Personal details

Personal details

First / **given name**	Eoghan
Second given name	James
Third given name	
Surname/family name	Farrell
Date of birth	07 April 2002
Preferred first/given name	Eoghan
Previous surname	
Country of birth	Ireland
Legal nationality	Irish
Dual nationality	
Country of residence	Ireland
Have you previously studied with us at the University of Bristol?	No

Contact details

Home address

Please provide your permanent residential address. If you have another address and would prefer for us to contact you at that address instead you have the opportunity to add a correspondence address in the next section.

Country	Ireland
Postcode	N41 E2A2
Address Line 1	40 Drummagh
Address Line 2	
City	Carrrick On Shannon
County	Leitrim
Telephone	

If you would like us to send any postal correspondence to an address which is not your home address please enter an alternative address here. If you want us to send correspondence to your home address then please select No.

Do you want to add a correspondence address?	No
Country	Ireland
Postcode	N41 E2A2
Address Line 1	40 Drummagh
Address Line 2	
City	Carrrick On Shannon
County	Leitrim
Telephone	

Agent

Agent details

Agency Name	
Email address	

Additional Documents

Please upload required documents as outlined in your admissions statement

Mode of study

How would like to study this programme? Full Time

Qualifications

Institution	Qualification	Type	Subject	Actual/predicted	Grade	Start date	End date
University of Birmingham	Other Qual	Academic Qualification	Mathematics	Predicted	first class hon	27/Sep/2021	21/Jun/2025

If these qualifications have altered since your last application please note the changes in the free text box here.

English Language

Is English your first language? Yes

What is your first language?

Did you study at school/university where you were taught in English?

For how many years?

Have you sat a relevant English language test?

TOEFL (internet-based)

Registration number
Date of TOEFL test
TOEFL reading score
TOEFL listening score
TOEFL speaking score
TOEFL writing score
TOEFL total score

IELTS (International English Language Testing System)

Test report form (TRF) number
UKVI number (if applicable)
Date of IELTS test
IELTS listening score
IELTS reading score
IELTS writing score
IELTS speaking score
IELTS total score

Pearson Test of English

Score report code
Date of Pearson test
Pearson listening score
Pearson reading score
Pearson speaking score
Pearson writing score
Pearson overall score

Other English Language test

Name of course

Registration number
Date of test
Listening score
Writing score
Reading score
Total score

Experience

Current Employer

Employer name and address	School of Mathematics, University of Birmingham, Edgbaston, Birmingham B15 2TT, United Kingdom
Job title and main duties	EPSRC Undergraduate Researcher Submitted a paper titled The connectivity of the normalising an permuting of a finite soluble group with Professor Chris Parker to Communications in Algebra.
Full time/Part time	Full time
Date of Appointment	15 July 2024
End date (if applicable)	09 September 2024

Previous employment 1

Employer name and address	School of Mathematics, University of Birmingham, Edgbaston, Birmingham B15 2TT, United Kingdom
Job title and main duties	London Mathematical Society Undergraduate Researcher Conducted a summer research project, titled Regular Polytopes and related Group Theory, under the supervision of Professor Sergey Shpectorov at the University of Birmingham.
Full time/Part time	Full time
Date of Appointment	01 July 2024
End date (if applicable)	24 August 2024

Previous employment 2

Employer name and address
Job title and main duties
Full time/Part time
Date of Appointment
End date (if applicable)

Previous employment 3

Employer name and address
Job title and main duties
Full time/Part time
Date of Appointment
End date (if applicable)

Other Experience

Do you have any other relevant work experience to support your application?	No
Please provide details	

Personal statement

Personal details

Do you have a personal statement to upload? Yes

Please type your personal statement in the box

Research proposal

Research proposal

Proposed supervisor 1 Professor Tim Burness

Proposed supervisor 1

Proposed project title (max 150 chars) Finite Permutation Groups

Passport and visa

Visa required

Do you require a visa to study in the UK? No

Please fill out your passport details below. If you are unable to provide these at the current time you will have another opportunity to upload your passport after you submit the form. If you do not provide us with this information we will be unable to issue you with your confirmation of acceptance number and you will be unable to obtain a visa.

Passport details

Passport number

Further details

Have you previously studied in the UK?

What was the highest level of study in the UK?

Please confirm the total length of your UK study in years

Referees

Referee 1

Do you have a reference to upload? No

Type of reference Academic

Referee title Dr

Forename David

Surname Craven

Position Senior Birmingham Fellow in Pure Mathematics

Institution/Company University of Birmingham

Email address d.a.craven@bham.ac.uk

Country United Kingdom

Referee 2

Do you have a second reference to upload? No

Type of reference Academic

Referee title Professor

Forename Christopher

Surname Parker

Position Professor of Pure Mathematics

Institution/Company University of Birmingham

Email address c.w.parker@bham.ac.uk

Country United Kingdom

Funding

Funding 1

What is your likely source of funding?	Studentship
Please give the name of your scholarship or Studentship	EPSRC DLA studentship
Please specify	
Percentage from this source	100
Is this funding already secured?	No

Funding 2

What is your likely source of funding?	University of Bristol scholarship
Please give the name of your scholarship or Studentship	
Please specify	
Percentage from this source	100
Is this funding already secured?	No

Funding 3

What is your likely source of funding?	Other
Please give the name of your scholarship or Studentship	
Please specify	Heilbronn Doctoral Partnership
Percentage from this source	100
Is this funding already secured?	No

Other funding

I would like to be considered for other funding opportunities	Yes

Documents

Document type	File name
Curriculum vitae	BristolCV.pdf
Research proposal	Bristol Research Statement.pdf
Personal statement	Bristol Personal Statement.pdf
Transcript	Academic transcript.pdf

By ticking the checkbox below and submitting your completed online application form, you acknowledge the University of Bristol will use the information provided from time to time, along with any further information about you the University may hold, for the purposes set out in the [University's full Data Protection Statement](). Applicants applying to the collaborative programmes of doctoral training should also read the [Data Protection Statement]() for collaborative programmes of doctoral training.

The information that you provided on your application form will be used for the following purposes:

- To enable your application for entry to be considered and allow our Admissions Advisors, where applicable, to assist you through the application process;
- To enable the University to compile statistics, or to assist other organisations to do so. No statistical information will be published that would identify you personally;
- To enable the University to initiate your student record should you be offered a place at the University.

All applicants should note that the University reserves the right to make without notice changes in regulations, courses, fees etc at any time before or after a candidate's admission. Admission to the University is subject to the requirement that the candidate will comply with the University's registration procedure and will duly observe the Charter, Statutes, Ordinances and Regulations from time to time in force.

By ticking the checkbox below and submitting your completed online application form, you are confirming that the information given in this form is true, complete and accurate and that no information requested or other material information has been omitted. You are also confirming that you have read the Data Protection Statement and you confirm the statement below.

I can confirm that the information I have provided is true, complete and accurate. I accept that the information given in my application will be stored and processed by the University of Bristol, in accordance with the *UK General Data Protection Regulation and Data Protection Act 2018*, in order to:

- Consider my application and operate an effective and impartial admissions process;
- Monitor the University's applicant and student profile;
- Comply with all laws and regulations;
- Ensure the wellbeing and security of all students and staff;
- If my application is successful to form the basis of the statement made within my application.

If the University of Bristol discovers that I have made a false statement or omitted signification information from my application, for example examination results, I understand that it may have to withdraw or amend its offer or terminate my registration, according to circumstances.

EDUCATION

University of Birmingham   September 2021 - Present
MSci Mathematics   *Birmingham, UK*

· Average grades of 84.75%, 88.67% and 82.83% in the first, second and third year of my integrated masters respectively.
· Key modules in my third year included Metric Spaces and Topology, Combinatorics and Communication Theory, Graph Theory, Group Theory and Number Theory.
· Key modules in my fourth year include Advanced topics in Algebra, Randomness and Computation, Algebraic and Differential Topology, and Functional and Fourier Analysis.

Carrick on Shannon Community School   September 2014 - June 2020
Leaving Certificate   *Carrick on Shannon, Co.Leitrim, Ireland*

· Completed my Leaving Certificate in June 2020, obtaining 613 points. This ranked amongst the top 2% of all students in Ireland who completed the Leaving Certificate in 2020.

RESEARCH EXPERIENCE

University of Birmingham   September 2024 - Present
MSci Research Project   *Birmingham, UK*

· As part of my fourth year studies, I am currently conducting a research project titled "Finite Permutation Groups". This project is being conducted under the supervision of Dr David Craven.

University of Birmingham   July 2024 - September 2024
EPSRC Undergraduate Researcher   *Birmingham, UK*

· Received funding from the Engineering and Physical Sciences Research Sciences Council to carry out a summer research project at the University of Birmingham under the supervision of Professor Chris Parker. This project investigated the connectivity of the Normalising and Permuting graph of a finite soluble group and resulted in the submission of a paper to Communications in Algebra.

University of Birmingham   January 2024- March 2024
Research Skills in Mathematics   *Birmingham, UK*

· In the third year of my integrated masters, I completed a 20 credit module on research skills in mathematics. This involved writing a 15 page report on a mathematical topic of my choosing. My project was titled "Young Tableaux and Representation Theory of Symmetric Groups". This project was conducted under the supervision of Dr Allan Lo.

University of Birmingham   June 2023- August 2023
London Mathematical Society Undergraduate Researcher   *Birmingham, UK*

· Received funding from the London Mathematical Society to undertake a six week summer research project at the University of Birmingham under the supervision of Professor Sergey Shpectorov. This project focused on Regular Polytopes and related Group Theory.

University of Birmingham   September 2022 - December 2022
Mathematics in Industry group project   *Birmingham, UK*

- Participated in a group project in the 2nd year of my integrated masters. We were asked by Mott MacDonald to analyse the effectiveness of the M6 and M6 toll roads in Birmingham and the surrounding area. I developed and implemented a shortest path algorithm in Matlab to analyse the data which was gathered, participated in writing up the project and made a poster presentation.

VOLUNTEERING

University of Birmingham   September 2022 - May 2024
Peer Assisted Study Session Leader   *Birmingham, UK*

- Volunteered as a Peer Assisted Study Sessions Leader during the second and third year of my integrated masters. This involved running drop-in sessions for first year mathematics students and liaising with academic members of staff in the school of mathematics and in library services to organise these sessions.

CONFERENCES AND SUMMER SCHOOLS

University of Birmingham, School of Mathematics   October 2024
Summer Research Project Presentation Day   *Birmingham, UK*

- Contributed a talk titled "The Normalising and Permuting Graph of a Finite Soluble Group".

University of Birmingham   July 2024
Postgraduate Group Theory Conference   *Birmingham, UK*

- Attendee.

University of Birmingham   June 2024
British Early Career Mathematicians Colloquium   *Birmingham, UK*

- Attendee.

University of Birmingham, School of Mathematics   October 2023
Summer Research Project Presentation Day   *Birmingham, UK*

- Contributed a talk titled "Regular Geometric Shapes and Related Group Theory".

University of Sheffield   July 2023
London Mathematical Society Undergraduate Summer School   *Sheffield, UK*

- Selected by the London Mathematical Society to attend a two week summer school at the University of Sheffield. One of three Birmingham attendees, the maximum number allowed per university, and the only student from my year group to be selected.

TECHNICAL SKILLS

- Proficiency in Matlab and GAP computer programming.
- Experienced LaTex user.

AWARDS

- Engineering and Physical Sciences Research Council Undergraduate Research Scholarship - Summer 2024.
- London Mathematical Society Undergraduate Research Bursary - Summer 2023.

PUBLICATIONS AND PREPRINTS

· Eoghan Farrell and Chris Parker. The connectivity of the normalising and permuting graph of a finite soluble group. arXiv:2411.19837, (2024).

My decision to apply for a PhD in Mathematics has been informed by the experience I have had as an undergraduate student. Throughout the last three and a half years, I have sought out and availed of many opportunities to learn more about Mathematics. The more I learn, the more I am amazed and intrigued by the subject. My exposure to mathematical research has played a significant role in developing this opinion.

I am particularly interested in continuing my mathematical education at the University of Bristol under the supervision of Professor Burness. Many of the problems, particularly those relating to the subgroup structure of finite groups, which Professor Burness is pursuing appeal to me. One of the underlying themes of my research to date has been to better understand this topic.

During the last two summers, I have received funding from the London Mathematical Society and the Engineering and Physical Sciences Research Council to carry out research projects in Finite Group Theory. Working with Professor Sergey Shpectorov in the summer of my second year, I realised the importance of being able to draw on connections and use techniques from many different areas of Mathematics to study a specific problem. This summer, I worked on a project with Professor Chris Parker which led to the submission of a paper to Communications in Algebra. Throughout this project I developed my understanding of how mathematical research is conducted. From choosing a suitable research problem, to developing conjectures, having the patience and perseverance to try new methods to solve a problem and finally refining my work whilst writing a paper. Although the process of doing mathematical research is challenging, I thoroughly enjoyed this challenge and the freedom to work on a problem that interests me. I am currently conducting my masters research project, with Dr David Craven, studying finite permutation groups. This project has provided me with a new perspective on many problems in Finite Group Theory which I am eager to explore further. From speaking with Professor Burness, I know that he is interested in using the theory of permutation groups, along with other techniques, to better understand subgroup structure of finite groups. I would look forward to working under his supervision as part of a PhD in Mathematics at the University of Bristol.

On completion of each of my summer research projects, I have given a presentation outlining my work. I also have experience teaching mathematics. During my second and third year I volunteered as a Peer Assisted Study Leader. This involved running weekly drop-in sessions to support first year mathematics students. I found the process of helping and teaching students rewarding. These experiences have been beneficial in improving my mathematical communication skills. I would look forward to the opportunity to be involved in the teaching of mathematics as part of a PhD program at the University of Bristol.

Attending Summer schools and conferences has encouraged me to pursue a PhD in Mathematics. I was selected by the London Mathematical Society to attend a two-week undergraduate summer school at the University of Sheffield, whilst I also attended the British Early Careers Mathematicians Colloquium and the Postgraduate Group Theory Conference. Attending these events provided me with insights into current research areas. It exposed me to new mathematical ideas that are waiting to be explored. To witness the cross fertilisation of ideas and observe the collaborative approach which occurs in a conference setting was stimulating and exciting to see. Speaking to the postgraduate students at these conferences reaffirmed my interest in pursuing a PhD in Mathematics.

My research experience to date has provided me with a glimpse into what a PhD in Mathematics could entail. Working with eminent mathematicians has been an invaluable and rewarding experience. Observing the creativity and depth of knowledge required to conduct original mathematical research inspires me. The privilege of having been part of the research process motivates me to strive to conduct innovative research in the future. I would look forward to the opportunity of doing this as part of a PhD at the University of Bristol under the supervision of Professor Burness. Holding a PhD from the University of Bristol would be hugely beneficial for me in pursuing a career in mathematical research.

I am applying for a PhD in Mathematics at the University of Bristol under the supervision of Professor Burness because I am drawn to the problems in Finite Group Theory that he works on. I am particularly interested in his work on permutation groups, the subgroup structure of finite groups and the Combinatorics associated with Finite Group Theory. During my MSci degree I have completed several projects in Finite Group Theory. Conducting these projects under the supervision of experienced finite group theorists, at the University of Birmingham, has allowed me to develop a well rounded perspective on the subject. These experiences have motivated me to pursue a PhD in Mathematics at the University of Bristol under the supervision of Professor Burness.

During the summer between my second and third year, I received funding from the London Mathematical Society to conduct a research project under the supervision of Professor Sergey Shpectorov. This project was titled "Regular Geometric objects and related Group Theory" and focused on HSM Coxeters's work on regular polytopes. This project was my introduction to Finite Group Theory. The nature of the topic, alongside the guidance and support of Professor Shpectorov, allowed me to develop a geometric perspective on problems in Finite Group Theory. Some personal highlights of the project included studying geometric constructions of regular and quasi-regular polytopes and combinatorial problems relating to the substructures of regular polytopes in arbitrary dimensions.

In my third year, my undergraduate dissertation was titled "Young Tableaux and the Representation Theory of Symmetric Groups". I studied the construction of Specht modules. These modules provide us with a way of obtaining all irreducible representations of the symmetric group. I also studied the probabilistic proof of the hook length formula. This formula provides us with a way to calculate the dimension of any Specht module by relating it to a Young tableau. During this project I developed my understanding of the connection between Finite Group Theory and Combinatorics. As part of the Advanced Topics in Algebra module, I am currently studying the Representation Theory of Finite Groups in further detail.

Upon completion of my undergraduate dissertation, I continued my exploration of Finite Group Theory and related Combinatorics. I received funding from the Engineering and Physical Sciences Research Council to conduct a research project under the supervision of Professor Chris Parker. Motivated by the work of Professor Parker on the commuting graph and Professor Burness' work on the solubility graph, we introduced the normalising graph of a finite group. For a finite group, G, the vertices of the normalising graph of G consist of all non-trivial elements of G. Two vertices, x and y, share an edge if and only if x lies in the normaliser in G of the cyclic subgroup generated by y or y lies in the normaliser in G of the cyclic subgroup generated by x. Our work focused on the connectivity of the normalising graph when the group is soluble. We determined a set of necessary and sufficient conditions for the normalising graph of a finite soluble group to be connected. We showed that the connected components of such a graph have diameter at most 6 and that this bound is best possible. As a consequence of our work, we showed that the permuting graph of a finite soluble group is connected if and only if the normalising graph is connected. Similarly, the diameter of any connected component of the permuting graph is at most 6 and this bound is tight. The permuting graph has the same vertex set as the normalising graph however two vertices share an edge in the permuting graph if and only if the cyclic subgroups they generate permute. This project led to the submission of a paper to Communications in Algebra.

I am currently conducting my MSci dissertation under the supervision of Dr David Craven. This project is titled "Finite Permutation Groups". I am studying how one can use the theory of permutation groups to understand the maximal subgroups of a finite group. The first half of this project focused on the O'Nan Scott theorem. The objective for the remainder of the project is to investigate the classical groups of Lie type and Aschbacher's classification of the maximal subgroups of these groups. These two results are of fundamental importance in tackling many problems about finite permutation groups. As a result, this project leaves me well equipped to tackle problems involving finite permutation groups as part of a PhD at the University of Bristol under the supervision of Professor Burness.

From speaking to Professor Burness, and attending a talk given by his PhD student Marina Anagnostopoulou-Merkouri at the Post Graduate Group Theory Conference, I know that Professor Burness is interested in developing new methods to tackle problems involving finite permutation groups. In their recent paper on the regularity number of a finite group, Professor Burness and Marina Anagnostopoulou-Merkouri describe probabilistic methods which can be used to study the regularity number of a finite group. This appealed to me as I enjoy finding connections between different areas of Mathematics. I subsequently learnt that Professor Burness has a longstanding interest in developing probabilistic methods in Finite Group Theory. I particularly enjoyed reading his 2023 paper on the probability of two elements of prime order in a finite group commuting. From my MSci degree at the University of Birmingham, I am familiar with using probabilistic methods in other areas of Mathematics. In the Graph Theory and Combinatorics and Communication Theory modules I was introduced to probabilistic combinatorics. I am currently taking the Randomness and Computation module where I have learnt about the use of probabilistic methods in Number Theory and the analysis of randomised algorithms. The application of probabilistic methods in Finite Group Theory is something I would enjoy working on as part of a PhD under the supervision of Professor Burness. Professor Burness frequently uses computational methods whilst working on problems involving permutation groups, most notably in his work on bases. During my summer project with Professor Shpectorov I was introduced to the GAP programming language. I would look forward to further developing my computational skills whilst working with Professor Burness.

Professor Burness' reputation as a leader in the field of Finite Group Theory has motivated me to apply for a PhD at the University of Bristol under his supervision. There are many interesting avenues for future exploration in Finite Group Theory and I aspire to be involved in this process. Working under the supervision of Professor Burness at the University of Bristol would provide me with a unique opportunity to be involved in exciting and original research as I pursue a career as a mathematical researcher.

UNIVERSITY OF BIRMINGHAM

Academic Transcript

Full Name: Eoghan Farrell

Date of Birth: 07 April 2002

Student ID: 2192851

HESA Number: 2011101928513

This is to certify that the individual named above is/was a registered student of this University during the academic sessions shown. The details of the programme(s) of study followed, together with the results of the assessments taken and the credits obtained, are listed below (see overleaf for glossary and explanation of terms).

Awarding Institution(s): University of Birmingham

Delivering Institution(s): University of Birmingham

Date of Entry: 27 September 2021

Language(s) of Instruction: English

2021/22 Session	B.Sc. Mathematics with a Year in Industry						Undergraduate	

Module Code	Module Description	Module Level	Credits Studied	Credits Awarded	Mark	Result	Attempts
06 25659	LC Algebra and Combinatorics 1	Certificate Level	20	20	90	PASS	1
06 25661	Mechanics	Certificate Level	10	10	92	PASS	1
06 25662	LC Mathematical Modelling and Problem Solving	Certificate Level	10	10	74	PASS	1
06 25663	LC Probability and Statistics	Certificate Level	10	10	75	PASS	1
06 25664	LC Vectors, Geometry and Linear Algebra	Certificate Level	20	20	89	PASS	1
06 34038	LC Mathematical Workshops (Autumn)	Certificate Level	10	10	79	PASS	1
06 34044	LC Mathematical Workshops (Spring)	Certificate Level	10	10	91	PASS	1
06 34047	LC Sequences and Series	Certificate Level	10	10	78	PASS	1
06 34051	LC Real Analysis	Certificate Level	20	20	85	PASS	1

Credits Achieved **120**

2022/23 Session	B.Sc. Mathematics						Undergraduate	

Module Code	Module Description	Module Level	Credits Studied	Credits Awarded	Mark	Result	Attempts
06 25665	LI Algebra and Combinatorics 2	Intermediate Level	20	20	96	PASS	1
06 25666	LI Real and Complex Analysis	Intermediate Level	20	20	95	PASS	1
06 25667	LI Multivariable and Vector Analysis	Intermediate Level	20	20	92	PASS	1
06 25668	LI Mathematics in Industry	Intermediate Level	10	10	74	PASS	1
06 25669	LI Numerical Methods and Programming	Intermediate Level	10	10	78	PASS	1
06 25670	LI Differential Equations	Intermediate Level	20	20	87	PASS	1
06 25765	LI Linear Algebra and Linear Programming	Intermediate Level	20	20	86	PASS	1

Credits Achieved **120**

UNIVERSITY OF BIRMINGHAM

Academic Transcript

2023/24 Session — M.Sci. Mathematics — Undergraduate

Module Code	Module Description	Module Level	Credits Studied	Credits Awarded	Mark	Result	Attempts
06 19592	Graph Theory	Honours Level	20	20	77	PASS	1
06 19601	Combinatorics and Communication Theory	Honours Level	20	20	92	PASS	1
06 22498	Number Theory	Honours Level	20	20	86	PASS	1
06 23753	LH Research Skills in Mathematics	Honours Level	20	20	76	PASS	1
06 27722	LH Metric Spaces and Topology	Honours Level	20	20	75	PASS	1
06 29727	LH Group Theory	Honours Level	20	20	91	PASS	1

Credits Achieved 120

2024/25 Session — M.Sci. Mathematics — Undergraduate

Module Code	Module Description	Module Level	Credits Studied	Credits Awarded	Mark	Result	Attempts
06 02482	LM Project in Mathematical Science	Masters Level	40	0		NO RESULT	
06 31130	LM Functional and Fourier Analysis	Masters Level	20	0		NO RESULT	
06 33916	LM Advanced Topics in Algebra	Masters Level	20	0		NO RESULT	
06 34176	LM Algebraic and Differential Topology	Masters Level	20	0		NO RESULT	
06 36084	LM Randomness and Computation	Masters Level	20	0		NO RESULT	

Credits Achieved 0

Total Credits Achieved: 360

Qualification Obtained: Not Applicable

Date of Leaving: Not Applicable   **Date of Conferment:** Not Applicable

Additional Awards
Other activities

- Peer Assisted Study Sessions (PASS) scheme, 2022/2023
- Peer Assisted Study Sessions (PASS) scheme, 2023/2024

Guild or University position

- 150 Worklink Hours Worked , 2023/2024

UNIVERSITY OF BIRMINGHAM

Academic Transcript

Date Printed: 21 October 2024

FOR ELECTRONIC

USE ONLY

University of Birmingham Registry – Transcript Explanatory Notes

A transcript is an official statement of a student's academic performance and progress on their programme of study. The front page of an official transcript is printed in black ink on a pale blue background with the University's colour crest in the top left-hand corner and does not include a signature.

Academic Session: Defines the Academic Year and its duration (e.g., late September to mid-June for most Undergraduate programmes).

Programme: Recognised learning pathway necessary to obtain a particular qualification.

Modules: A module is a coherent and identifiable unit of learning and teaching with defined learning outcomes and which generates a single mark.

Programme and Module Levels: University of Birmingham programme and module levels are defined by the Framework for Higher Education Qualifications (FHEQ), and Qualifications and Credit Framework (QCF).

D (Doctoral) / 8	Doctoral degrees (e.g. PhD, EdD, ClinPsyD)	
M (Masters) / 7	Masters Degrees (e.g. MSc, MA, MRes, MA/MSc by Research), Undergraduate Integrated Masters Degrees, Postgraduate Diplomas, Postgraduate Certificates	
H (Honours) / 6	Bachelor's Degrees with Honours, Ordinary Bachelor's Degrees, Graduate Diplomas, Graduate Certificates	Level H Modules equivalent to those taken in UG Year 3
I (Intermediate) / 5	Diplomas of Higher Education, Foundation Degrees	Level I Modules equivalent to those taken in UG Year 2
C (Certificate) / 4	Certificates of Higher Education, University Certificates	Level C Modules equivalent to those taken in UG Year 1
F (Foundation) / 3	Foundation Certificates	

The level of a module is an indicator of the complexity, depth of study and learner autonomy involved. As it is possible to take some modules of a higher level than the corresponding programme year, it does not necessarily coincide with the stage or year that a module is being studied.

Credits Studied: The credit value indicates the notional number of study hours required (including contact time & time spent on assessed work) to achieve the learning outcomes. A single University of Birmingham credit is roughly equivalent to 10 notional hours of learning.

Credits Awarded: The award of credit in combination with a result of 'Pass' signifies that the learning outcomes of the module have been achieved. Where all of the assessments for a module have been completed, the credits achieved for that module will be the same as the credits studied. Where some but not all of the assessments for a module have been completed, the credits achieved for that module have been pro-rated so the credits awarded will be fewer than the credits studied. Under the European Credit Transfer and Accumulation Scheme, 10 University of Birmingham credits are equal to 5 ECTS credits.

Marks: A module is passed if its specified learning outcomes have been achieved. Marks are based on percentages, except for the following:

Mark Indicator	Definition
P	Pass
F	Fail
APL	AP(e)L (credit transfer)
-	Module studied but assessments not completed.

Suffixes of Marks: Some marks are suffixed by a single character. These represent the following meanings:

Suffix	Definition
R	Re-sit mark
S	Re-sit required
T	Next attempt to be regarded as a first attempt
H	Failed internal hurdle
X	Condoned fail (where referenced for historic marks)
C	Pass by compensation (where referenced for historic marks)

Number of Attempts in the Academic Session

0	Module is yet to be assessed
1	First attempt
2	Re-assessment attempt/repeat

Module Result	Definition
Pass	Learning outcomes achieved
Failed	Learning outcomes not achieved
Audited	Module studied but assessments not completed
No Result	To be attempted

Credits Achieved: Total number of credits achieved within the corresponding Academic Session.

Total Credits Achieved: Total number of credits achieved within the programme of study (Taught programmes only).

Qualification Obtained: Title of qualification awarded. For Undergraduate programmes, this includes the classification of degree.

Date of Leaving: Last date of attendance on the named programme. For Postgraduate Research students, this is the date on which the examiners make their final recommendation on the outcome of the examination of a student's thesis. Where the qualification obtained is blank or not applicable, the date of leaving is the date of withdrawal from the University.

Date of Conferment: Date on which the degree qualification is officially awarded at a degree ceremony (this applies to Bachelor's, Masters, and Doctoral programmes). If the qualification is not yet conferred or it is a certificate/diploma then the words 'Not Applicable' will be printed.

Undergraduate: The pass mark for level C, I and H modules is 40% except, where required by external bodies as in the case of some dental and medical qualifications such as BDS and MBChB, modules may be permitted to have a pass mark other than 40%.

Postgraduate: From 2003-04, the pass mark for Level M modules taken as part of a Postgraduate Taught or Postgraduate Research programme is 50% for all programmes.

Doctorate: From 2016-17, the pass mark for Level D modules taken as part of a Doctoral Research programme will be 50%. Some Level D modules may be granted an exemption to this requirement and assessed on a pass/fail basis.

Award criteria: For information about credit requirements and the criteria to determine awards for Undergraduate, Postgraduate and Doctoral qualifications, please refer to Regulations; Section 7: 'Assessment, Progression and Award' for your relevant cohort. (https://www.birmingham.ac.uk/university/leadership/governance/legislation/index.aspx)

Postgraduate Research: Some Postgraduate Research degree programmes do not require the completion of taught modules and are assessed on the submission of a thesis at the end of the relevant period of study. In such cases there will be no module registrations displayed. For Postgraduate Research programmes that require taught modules to be completed alongside the research, the total credits achieved is the sum of the taught elements of the programme only. Notional credits for the research thesis will not be shown for any Postgraduate Research programmes.

Accreditation of Prior Learning and Prior Experiential Learning (AP(E)L): Applicants may be admitted onto Taught programmes of study and Research Degree programmes with taught elements on the basis of credit achieved on another programme or at another institution or through work experience which has been accredited. Credits achieved in this way may contribute towards the achievement of the credit requirements of the University of Birmingham programme concerned.

Direct Entry: Students who show that they have completed sufficient transferable credit may be admitted directly into the second/third year of a programme of study. In this instance, it is possible for an undergraduate student to graduate with only 120/240 credits.

Year Abroad/Year in Industry: Some programmes allow a year abroad at the end of Stage 2. Students may also be able to pursue a year in industry during their programme of study.

School of Mathematics,
University of Birmingham,
Edgbaston, Birmingham,
B15 2TT, United Kingdom

7th January, 2025

School of Mathematics,
University of Bristol,
Fry Building,
Woodland Road,
Bristol,
BS8 1UG

To whom it may concern,

I am writing to provide a highly positive reference for Eoghan, who I have had the pleasure of supervising and teaching at the University of Birmingham since January 2024. He attended my course in Group Theory during his third year, where he demonstrated an exceptional aptitude for abstract reasoning and problem solving. Currently, Eoghan is undertaking his fourth-year dissertation under my supervision, focusing on finite permutation groups. His analytical skills and ability to grasp advanced concepts in this area of mathematics are impressive, and his work is progressing to a very high standard.

His 91% in Group Theory, 92% in Combinatorics and Communications Theory, and 90% and 96% in Algebra and Combinatorics 1 and 2 show his strong predisposition towards these fields. This makes him a prime candidate for a PhD position in a field with strong connections to algebra and combinatorial objects, such as permutation groups and probabilistic methods.

Eoghan has already distinguished himself through his commitment to research. He has undertaken two summer research projects—something that I believe is quite rare among undergraduate students. The most recent of these projects has resulted in a publication that has been submitted to *Comm. Algebra*, which is unusual for an undergraduate project in algebra.

Beyond his technical abilities, Eoghan has shown strong independent learning skills, an excellent work ethic, and a collaborative spirit, all of which make him an ideal candidate for further research.

His suitability to a project in permutation groups is clear. His fourth-year dissertation is on permutation groups, on the O'Nan-Scott theorem in the first semester and maximal subgroups of classical groups in the second. His high marks in both algebra and combinatorics suggest a predilection for those subjects. This gives him a natural advantage in a topic like finite permutation groups from a probabilistic point of view.

In summary, I have absolutely no hesitation in recommending Eoghan for a PhD position at your department. His mathematical abilities, dedication to research, and intellectual curiosity will undoubtedly enable him to make valuable contributions to the field.

We advance
We activate

birmingham.ac.uk

Please do not hesitate to contact me if you require any further information.

Yours faithfully,

David A. Craven

Prof. Christopher William Parker
School of Mathematics
The University of Birmingham
Edgbaston
Birmingham B15 2TT
England

c.w.parker@bham.ac.uk

January 5, 2025

Letter of Recommendation for Eohgan Farell

I have known Eoghan well for about six months, but I have been familiar with him as a student in Birmingham for at least two years.

Eoghan is currently a fourth-year MSci student with us, and his academic performance is exceptional. His marks consistently cluster around 85%, demonstrating that he's a top calibre student. Based on his achievements to date, I fully expect him to graduate with a very high first-class degree.

Eoghan has shown a unusual initiative in seeking out research opportunities with various members of staff. In 2023, at the end of his second year, he was awarded an LMS Undergraduate Research Bursary to work with Professor Sergey Shpectorov. For his third-year project, he shifted focus to a combinatorial problem, working under Dr. Allan Lo to explore the representation theory of symmetric groups and the combinatorics of Young tableaux.

In the summer of 2024, Eoghan was awarded EPSRC funding to carry out a research project with me. The project combined elements of graph theory and group theory, culminating in a paper that has been submitted for publication. This work showcased his imagination, intellectual curiosity, and exceptional problem-solving skills. Now, for his fourth-year project, he is working with David Craven, and I trust he can provide you with details on his current progress.

Beyond his academic talents, Eoghan is a dedicated and hard-working person. His enthusiasm for mathematics, coupled with his ability to engage with challenging problems, makes him an exceptional student and a promising future researcher.

I have no reservations in recommending Eoghan to you. It will be exciting to see him transition from a student to an independent mathematician.

Yours faithfully,
CWP

Prof. Christopher Parker
Professor of Group Theory