and research in the animal sciences
- access to a range of world-leading first-class modern laboratories
- teaching supported by 1000 ha of farmland, a 350 cow dairy unit, upland and lowland sheep flocks, and an equine teaching and research yard.

Employability

This degree provides you with the knowledge and skills required to pursue a leading career in animal research and development, nutrition and welfare, academia, training and teaching, public and private commercial enterprise, advisory and consultancy work, government agencies and non-government organisations throughout the world. Many of our graduates have also progressed to PhD and Veterinary Medicine.

Key Facts

Degree type: MRes

Course code: D311

Duration: 1 year (full-time) or 2 years (part-time)

Modules

Core modules that you will study on this course include:

- Research Methods in the Biosciences.

You will also choose two from a selection of optional modules, which currently include:

- Infection and Immunity
- Animal Breeding and Genetics
- Equine Nutrition
- Equine Reproductive Physiology and Breeding Technology
- Understanding Equine Action: From Anatomy to Behaviour
- Livestock Nutrition
- Livestock Production Science
- Grassland Science.

Animal Breeding and Genetics

Studies the potential for genetic improvement for economic and/or performance traits using Mendelian and molecular genetics.

Infection and Immunity

Studies the role of immunology, bacteriology, virology and parasitology at a molecular and applied level in animal disease.

Equine Nutrition

Studies the principles of nutrition as applied to feeding the horse for optimum growth, development and performance.

Equine Reproductive Physiology and Breeding Technology

Considers the application of reproductive physiology to, and the use of advanced reproductive techniques in, the management of horses for breeding.

Understanding Equine Action from Anatomy to Behaviour

Provides an understanding of equine anatomy, physiology and behaviour to optimise equine welfare, in particular performance horses.

For more details and the latest information on our modules, see our website.

Biosciences

MRes

This degree will provide you with the skills, knowledge and critical insight necessary for research in the biological sciences.

You will learn how to undertake excellent research and appreciate how research can address the grand challenges in biology that we face as a society.

Whichever area of the biosciences you are interested in, on the MRes Biosciences you will be able to engage with generic and specific skills through taught modules and supervised research training. The research training builds on IBERS's capabilities for novel and internationally important science in all areas of the biosciences, including agriculture, animal reproduction, aquatic biology, behaviour, biochemistry, cell biology, ecology, environmental science, evolutionary biology, exercise and health, genetics, microbiology, parasitology, physiology, plant and animal breeding, sport science and zoology.

The core element of this course is the MRes Dissertation which will allow you to specialise in a topic of interest to you. You will undertake a prolonged period of experimental work/data gathering and research under the supervision of your dissertation supervisor. The MRes is therefore an ideal stepping stone for those considering a PhD and/or a career in research.

Specialist opportunities for Biosciences students at Aberystwyth include:

- the chance to organise and participate in a research conference
- the opportunity to interact with internationally renowned researchers, helping you make contacts for your future career
- research projects supervised by leaders in their field.

Employability

Throughout this course you will develop strong data collection/analysis, fieldwork and laboratory skills. You will have also learnt to work effectively and independently and will have enhanced your project management skills to deliver a demanding combination of research, analysis, communication and presentation.

Modules

Core modules that you may study on this course include:

- Frontiers in the Biosciences
- Research Methods in the Biosciences
- Dissertation.

Frontiers in the Biosciences

Aims to provide you with a thorough and practical insight into how the biosciences are being used to address global challenges.

Research Methods in the Biosciences

Will prepare you for your dissertation.

You will also choose from a selection of optional modules, which currently include:

- Infection and Immunity
- Current Topics in Biotechnology
- Field and Laboratory Techniques.

For more details and the latest information on our modules, see our website.

Key Facts

Degree type: MRes

Course code: C190

Duration: 1 year (full-time) or 2 years (part-time)

Biotechnology

MSc

MSc Biotechnology provides you with key skills, specialist knowledge and essential training for a career in industrial or academic bioscience.

This degree focuses on two key areas of biotechnology: Industrial Biotechnology (fermentation) and Plant Biotechnology. In addition, you will receive practical training in state-of-the-art molecular and analytical techniques; marine, food and health biotechnology; and learn how the sustainable use of bioresources and bioscience can help meet the needs of the growing human population.

The degree develops your skills in creative problem-solving, strategic thinking and turning ideas into viable businesses and successful grant applications. All course modules are delivered by academics and professional practitioners at the forefront of activity in the field.

Specialist opportunities for Biotechnology students at Aberystwyth include:

- course modules delivered by academics and professional practitioners at the forefront of activity in their field
- access to advanced facilities at IBERS (the BEACON Biorefining Centre and the National Plant Phenomics Centre)
- visits to biotechnology companies to see at first-hand how biotechnology supports innovation and commercialisation
- the opportunity to interact with internationally renowned researchers, helping you make contacts for your future career.

Employability

There is great demand nationally and internationally for skilled graduates in biotechnology. Indeed the UK Biotechnology and Biological Research Council (BBSRC) have made bioenergy and biotechnology a strategic priority for science funding. Our students are provided with a range of vocational skills to enable them to enter professional employment in the Biotechnology sector or in research.

Modules

Core modules that you may study on this course include:

- Bioconversion and Biorefining
- Biotechnology and Business
- Crop Biotechnology
- Current Topics in Biotechnology
- Frontiers in the Biosciences
- Research Methods in the Biosciences
- Dissertation.

Bioconversion and Biorefining

As well as introducing you to microbial biotechnology, you will learn in detail of the scale of the challenge in the transition to a low carbon future, and will study current and emerging technologies.

Biotechnology and Business

Through discussions with company representatives, entrepreneurs and scientists, you will learn how various biotechnology businesses identified and established their place in the market, developed their technologies, the issues they face, and how they operate.

Crop Biotechnology

Introduces you to the scientific principles underlying the development of a biotech crop.

Current Topics in Biotechnology

You will study various aspects of animal and medical, industrial/fermentative, plant-based and marine biotechnology.

For more details and the latest information on our modules, see our website.

Key Facts

Degree type: MSc

Course code: J701

Duration: 1 year (full-time) or 2 years (part-time)

Environmental Management

MSc

Our MSc in Environmental Management meets the needs of future environmental professionals and attracts students from all over the world.

This degree provides you with the key vocational skills and training to allow you to respond and find solutions to problems, to exploit opportunities and to meet challenges in environmental management.

Topics include recent advances on environmental issues, research skills and approaches, environmental auditing, project management, environmental law and environmental impact assessment (EIA). Much of the delivery of the course is based on applied learning through engaging with real-life problems and challenges.

Specialist opportunities for Environmental Management students at Aberystwyth include:

- Aberystwyth's location in a high quality outdoor physical environment, situated between the Cambrian and Snowdonia mountain ranges, and offering habitats ranging from coastal to upland
- engaging with a stakeholder to implement an investigation with specified outputs and agreed deliverables
- working with a professional environment practitioner
- being taught by internationally recognised researchers, consultants and professionals operating across a wide range of environmental topics.

Employability
Throughout this course, you will develop a solid grounding in key environmental management skills. You will also enhance your scientific communication, teamwork, problem-solving, datahandling, study and research skills. You will develop and display professionalism that will allow you to excel in any work environment. Recent graduates have gone on to careers as environmental consultants, in environmental regulation and monitoring, as conservation managers and researchers.

Modules

Core modules that you may study on this course include:

- Environmental Auditing and Management Skills
- Environmental Management in Practice
- Introduction to Environmental Law and Environmental Impact Assessment
- Frontiers in the Biosciences
- Research Methods in the Biosciences
- Dissertation.

Environmental Auditing and Management Skills
Provides you with training in environmental auditing and professional skills to enhance your employability in the environment sector.

Environmental Management in Practice
Will introduce you to the generic processes of problem characterisation, project design, project implementation and project reporting in the environmental sector.

Frontiers in the Biosciences
Aims to provide you with a thorough and practical insight into how the biosciences are being used to address global challenges.

For more details and the latest information on our modules, see our website.

Key Facts

Degree type: MSc

Course code: C197

Duration: 1 year (full-time) or 2 years (part-time)

Equine Science

MSc

This long-established internationally recognised degree will provide you with advanced subject knowledge and professional skills in equine science to pursue a range of careers in the equine industry.

This course places a strong emphasis on student-centred study in order to hone your skills in original thought, analysis, interpretation and reasoning, as well as encouraging you to pursue your own specific areas of interest. Equine science and physiology along with its application to practice will be core themes running throughout the course.

Specialist opportunities for Equine Science students at Aberystwyth include:

- being taught by the longest-established provider of equine-related higher education in the UK with the MSc Equine Science established in 1978
- the opportunity to interact with internationally renowned researchers helping you make contacts for your future career
- teaching supported by a modern well-equipped equine teaching yard and the only dedicated fully-licensed equine research yard in the UK outside of veterinary colleges
- access to a range of world-leading first-class modern laboratories.

Employability
As a graduate you will be ideally placed to enter the top careers in the equine industry or related professions in equine and animal research, development, academia, training, public and private commercial enterprise, advisory work, and government organisations in the UK and throughout the world. Many of our graduates have also progressed to PhD and Veterinary Medicine.

Modules

Core modules that you may study on this course include:

- Animal Breeding and Genetics
- Infection and Immunity
- Equine Nutrition
- Equine Reproductive Physiology and Breeding Technology
- Understanding Equine Action from Anatomy to Behaviour
- Research Methods in the Biosciences
- Dissertation.

Animal Breeding and Genetics
Studies the potential for genetic improvement for economic and/or performance traits using Mendelian and molecular genetics.

Infection and Immunity
Investigates the role of immunology, bacteriology, virology and parasitology at a molecular and applied level in animal disease.

Equine Nutrition
Studies the principles of nutrition as applied to feeding the horse for optimum growth, development and performance.

Equine Reproductive Physiology and Breeding Technology
Considers the application of reproductive physiology to, and the use of advanced reproductive techniques in, the management of horses for breeding.

Understanding Equine Action from Anatomy to Behaviour
Provides an understanding of equine anatomy, physiology and behaviour to optimise equine welfare, in particular performance horses.

For more details and the latest information on our modules, see our website.

Key Facts

Degree type: MSc

Course code: D391

Duration: 1 year (full-time) or 2 years (part-time)

Equine Science

MRes

The MRes degree provides you with the ideal opportunity to carry out research in a specific area of equine science, while studying a selection of taught elements relating to reproduction, anatomy, immunology, nutrition and genetics of the horse. Providing you with a high level of research training, the MRes is the ideal stepping-stone for those considering a PhD in equine science or the wider field of animal/veterinary/biological science as well as careers in research and development.

Working under the supervision of active researchers with expertise in the field, you will develop a year-long equine science research project in the areas of production, reproduction, parasitology, nutrition, cognition, behaviour, anatomy or exercise physiology. You will be mentored in hypothesis-driven experimental design, and will receive training in analytical techniques, statistical analysis and the interpretation of results. You will also explore other areas of equine science by studying two optional modules from a selection available.

Specialist opportunities for Equine Science students at Aberystwyth include:

- the opportunity to interact with internationally renowned researchers to become trained in the latest research techniques and to help you make contacts for your future research career
- access to a range of world-leading first-class modern laboratories
- teaching supported by a modern well-equipped equine teaching yard and the only dedicated fully-licensed equine research yard in the UK outside of veterinary colleges
- being taught by the longest-established provider of equine-related higher education in the UK with the MSc Equine Science established in 1978.

Employability

As a graduate you will be ideally placed to enter the top careers in the equine industry to improve horse health, welfare and performance. You will be well-suited to professions in equine and animal research, development, academia, training, public and private commercial enterprise, advisory work, and government organisations in the UK and throughout the world. Many of our graduates have also progressed to PhDs and Veterinary Medicine.

Modules

Core modules that you may study on this course include:

- Research Methods in the Biosciences.

You will also choose two from a selection of optional modules, which currently include:

- Infection and Immunity
- Animal Breeding and Genetics
- Equine Nutrition
- Equine Reproductive Physiology and Breeding Technology
- Understanding Equine Action: From Anatomy to Behaviour.

Animal Breeding and Genetics

Studies the potential for genetic improvement for economic and/or performance traits using Mendelian and molecular genetics.

Infection and Immunity

Investigates the role of immunology, bacteriology, virology and parasitology at a molecular and applied level in animal disease.

Equine Nutrition

Studies the principles of nutrition as applied to feeding the horse for optimum growth, development and performance.

Equine Reproductive Physiology and Breeding Technology

Considers the application of reproductive physiology to, and the use of advanced reproductive techniques in, the management of horses for breeding.

Understanding Equine Action from Anatomy to Behaviour

Provides an understanding of equine anatomy, physiology and behaviour to optimise equine welfare, in particular performance horses.

For more details and the latest information on our modules, see our website.

Key Facts

Degree type: MRes

Course code: D393

Duration: 1 year (full-time) or 2 years (part-time)

Livestock Science

MSc

This degree offers biological, scientific and professional training that will provide you with the knowledge and skills required to pursue leading careers in the livestock industry, scientific research, consultancy services and education.

Food security is vital to the success and stability of any country and its population. Meeting the world's increasing demand for food is one of the most important challenges of the 21st century. Livestock Science is, and will remain, central to meeting this challenge. Not only is food quantity important, but so too is quality, with consumers continuing to demand a high quality product at an affordable price. These demands can only be met by the development and implementation of innovative concepts and ideas by suitably well-qualified graduates, who will also then drive forward these exciting developments in livestock science and production.

Specialist opportunities for Livestock Science students at Aberystwyth include:

- the opportunity to interact with internationally renowned researchers, helping you make contacts for your future career
- teaching supported by 1000 ha of farmland, a 350 cow dairy unit, and upland and lowland sheep flocks
- conducting research projects alongside research active staff - IBERS' livestock-related research was worth in excess of £20 million in the last 5 years
- access to a range of world-leading first-class modern laboratories.

Employability

Graduates of this degree will have in-depth knowledge and a critical understanding of the key contemporary topics affecting the Livestock Sciences. You will acquire enhanced problem-solving, data handling, study, research and communication skills. Our graduates progress to careers in scientific research and publishing, laboratory work, animal nutrition, animal welfare, teaching, animal breeding and technical sales. Graduates have also progressed to PhDs or Veterinary Medicine.

Modules

Core modules you may study on this course include:

- Animal Breeding and Genetics
- Infection and Immunity
- Livestock Nutrition
- Grassland Science
- Livestock Production Science
- Research Methods in the Biosciences
- Dissertation

Animal Breeding and Genetics

Studies the potential for genetic improvement for economic and/or performance traits using Mendelian and molecular genetics.

Infection and Immunity

Examines the role of immunology, bacteriology, virology and parasitology at a molecular and applied level in animal disease.

Livestock Nutrition

Studies the principles of nutrition applied to feeding livestock to optimise growth and development for meat and dairy production.

Grassland Science

Studies the science of grass and forage production applied to its use as a livestock feed.

Livestock Production Science

Examines the application of livestock science to the economic production of livestock to ensure food quality and quantity.

For more details and the latest information on our modules, see our website.

Key Facts

Degree type: MSc

Course code: D320

Duration: 1 year (full-time) or 2 years (part-time)

Parasite Control

MRes

Parasitism is the most successful lifestyle on the planet and leads to diverse and highly-damaging infectious diseases of agricultural, veterinary and biomedical significance. Therefore, a greater understanding of the parasite species responsible for these conditions and the means by which they are controlled remains a priority for scientists, healthcare professionals and farmers in the 21st century.

Specifically focusing on parasites and the diseases that they cause, you will gain expert knowledge in the detection, prevention and control of protozoan as well as metazoan animal and human pathogens. You will be trained in biochemistry, molecular biology, whole organism/cell culture and manipulation, bioinformatics, proteomics, transcriptomics, genomics, functional genomics, drug discovery, vaccinology, biomarker discovery, genetics/epigenetics, epidemiology, vector/intermediate host biology and ecology. At the end of the course you will understand how interdisciplinary methods can be brought to bear on controlling some of the deadliest infectious organisms on the planet and be ready to pursue your career in parasitology.

Specialist opportunities for Parasite Control students at Aberystwyth include:

- studying a range of globally important parasites
- benefitting from research-led teaching, providing insight into the future of veterinary and human parasite detection, prevention and elimination
- applying your knowledge to animal disease to understand disease etiology, pathogenesis, treatment and prevention
- developing practical and analytical skills relevant to your future career in parasitology.

Employability

This MRes course will provide you with a range of vocational skills and prepare you for professional employment or further postgraduate PhD studies in parasitology or related disciplines (such as infectious diseases, public health and epidemiology).

You will develop strong skills in data collection and analysis, fieldwork and laboratory analysis, work in teams, and learn to write for audiences ranging from the academic to the wider public. You will improve your critical thinking and problem-solving, direct and sustain a self-initiated programme of study, and hone your project management skills to deliver a demanding combination of research, analysis, communication and presentation.

Modules

Core modules that you may study on this course include:

- Hot Topics in Parasite Control
- Infection and Immunity
- Research Methods in the Biosciences
- MRes Dissertation.

Hot Topics in Parasite Control

Equips you with an advanced understanding of the current theories, techniques and underpinning biological research related to parasitic disease control.

Infection and Immunity

Provides a detailed investigation into animal immunology, bacteriology, virology and parasitology both at the molecular and applied level.

Research Methods in the Biosciences

Will prepare you for your dissertation.

For more details and the latest information on our modules, see our website.

Key Facts

Degree type: MRes

Course code: C111

Duration: 1 year (full-time)

Statistics for Computational Biology

MSc

Computational Biology is an area of key strategic interest for interdisciplinary research and for employers in pharmaceuticals, advanced agriculture and public health. The application of statistics and machine learning to extract useful knowledge from large biological data sets is a key requirement in these fields.

The scheme is designed to introduce key, practice-based skills in statistics for computational biology. You will learn how to critically evaluate the application of specific statistical techniques to research problems in computational biology and then effectively interpret and report the results of analyses.

This MSc course combines the disciplines of Mathematics, Computer Science and Biological Sciences, and is suitable for graduates in any of these three subjects.

In studying this degree you will benefit from the combined wealth of expertise and knowledge available from the Department of Mathematics, the Department of Computer Science, and the Institute of Biological, Environmental and Rural Sciences (IBERS).

Employability
The rapidly growing pool of large biological datasets is leading to an increase in the demand for people with expertise in thinking about biological problems using computational and statistical tools. Both in industry and academia, graduates with good numeracy skills, some understanding of the underlying biology, and a good grasp of computational methods including programming, have a wide range of employment opportunities. This course will develop skills relevant to advanced agriculture, pharmaceutical software engineering and nanotechnology. Academic opportunities include bioinformatics, drug design and genome sciences. Graduates of this degree now work in areas such as pharmaceuticals, advanced agriculture, precision medicine and public health.

Modules

Core modules that you may study on this course include:

- Frontiers in the Biosciences
- Machine Learning for Intelligent Systems
- Programming for Scientists
- Statistical Concepts, Methods and Tools
- Statistical Techniques for Computational Scientists.

Frontiers in the Biosciences
Aims to provide you with a thorough and practical insight into how the biosciences are being used to address global challenges.

Machine Learning for Intelligent Systems
Will equip you with the main concepts in machine learning through seminar-based discussions on scientific papers.

Programming for Scientists
Using the Python programming language, you will learn the basics of programming and how to manipulate and organise relevant data.

Statistical Concepts, Methods and Tools
Will provide you with a foundation in statistics, including design of experiments, discrete and continuous probability distributions, linear modelling and hypothesis testing.

For more details and the latest information on our modules, see our website.

Key Facts

Degree type: MSc

Course code: G499

Duration: 1 year (full-time) or 2 years (part-time)

Agriculture

A Distance learning course

MRes

This scheme provides an opportunity for students wishing to undertake research in any area of agriculture to engage with generic and specific skills through taught modules and supervised research training, through distance learning.

While each module covers a different area of technical expertise they all focus on the challenges facing pasture-based production systems and potential solutions. The MRes is an ideal stepping stone for those considering a DAg and/or developing the research aspect of their career.

Contact time

We have designed our training to be as accessible as possible, particularly for those in full-time employment. Each taught module runs for 14 weeks via distance learning and can be taken for your own continuing professional development or interest, or built towards a postgraduate qualification.

A typical postgraduate student is expected to study for 200 hours when taking a 20-credit module. You should anticipate spending approximately 2-3 hours a week on online lectures, presentations and podcasts, and the remaining time on readings and assignments.

The research elements of our qualifications are carried out in your workplace with regular academic supervision. The training is web-based which means that as long as you have access to a reasonable broadband connection (and are able to stream videos such as on YouTube), you can study where and when best suits you. Learning material includes podcast lectures, e-group projects, guided reading, interactive workbooks and discussion forums, as well as assignments and e-tutorials.

Assessment

There are no exams within this course. Taught modules are assessed via course work and forum discussion. Research is monitored and assessed.

Modules

Core modules that you may study on this course include Research Methods and a Research Project.

You will also be able to choose from a range of optional modules, which currently include:

- Business Management for Rural Entrepreneurs
- Genetics and Genomics in Agriculture
- Grassland Systems
- Organic and Low Input Ruminant Production
- Plant Breeding
- Ruminant Gut Microbiology
- Ruminant Health and Welfare
- Ruminant Production
- Silage Science.

For more details and the latest information on our modules, see our website.

Key Facts

Degree type: MRes

Course code: D410D

Duration: Up to 5 years (Distance Learning). Also available as a 3-year Distance Learning degree.

Agrifood Innovation

A Distance learning course

MSc

The focus of this Masters programme is on facilitating knowledge flow along the agrifood supply chain. It is aimed at agricultural and environmental advisers, vets, FE lecturers and technical sales staff. If you work in one of these areas, or would like to, this distance learning and workshop-based course is the ideal way to develop your advisory skills, update your technical knowledge and gain a postgraduate qualification while you are working.

The scheme provides you with a detailed understanding of the challenges facing the agrifood sector and equips you with the technical and communication tools to instigate innovation and lead change. Optional modules will allow you to delve more deeply into specific facets of the supply chain and/or to expand your repertoire of communication skills. You will also develop research skills and put these into practice via a work-based research project. To accommodate working students, the course is delivered through a mixture of workshops and Distance Learning modules.

Contact time

The modules delivered by IBERS are entirely online distance learning. Each module includes recorded lectures from academics and industry experts, presentations, podcasts, e-group projects, guided readings, interactive workbooks and discussion forums, as well as assignments and e-tutorials. Workshop-based modules comprise two 2-day workshops and a 1-day final session. A typical postgraduate student is expected to study for 200 hours when taking a 20-credit module. You should anticipate spending approximately 2-3 hours a week on online lectures, presentations and podcasts, and the remaining time on readings and assignments.

Assessment

There are no exams within this programme. Taught modules are assessed via coursework (namely reports and essays, but also literature reviews, case studies, research proposals and data analysis tasks), online assignments, presentations and forum discussion. Workshop-based modules usually involve the design and execution of a practical task as part of the assessed work.

Modules

Core modules that you may study on this course include:

- Facilitation for Organisation Leadership (workshop-based module)
- Sustainable Supply Systems
- Research Methods
- Work-based Dissertation.

You will also study a range of optional modules from a selection available, which currently include:

- Leading Change (workshop-based module)
- Coaching and Mentoring for Leaders (workshop-based module)
- Business Management for Rural Entrepreneurs
- Genetics and Genomics in Agriculture
- Grassland Systems
- Organic and Low Input Ruminant Production
- Plant Breeding
- Ruminant Gut Microbiology
- Ruminant Health and Welfare
- Ruminant Production
- Silage Science
- Waste Resource Management
- Future of Packaging
- Controlled Environment Agriculture
- Life Cycle Assessment and Beyond
- Precision Livestock
- Meat Processing
- Behaviour Change
- Biorefining Technologies.

The following additional modules are only available to past or current Nuffield Scholars:

- Nuffield Scholarship Project (New Awards)
- Nuffield Scholarship Project (Post-Completion).

For more details and the latest information on our modules, see our website.

Key Facts

Degree type: MSc, PGDip, PGCert

Course code: D67ND

Duration: Typically 3 years, but up to 5 years

BioInnovation

A Distance learning course

MRes

This scheme is aimed primarily at those working with or within the Welsh agrifood supply chains and places a greater emphasis on research than on taught elements. You will take any two optional modules plus the Research Methods module where you will develop your research proposal with a designated supervisor. The 120 credit dissertation, approximately 20,000 words in length, forms the bulk of the scheme. We anticipate that most part-time students will take two years to complete their MRes dissertation. Generous discounts are available to those students living or working in Wales.

While each module covers a different area of technical expertise, they all focus on integrating a circular economy ethos into the agrifood sector. The MRes is an ideal stepping stone for those considering developing the research aspect of their career.

Contact time

We have designed our training to be as accessible as possible, particularly for those in full-time employment. Each taught module runs for 14 weeks via distance learning and can be taken for your own continuing professional development or interest, or built towards a postgraduate qualification.

A typical postgraduate student is expected to study for 200 hours when taking a 20-credit module. You should anticipate spending approximately 2-3 hours a week on online lectures, presentations and podcasts, and the remaining time on readings and assignments.

The research elements of our qualifications are carried out in your workplace with regular academic supervision. The training is web-based which means that as long as you have access to a reasonable broadband connection (and are able to stream videos such as on YouTube), you can study where and when best suits you. Learning material includes podcast lectures, e-group projects, guided reading, interactive workbooks and discussion forums, as well as assignments and e-tutorials.

Assessment

There are no exams within this course. Taught modules are assessed via course work and forum discussion. Research is monitored and assessed.

Modules

Core modules that you may study on this course are Research Methods and a Work-Based Research Project.

You will be able to choose two optional modules from a range which currently includes:

- Sustainable Supply Systems
- Precision Livestock
- Future of Packaging
- Waste Resource Management
- Membrane Filtration Technologies (delivered by Swansea University)
- Life Cycle Assessment and Beyond
- Public Goods
- Controlled Environment Agriculture (CEA)
- Behaviour Change
- Meat Processing
- Livestock Health and Welfare
- Biorefining Technologies
- Fermentation for Food Applications (delivered by Swansea University).

For more details and the latest information on our modules, see our website.

Key Facts

Degree type: MRes

Course code: J791D

Duration: Students register for 5 years (Distance Learning) but may finish in 3 years

BioInnovation

A Distance learning course

MSc, PGDip, PGCert, Short courses

This scheme is aimed primarily at those working with or within the Welsh agrifood supply chains. You will take the Sustainable Supply Systems module, any four optional modules and the Research Methods module, where you will develop your research proposal with a designated supervisor. We anticipate that most part-time students will take a year to complete their 60 credit dissertation. Generous discounts are available to those students living or working in Wales.

While each module covers a different area of technical expertise they all focus on integrating a circular economy ethos into the agrifood sector. This MSc provides access to the latest thinking around the Circular Economy and is ideal for anyone with an interest in integrating this ethos into agrifood practice or policy.

Contact time

We have designed our training to be as accessible as possible, particularly for those in full-time employment. Each taught module runs over 14 weeks via distance learning which can be taken for your own continuing professional development or interest or built towards a postgraduate qualification.

A typical postgraduate student is expected to study for 200 hours when taking a 20-credit module. You should anticipate spending approximately 2-3 hours a week on online lectures, presentations and podcasts, and the remaining time on readings and assignments.

The research elements of our qualifications are carried out in your workplace with regular academic supervision. The training is web-based which means that as long as you have access to a reasonable broadband connection (and are able to stream videos such as on YouTube), you can study where and when best suits you. Learning material includes podcast lectures, e-group projects, guided reading, interactive workbooks and discussion forums, as well as assignments and e-tutorials.

Assessment

There are no exams within this programme. Taught modules are assessed via course work and forum discussion. Research is monitored and assessed.

Modules

Core modules that you will study on this course include Sustainable Supply Systems, Research Methods and a Work-Based Research Project.

You will also be able to choose four optional modules from a range which currently includes:

- Precision Livestock
- Future of Packaging
- Waste Resource Management
- Membrane Filtration Technologies (delivered by Swansea University)
- Life Cycle Assessment and Beyond
- Public Goods
- Controlled Environment Agriculture (CEA)
- Behaviour Change
- Meat Processing.

In addition, up to two modules from the MSc Sustainable Efficient Food Production may be substituted as option modules. These are NOT subject to discount.

For more details and the latest information on our modules, see our website.

Key Facts

Degree type: MSc, PGDip, PGCert

Course code: J790D

Duration: Students register for 5 years (Distance Learning) but may finish in 3 years

Farm Consultancy and Knowledge Exchange

A Distance learning course

PGCert

This course is aimed at agricultural and environmental advisers, vets, FE lecturers and technical sales staff. If you work in one of these areas, or would like to, this blended or distance learning course is the ideal way to develop your advisory skills, update your technical knowledge and gain a postgraduate qualification while you are working.

To accommodate working students, the course is delivered through a mixture of blended learning and/or Distance Learning. You will take three taught modules over one to two years. At least one and up to two of these modules will be focused on improving your interactions with farmers and farming groups for effective knowledge exchange or farm business advice. This will be complemented by at least one and up to two technical modules aimed at updating your technical knowledge.

This unique course provides a diverse blend of options in communication skills, science and business. To deliver this range of skills two Aberystwyth University departments, IBERS and Aberystwyth Business School, have partnered with Menter a Busnes, a Welsh company specialising in agricultural knowledge exchange, who provide practical workshop sessions.

Contact time

The modules delivered by IBERS and by Bangor University are entirely online distance learning. Each module includes recorded lectures from academics and industry experts, presentations, podcasts, e-group projects, guided readings, interactive workbooks and discussion forums, as well as assignments and e-tutorials.

A typical postgraduate student is expected to study for 200 hours when taking a 20-credit module. You should anticipate spending approximately 2-3 hours a week on online lectures, presentations and podcasts, and the remaining time on readings and assignments.

Assessment

There are no exams within this programme. Taught modules are assessed via coursework (namely reports and essays, but also literature reviews, case studies, research proposals and data analysis tasks), online assignments, presentations and forum discussion. Workshop-based modules usually involve the design and execution of a practical task as part of the assessed work.

Modules

On this degree you will study a range of optional modules from a selection available, which currently includes:

- Coaching and Mentoring for Leaders
- Facilitation for Organisation Leadership
- Farm Business Management
- Genetics and Genomics in Agriculture
- Grassland Systems
- Home Grown Feeds
- Organic and Low Input Ruminant Production
- Plant Breeding
- Ruminant Gut Microbiology
- Ruminant Health and Welfare
- Ruminant Nutrition
- Ruminant Production
- Silage Science.

For more details and the latest information on our modules, see our website.

Key Facts

Degree type: PGCert

Course code: D408D

Duration: Typically 2 years, but up to 5 years (Distance Learning)

Sustainable and Efficient Food Production

A Distance learning course

MSc, PGDip, PGCert

This degree focuses on increasing efficiency and reducing environmental impact within the extensive pasture-based production sector.

The programme provides flexible, accessible, postgraduate level training for people employed in the agri-food sector. Training comprises distance learning modules and work-based research projects. These are accessible as CPD or as credit-bearing units, which can be built towards a range of postgraduate qualifications.

Contact time

We have designed our training to be as accessible as possible, particularly for those in full-time employment. Each taught module runs over 14 weeks via distance learning which can be taken for your own continuing professional development or interest or built towards a postgraduate qualification.

A typical postgraduate student is expected to study for 200 hours when taking a 20-credit module. You should anticipate spending approximately 2-3 hours a week on online lectures, presentations and podcasts, and the remaining time on readings and assignments.

The training is entirely web-based which means that as long as you have access to a reasonable broadband connection you can study where and when best suits you. Learning material for each 14 week module includes recorded lectures from academics and industry experts, presentations, podcasts, e-group projects, guided readings, interactive workbooks and discussion forums, as well as assignments and e-tutorials.

Assessment

There are no exams within this course. Taught modules are assessed via coursework (namely reports and essays, but also literature reviews, case studies, business plans and data analysis tasks), presentations and forum discussion.

Modules

Core modules that you may study on this course include Research Methods module and the Dissertation.

You will also study a range of optional modules from a selection available, which currently include:

- Business Management for Rural Entrepreneurs
- Genetics and Genomics in Agriculture
- Grassland Systems
- Organic and Low Input Ruminant Production
- Plant Breeding
- Ruminant Gut Microbiology
- Ruminant Health and Welfare
- Ruminant Production
- Silage Science.

The following additional modules are only available to past or current Nuffield Scholars:

- Nuffield Scholarship Project (New Awards)
- Nuffield Scholarship Project (Post-Completion).

For more details and the latest information on our modules, see our website.

Key Facts

Degree type: MSc, PGDip, PGCert

Course code: D409D

Duration: Up to 5 years (Distance Learning). Also available as a 3-year Distance Learning degree (D409D3).

Research Degrees

MPhil, PhD, DAg, DProf

We offer DAg, DProf and PhD degrees where students are guided and trained in the wide range of skills necessary to become 21st century research scientists.

IBERS students are integrated within a multi-disciplinary research environment encompassing both fundamental and commercially-linked research in agricultural, rural, environmental and biological science disciplines.

IBERS carries out internationally important science in:

- plant, animal and microbial sciences
- agriculture
- cell biology and physiology
- biochemistry
- genomics
- bioinformatics
- parasitology
- marine and freshwater biology
- ecology
- plant and animal breeding/reproduction
- evolutionary processes.

MPhil and PhD

These focus on research projects and involve in-depth study within a specific field which is compatible with the research interests of the University. Work produced is original and publishable work, the results of which are presented in a thesis and through an oral examination. Full-time research students must be in Aberystwyth for at least 44 weeks of the year.

DAg

This Professional Doctorate programme produces a qualification which, whilst being equivalent in status and challenge to a PhD, is more appropriate for those pursuing professional rather than academic careers. Our DAg programme comprises 3 taught modules carried out via distance learning and 2 work-based research projects supported through live and virtual supervisory meetings. While the primary academic focus is on the completion of an advanced piece of research, the collaborative route provided by a work-based research project provides an ideal opportunity to embed new knowledge in the workplace and ensure that research is relevant to industry.

DProf

The DProf or Professional Doctorate in Bioinnovation (currently only available to students living or working in Wales) offers a qualification which, whilst being equivalent in status and challenge to a PhD, is more appropriate if you are pursuing a professional rather than an academic career. It provides a career development path but it also offers a route for industry to engage in meaningful research. Our DProf programme comprises 3 taught modules carried out via distance learning and 2 work-based research projects supported through live and virtual supervisory meetings.

For further information see our How to Apply pages, or contact us.

Our research

Postgraduate research training and taught Masters research projects are completed with supervisors aligned with one or more of the Institute's research groupings which collectively address four key societal challenges: sustainable agriculture, climate change, animal and human health, and biodiversity.

1. Sustainable agriculture & healthy food

- **Sustainable grassland agriculture** - understand the impact of livestock products on the environment, develop the use of forage legumes to provide sustainable protein, conservation of soil fertility and ecosystem services.
- **Phenomic science & controlled environment agriculture** - understanding how plants respond to their environment, in the field, or in controlled environments.
- **Plant breeding for the future** - developing new crop varieties using conventional and new molecular breeding technologies to enhance performance and quality traits, reduce the environmental impact of agriculture, and accelerate progress for tackling abiotic and biotic stresses.
- **Diet and health** - linking food materials with the effect of diet and physical activity on health and disease, ageing and the management of chronic medical conditions.

2. Climate Change adaptation & mitigation

- **Greenhouse gas reduction in livestock agriculture** - helping the UK meet its net zero GHG emissions target by 2050.
- **Crops for sustainable energy and materials** – developing sustainable sources of biomass for renewable energy and materials, whilst decreasing GHG emissions (bioenergy with carbon capture and storage BECCS) and delivering ecosystem benefits including carbon sequestration.
- **Natural resources and the circular economy** – minimising waste through regenerative technologies, such as through biorefining (in the BEACON Biorefining Centre) and the recapture of components.
- **Marine environmental impacts and remedies** - understanding the responses of species to changing environments, and how changes in demographic change, geographical distribution, and genetic diversity interact with natural and anthropogenic stresses to affect the sustainability of marine systems and resources.

3. Interconnected animal & human health

Parasitology and helminth control – studying a range of infectious diseases caused by viruses, bacteria, protozoa, microsporidia and helminths; working with partners from developed, low and middle income countries spanning academic, government and private organisations.

Bovine TB detection, protection and control - understanding the biology of Mycobacterium bovis infection to underpin the development and use of new diagnostic tests and vaccines, and providing expert advice and support to government and other key stakeholders on bovine TB eradication.

Epidemiology – studying the distribution and determinants of health-related events in human and animal populations (especially in farmed and wild animals in Wales) at both macroscopic and microscopic scales by investigation at the level of population rather than individuals.

One health and zoonotic diseases - working on projects in Wales and internationally to improve health and well-being through the prevention of risks and the mitigation of effects of crises at the interface between humans, animals and their various environments.

4. Exploring & conserving biodiversity

Conservation and management of natural resources - deepening our knowledge of how management impacts upon natural capital and ecosystem service provision e.g. the provision of drinking water and flood mitigation, soil carbon sequestration and storage, landscape and heritage management, and biodiversity.

Understanding and restoring ecosystems and their services - studying how natural resources have been damaged by human activity or are affected by global climate change. Developing strategies for restoration including bioremediation of polluted systems, land management to promote water retention, adaptation of plant community composition for resilience to climatic extremes, and interventions to prevent species invasion.

Ecology and evolution, populations to ecosystems - understanding how climate change variables (temperature, CO2, ocean acidification and ultraviolet radiation) will impact on ecosystems, and developing strategies for species, habitat and ecosystem conservation and management.

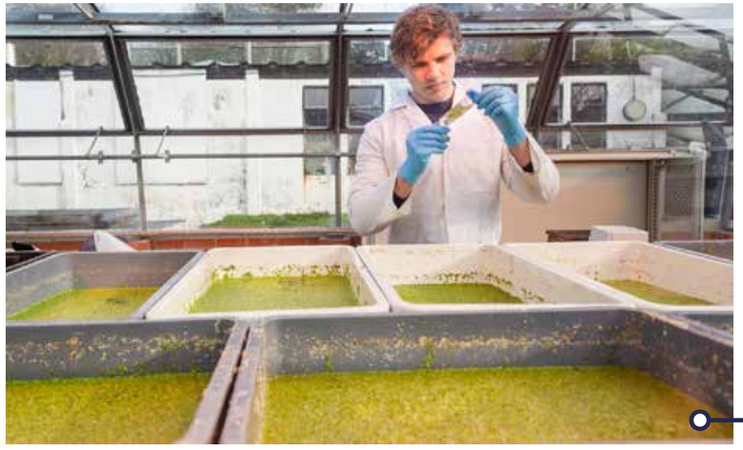
Research highlights

Scientists harness technology to improve stroke patients' recovery

Working with colleagues from the Department of Computer Science, our scientists have developed a mobile app to improve the quality of life of stroke patients whose mobility has been affected by the condition. The wearable devices use artificial intelligence to measure their ability to move to monitor and improve exercise rehabilitation in stroke patients.

Mixed farming and agroforestry systems have many advantages

Our researchers will explore different types of mixed agricultural systems, including agroforestry. Mixed farming can result in many benefits in terms of general sustainability, resilience to climate change, better utilisation of nutrients and biodiversity. The project is built around networking and co-learning. The backbone of the project is a network of farmers, from 10 different European countries, who have existing knowledge of different types of mixed farming that others in the networks, and beyond, can benefit from.



Turning farm waste into high-protein animal feed

Our scientists are investigating how slurry and wastewater from the dairy industry could be used to produce a high-energy, low-cost and environmentally-friendly feed for livestock. The aim is to use farm waste to grow duckweed - a fast-growing plant biomass which can then be used as a protein source for feeding livestock. It is anticipated that using the waste products on the farm could lead to improved water quality in rivers and coastal areas.

Constructing artificial coastal structures

Researchers at IBERS are attaching special tiles to man-made coastal flood-prevention structures in nearby Borth, which are designed to mimic the ideal conditions to enable wildlife to take hold. The concrete tiles have been designed using a process called photogrammetry which creates a 3D image of the terrain found on natural rocky shores, and will enable the most diverse and rare species to thrive.

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