



Department of Physics and Astronomy

BACHELOR OF SCIENCE MAJOR IN PHOTONICS

Photonics, the use and application of light, is the basis for products such as DVDs, digital cameras and flat-panel displays, laser scanners, biomedical instrumentation and communication systems. It is intrinsic to many 21st Century technologies from medicine to modern manufacturing. The Bachelor of Science major in Photonics combines studies in physics, optics, materials science and electronics in a professionally oriented degree, incorporating nanophotonics, biophotonics, and technologies such as lasers, optical fibres and communications. You will develop practical and industry relevant skills including technical writing and communications skills, technology management, using modern instrumentation. You will experience our well equipped laboratories, known for their comprehensiveness and quality. Placement in a local technology company in your final semester, in an industry based project, enhances your employment opportunities.

Program of study

The degree requires full time study over three years. The first year lays the foundations in physics and mathematics for an understanding of photonics. Students may take other units in engineering, chemistry and computing.

The second year introduces photonics, optical communication systems, continues studies of physics including optics, waves and electromagnetism, and mathematics. Additional units may be taken in physics, astronomy, engineering or computing.

The third year trains you in photonic devices and systems, lasers, microscopy, biophotonics and nanophotonics as well as quantum mechanics, electromagnetism and optics.

You will complete an industry project gaining valuable experience applying your knowledge to a real world problem. Additional units include physics, astronomy, technology management, engineering or computing.

Scholarships

Scholarships include those focusing on general support, equity, Indigenous students, accommodation, sport or international travel. To find out more go to www.futurestudent.mq.edu.au/undergraduate

Vacation scholarships are offered to students to work on research projects during summer. For more information go to www.physics.mq.edu.au/future/vacation/

Entry requirements

HSC Mathematics Band 4 or equivalent. HSC Science subjects physics or chemistry; engineering studies or senior science; and information processes and technology, or equivalent, are recommended.

Introductory units and bridging courses are available for students without the recommended prior knowledge. Other units taken as part of a degree may require assumed knowledge, prerequisites or recommended studies. You should refer to the Macquarie University Handbook of Undergraduate Studies at www.handbook.mq.edu.au

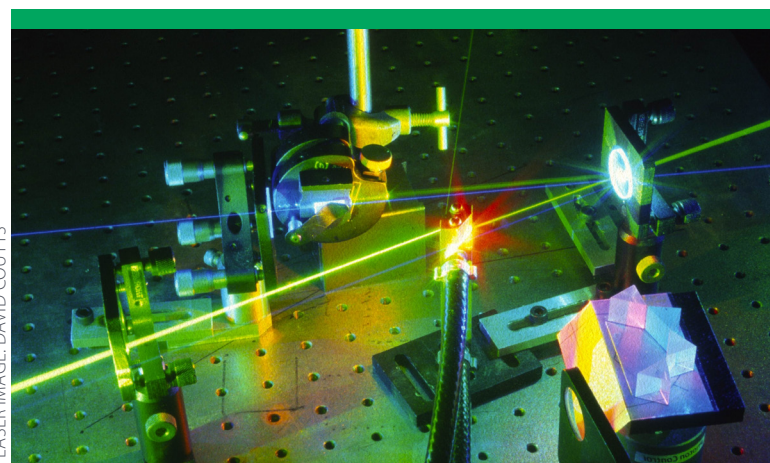
Career options

- Engineering
- High tech industry
- Management, education and training
- Research and postgraduate study
- Science research support/technical sales support
- Telecommunications

Research degrees in Photonics

Employers value graduates with honours and postgraduate degrees. Students with suitable academic performance are invited to enrol in a one year Honours program after they complete a Bachelor of Science major in Photonics. This program consists of 50% advanced coursework and 50% research thesis. Research projects vary from year to year. To view sample projects go to: www.physics.mq.edu.au/future/honours

The Department of Physics and Astronomy incorporating the MQ Photonics Research Centre and a node of the Australian Research Council Centre of Excellence and Centre for Ultrahigh Bandwidth Devices for Optical Systems (CUDOS), has an internationally renowned reputation in photonics. Many of our successful PhD and masters graduates are working both locally and internationally in academic, industrial and government positions.



LASER IMAGE: DAVID COUTTS



SUGGESTED PROGRAM OF STUDY

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Required and recommended units of study: Completion of a minimum of 68 credit points including the following **prescribed** and optional units. This major must be completed as part of a degree. The general requirements for the degree must be satisfied in order to graduate.

100 LEVEL

200 LEVEL

300 LEVEL

LEVEL		CODE	NAME	CREDIT POINTS SEMESTER 1	CREDIT POINTS SEMESTER 2
Required		PHYS140	Physics IA	3	
Required		PHYS143	Physics IB		3
Required	<i>either</i>	MATH135	Mathematics IA	3	
	<i>or</i>	MATH132	Mathematics IA (Advanced)	3	
Required	<i>either</i>	MATH136	Mathematics IB		3
	<i>or</i>	MATH133	Mathematics IB (Advanced)		3
<i>Recommended Additional Units: 3 of the following optional units</i>					
Optional		ELEC141	Digital Fundamentals	3	
Optional		ELEC170	Introduction to Electronic Systems	3	
Optional		CBMS101	Introductory Chemistry	3	
Optional		COMP125	Fundamentals of Computer Science		3
Required		PHYS201	Physics IIA	3	
Required		PHYS202	Physics IIB		3
Required		PHTN221	Introduction to Optical Science and Technology	3	
Required		MATH235	Mathematics IIA	3	
<i>Recommended Additional Units: 3 of the following optional units</i>					
Optional		ELEC270	Linear Circuits and Devices	3	
Optional		PHYS220	Scientific Modelling	3	
Optional		MATH236	Mathematics IIB		3
Optional		MATH232	Mathematical Techniques		3
Optional		ELEC260	Introduction to Mechatronics		3
Optional		ELEC241	Programmable Logic Design		3
Capstone		PHTN310	Industrial Project (Participation Unit)		3
Required		PHTN321	Optical and Photonic Devices and Systems 1	3	
Required		PHTN322	Optical and Photonic Devices and Systems 2		3
Required		PHYS301	Electromagnetism and Quantum Physics	3	
<i>Recommended Additional Units: 3 of the following optional units</i>					
Optional		PHYS303	Atomic and Solid State Physics	3	
Optional		PHYS306	Optical Physics		3
Optional		ISYS360	Technology Management	3	
Optional		ELEC321	Communications Systems		3
Required		PLANET UNIT			3
Required		PEOPLE UNIT			3
TOTAL CREDIT POINTS REQUIRED FOR THIS DEGREE				68	

Academic and Administrative Enquiries

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CRICOS Provider Number 00002J

Disclaimer: This publication is correct at time of printing, August 2011. Macquarie University reserves the right to change program details at any time and change its fees without notice.

Please note: This information is intended as a guide only and does not replace the Macquarie University Handbook of Undergraduate Studies. For full degree requirements you should refer to the Macquarie University Handbook of Undergraduate Studies at www.handbook.mq.edu.au
Offerings of units may change from year to year.