Computing, Mathematics and Physics
Information for undergraduate students
Achieve with UWA

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The unique combination of computing, mathematics, physics 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 and industry partners.

Flexible learning

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

Global reputation

UWA is ranked among the top one per cent 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 more than 100 years of achievement and as a student you will benefit from close interaction with our leading researchers and their links to industry.

Winthrop Professor David Blair, an internationally acclaimed Physicist, known for his role in the ‘scientific discovery of the century’- gravitational waves, 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.

One of the most rapidly growing fields in IT, Data Science unearths value and meaning from data. Using techniques from computer science, statistics and information management, it helps businesses and organisations across the globe.

In our data-driven world, information is now being collected electronically at an unprecedented speed and scale. According to IBM, we now generate more than 2.5 quintillion bytes of data a day.

From predicting trends to protecting personal information, companies around the world need data scientists to process, explore and harness meaning from their data. Insights from data drive decision-making on everything from healthcare and product design to marketing and finance.

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.

Accreditation

The Data Science major is provisionally accredited by the Australian Computer Society.*

Careers

As organisations around the world implement data-analytics programs, the demand for data scientists is only set to increase. Opportunities exist in areas such as mining and resource engineering; bioinformatics and biochemistry; computational physics and astronomy; transportation; health; finance; marketing; geophysics; geographic information systems; and biomechanics.

Course structure

The Data Science major consists of twelve units:

- Eight core units
- Four complementary units

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: Methods ATAR 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, except for students with Mathematics: Applications ATAR, who will be required to complete Mathematics: Fundamental.

*As is standard practice, courses remain provisionally accredited until the required number of students graduate.

Data Science

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UWA’s spectacular garden campus is located just 4.8km from Perth’s CBD and industry partners.

Data Science major

| Degree-specific Major Unit | 2 |
| Problem Solving and Programming | Global Challenges in Engineering |
| Analytical Database Management Systems | Statistics for Science |
| Business Analysis | Mathematics Fundamentals* |
| Computer Analysis and Visualisation | Elective/Second Major Unit |
| Relational Database Management Systems | Elective/Second Major Unit |
| Systems Programming | Elective/Second Major Unit |
| Data Warehousing | Elective/Second Major Unit |
| Professional Computing | Elective/Second Major Unit |
| Business Analytics | Elective/Second Major Unit |
| High-performance Computing | Elective/Second Major Unit |
| Broadening Unit | Elective/Second Major Unit |

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STUDY DATA SCIENCE AT UWA

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

Data Science student

Xiaofan Wu

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

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The Computer Science 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.

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 infrastructures for large aerospace and engineering companies.

The Mathematics and Statistics major consists of eleven units:
- Eight core units
- Three complementary units

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

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1: Not required by students with a pass in Mathematics Methods ATAR or higher.
2: As is standard practice, courses remain provisionally accredited until the required number of students graduate.
3: Students intending to take Honours in Mathematics and Statistics should check that they will have the correct prerequisites for their desired specialisation.
Physics

Physics examines the world around us at the most fundamental level, from the origin and fate of the universe to the behaviour of matter on subatomic length scales and everything in between.

This major gives you access to the frontiers of modern physics via a focus on mathematical skills. These skills are required to access modern physics, including the key pillars of relativity and quantum physics, with applications to atomic, nuclear and particle physics, condensed matter physics, photonics and astrophysics.

The knowledge generated through the study of physics is the driving force behind most new technologies, from radars to lasers, transistors to quantum computers and electron microscopes to advanced medical imaging scanners.

To complement your lectures, you’ll have the chance to discuss, apply and expand on the theory of your unit in weekly practical laboratory classes and structured tutorials.

Careers

The Physics major opens doors to a diverse range of careers. As a Physics graduate, your strong problem-solving and critical-thinking abilities will be in demand from employers in industry, government and the business and finance sectors.

Your discipline-specific skills are particularly valued in teaching, research and high-tech industries. Graduates with a strong mathematics and physics background have opportunities in the resources sector modelling big data sets. Further studies will lead to careers in research or academia.

The Square Kilometre Array project will provide a variety of job opportunities for Physics graduates in the astronomy and astrophysics stream.

“Physics is a subject that allows me to put my mathematical and problem solving skills to use solving issues relating to a real world context.”

Kai Metzner
Physics student

Course structure

The Physics major consists of eleven units:

- Eight core units
- Three complementary units

Find out more at study.uwa.edu.au/courses/physics

Further study opportunities

Master of Data Science

Big data and analytics now drive and inform strategic decision-making and innovation, whether it is in relation to engineering, finance, health or other professional areas. The Master of Data Science is ideal for graduates who wish to take on the challenge of big data and pursue a career as a data scientist or data analyst.

Find out more at study.uwa.edu.au/mds

Master of Information Technology

The Master of Information Technology equips students with advanced IT skills and the ability to engage at the cutting edge of global technology solutions.

Find out more at study.uwa.edu.au/mit

Master of Professional Engineering: Software Specialisation

Undergraduate students who are interested in software engineering should consider the engineering pathway at UWA, which commences with the Engineering Science major. The software engineering preparation stream leads on to the Master of Professional Engineering and a global career as a professional engineer.

Find out more at study.uwa.edu.au/courses/master-of-professional-engineering-preliminary

Master of Physics

Further study options include the Master of Physics – Astronomy and Astrophysics, Computational Physics, Experimental Physics, Medical Physics and Theoretical Physics.

Find out more at study.uwa.edu.au/courses/master-of-physics-coursework-and-dissertation

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).

study.uwa.edu.au/undergraduate

TISC entry

If you’re thinking of studying Data Science, Computer Science, Mathematics and Statistics or Physics as your degree-specific major, you should use the Bachelor of Science code (UWISC) 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 EMS study.uwa.edu.au/mds

International applicants

A minimum Australian Tertiary Admissions Rank (ATAR) of 80 (or 98 for the Bachelor of Philosophy (Honours) or equivalent, if required in addition to satisfying UWA’s English Language Competence requirement (see study.uwa.edu.au/els) and meeting the prerequisites for the major in Data Science, Computer Science, Mathematics and Statistics or Physics. Please refer to study.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 offers a range of scholarships to help students reach their full potential. A full list of scholarships is available online at scholarships.uwa.edu.au

*Students with Mathematics: Specialist ATAR may complete a Level 1 bridging unit to be eligible for this major.

Student Office for advice at enquiries-ems@uwa.edu.au

Prerequisites

Data Science

Mathematics: Applications ATAR

Recommended:

Mathematics: Methods ATAR

Computer Science

Mathematics: ATAR or applications ATAR with additional mathematics units taken in the first year

Recommended:

Mathematics: Methods ATAR

Mathematics and Statistics

Mathematics: Specialist ATAR

Physics

Mathematics: Specialist ATAR, Mathematics: ATAR and Physics ATAR or Mathematics: ATAR with additional specified units taken in the first year

Recommended:

Mathematics: Specialist ATAR, Mathematics: Methods ATAR and Physics ATAR

Multivariable Calculus

Mathematics: Specialist ATAR, Mathematics: ATAR and Physics ATAR or Mathematics: ATAR with additional specified units taken in the first year

Required:

Mathematics: Methods ATAR

Mathematics: Applications ATAR

Mathematics: Specialist ATAR

Recommended:

Mathematics: Methods ATAR

English Language Competence requirement

Domestic applicants must achieve the University’s minimum entry score (ATAR or Mathematics: Methods ATAR or Mathematics: Applications ATAR or Mathematics: Specialist ATAR, depending on your major) of at least 80, in addition to satisfying English Language Competence (see study.uwa.edu.au/els).

International applicants must achieve an entry score (ATAR or Mathematics: Methods ATAR or Mathematics: Applications ATAR or Mathematics: Specialist ATAR, depending on your major) of at least 98, in addition to satisfying English Language Competence (see study.uwa.edu.au/els).

Further study opportunities

Master of Data Science

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Find out more at study.uwa.edu.au/courses/master-of-professional-engineering-preliminary

Master of Physics

Further study options include the Master of Physics – Astronomy and Astrophysics, Computational Physics, Experimental Physics, Medical Physics and Theoretical Physics.

Find out more at study.uwa.edu.au/courses/master-of-physics-coursework-and-dissertation