G5K609: Scientific Computing and Data Analysis
Postgraduate Taught MSc 2020

Essentials

Please note: 2020-21 courses may be affected by Covid-19 and are therefore subject to change due to the ongoing impact of Covid-19. Summaries of course-specific changes resulting from the impact of Covid-19 will be provided to applicants during August 2020.

For the latest information on our plans for teaching in academic year 2020/21 in light of Covid-19, please see www.durham.ac.uk/coronavirus

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<thead>
<tr>
<th>UCAS code</th>
<th>Degree</th>
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<td></td>
<td>MSc</td>
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<tr>
<th>Mode of study</th>
<th>Full Time</th>
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<tr>
<td>Duration</td>
<td>12 months</td>
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<tr>
<td>Start Date</td>
<td>October</td>
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<td>Location</td>
<td>Durham City (<a href="http://www.durham.ac.uk/study/location/durham.city">www.durham.ac.uk/study/location/durham.city</a>)</td>
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<tr>
<td>More information</td>
<td>Still have questions? (<a href="http://www.durham.ac.uk/study/askus/">www.durham.ac.uk/study/askus/</a>)</td>
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<tr>
<td>Department(s) Website</td>
<td><a href="http://www.durham.ac.uk/computer.science">www.durham.ac.uk/computer.science</a></td>
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Course Summary

Description

Advances in fields such as Physics, Engineering, Earth Sciences or Finance are increasingly driven by experts in computational techniques. Notably, people skilled to write code for the most powerful computers in the world and skilled to process the biggest data sets in the world can truly make a difference.

The MSc in Scientific Computing and Data Analysis offers an application-focused program to deliver these skills with three interwoven strands:

- Computer Science underpinnings of scientific computing (algorithms, data structures, implementation techniques, and computer tool usage);
- Mathematical aspects of data analysis;
- Implementation and application of fundamental techniques in a domain specialisation (presently astrophysics, particle physics, or financial mathematics).

Why study this course

This course will open doors for you, both in the industry as well as in further study, and aims to:

1. Train the next generation of expert research-aware data and computational scientists and engineers for the global high tech sector, equipped with genuine understanding of the underlying computing technologies and methodologies
2. Give you a deep insight into the state-of-the-art computational and data challenges in your chosen specialisation
3. Enable you to bridge the widening gap between application domains, big data challenges and high-performance computing
4. Prepare you to apply successfully for further higher education programmes (PhD) with a strong computing and data flavour in Durham or other world-leading institutions
5. Make you aware of the societal, economical and ethical responsibilities, opportunities and implications tied to massive data processing and compute power; this includes training on entrepreneurship.

Watch our 1-minute course overview video here (youtu.be/lthbVnKyj2Y)!

Chinese version here (www.youtube.com/watch?v=pkb4l2FKGc0&feature=youtu.be)

Course structure

The course is structured into five modules spanning three terms and is currently available with a specialisation in astrophysics (astro.dur.ac.uk/), particle physics (www.ippp.dur.ac.uk/), or financial mathematics.
In this course:

1. you will obtain a strong baseline in methodological skills
2. you will study selected topics from your chosen specialisation area with a strong emphasis on computational and data challenges.
3. you can choose to put emphasis on data analysis or scientific computing
4. you will do a challenging project either within the methodological academic departments (Mathematical Sciences or Computer Science), or within the specialisation area, or in close cooperation with our industrial partners
5. you will acquire important professional skills spanning collaboration and project management, presentation and outreach as well as entrepreneurial thinking
Admissions Process

Subject requirements, level and grade

A UK first or upper second class honours degree (BSc) or equivalent

- In Physics or a subject with basic physics courses OR
- In Computer Science OR
- In Mathematics OR
- In any natural sciences with a strong quantitative element.

We strongly encourage students to sign up for a specialisation area for which they already have some background or affinity. At the moment, the course targets primarily Physics students and Mathematics students. If you do not have a degree from these subjects, we strongly recommend you to contact the University beforehand to clarify whether you bring along the right background. Please note that standard business degrees are not sufficient, as they lack the required level of mathematical education.

Programming knowledge on an L3 level in at least one programming language and commitment to learning C and Python independently if not known before.

Interest in Computational Physics or its Data Analysis. The course tackles computational and data analysis challenges from this area.

Additional requirements

The course page provides self-assessment tests and tutorial links (miscada.phyip3.dur.ac.uk/curriculum/prerequisites/) to assess your programming skills. We expect applicants to confirm themselves that they are aware of the required programming skills and provide evidence (course transcripts, links to programming projects or brief description of conducted projects).

English Language requirements - Band E (IELTS of 6.5 with no element below 6.0)

English Language requirements

Please check requirements for your subject and level of study (www.durham.ac.uk/learningandteaching.handbook/1/3/3/).

How to apply

www.durham.ac.uk/postgraduate/apply
Fees and Funding

The tuition fees for 2020/21 academic year have not yet been finalised, they will be displayed here once approved.

The tuition fees shown are for one complete academic year of full time study, are set according to the academic year of entry, and remain the same throughout the duration of the programme for that cohort (unless otherwise stated).

Please also check costs for colleges and accommodation (www.durham.ac.uk/postgraduate/accommodation/costs/).

Scholarships and funding

www.durham.ac.uk/postgraduate/finance
Career Opportunities

Department of Computer Science

For further information on career options and employability, including the results of the Destination of Leavers survey, student and employer testimonials and details of work experience and study abroad opportunities, please visit our employability web pages (www.dur.ac.uk/computer.science/undergraduate/careers).
Open days and visits

Pre-application open day
www.durham.ac.uk/postgraduate/visit

Overseas Visit Schedule
www.durham.ac.uk/international/office/meetus

Postgraduate Visits
PGVI or
www.durham.ac.uk/postgraduate/visit/
Department Information

Department of Computer Science

Overview

The Department of Computer Science offers postgraduate courses that are challenging and technologically relevant, covering topics including big data, computer graphics, computer vision, image analysis, the Internet and the mathematical foundations of computing. You will have access to extensive and diverse research facilities, for example a Tier-3 supercomputer, a visualisation suite, several general-purpose computing on graphics processing units clusters and workstations, autonomous cars, and a team of intelligent robots. We have strong links with industrial partners; recent graduates have become successful entrepreneurs and software developers, have gained prestigious positions in banking and finance, and have entered the IT and engineering industries.

Ranking

Ranked joint 1st in the UK for Internationally Excellent or World-Leading research impact in REF 2014.

Website

www.durham.ac.uk/computer.science