

GO BEYOND BOUNDARIES



Computing Science

UNDERGRADUATE GUIDE



|| Athinoulla Konstantinou
BSc Computing Science

I would strongly encourage any student who is interested in Computing Science to pursue this program. I am confident that any student would not only considerably benefit from taking part in this programme but also be well-positioned to thrive, not solely from an academic standpoint but also in terms of career advancement opportunities in both research and industry.

I am convinced that any student would derive substantial benefit from participating in this programme, given its plethora of opportunities for career development.

My involvement in this programme enabled me to engage in several internships, demonstrating the diverse and significant prospects it provides. Specifically, it paved the way for my participation in two research internships at different Research and Innovation centres, as well as securing an internship at a big-four tech company (Deloitte). Regarding my latest internship, I was one of the seven distinguished students who was awarded a research internship at the Undergraduate Research Opportunities Program in 2023 at KIOS Research and Innovation Centre, a collaboration between the University of Cyprus and Imperial College London.

My research focus was the robustification of sensor-sharing systems of Connected and Autonomous Vehicles through spatial-temporal autoencoders. This program provided me with a strong foundation in Artificial Intelligence to successfully complete this research internship.

Why study Computing Science at Aberdeen?

Are you excited by the power of computers and information technology? Do you think you might want to get into Software, Big Data, Machine Learning, Internet of Things, or Cybersecurity? Our programmes will provide you with deep knowledge and powerful abilities in a subject in very high demand, giving you skills in programming, data management, software engineering, systems, security, AI and creative computational problem-solving

Degree Programmes

Single Honours:

- BSc Computing Science
- MA Computing
- BSc Data Science
- MEng Computing Science (5 Years)
- MEng Software and Electronic Engineering (5 Years)
- MSci Computing Science with Industrial Placement (5 Years)
- Joint Honours
- BSc Computing Science and Mathematics
- BSc Computing Science and Physics
- BSc Business Management and Information Systems
- MA Business Management and Information Systems

Research-Led Teaching

At Aberdeen, you will develop the practical skills in software development, programming, modelling and web development before moving on to study topics including artificial intelligence, cybersecurity, machine learning and data mining and the impact technologies have on individuals and the wider society.

Our degrees are taught by leading researchers in these fields, ensuring that the knowledge and skills you learn are informed by the very latest thought, techniques and technologies. This is essential in a rapidly-changing and evolving subject like Computing Science.

Placement Opportunities

The Department of Computing Science has strong links with industry, including local, national and international organisations that support our teaching through guest lectures and seminars, work placements and prizes (including for example Amazon, CGI and ScotlandIS).

Students can spend a year on industrial placement during their studies of Computing Science. It is an excellent opportunity for students to gain first-hand professional experience of working in industry. A year of industrial placement can be taken either between the third and fourth year of studies or after the fourth year.

Students who successfully complete a CS50IP-style placement, and otherwise fulfil the requirements for an honours degree, will be awarded an MSci degree "with industrial placement" to acknowledge the fact that these degrees take five years.

Short-Term Placements

Students also have opportunities to undertake short-term placements, such as a 3-month summer placement or 1 month placement during term, when you can work for a couple of weeks during term break or part-time in a company and earn credits towards your degree.

What You Will Study

Helping doctors to treat a newborn baby, analysing the huge volume of data from the human genome, tracking jet engines in flight and ensuring that maintenance is planned accordingly, and making online shopping easier and more secure - these are just some of the challenges that computer scientists face every day.

Programme Overview

Our undergraduate degree programmes are designed to equip you with the high-demand skills and knowledge in algorithms, AI, programming, data management, software engineering, systems, security, and computational problem-solving.

Computing is predominantly a classroom and computer-lab based subject, however, we run a regular programme of activities and events to enable you to apply your skills and knowledge through industry experience.

You will typically spend 2 hours per course module per week in tutorials or computer labs. Courses that emphasise practical skills, such as programming or databases, are mainly taught in labs, however, you will spend significant time working independently or with groups on practical topics.

BSc or MA?

Both the BSc Computer Science and MA Computing contain the same core computing courses. BSc Computing Science students have the option to take further science-related courses as part of their degree while MA Computing students have the option to take other arts-based courses.

Degree Structure

This is an example course list for a four-year degree at undergraduate level. For full course lists, please see the relevant pages on our online prospectus at:

www.abdn.ac.uk/ug/computing

Year 1

- Programming 1
- Modelling and Problem Solving for Computing
- Object-Oriented Programming
- Web Development

Year 2

- Software Programming
- Databases and Data Management
- Human - Computer Interaction
- Algorithms and Data Structures

Year 3

- Operating Systems
- Principles of Software Engineering
- Artificial Intelligence
- Distributed Systems and Security
- Enterprise Computing and Business
- Software Engineering and Professional Practice

Year 4

- Natural Language Processing
- Research Methods
- Security



Extra-curricular Activities

The Aberdeen Software Factory is a student-run software house, which is supervised by staff, that enables computing science students to gain experience working on larger software projects for external clients.

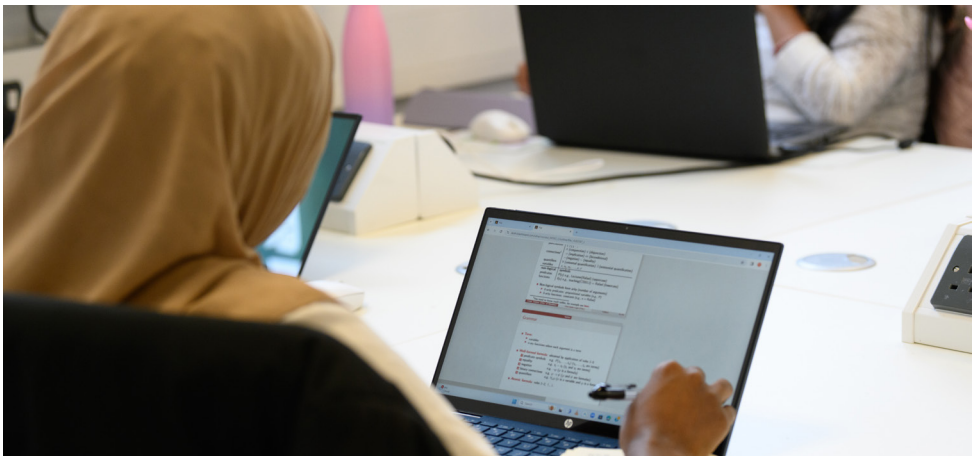
The programme enables students to enhance their software skills with real-world projects while also gaining a commercial perspective of software development, which is something that can benefit you when setting up your own software house in the future, or provide you with experience when applying for jobs in the future.

The Department of Computing Science also runs an Industrial Seminar series, where relevant speakers from industry are invited to give talks to our students.

Other activities, including TechMeetUps, including talks from local SMEs, Code the City and other hackathons, conferences and competitions allow our students to develop their professional skills.

Student Societies

Both the Aberdeen University Artificial Intelligence Society and the Aberdeen University Computing Society provide a forum for students to share their interest and expertise in computing through workshops, guest talks, coding challenges and social events. Find out more at www.ausa.org.uk/societies/





→ **92% OF ABERDEEN'S
COMPUTER SCIENCE
RESEARCH RANKS AS
WORLD-LEADING OR
INTERNATIONALLY
EXCELLENT**

Based on the combined 4*+3*
scores in the 2021 Research
Excellence Framework (REF).



Aron Molnar

BSc Computing Science

In mechanical or electrical engineering, you can create living, breathing systems of many parts that produce industrial (or research) value.

I chose CS over these two because of its compactness: you build systems on the same scale, but due to some magic, you can fit all that into your pockets. Also, CS allows you to build systems with near-human intelligence (at the time of writing this), which is pretty cool.

We had a two-semester course, which was essentially a tech startup simulator. We were in teams, and we had to come up with an idea, implement it, market research it, and then at the end of the year, present it at a competition. I loved the process, especially the adrenaline rush during the final presentation.

In another one of my favourite courses, we had to come up with a research question, and then answer it, testing it from all possible angles.

The whole course was a simulation of the entire academic research process. I loved the idea of my chosen project, where I investigated a unique phenomenon present in the hyperlinked web of Wikipedia, and then utilised it to create a novel metric for specific AI systems.



I am a Lecturer in the Computing Science department and my research centres around the area of Natural Language Processing. I am fascinated by how humans use language, how they adapt to one another and how we can learn from their language use in an interactive setting to create more advanced, human-like, and adaptive language technologies.

I have returned to Aberdeen, where I did my undergraduate degree, after completing an MPhil at the University of Cambridge, PhD at the University of Edinburgh, then holding a research position at the University of Amsterdam. I also worked as a data science engineer in a start-up in Berlin, as well as a Research Scientist intern in another start-up in London before and during my PhD research.

I teach Research Methods to level 4 students, where they apply the technical skills developed in their studies to designing, implementing, and evaluating their own mini research project, as well as practice forming and communicating theories and intuitions about their area of interest.

I remember choosing to study computing science because it is such a creative discipline, where you learn problem solving and critical thinking tools for how to manage, process, transform and interpret data for whichever end use you find most interesting.

Dr Arabella Sinclair



I am a senior lecturer in the department of computing science. My research is primarily concerned with making technology safer, giving users more control over it, and protecting their privacy. My primary goal in research is to develop "good technology" that can help make society more open, fair, and transparent.

Before I started working at the University of Aberdeen, I worked at the Royal Holloway, the University of London, the University of Waikato, and the Edinburgh Napier University. I have also worked in the business world for more than five years and helped start two companies. I got my PhD and M.Sc. in information security from Royal Holloway, University of London.

I teach operating systems to people in grades 3 and 4. I also teach security architecture and secure software design to M.Sc. Cybersecurity students. In these classes, we try to learn good theoretical foundations and practical skills that show how theoretical ideas can be used. I also teach cybersecurity in international law at the University of Aberdeen's School of Law and embedded software development at Royal Holloway, University of London.

I've always considered building, breaking, and fixing to be puzzles and I still enjoy solving them. This was the beginning of my interest in computer science. Computer science will continue to change the world, and I invite you all to be a part of it.

Dr Raja Naeem Akram



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UNIVERSITY OF
ABERDEEN
Computing Science

Careers and Employability

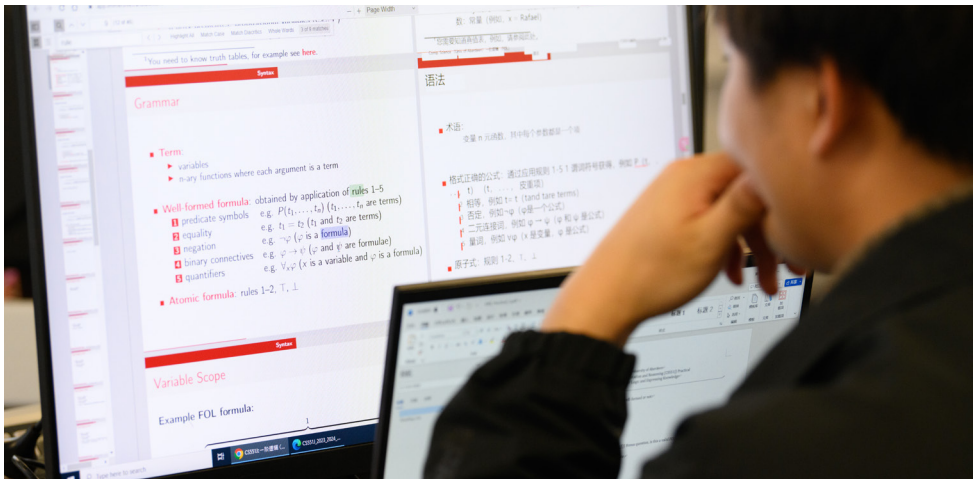
Our degrees develop an ability to understand new and complex computer systems and to communicate this to others. In addition to the core computing science skills such as programming, database, operating systems, AI techniques, and security, you will learn a wide range of important transferable skills including problem-solving, structured thinking, project management and team working. This means our graduates can choose from a variety of employment opportunities in industry, business or research.

We send newsletters to keep you up to date with exciting computing science opportunities such as networking events, career fairs, internships, placements and graduate jobs.

Our department interacts closely with the Careers and Employability service in the university to bring you one-on-one mock interviews, CV planning, and more. We also help to organise sector career fairs in technology, business, finance, and other related areas where you get to interact directly with the employers.

Some of the organisations that our graduates have gone to work for in recent years include Google, Citi Bank, Coca-Cola, Danske Bank, Dell, Disney Pixar, Morgan Stanley, Huawei, JPMorgan Chase, GE Digital and Allianz Insurance.

We also nurture a strong entrepreneurial spirit amongst our students through, for example, the ABVenture Zone and the Opportunity North East Tech Hub.





|| Klara Krämer
MSci Computing Science
with Industrial Placement

The MSci Computing Science with Industrial Placement degree perfectly integrates phases of studying different aspects of computing science at university and practical work experience in a corporate environment. I have found that the courses taught at university in combination with the valuable experience gained in industry make for a well-rounded programme that has prepared me for my future career in a way that makes me confident of my success in the computing industry.

The opportunity to undertake a year-long internship at any company in any computing-related industry of my choice has proven to be an invaluable component of my university experience. I chose to complete the placement as a data analyst at a technology and logistics consulting firm, which was a dynamic experience that enabled me to get involved in a range of different activities. These include the development of internal applications, the analysis of client data, meticulous data cleaning and preparation, and report crafting. The engaging activities I was allowed to take part in not only deepened my industry knowledge, but also gave me a skillset covering more than just technical know-how.

Undertaking this placement has additionally enabled me to get a feeling for the job market that awaits me once I graduate from university, helping me develop a sense of clarity and direction regarding my career aspirations. This is why I can definitely recommend doing placements during university degrees, as in my opinion this is the best way to orientate oneself towards future career opportunities.




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