Achieve with UWA

The unique combination of computing, mathematics and engineering programs in our Faculty offers students and academics greater opportunities to take on multidisciplinary real-world challenges.

Mathematics and strong technology skills drive advances in science and engineering, enabling major innovations from smart phones to GPS systems, to the sequencing of the human genome. Our majors in computing and mathematics provide you with the skills to understand and solve complex problems and will prepare you for a range of exciting careers.

Global reputation

UWA is ranked among the top 1% of universities in the world and is part of the elite Group of Eight research-intensive Australian universities. Our Faculty has a rich heritage of over 100 years of achievement and as a student you will benefit from close interaction with our leading researchers and their links to industry.

Flexible learning

UWA’s flexible course structure means that you can combine our computing and mathematics majors with another major within your undergraduate bachelor’s degree.

Professor Cheryl Praeger, an internationally acclaimed mathematician and the Foreign Secretary of the Australian Academy of Science is one example. UWA is also home to Australia’s “Fornax” supercomputer, which allows scientists to explore new realms of high-powered data-intensive research and is expected to support radio astronomy.

Global reputation

Given that graduates with mathematics and technology skills are in high demand across a range of sectors, I encourage you to explore our computing and mathematics majors to discover how they can enhance your undergraduate studies and broaden your career opportunities. Welcome to our Faculty.

Professor John Dell, Dean, Faculty of Engineering, Computing and Mathematics

Contents

Data Science major
Computer Science major
Mathematics and Statistics major
Quantitative Methods major
Master of Professional Engineering: Software
Admissions
Data Science

Data Science is the practical application of computer technology, concepts and knowledge to solve real-world problems.

The Data Science major at UWA focuses on data and scientific computation. Through a combination of practical and theoretical units you will develop an understanding of how to use technology for efficient and effective data collection, conversion, analysis, visualisation and interpretation.

You will learn how to integrate new technologies to create science, engineering and business systems; and how to design useful and usable software.

Careers

A broad range of professions rely heavily on computing resources and data analysts, creating many career opportunities in areas such as mining and resource engineering, bioinformatics and biochemistry, computational physics and astronomy, transportation, health, finance, geophysics, geographic information systems and biomechanics.

Course structure

The Data Science major consists of 12 units:
- 8 core units
- 4 complementary units

Find out more at studyat.uwa.edu.au/courses/data-science

Data Science major

Degree-specific major: BP004 Bachelor of Science/ BP005 Bachelor of Philosophy (Honours)

<table>
<thead>
<tr>
<th>Yr1</th>
<th>Level 1: Students complete two core units and two complementary units in the Data Science major</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Problem Solving and Programming</td>
</tr>
<tr>
<td></td>
<td>Global Challenges in Engineering</td>
</tr>
<tr>
<td></td>
<td>Relational Database Management Systems</td>
</tr>
<tr>
<td></td>
<td>Broadening Unit A or B</td>
</tr>
<tr>
<td></td>
<td>Mathematics Foundations: Methods ✽</td>
</tr>
<tr>
<td></td>
<td>Elective/Second Major Unit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Yr2</th>
<th>Level 2: Students complete two core units in the Data Science major</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Computer Analysis and Visualisation</td>
</tr>
<tr>
<td></td>
<td>Analysis of Experiments</td>
</tr>
<tr>
<td></td>
<td>Broadening Unit A or B</td>
</tr>
<tr>
<td></td>
<td>Elective/Second Major Unit</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Yr3</th>
<th>Level 3: Students complete four core units in the Data Science major</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Data Warehousing and Data Mining</td>
</tr>
<tr>
<td></td>
<td>Agile Web Development</td>
</tr>
<tr>
<td></td>
<td>Elective/Second Major Unit</td>
</tr>
</tbody>
</table>

Course structure diagrams for illustrative purposes only. Refer to the UWA Handbook (handbooks.uwa.edu.au) for full details.

① Not required by students with a pass in Mathematics Specialist 3A/3B or higher.

② Students who choose to study Data Science as a second major will not be required to complete the complementary units listed above.

“Studying Data Science has been a great experience, filled with practical exercises and fascinating concepts.”

Xiaofan Wu, Data Science Student

The University of Western Australia | 01
While studying the Computer Science major at UWA, you will learn the theoretical, algorithmic, implementation and systems principles that underpin computer languages and networks and discover how to develop new technologies and advanced programming.

**Accreditation**
UWA’s Computer Science major is fully accredited by the Australian Computer Society.

**Careers**
If you wish to play a role in developing new computing technologies for companies like Google and Microsoft or pursue a career in enterprise-level programming, systems, software engineering or research, then this major will equip you with lifelong computing skills that will be advantageous for a range of industries and careers. Past students have gone into a wide variety of jobs – from running network systems for local organisations to managing software development and technology infrastructures for large aerospace and energy companies.

**Course structure**
The Computer Science major consists of 11 units:

- 8 core units
- 3 complementary units

Find out more at studyat.uwa.edu.au/courses/computer-science

---

At UWA I’ve experienced some of the coolest aspects of the field—including writing a Tetris-playing AI, building a dancing robot and creating video warping software.”

*Michael Martis, Computer Science Student*
Mathematics and Statistics

Mathematics is humanity’s most powerful tool for comprehending the universe and is essential in many fields, including science, technology, engineering and finance.

The Mathematics and Statistics major at UWA will equip you with the mathematical tools and techniques of at least two of the three major disciplines of Pure Mathematics, Applied Mathematics and Mathematical Statistics.

Applied Mathematics uses the theory and techniques of mathematics and statistics to understand and deal with the real world. Mathematical Statistics is concerned with the application of statistical methods. Pure Mathematics proves theorems in a wide range of topics usually motivated and illustrated by problems in physics, engineering and computer science.

Careers

Many mathematics graduates become statisticians, actuaries, scientists or accountants. There are opportunities in areas as diverse as banking, insurance and investment, environmental modelling, oceanography, meteorology, medicine, computing, information technology, government, education and research. Past students have gone into a wide variety of jobs – from managing research for telecommunications companies like Telstra and analysing business data for major banking firms like Macquarie Group, to planning strategic operations for Australia’s Department of Defence and editing news content for mathematics publications.

Course structure

The Mathematics and Statistics major consists of 9 units:

- 8 core units
- 1 complementary unit

Find out more at studyat.uwa.edu.au/courses/mathematics-and-statistics

Mathematics and Statistics major

Degree-specific major: BP004 Bachelor of Science/ BP005 Bachelor of Philosophy (Honours)

<table>
<thead>
<tr>
<th>Year</th>
<th>Level</th>
<th>Students complete two core units and one complementary unit in the Mathematics and Statistics major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yr1</td>
<td></td>
<td>Mathematical Methods 1&lt;br&gt;Mathematical Methods 2&lt;br&gt;Introduction to Scientific Practices&lt;br&gt;Elective/Second Major Unit&lt;br&gt;Elective/Second Major Unit</td>
</tr>
<tr>
<td>Yr2</td>
<td></td>
<td>Introduction to Applied Mathematics&lt;br&gt;Or Fundamentals of Probability with Applications&lt;br&gt;Or Introduction to Pure Mathematics&lt;br&gt;Broadening Unit A or B&lt;br&gt;Broadening Unit A or B&lt;br&gt;Elective/Second Major Unit&lt;br&gt;Elective/Second Major Unit</td>
</tr>
<tr>
<td>Yr3</td>
<td></td>
<td>Dynamics and Control&lt;br&gt;Scientific and Industrial Modelling&lt;br&gt;Algebraic Structures and Symmetry&lt;br&gt;Analysis and Geometry&lt;br&gt;Random Processes and Their Applications&lt;br&gt;Statistical Science&lt;br&gt;Elective/Second Major Unit&lt;br&gt;Elective/Second Major Unit&lt;br&gt;Elective/Second Major Unit&lt;br&gt;Elective/Second Major Unit</td>
</tr>
</tbody>
</table>

Course structure diagrams for illustrative purposes only. Refer to the UWA Handbook (handbooks.uwa.edu.au) for full details.

* Students who choose to study Mathematics and Statistics as a second major will not be required to complete the complementary unit listed for Year 1.

“Studying Mathematics and Statistics has shown me that mathematics is so much more than what you learn at school. It is applicable to just about any discipline.”

Georgia Carson, Mathematics and Statistics Student

The University of Western Australia | 03
Quantitative Methods

Quantitative methods refer to the range of mathematical and statistical techniques used to analyse and interpret data.

Quantitative methods are used during the decision making process in a variety of areas such as science, economics, marketing, engineering, medicine, public health, psychology, education and sport.

Many industries use quantitative reasoning for improving products and quality, increasing efficiency in the workplace, and assessing their growth strategies.

This major is designed to empower you by ensuring you develop a broad range of skills and abilities that you will find useful and relevant to your own interests.

**Careers**
There is a high demand for graduates trained in quantitative methods across a wide range of industries in careers such as researchers and analysts. Past students have gone on to work for universities, medical centres, private research firms, and government agencies.

**Course structure**
The Quantitative Methods major consists of 8 core units.

Find out more at studyat.uwa.edu.au/courses/quantitative-methods

---

**Quantitative Methods major**

**Degree-specific major:** BP004 Bachelor of Science/ BP005 Bachelor of Philosophy (Honours)

<table>
<thead>
<tr>
<th>Year</th>
<th>Core Units</th>
<th>Elective Units</th>
<th>Complementary Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yr1</td>
<td>Statistics for Science</td>
<td>Broadening Unit A or B</td>
<td>Elective/Second Major Unit</td>
</tr>
<tr>
<td></td>
<td>Relational Database Management Systems</td>
<td>Broadening Unit A or B</td>
<td>Elective/Second Major Unit</td>
</tr>
<tr>
<td>Yr2</td>
<td>Analysis of Experiments</td>
<td>Broadening Unit A or B</td>
<td>Elective/Second Major Unit</td>
</tr>
<tr>
<td></td>
<td>Analysis of Observations</td>
<td>Broadening Unit A or B</td>
<td>Elective/Second Major Unit</td>
</tr>
<tr>
<td>Yr3</td>
<td>Advanced Data Analysis</td>
<td>Surveys</td>
<td>Elective/Second Major Unit</td>
</tr>
<tr>
<td></td>
<td>Communication and Problem Solving with Statistics</td>
<td>Statistical Significance</td>
<td>Elective/Second Major Unit</td>
</tr>
</tbody>
</table>

---

Course structure diagrams for illustrative purposes only. Refer to the UWA Handbook (handbooks.uwa.edu.au) for full details.

1. OR students can select ‘Economic and Business Statistics’ or ‘Mathematical Methods 2’.
2. OR students can select ‘Mathematical Methods 1’ or ‘Quantitative Methods for Business and Economics’.

---

“In Quantitative Methods we are taught the theory behind statistics, which is then complemented by practical computer skills and hands-on laboratory sessions.”

Francesca Kavanagh, Quantitative Methods Student
The Master of Professional Engineering (MPE) is a postgraduate engineering qualification of usually two years duration. The MPE Software Engineering specialisation will allow you to undertake advanced technical units, professional units, a research project, a design project and an industry placement.

The course, designed in consultation with industry, will equip you with both outstanding technical skills and the ability to work creatively as part of a team across the breadth of any software engineering challenge. It features advanced topics in mobile computing, cloud computing, digital systems, artificial intelligence and project management.

Upon successfully completing the Master of Professional Engineering, you will receive an internationally recognised engineering qualification, enabling you to practice as a professional engineer.

MPE Pathway

The undergraduate Engineering Science major at UWA is the pathway for the Master of Professional Engineering. For more information and admissions visit studyat.uwa.edu.au/mpe

The MPE has been granted provisional accreditation at the level of Professional Engineer by Engineers Australia. As is standard practice for new courses, accreditation is provisional until graduation of the first cohort of students in 2014/2015.

Undergraduate admissions

Domestic applicants

Entry requirements

To be considered for entry into the UWA three-year undergraduate degrees listed in this publication, you must achieve the University’s minimum entry score (ATAR of 80 or equivalent), and demonstrate English Language Competence.

To be considered for entry into the Bachelor of Philosophy (Honours) you must achieve an entry score (ATAR or equivalent) of at least 98 in addition to satisfying English Language Competence requirements and prerequisites for your major(s).

studyat.uwa.edu.au/ela

TISC entry

If you’re thinking of studying Data Science, Computer Science, Mathematics and Statistics or Quantitative Methods as your degree-specific major, you should use the relevant Bachelor of Science code in your TISC application. If you are considering one of these majors as your second major, simply discuss this when you enrol. Alternatively, you can contact ECM Student Office at enquiries-ecm@uwa.edu.au for advice.

Prerequisites

Data Science:

- WACE Mathematics 3A/3B;
- WACE Mathematics 3C/3D is recommended.

Computer Science

- At least WACE Mathematics 3A/3B;
- WACE Mathematics 3C/3D is recommended.

Mathematics and Statistics

- WACE Mathematics 3C/3D;
- Mathematics Specialist 3C/3D

Quantitative Methods

- At least WACE Mathematics 3A/3B;
- WACE Mathematics 3C/3D is recommended.

International applicants

A minimum Australian Tertiary Admissions Rank (ATAR) of 80 (or 98 for the Bachelor of Philosophy (Honours)) or equivalent, in addition to satisfying UWA’s English Language Competence requirement (see studyat.uwa.edu.au/ela) and meeting the prerequisites for the major in Data Science, Computer Science, Mathematics and Statistics or Quantitative Methods. Please refer to studyat.uwa.edu.au for more details on prerequisites and minimum scores. Students with previous tertiary level qualifications will be considered for advanced standing (credit).

Scholarships

UWA scholarships and awards are designed to ensure equity and access for all students and to reward and acknowledge excellence in our community. A full list of scholarships is available online.

scholarships.uwa.edu.au