1872 PRIFYSGOL ABERYSTWYTH UNIVERSITY

Department of Computer Science

Postgraduate studies in

Computer Science

Contents

Important information

The programme information published in this brochure was correct at time of going to print (February 2025) 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

At Aberystwyth, we are proud to be one of the longest-established Computer Science departments in the UK, ranked Top 5 in the UK for Student Experience for the subject of Computer Science and Top 10 in the UK for Teaching Quality for the subject of Computer Science (Good University Guide 2025, The Times and Sunday Times), and we continue to be at the forefront of technological research. With an Athena SWAN Bronze award, we are committed to promoting gender equality across our department and advancing the careers of women in science and technology. All this makes Aberystwyth University the ideal place to pursue both Masters and Doctoral degrees in the field of Computer Science.

Our awards as the Top University in England and Wales for Student Experience and 7th in the UK for Teaching Quality in The Times and Sunday Times' Good University Guide 2025 speak volumes about the standard of the education we deliver.

Our areas of research and development include robotics, artificial intelligence, bioinformatics, image processing, internet communications and software engineering. From developing cameras for use in space missions to improving ways of screening cancers, our lecturers are making important contributions in the real world. Our industrial collaborators include Qinetiq, Ford, Jaguar Cars, Unilever, Daimler Benz, Integral Solutions Ltd., Costain, Glaxo, and the NHS.

Our taught Masters degrees draw on our research foci, and link to the expertise and interests of staff in the department. They are designed to meet the needs of students wanting a foundation for a career in research, and those seeking to expand on their skills to accelerate their industrial career.

Our graduates are highly sought after and readily find employment in areas such as software design; communications and networking; computer applications; web development; IT consultancy and management; and systems analysis and development.

Aberystwyth is a vibrant and cosmopolitan seaside town, with lots to offer our students. Situated in a stunning landscape including sea, beach, valleys and hills it is a unique place to live and study. Read through this brochure to discover more about our postgraduate courses and find out what makes Aberystwyth such an incredible place to live and study. Please do not hesitate to contact us if you require more information.

Dr Thomas Jansen
Head of Department

Our courses

Taught degrees

Research degrees

Advanced Computer Science

MSc

With its emphasis on professional software engineering, this degree is suitable for students intending to pursue a career in the software industry. It can also lead to a career in research and academia.

Topics you may study on this course include advanced software engineering, intelligent systems, statistical methods and data management. Recent MSc project topics include machine learning for the internet of things, augmented reality applications for tourism, analysis and management of agricultural emissions data, network intrusion detection and supply chain management.

In studying this course you will develop specialised technical skills and will gain practical experience in agile software development and in using a variety of techniques to present the latest research to mixed audiences.

Modules

Modules that you may study on this course include:

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

- Research Topics in Computing
- Agile Software Development Project
- Fundamentals of Intelligent Systems
- Internet Technologies
- Individual Project
- Statistical Concepts, Methods and Tools.

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

Key facts

Course code: G493 (entry in September), G502 (entry in January).

Duration: 1 year full-time. G498 and G503 are 2 years, G504 is 3 years.

Contact time: Approximately 12 hours a week in the first two semesters, then mutually agreed contact time with assigned supervisor.

Artificial Intelligence

MSc

Artificial Intelligence is changing the way we live. Applications permeate all aspects of our lives, ranging from health and social care through fraud prevention and computer games to digital assistants.

Topics you may study on this course include machine learning and computational intelligence, applied data mining, and statistical concepts, methods and tools.

By studying this course you will develop specialised technical skills in the areas of intelligent systems, deep learning, big data and computational intelligence.

Modules

Core modules that you may study on this course include:

- Fundamentals of Intelligent Systems
- Statistical Concepts, Methods and Tools
- Computational Intelligence
- Applied Data Mining
- Machine Learning for Intelligent Systems.

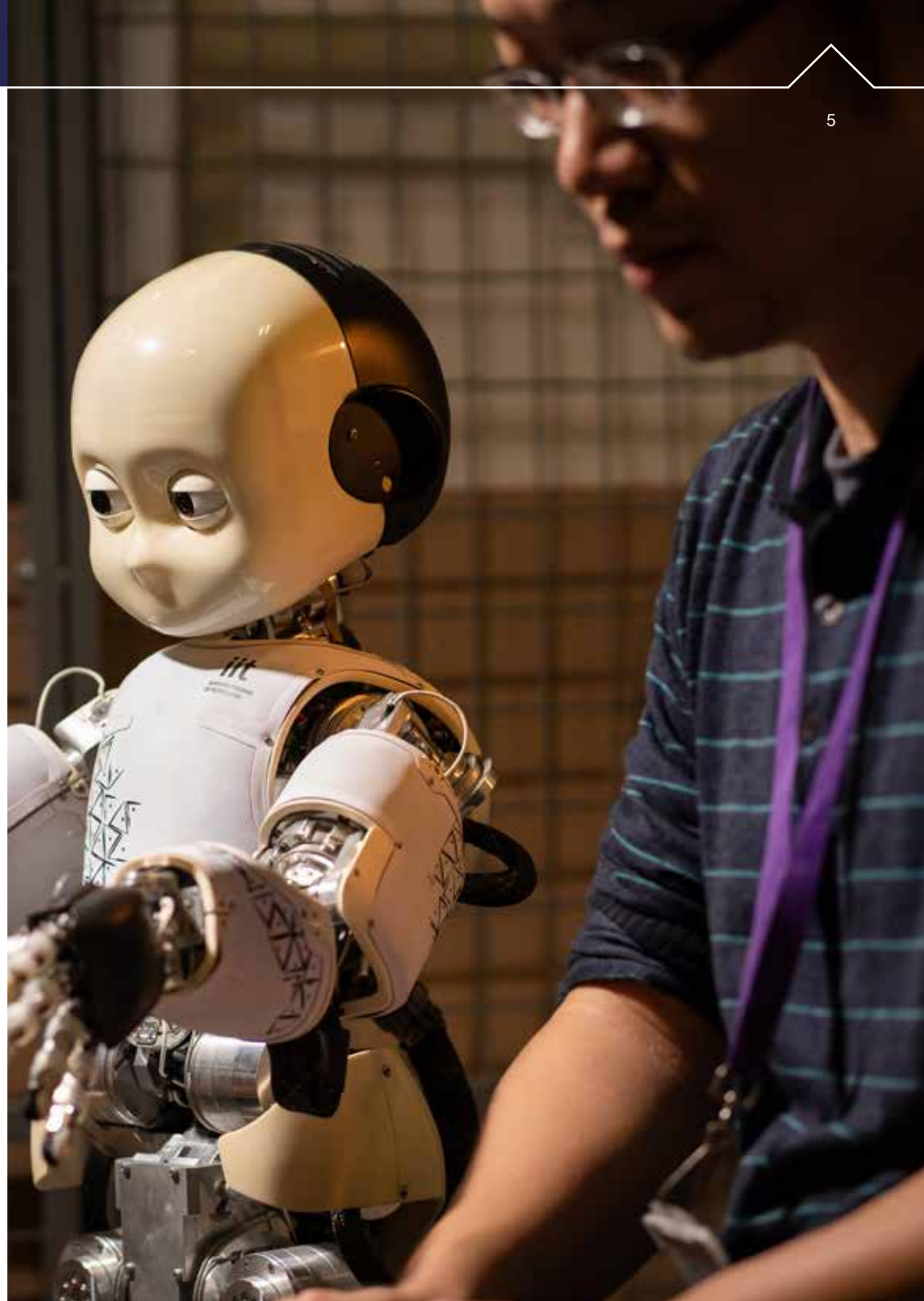
For more details and the latest information, see our website.

Key facts

Course code: G790

Duration: 1 year full-time

Contact time: Approximately 12 hours a week in the first two semesters, then mutually agreed contact time with assigned supervisor.



Computer Science

MSc

This degree aims to provide an intensive, professionally- oriented introduction to computing for able graduates in other disciplines (especially the humanities) to enable them to enter the software industry. No previous experience of computing is required.

Topics you may study on this course include computer programming, data management and intelligent systems. Recent MSc project topics include machine learning for the internet of things, augmented reality applications for tourism, analysis and management of agricultural emissions data, network intrusion detection and supply chain management.

You will be introduced to programming to learn the foundational skills that you can expand and apply in the more advanced modules including Advanced Software Engineering and an Agile Software Development Project. The course also includes introductions to other important areas of Computer Science like Artificial Intelligence and data management.

Modules

Modules that you may study on this course include:

- Research Topics in Computing
- Agile Software Development Project
- Fundamentals of Intelligent Systems
- Programming for Scientists
- Modelling, Managing and Securing Data
- Applied Data Mining.

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

Key facts

Course code: G790

Duration: 1 year full-time

Contact time: Approximately 12 hours a week in the first two semesters, then mutually agreed contact time with assigned supervisor.

Data Science

MSc

Data Science is a rapidly growing specialism, with applications in business, government and science. In a wide range of situations, from banking to shopping, and from governmental bodies to the NHS, our everyday activities are leaving digital footprints and the world of work is being transformed. There is a high demand for Data Scientists, people skilled in extracting meaning from data and being comfortable working across the disciplines of Computer Science, Mathematics and Statistics, who are also able to integrate many streams of data to produce new, insightful syntheses.

Applications range from identifying customers' buying patterns to tracking the spread of a disease, from monitoring expensive machinery to logging and improving an individual's health.

Data Science is particularly appropriate as a focus for a generalist Masters degree in computing, providing opportunities for graduates of other disciplines to apply their new computing knowledge to their original field of study.

Modules

Modules that you may study on this course include:

- Modelling, Managing and Securing Data
- Programming for Scientists
- Statistical Concepts, Methods and Tools
- Applied Data Mining
- Machine Learning for Intelligent Systems
- Statistical Techniques for Computational Scientists.

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

Key facts

Course code: G490

Duration: 1 year full-time

Contact time: Approximately 10 hours a week in the first two semesters, then mutually agreed contact time with assigned supervisor.

MPhil, PhD, DProf

Research in the Department is motivated by the needs of industry, business and government; we actively look for opportunities for technology transfer. An important aspect of this is that our research work is reflected in our teaching.

The Department offers MPhil, PhD and DProf research degrees and provides supervision in all areas of our research interests and academic expertise, including:

- AdvancedReasoning
- BioinformaticsandHealthInformatics
- Vision, Graphics and Visualisation
- Intelligent Robotics.

We also have considerable and widely recognised expertise in Software Engineering and Network Technology. Industrial collaborators include Ford, Jaguar Cars, Unilever, Daimler Benz, Integral Solutions Ltd., Costain and Glaxo.

In addition to core transferable skills training, you will receive further technical and research training from the Department. The Department pays for your specialist training courses and encourages you to present peer-refereed papers at conferences. You may also have opportunities to contribute towards teaching, with training provided, which will improve your employability.

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. Research produced is original and publishable work, the results of which are presented in a thesis and through an oral examination.

The MPhil is a one-year course (or two years part-time) where you will be expected to produce a thesis of around 50,000-60,000 words. A PhD is awarded upon the satisfactory completion of a thesis of up to 100,000 words followed by a viva voce examination. The normal period of registration is three years (full-time) and it is expected that the thesis will be submitted within four years of your initial registration.

DProf

The Professional Doctorate or DProf is more appropriate for those pursuing professional rather than academic careers and is designed to allow qualified professionals to study towards a doctorate while maintaining their employment.

A DProf will be awarded in recognition of the successful completion of an approved taught programme of study, together with the successful completion of an advanced piece of research. The collaborative aspect provided by a work-based research project provides an ideal opportunity to embed new knowledge in the workplace and ensure that your research is relevant to industry.

Idris is a four wheel drive and steering electric vehicle. The main use of Idris is for the Department of Computer Science's research in field robotics and visual navigation in particular.

Our research

We believe that collaboration in research is essential and we work closely with industry, government and other academic institutions on a national and international level.

The Department's research is organised within four groups, all of which investigate and develop techniques and applications of intelligent systems. There is significant inter-group working, giving a high degree of coherence to the Department's research. The Department has international collaborative projects within all four research groups.

A significant part of the Department's research is driven by end-users needs. Our research strategy reflects the recognition of the significance of such work and the potential impact such research may have in terms of more direct benefits for the public.

The research groups within the Department are:

Advanced Reasoning Group

The group is well known for its ground-breaking work on automated diagnosis and failure analysis, and its invention of approximate reasoning techniques for knowledge model formulation and simplification. It plays a leading role in the international community of computational intelligence research, especially in feature selection, interpolative reasoning, imprecise data modelling and analysis, and theoretical properties of evolutionary computation. Supported by EPSRC and substantial third mission income, we have developed a number of novel techniques tailored to tackling current challenging real-world problems,

e.g. serious crime analysis, academic performance analysis, systems monitoring and diagnosis.

Bioinformatics and Health Informatics Group

This interdisciplinary group conducts leading research in formalisation of biological data, and integrative data analysis in systems biology and healthcare.

It works at the interface between computing, biological and medical applications. We have our own wet laboratory, access to University computer clusters and close ties to the Department of Life Sciences. Supported by the BBSRC, RAEng/EPSRC and the EU, we have developed methods, techniques and tools in the following areas: laboratory automation, analysis of large scale biological data, formalisation of biological/chemical data, systems biology, biomedical informatics and genomics.

Intelligent Robotics Group

This is one of the best-known robotics groups in the UK, and is involved in both national and international research consortia from novel computational models to space missions to Mars. It focuses on both software and hardware issues that are key to unconstrained environments.

It has an international reputation, especially with respect to field, space and cognitive robotics, covering autonomous survey and unmanned surface craft, long-term autonomy and power management, design of neuro-controllers for autonomous robots, planetary exploration and image processing, evolutionary robotics and cognitive robotics, robot visual navigation, and robotic platforms.

Supported by EPSRC, EU-FP7, TSB, STFC and funded commercial collaboration, we have developed the following areas: explosive and chemical agent detection, power management for hybrid power systems, automated asset recognition in laser scans of roads, bio-inspired developmental robotics, mobile ad-hoc network and design of control systems for autonomous robots.

Vision, Graphics and Visualisation Group

The group carries out research in image analysis and geometrical and topological understanding of visual information, with applications concentrated on medical and psychology analysis, environmental and heritage data analysis, vision for robotics, facial analysis and 3D data analysis. It has built up an international reputation in computer vision, especially in 2D/3D data modelling and registration, dynamic processes, texture classification and modelling,

facial modelling, and texture and shape based segmentation. We have developed novel approaches in close collaboration with end-users, including medical image analysis, the National Plant Phenomics Centre investigating plant modelling, vision for robotics, 3D heritage modelling, and art-related research. The research has been supported by EPSRC, ESRC, AHRC, NISCHR, BBSRC, HEFCW, and Prostate Cancer Charity.

Employability

Our exciting and workplace-relevant degree schemes are highly regarded by both students and employers. Some of our schemes include an integrated year in industry option, enabling student to gain hands-on practical experience that's valued by employers. Our graduates have gone on to work for companies such as Google, MarkLogic, Roche, IBM, Mentor Graphics, Vodafone, Airbus, Microsoft, Bosch, Amadeus, Laura Ashley, BSquare, and DCA Design International among others. Some have gone on to set up their own companies.

Careers Service

Your time at university is a great chance to learn, develop and explore a whole range of experiences and options. As a Careers Service, we help you recognise who you are, what you are good at, and where you might like to go, and empower you to see what a world of opportunity awaits you.

The University's Careers Service has experienced and professionally qualified staff to help you:

- identify and source useful work experience options
- recognise the skills your university degree gives you that are valuable to employers
- plan your possible future career path(s)
- support you as you make applications to employers
- develop your entrepreneurial streak and set up your own business
- link up with employers, alumni and professional bodies to progress your career plans.

For PhD students there are a range of focused career development workshops on offer to help you network and raise your profile in the world of research. Aberystwyth University has also subscribed to the Vitae Research Development Planner to assist you with your professional development planning and prepare you for your next step after your degree, whether it be further academic study or employment.

Extra curricular activities

There are several societies and clubs for Computer Science students, including:

AberCompSoc

Our student computer science society organises regular events and trips, as well as weekly socials.

Aberystwyth Community Of Gamers (ACOG)

Devoted to providing a social and competitive platform for the gamers of Aberystwyth. ACOG frequently holds gaming events in the Students Union, runs weekly socials around town and competes nationally with other universities. Over the last few years, ACOG has continued to grow and is now one of the largest and most successful societies in Aberystwyth.

Aberystwyth Robotics Society

This society meets every Wednesday afternoon to work together as groups or as individuals to create the hardware and software for all things robotics related. No experience is required, just enthusiasm!

Supporting entrepreneurship

If you are thinking of starting a business or social enterprise or perhaps considering freelancing, our University Careers Service can offer you help and advice on all aspects of turning your good idea into a great enterprise. The AberPreneurs service offers:

- Free start-up workshops and presentations
- Free start-up workshops and presentations
- Free one-to-one start-up mentoring from a professional business consultant
- InvEnterPrize - Aberystwyth University's annual £10,000 student ideas competition
- Business Start-Up Week - a whole week in June of workshops and presentations for budding entrepreneurs.

InvEnterPrize

If you have an idea for a new product or service which you could turn into a successful business venture, then InvEnterPrize - our 'Dragon's Den' style student entrepreneurship competition - is a fantastic opportunity to kick-start your new enterprise.

Individuals or teams with inventions, business start-up ideas or other ambitious plans can enter to win a generous prize package including support and investment worth up to a maximum of £20,000 to start the business. In addition, all shortlisted finalists will receive expert advice from a panel of successful entrepreneurial alumni.

Past winners include Car-go, a concept driverless delivery vehicle; Amigrow, which uses satellite technology and machine learning to assist farmers with decision making and is designed to help Colombian farmers improve crop productivity; and Papora.com, a language learning website.

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