

# MECHANICAL ENGINEERING

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[www.eng.waikato.ac.nz](http://www.eng.waikato.ac.nz)

*The Mechanical Engineering programme combines papers in mechanical engineering, general engineering, science and mathematics, to give graduates a good balance between intellectual rigour and engineering practice. This prepares graduates typically for employment in industry and a wide range of other careers. During the first three years, the curriculum includes engineering design as a major theme. In the final year, students specialise into areas such as advanced product development and undertake a major design or laboratory-based project.*

This specified programme has full IPENZ accreditation, making the Bachelor of Engineering a nationally and internationally recognised degree.

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## CONTACTS FOR THE SCHOOL OF ENGINEERING

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<b>School Administrators</b>	Room: EG.04
Mary Dalbeth / Janine Williams	Phone: 07 838 4266 / 07 838 4026
	Email: <a href="mailto:engineering@waikato.ac.nz">engineering@waikato.ac.nz</a>
<b>Enrolment Contact Person &amp; First Year Mentor</b>	Room: EG.04C
Professor Janis Swan	Phone: 07 838 4049
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<b>Convenor</b>	Room: EF2.04
Dr Mike Duke	Phone: 07 838 4522
	Email: <a href="mailto:dukemd@waikato.ac.nz">dukemd@waikato.ac.nz</a>

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## Degree

This specified programme is available for the Bachelor of Engineering or Bachelor of Engineering (Honours) degrees.

# MECHANICAL ENGINEERING

## Programme Details

Structure of the Mechanical Engineering Programme								
YEAR 1	ENGG180 15 points	ENMP102 15 points	MATH101 15 points	MATH102 15 points	CHEM101 15 points	COMP103 15 points	ENEL111 15 points	PHYS103 15 points
	ENMP211 20 points	ENMP213 20 points	ENGG282 10 points ENMP282 10 points	ENGG283 10 points ENGG284 10 points	ENMP221 20 points	ENMP223 20 points	ENGG279 0 points	ENGG371 0 points
YEAR 3	ENGG285 10 points ENGG287 10 points	ENMP214 10 points ENMP215 10 points	ENME351 20 points	ENME352 20 points	ENME380 20 points	ENMP313 20 points	ENGG372 0 points	ENGG379 0 points
	ENME480 10 points * 10 points	ENGG381 20 points	*	DESIGN PROJECT ENGG482 OR ENGG492 60 points				

**Work Placement** – Work experience in an appropriate and approved industry or applied field (0 points).  
 **Design Project** – A major design project (60 points) is undertaken in Year 4.

### Year 1 – Papers are worth 15 points.

- » CHEM101A – Chemical Concepts
- » COMP103A/B – Introduction to Computer Science 1
- » ENEL111A – Introduction to Electronics
- » ENGG180A – Foundations of Engineering
- » ENMP102B – Introduction to Materials Science and Engineering
- » MATH101A/B/C/D – Introduction to Calculus
- » MATH102A/B/C/D – Introduction to Algebra
- » PHYS103B – Physics for Scientists and Engineers 1

### Year 2 – Papers are worth 20 points unless specified.

- » ENGG279B – Preparation for the Professional Workplace (0 points)
- » ENGG282B – Engineering Design (10 points)
- » ENGG283A – Linear Algebra for Engineers (10 points)
- » ENGG284B – Differential Equations for Engineers (10 points)
- » ENMP211A – Materials 1
- » ENMP213B – Mechanics of Materials 1
- » ENMP221A – Engineering Thermodynamics
- » ENMP223B – Thermofluids
- » ENMP282A – Science and Engineering Management A (10 points)
- » ENGG371C – Engineering Work Placement 1 (0 points)

**Year 3 – Papers are worth 20 points unless specified.**

- » ENGG285A – Multivariable Calculus for Engineers (10 points)
- » ENGG287A – Engineering Applications (10 points)
- » ENMP214B – Manufacturing Processes (10 points)
- » ENMP215B – Manufacturing Technology (10 points)
- » ENGG372C – Engineering Work Placement 2 (0 points)
- » ENGG379A – Reflection on Professional Workplace Experience (0 points)
- » ENME351A – Dynamics and Mechanisms
- » ENME352B – Machine Dynamics and Control
- » ENME380B – Mechanical Engineering Design
- » ENMP313A – Mechanics of Materials 2

**Year 4 – Papers are worth 20 points unless specified.**

- » (BE) ENGG482A/B/C/Y – Engineering Design and Management Project (60 points) or
- » (BE (Hons)) ENGG492A/B/C/Y – Honours Research and Management Project (60 points)
- » ENGG301C – Special Topics in Engineering
- » ENGG381A – Engineering Statistics
- » ENME480A – Advanced Product Development (10 points)

\*Choose a further 30 points from the following:

- » ENME440A – Computer Aided Engineering
- » ENME451A – Mechanics of Vibration (10 points)
- » ENMP311B – Materials 2
- » ENMP407A/B – Materials and Process Engineering Elective (10 points)
- » ENMP413B – Materials Performance in Service (10 points)
- » ENMP421A – Advanced Process Engineering and Control (10 points)

**Note(s):** For descriptions of individual papers refer to the following subjects: CHEM Chemistry; ENEL Electronics; ENGG Engineering; ENMP Materials & Processing; ENME Materials & Processing; PHYS Physics. For descriptions of papers with subject codes COMP, MATH or STATS, refer to the *Computing & Mathematical Sciences Handbook* or the *University Calendar*.

# PHYSICS

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*Physics involves understanding the basic principles by which all things in the universe exist and operate, and is the foundation of other scientific disciplines. It is also the natural basis of all the technology disciplines such as electronics, engineering and computer science, which were pioneered by physicists.*

## CONTACTS FOR PHYSICS

Physics is administered by the School of Engineering.

<b>School Administrators</b>	Room: EG.04
Mary Dalbeth / Janine Williams	Phone: 07 838 4266 / 07 838 4026
	Email: <a href="mailto:physics@waikato.ac.nz">physics@waikato.ac.nz</a>
<b>Enrolment Contact Person</b>	Room: DE2.01
Associate Professor Alistair Steyn-Ross	Phone: 07 838 4340
	Email: <a href="mailto:asr@waikato.ac.nz">asr@waikato.ac.nz</a>

## Degrees

Physics is available as a major subject for the Bachelor of Science or Bachelor of Science (Technology) degrees. The Faculty offers papers at all levels of study from pre-degree and undergraduate degrees through to postgraduate and doctoral studies.

## Physics Major

### General Structure of a Physics Major for the BSc and BSc(Tech) degrees

<b>100 LEVEL</b>	ENEL111 15 points	PHYS103 15 points	MATH101 15 points	<b>100 Level</b> – Prerequisites: ENEL111 Introduction to Electronics, PHYS103 Physics for Scientists and Engineers, MATH101 Introduction to Calculus.
<b>200 LEVEL</b>	PHYS204 20 points	PHYS206 10 points ENEL284 10 points	PHYS205 10 points ENEL285 10 points	
<b>300 LEVEL</b>	PHYS301 20 points	* 20 points	* 20 points	

**200 Level** – PHYS204 Experimental Physics and Instrumentation, PHYS205 Statistical and Thermal Physics, PHYS206 Relativity, Nuclear and Astrophysics, ENEL284 Electricity and Magnetism, ENEL285 Quantum and Solid State Physics.

**300 Level** – PHYS301 Biophysics. \*Choose 40 points from 300 Level Physics papers. Recommended: PHYS302 Quantum Physics, PYSH315 Computational Biophysics, or any ENEL paper at 300 Level.