THE UNIVERSITY of EDINBURGH

Postgraduate Virtual **Open Days**

High Performance Computing and High Performance Computing with Data Science

MSc Overview

Jemma Auns & David Henty

EDINBURGH
Extraordinary futures await

THE UNIVERSITY of EDINBURGH

epcc

High Performance Computing
High Performance Computing with Data Science

MSc Overview

19 November 2025

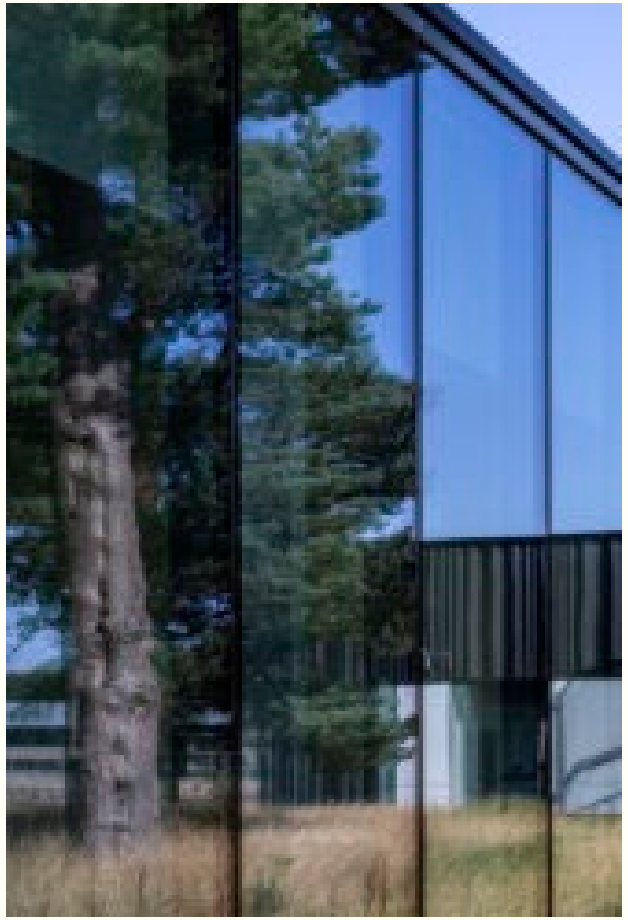
Jemma Auns – Postgraduate Programmes Manager

EPCC – Who we are

- EPCC established in 1990
- Centre of Excellence in the University of Edinburgh
- UK National Supercomputing Centre
- MSc established in 2001
- Currently have over 120 staff and 100+ students

- Based in two locations in Edinburgh:
  - Bayes Centre, Central University campus
  - Advanced Computing Facility (ACF)

EPCC – What we do



- Work with industry, academia, public and third-sector organisations to promote the adoption and value of HPC
  - advanced computing and data science research and consultancy
  - novel and high-performance software solutions
- Host multiple national services including:
  - **ARCHER2** – EPSRC UK Tier-1 National HPC Service
  - **Cirrus** – EPSRC UK Tier-2 National HPC Service
  - **Edinburgh International Data Facility (EIDF)** - portfolio of services to support the Data Driven Innovation (DDI) initiative
- Commercial and non-commercial training and education
- Specialise in postgraduate education programmes in ***High Performance Computing*** and ***High Performance Computing with Data Science***

EPCC Postgraduate Study

Postgraduate Taught Programmes in:

- High Performance Computing*
- High Performance Computing with Data Science*
- Image and Vision Computing with HPC
  - joint on-campus degree with Herriot Watt University (launched September 2024)

PhD Opportunities

- HPC, Computational and Data Science, Software Engineering and Sustainability

**available part-time and as MSc or PG Diploma*

Meet the Programmes team

Academic Staff		Administrative & Support Staff	
			
David Henty	**Caoimhin Laoide-Kemp**	**Jemma Auns**	**Beth McDenoual**
Programme Director	Cohort Lead	Postgraduate Programmes Manager	Postgraduate Programmes Coordinator & Student Advisor

MSc

- 120 credits of compulsory and elective classes
- 60 credit dissertation
- Accredited award
- 1-year full time, 3-year part time

PG Diploma

- 120 credits of compulsory and elective classes
- HPC only
- Accredited award
- 9 months (September – May)

Programme Structure

On Campus

- In-person attendance at lectures, practical, some assessments
- Online platform to release course material and submit some assessments
- Combined cohort size of approximately 50 students

Semester timeline

- Semester 1 – September to December
- Semester 2 – January to May
- Dissertation – June to August

Expected Workload

- A lot to fit into a year
- 10 credit course equates to ~100 hours of engagement or
  - Lectures, practicals, independent study
  - Around 3 hours of scheduled contact time per week for each course

Programme Structure

Assessment

- Majority of courses are coursework and/or limited release short answer questions
- Some in-person examinations
- Also: groupwork courses, oral presentations, repository use
- Deadlines published in advance at start of course to enable planning in advance

Programme Requirements

- Passing grade at MSc level is 50%, and 40% for PG Diploma
- Must complete the required number of credits for your programme and meet progression/awarding criteria
  - Two thirds of courses at or above pass level
  - Overall average at or above pass level
  - Passing three HPC “core courses”

Entry Requirements

- A UK 2:1 honours degree, or its international equivalent, in a relevant subject such as computer science and informatics, physics, mathematics, engineering, biology, chemistry and geosciences.
- Experienced and competent programmer in at least one of C, C++, Python, Fortran, or Java.
- Familiar with mathematical concepts such as algebra, linear algebra and probability and statistics.
- We will also consider your application if you don't have formal programming training (e.g. if you are primarily self-taught), or if you have a 2:2 honours degree with high marks in computational courses and/or additional relevant work experience.
- English-language requirements set by UoE

Fees & Funding

Current 2026/27 course rates available online

- We recommend you look into payment options and your sources of funding
  - Self-funded
  - Employer contribution
  - Government bursary
  - Scholarships
    - John Fisher High Performance Computing (HPC) Masters Scholarships

https://registryservices.ed.ac.uk/student-funding/postgraduate

Curriculum Overview

Curriculum

Compulsory courses

Course	Semester	Credits
Practical Software Development	Full Year	20
Project Preparation	Full Year	10
Message Passing Programming	Semester 1	10
Threaded Programming	Semester 1	10

Curriculum

Compulsory courses – High Performance Computing

Course	Semester	Credits
HPC Architectures	Semester 1	10

Compulsory courses – High Performance Computing with Data Science

Course	Semester	Credits
Fundamentals of Data Management	Semester 1	10
High Performance Data Analytics	Semester 2	10

Curriculum

Elective courses

Course	Semester	Credits
HPC Architectures	Semester 1	10
Fundamentals of Data Management	Semester 1	10
Design and Analysis of Parallel Algorithms	Semester 1	10
Numerical Algorithms for High Performance Computing	Semester 1	10
Programming Languages for HPC	Semester 1	10
Advanced Message-Passing Programming	Semester 2	10
Accelerated Systems: Principles and Practice	Semester 2	10
High Performance Data Analytics	Semester 2	10
Machine Learning at Scale	Semester 2	10
Parallel Design Patterns	Semester 2	10
Performance Programming	Semester 2	10

Curriculum

HPC core courses

- Students are required to pass at least 3 out of our 6 HPC “core courses” at the 50% level
  - Message Passing Programming
  - Threaded Programming
  - HPC Architectures
  - Advanced Message Passing Programming
  - Parallel Design Patterns
  - Accelerated Systems: Principles and Practice
- List is a combination of compulsory and elective courses, to allow you flexibility to take courses you are interested in whilst ensuring the programme maintains its HPC focus.

Course overviews

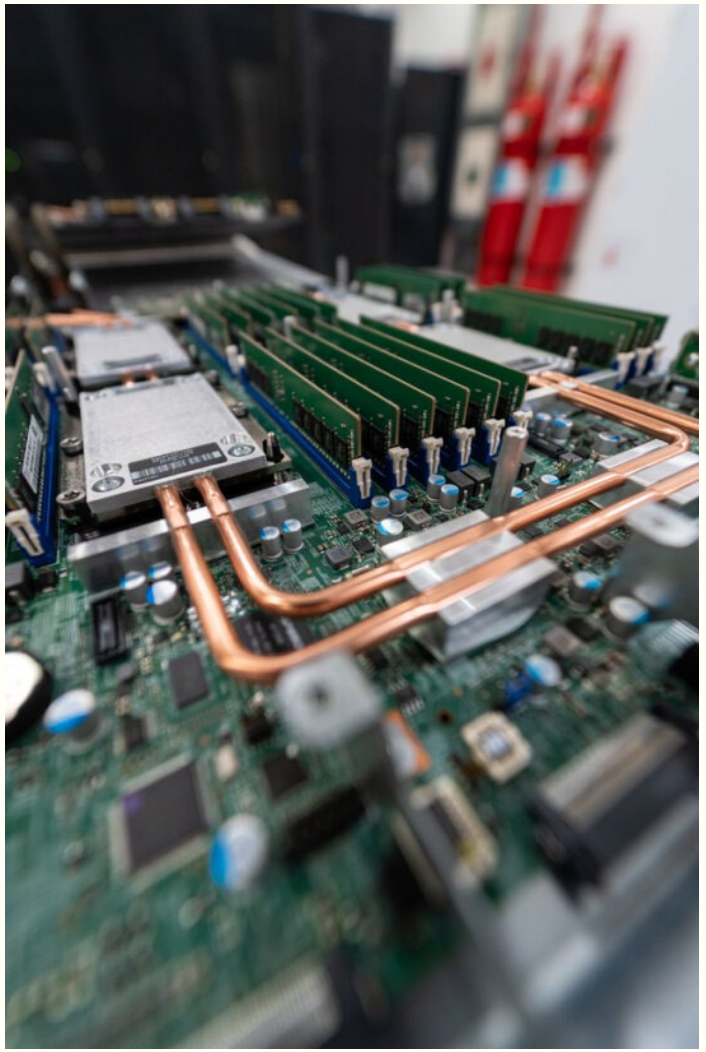
View all courses on DRPS http://www.drps.ed.ac.uk/25-26/dpt/cx_sb_epcc.htm

Learning Outcomes

- equip you with an understanding of HPC architectures and technologies,
- equip you with expertise in advanced tools and techniques for HPC software development
- enable you to apply this knowledge in order to exploit modern parallel and multicore computing systems in key scientific and commercial application areas
- enable you to develop skills in problem-solving, project management, independent and critical thinking, teamwork, professionalism and communication
- enable you to develop as HPC practitioners, able to apply current and emergent technologies in both industry and research
- teach you the leading-edge programming techniques required to exploit the power of the world's largest parallel supercomputers

Why choose EPCC?

- Leading international HPC centre at leading international University
- On-campus MSc programmes established more than 20 years ago
- Focus on practical hands-on experiential learning directed by leading practitioners and using national HPC system(s)
- Potential access to wide array of HPC systems and architectures
- Smaller cohort to promote discussion and appropriate support
- Alumni have gone on to work for companies such as:
  - ARM
  - Nvidia
  - Leonardo
  - EPCC
- Exciting PhD opportunities



Q & A

- Type your questions into the chat feature.
- Email our team at msc-hpc@ed.ac.uk and we will get back to you as soon as we can

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Thank you!

We hope to welcome you on to our programme soon