Our changing world creates new opportunities and faces new challenges every day. At Waikato, we're leading the way with an innovative approach to education that is supported by world-renowned experts and is producing successful graduates across all Engineering disciplines.

Check out some of the top reasons that make Waikato a great place to study Engineering:

**In 2018**

$17,500 worth of Engineering Scholarships were given out

**WORLD LEADING RESEARCHERS**

in biomedical innovation, sustainable industry, agriculture, 3D imaging and titanium alloys

**Build a Formula SAE CAR**

with WESMO

**60 OVER UNIVERSITY PARTNERS**

around the world. Take part in an exchange and see the world while you study.

**Specialized LARGE SCALE LAB**

complex dedicated to ENGINEERING teaching and research

**OVER 220 INTERNATIONAL SCHOOL STUDENTS**

from more than 50 countries

**EXCITING WORK PLACEMENT**

opportunities with our Co-operative Education Unit
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNDERGRADUATE STUDY</td>
<td></td>
</tr>
<tr>
<td>Overview of Qualifications</td>
<td>12</td>
</tr>
<tr>
<td>Certificates and Diplomas</td>
<td>16</td>
</tr>
<tr>
<td>General Entry Requirements (Bachelors Degrees)</td>
<td>18</td>
</tr>
<tr>
<td>Chemical and Biological Engineering</td>
<td>20</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>22</td>
</tr>
<tr>
<td>Electronic Engineering</td>
<td>24</td>
</tr>
<tr>
<td>Environmental Engineering</td>
<td>26</td>
</tr>
<tr>
<td>Materials and Process Engineering</td>
<td>28</td>
</tr>
<tr>
<td>Mechanical Engineering</td>
<td>30</td>
</tr>
<tr>
<td>Software Engineering</td>
<td>32</td>
</tr>
<tr>
<td>BE(Hons) Tauranga Campus</td>
<td>34</td>
</tr>
<tr>
<td>PAPERS</td>
<td></td>
</tr>
<tr>
<td>General Engineering Papers</td>
<td>37</td>
</tr>
<tr>
<td>Chemical and Biological Engineering Papers</td>
<td>43</td>
</tr>
<tr>
<td>Civil Engineering Papers</td>
<td>46</td>
</tr>
<tr>
<td>Electronic Engineering Papers</td>
<td>49</td>
</tr>
<tr>
<td>Environmental Engineering Papers</td>
<td>53</td>
</tr>
<tr>
<td>Materials and Process Engineering Papers</td>
<td>54</td>
</tr>
<tr>
<td>Mechanical Engineering Papers</td>
<td>56</td>
</tr>
<tr>
<td>Software Engineering Papers</td>
<td>59</td>
</tr>
<tr>
<td>GRADUATE STUDY</td>
<td></td>
</tr>
<tr>
<td>Introduction</td>
<td>64</td>
</tr>
<tr>
<td>Graduate and Postgraduate Qualifications</td>
<td>65</td>
</tr>
<tr>
<td>Masters Qualifications</td>
<td>67</td>
</tr>
<tr>
<td>Subject Areas within Engineering</td>
<td>78</td>
</tr>
<tr>
<td>Higher Research Degrees</td>
<td>79</td>
</tr>
<tr>
<td>Academic Staff</td>
<td>82</td>
</tr>
</tbody>
</table>
The information contained in this handbook is correct at the time of printing. However, it is subject to a continuous process of review and improvement. A new handbook is produced every year and students should use the latest handbook available. The handbook can also be downloaded from sci.waikato.ac.nz/student-resources. The University’s document of authority for information contained in this handbook is the 2019 University of Waikato Calendar.

Please note: This handbook contains information for new students starting in 2019 only. If you are a current student (enrolled before 2019), please consult with the Undergraduate or Postgraduate Advisor, or the Programme Convenor.
Kia Ora and welcome to University of Waikato School of Engineering. I would like to congratulate you on choosing a qualification in engineering that can provide you with an interesting and very rewarding career. You have chosen to be taught by some of the world’s leading engineering practitioners and researchers who can open your eyes to the science and art of chemical engineering, mechanical engineering, mechatronics, environmental engineering, civil engineering, electronic engineering, product design and materials science.

You will attend undergraduate labs where you will hone your skills, as well as have the opportunity to be involved in practical research projects. Some of our students in the past have worked on some impressive projects including: developing innovative robots for fruit picking, intelligent sensors for in-flight detection, prosthetic limbs for amputees, bioreactors for waste processing and energy saving devices. The opportunities for you are limitless if you are willing to work hard. With our programmes you will be equipped with the skills to learn independently and think critically, whilst having many options to get involved with some exciting projects.

Professor Mark Dyer
DEAN OF ENGINEERING
KEY ENROLMENT CONTACTS

FACULTY REGISTRAR
Hannah Te Puia
Room: F.G.06
Email: hannah.tepuia@waikato.ac.nz

ADMINISTRATOR
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STUDENT SUPPORT COORDINATOR
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Email: rewa.gilbert@waikato.ac.nz

ASSOCIATE DEAN (TEACHING & LEARNING)
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Email: alison.campbell@waikato.ac.nz

ASSOCIATE DEAN (POSTGRADUATE)
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Room: G.2.17
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COOPERATIVE EDUCATION UNIT DIRECTOR
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Email: karsten.zegwaard@waikato.ac.nz

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Email: rosie.campbell@waikato.ac.nz

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Email: michelle.earney@waikato.ac.nz

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Email: rob.torrens@waikato.ac.nz

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Email: james.carson@waikato.ac.nz

SCHOOL ADMINISTRATOR
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Email: mary.dalbeth@waikato.ac.nz

SCHOOL ADMINISTRATOR
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Room: E.2.07
Email: natalie.shaw@waikato.ac.nz
UNIVERSITY TERMINOLOGY

100, 200, 300, 500 LEVELS
These refer to the different levels at which papers are taught and are usually associated with years of study. First year (100 level) papers are more general while fourth year (500 level) papers are more advanced.

BACHELORS DEGREE
This is a first degree. It is sometimes also called an undergraduate degree. It takes a minimum of three years of full-time study to complete. The BE(Hons) usually takes four years to complete.

CALENDAR
The University’s official record of rules and regulations, staff, papers, dates, etc. It is available online at calendar.waikato.ac.nz.

COREQUISITES
Corequisites are papers that are complementary to each other. While the knowledge gained from one paper is not required to take the other, students are required to complete both papers.

COMPULSORY PAPER
These are papers that are required by a particular degree and must be completed to gain a degree.

DEGREE
A degree is a structured course of study in a particular area such as science or management. Each degree has a different structure with a set number of papers (or courses) at different levels. To complete a degree, a student must take the papers required for that degree.

EFTS
EFTS stands for Equivalent Full-time Student. This relates directly to points –120 points equate to one EFTS. StudyLink uses this information when looking at your Student Loan and Student Allowance eligibility.

ELECTIVE
Students may have room in their degree to take papers outside of their major. These can be chosen from almost any subject at Waikato.

GRADUATE
A person who has been awarded a university degree.

GRADUATE QUALIFICATIONS
Students who have successfully completed an undergraduate qualification may be eligible to take a graduate qualification. Graduate qualifications include the Master of Engineering, Master of Engineering Practice, Graduate Diplomas and Postgraduate Diplomas.
LECTURES, LABS AND TUTORIALS
Lectures start in the first week of term and are detailed in the University’s Catalogue of Paper Offerings and Timetable. Laboratory sessions normally start in the first or second week of teaching. Lab sessions for first-year students are normally assigned by the School Office prior to the start of the first week of A Semester. You can select your tutorial times during the first week of teaching from a list of options included in the timetable and available at the first lecture.

MAJOR
This is the main subject of your degree. To major in a subject, it must be studied to an advanced level.

PAPER
A paper is a series of lectures, tutorials and assessment tasks that relate to a specific topic.

POINTS
Degree requirements are expressed in terms of points (e.g. a four-year degree generally requires 480 points). Points bear a direct relationship to workload: one point equates to approximately 10 hours’ total work; so a student might expect to spend about 150 hours on 15-point papers.

PREREQUISITES
Some papers build upon the knowledge gained in earlier papers. Because of this, it is necessary to take these earlier papers first. Papers that must be taken before you can progress to other papers are known as prerequisites for the later papers.

PROGRAMME
A set of compulsory papers that meet the requirements of a professional degree, e.g. BE(Hons).

RESTRICTION
A restriction against a paper means you cannot do that paper if you have done a paper with similar content, e.g. ENGEN112 is restricted against ENMP102.

ROOM NUMBERS
A numbering system applies to every building on campus. For example, FG.G.04: FG = ‘FG’ block, G = Floor level ‘ground’, 04 = Room number ‘04’.

UNDERGRADUATE
A person who is studying at university for a first degree is known as an undergraduate.
**PAPER CODES EXPLAINED**

Each paper code contains information regarding the subject, the level, the year, the semester, and teaching location.

**ENGINEERING PAPER CODES**

Descriptions of papers with the following subject codes are listed in this handbook.

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Description</th>
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<tbody>
<tr>
<td>ENGCB</td>
<td>Chemical and Biological Engineering</td>
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<tr>
<td>ENGCV</td>
<td>Civil Engineering</td>
</tr>
<tr>
<td>ENGEE</td>
<td>Electronic Engineering</td>
</tr>
<tr>
<td>ENGEV</td>
<td>Environmental Engineering</td>
</tr>
<tr>
<td>ENGEN</td>
<td>Engineering</td>
</tr>
<tr>
<td>ENGMP</td>
<td>Materials and Processing Engineering</td>
</tr>
<tr>
<td>ENGME</td>
<td>Mechanical Engineering</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEMY</td>
<td>Chemistry</td>
</tr>
<tr>
<td>COMPX</td>
<td>Computer Science</td>
</tr>
<tr>
<td>EARTH</td>
<td>Earth Sciences</td>
</tr>
<tr>
<td>MATHS</td>
<td>Mathematics</td>
</tr>
<tr>
<td>PHYSIC</td>
<td>Physics</td>
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<td>STATS</td>
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**SEMESTER INDICATORS**

<table>
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<tr>
<th>Indicator</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>A Semester: February – June</td>
</tr>
<tr>
<td>B</td>
<td>B Semester: July – November</td>
</tr>
<tr>
<td>C</td>
<td>An atypical teaching period</td>
</tr>
<tr>
<td>S</td>
<td>Summer School 1: January – February</td>
</tr>
<tr>
<td>T</td>
<td>Summer School 2: November – December</td>
</tr>
<tr>
<td>Y</td>
<td>Full year: February – October</td>
</tr>
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**LOCATION INDICATORS**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAM</td>
<td>Papers taught in Hamilton</td>
</tr>
<tr>
<td>TGA</td>
<td>Papers taught in Tauranga</td>
</tr>
<tr>
<td>NET</td>
<td>Papers taught online</td>
</tr>
</tbody>
</table>
HELP AND ADVICE

HOW DO I CHECK WHAT I AM ENROLLED IN?
You are responsible for your programme of study and choices at enrolment. You should keep copies of any information that the University sends you confirming your enrolment status and the papers you are enrolled in. You can access your current enrolment information through My Waikato at my.waikato.ac.nz.
You can also visit the FG Link reception in FG.G.04.

CHECK YOUR TIMETABLE
Engineering papers normally involve attending lectures, tutorials and laboratory work. Timetable clashes can occur between papers from different subject areas, or between papers at different levels.
You are required to attend all lectures and you will not usually be permitted to take papers that have more than one lecture clash per semester. Lectures in the School of Engineering are recorded with Panopto to make it easier to accommodate students who may have a lecture clash.
There are often several streams for laboratories, so laboratory clashes can usually be resolved. If you have a laboratory clash, you should initially contact the convenor of the papers concerned.
You can check your timetable at timetable.waikato.ac.nz.
If you want to change your papers after you have paid your fees (i.e. after you become officially enrolled), you can apply to do a “change of enrolment” on MyWaikato at my.waikato.ac.nz.

CHANGING PAPERS
Withdrawals must be made by the required date to obtain a fees refund. You can add or withdraw from an industry paper or any C Semester paper with a full fees refund at any time before those papers begin.
Withdrawals on medical or compassionate grounds may be made after these periods, and fees may be refunded on a pro-rata basis. Some conditions apply, and you should consult with the Faculty Registrar by calling 0800 438 254 or by dropping into the School of Engineering office.
FREQUENTLY ASKED QUESTIONS

WHAT PAPERS SHOULD I TAKE?
The answer to this question depends on a lot of things - what programmes you are taking, which qualification you’re enrolled in, how far through the qualification you are, amongst other things. The best thing to do is to make an appointment for personal enrolment advice with the School Office staff by calling them on 07 838 4625, calling in to FG.G.04 or by emailing science@waikato.ac.nz.

WHERE CAN I GET SUBJECT SPECIFIC ADVICE?
You can make an appointment with the relevant subject contact of your programme listed in this handbook.

HOW DO I CHANGE MY PAPERS AFTER I AM ENROLLED?
You need to complete and submit a Change of Enrolment application online through your MyWaikato account click on 'change enrolment' then follow the steps onscreen. If you do wish to change your papers, you have until the end of the first week of classes (for S or T semester papers) and until the end of the second week of classes (for A, B and Y Semester papers) to apply to change your papers.

WHERE DO I GET A LAB COAT IF I NEED ONE?
Lab coats can be purchased by paying the prescribed fee (currently $58.00) at the Fees Office in the Student Centre at the Library, and then taking your receipt to collect your lab coat from the Science Store, which is located on the Ground Floor of F block.
Alternatively, you can purchase a second-hand lab coat for a reasonable price at Apparel Master, 10 Main Street, off Sunshine Ave, Te Rapa.

WHAT DO I DO IF I HAVE MISSED A LAB?
You should try to attend another lab stream that week, wherever possible. You will be expected to provide a reason why you missed a lab, so if your absence was due to illness, on your first day back on campus you should immediately see the paper coordinator to discuss your options and any work you have missed. You may be asked to provide a medical certificate.

HOW DO I GET AFTER HOURS ACCESS TO THE COMPUTER LABS?
You need to complete the required form at the School of Engineering office. The School Administrators will be able to advise you further on the process.

HOW DO I ENSURE RE-ENTRY INTO MY DEGREE IN THE FOLLOWING YEAR?
You should aim to get the best possible grades you can, but if you are struggling at all, then it is best to try and gain a clear pass with a C grade or in better in all your papers. The absolute minimum you need to be automatically eligible for re-entry is unrestricted passes (ie; C- grades or better) in papers worth at least half of the total points you are enrolled in for the year.
UNDERGRADUATE STUDY
OVERVIEW OF QUALIFICATIONS

BACHELOR OF ENGINEERING WITH HONOURS (BE(HONS))

The Bachelor of Engineering with Honours (BE(Hons)) focuses on how problems can be solved by using design and engineering processes.

Four-year degree with programmes in:
- Chemical and Biological Engineering
- Civil Engineering
- Electronic Engineering
- Environmental Engineering
- Materials and Process Engineering
- Mechanical Engineering
- Software Engineering (School of Computing & Mathematical Sciences)

![Diagram of course structure]

**KEY**
- Compulsory
- Placement
- Stream
- Programme Elective
- Project Paper
IF YOU WANT TO LEAD THE WAY IN INNOVATION, IMPROVE INFRASTRUCTURE, BUILD SMARTER TECHNOLOGIES AND FIND ALTERNATIVE ENERGY SOLUTIONS, A WAIKATO BACHELOR OF ENGINEERING WITH HONOURS WILL HELP YOU ACHIEVE JUST THAT.

New Zealand needs more professional engineers working in the economy. Currently, fewer than 1,000 professional engineers graduate each year. Countries with similar populations to New Zealand have more than double that number of engineering graduates. Increasing the number of trained engineers and getting them working in New Zealand businesses is seen as essential for New Zealand’s growth in technology-related enterprises.

Close links with New Zealand industry ensures our graduates are work ready and can apply engineering skills and scientific knowledge to solve real world, industrial and societal problems. Waikato’s BE(Hons) encourages creative thinking and problem solving in all students using design and engineering processes from year one.

If you are good at mathematics and physics, are a highly creative thinker and enjoy making things, the BE(Hons) will appeal to you. At every stage of the degree, you’ll be deeply involved in creating, designing and realising sophisticated engineering products. Studying engineering at Waikato offers you a future-proofed education with project-based learning that will put you at the top of your game for a career in engineering.

By the end of your degree you will have worked in teams, managed your own projects, worked with budgets and spent significant time working within the industry. Our BE(Hons) programmes are accredited by Engineering New Zealand (formerly known as the Institute of Professional Engineers New Zealand (IPENZ)), meaning they are professionally recognised in a wide range of countries and regions around the world including Australia, Canada, the UK, Japan, Singapore and the USA.

DEGREE LENGTH
The BE(Hons) requires four years of full-time study, plus six months work experience.

REQUIREMENTS
• 480 points from 100, 200, 300 and 500 level papers.
• Complete the requirements of one of the specified engineering programmes, which includes 800 hours of work experience during Summer School.
DIPLOMA OF ENGINEERING PROFESSIONAL PRACTICE (DIPEPP)

FOCUS ON THE PRACTICE OF BEING A PROFESSIONAL ENGINEER AND GAIN GRADUATE LEVEL EDUCATION, SKILLS AND EXPERTISE IN COMMERCE, MANAGEMENT AND LEADERSHIP ALONGSIDE THE RELEVANT BE(HONS) PROFESSIONAL WORK EXPERIENCE.

The Diploma of Engineering Professional Practice (DipEPP) is a new and additional qualification available to BE(Hons) students to enhance their degree and gain a competitive edge over other engineering graduates.

The DipEPP includes the 800 hours of required relevant work experience of the BE(Hons) degree and equips graduates with business management and leadership skills in preparation for rapid progression into management and leadership positions. The DipEPP work placement papers are points-bearing and offer enhanced work experience and learning in business studies over the standard BE(Hons) work placements.

Students will need to decide during their second year of BE(Hons) study whether to proceed with the DipEPP or the standard work placement path. Most students will complete the Diploma at the end of their fourth year or the end of the summer of their fourth year, while some may opt to take one or both management papers in Semester A of their fifth year.

For more information visit waikato.ac.nz/go/DipEPP.

BACHELOR OF ENGINEERING WITH HONOURS (BE(HONS)) & DIPLOMA OF ENGINEERING PROFESSIONAL PRACTICE (DIPEPP).

<table>
<thead>
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<th>Year</th>
<th>ENGEN170</th>
<th>ENGEN180</th>
<th>ENGEN183</th>
<th>ENGEN184</th>
<th>ENGEN103</th>
<th>ENGEN112</th>
<th>Stream</th>
<th>Programme Elective</th>
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<td>Y3</td>
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<td></td>
<td></td>
<td></td>
<td>Research and Design Projects</td>
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</tr>
</tbody>
</table>

**KEY**
- Compulsory
- Placement
- Stream
- Programme Elective
- Project Paper
**MANAGEMENT ELECTIVE PAPERS**

**LIST A - Choose 1 paper**
- EXMBM511 People in Organisations
- EXMBM512 Leadership and Change Management
- EXMBM513 Sustainability and Responsible Management
- EXMBM532 Managing Innovation and Value Creation

**LIST B - Choose 1 paper**
- EXMBM514 Economics and Global Context
- EXMBM521 Managing Strategically
- EXMBM522 Marketing Strategy
- EXMBM523 Digital Business and Supply Chain Management
- EXMBM524 Financial Analysis and Performance

---

**CONTACTS FOR DIPEPP**

**COOPERATIVE EDUCATION UNIT DIRECTOR**
Dr Karsten Zegwaard
Room: E.G.16A  Phone: 07 838 4892
Email: karsten@waikato.ac.nz

**SCHOOL OF ENGINEERING OFFICE**
Room: E.2.07  Phone: 07 838 4266
Email: engineering@waikato.ac.nz
CERTIFICATES AND DIPLOMAS

WHO ARE DIPLOMAS AND CERTIFICATES SUITABLE FOR?
• Students who want an introductory programme in one of our subjects.
• Students with no background in their chosen area of study, although a diploma is suitable for those with some background or relevant experience in an area of study.
• Students who want to work towards a degree programme part-time, or who would like to work through a degree programme in stages.

CERTIFICATE
A Certificate is equivalent to the first year of study of a bachelors degree. It’s a great way to gain an introductory qualification in a particular field. Candidates must complete 120 points at 100 level or above.

CERTIFICATE (SCIENCE) PLANNER 1 year 120 points

| 100 level | 100 level | 100 level | 100 level | 100 level | 100 level | 100 level or above | 100 level or above |

DIPLOMAS
A diploma is equivalent to the second year of study of a bachelor’s degree. A diploma is a good way to gain an introductory qualification in a particular field, and is slightly more comprehensive than a certificate programme.

DIPLOMA (SCIENCE) PLANNER 1 year 120 points

| 200 level | 200 level | 200 level | 200 level | 200 level or above | 100 level or above | 100 level or above | 100 level or above |

KEY

Compulsory  
Elective paper
THE STUDENT CENTRE
The Student Information Centre, The University of Waikato, Private Bag 3105, Hamilton 3240, New Zealand
Phone  +64 7 838 4176 or 0800 WAIKATO (0800 924 528)
Fax  +64 7 838 4370
GENERAL ENTRY REQUIREMENTS (BACHELORS DEGREES)

There are several ways you can gain admission to study at The University of Waikato: University Entrance, Admission at Entrance Level or with credit from previous study, Discretionary Entrance and Special Admission. Some first-year papers may have specific prerequisites, so check the paper catalogue (papers.waikato.ac.nz) carefully. If you do not meet the prerequisites, contact recruitment@waikato.ac.nz as there may be other pathways you can take.

If you gain University Entrance through NCEA, you are eligible to apply to enrol in the BE(Hons) as long as you also meet the specific Engineering requirements (see page 19).

<table>
<thead>
<tr>
<th>Numeracy Level 1 or higher:</th>
<th>10 credits from specified achievement standards available through a range of subjects OR from a package of three numeracy unit standards (26623, 26626, 26627 – all three required)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Literacy Level 2 or higher:</td>
<td>5 reading credits AND 5 writing credits from the specified list. The credits can come from a range of subjects. For more information go to waikato.ac.nz/go/UEliteracy</td>
</tr>
<tr>
<td>Level 3:</td>
<td>14 credits in one approved subject 14 credits in a second approved subject 14 credits in a third approved subject</td>
</tr>
<tr>
<td>Achieve NCEA Level 3 Certificate (60 credits at Level 3 or above and 20 credits from Level 2 or above)</td>
<td></td>
</tr>
<tr>
<td>University Entrance from NCEA</td>
<td></td>
</tr>
</tbody>
</table>
GENERAL ENTRY REQUIREMENTS
(BACHELORS DEGREES)

CIVIL ENGINEERING, ELECTRONIC ENGINEERING AND MECHANICAL ENGINEERING
You must gain University Entrance, including a minimum of 16 credits in NCEA at level 3 in Calculus (from standards 3.1, 3.2, 3.3, 3.5, 3.6, 3.7, or 3.15), and 14 credits in Physics at level 3.

CHEMICAL AND BIOLOGICAL ENGINEERING, ENVIRONMENTAL ENGINEERING AND MATERIALS AND PROCESS ENGINEERING
You must gain University Entrance, including a minimum of 16 credits in NCEA at level 3 in Calculus (from standards 3.1, 3.2, 3.3, 3.5, 3.6, 3.7, or 3.15), and at least 16 credits in Chemistry and 14 credits in Physics at level 3.

SOFTWARE ENGINEERING
You must gain University Entrance, including a minimum of 16 credits in NCEA at level 3 in Calculus (from standards 3.1, 3.2, 3.3, 3.5, 3.6, 3.7, or 3.15) and at least 14 credits in NCEA at level 3 in two other approved subjects.

CAMBRIDGE INTERNATIONAL EXAMINATIONS (CIE) STANDARD RECOGNISED BY UNIVERSITIES NEW ZEALAND
PART A: A minimum of 120 points on the UCAS Tariff at A or AS level other than the General Paper, including at least three subjects (other than Thinking Skills) in which no grade is lower than D.
PART B: Literacy: An E grade or better in any one of AS English Language, Language and Literature in English, Literature in English. A D grade or better will satisfy one of the subject requirements of Part A; or as prescribed for University Entrance with NCEA.
NUMERACY: Either a D grade or better in IGCSE or GCSE mathematics, or any mathematics passed at AS level. A D grade or better will satisfy one of the subject requirements of Part A; or as prescribed for University Entrance with NCEA.

INTERNATIONAL BACCALAUREATE (IB) STANDARD RECOGNISED BY UNIVERSITIES NEW ZEALAND
Award of the full IB Diploma (24 points or higher).

UNIVERSITY ENTRANCE FROM BURSARY
Three C grades or higher in the New Zealand University Entrance Bursaries and Scholarships examinations (NZUEBS) plus Higher School Certificate (HSC).

ADMISSION AT ENTRANCE LEVEL OR WITH CREDIT FROM PREVIOUS STUDY
New Zealand citizens and permanent residents who have studied overseas at secondary school or at tertiary level (in New Zealand or overseas) should apply for admission at Entrance level. We will assess your study to determine whether it is an acceptable equivalent to the New Zealand University Entrance qualification. Students who successfully complete the Certificate of University Preparation are eligible for admission at Entrance Level.

SPECIAL ADMISSION
STUDENTS AGED 20 AND OVER
If you left school without University Entrance and will be 20 years of age or over by the first day of the semester in which you are applying to enrol, you may be eligible for special admission.
CHEMICAL AND BIOLOGICAL ENGINEERING

CHEMICAL AND BIOLOGICAL ENGINEERING Focuses on solutions that assist our society to sustain good health, provide sufficient food, supply clean water and produce sustainable energy and materials.

Chemical and Biological Engineering uses process engineering, science, maths and economic principles to transform chemical and biological materials into high value products and services, in a safe and cost-effective way.

Chemical and biological engineers are ‘think big’ professionals who work in cooperation with others to bring about the large-scale benefits of advances in chemistry, biotechnology, environmental and materials to solve the world’s sustainability challenges.

As a chemical and biological engineer, you can play a vital role in the creation and production of new medicines, nutritious foods, novel materials, new energy systems, better waste treatment methods and a sustainable global future.

This programme has full Engineering New Zealand accreditation, meaning it is nationally and internationally recognised. It offers growing employment opportunities, with a high salary and excellent prospects of progress into management.

CAREER OPPORTUNITIES

• Chemical Engineer
• Biological Engineer
• Agricultural Engineer
• Process Engineer
• Biomedical Engineer
• Nuclear Engineer
• Sustainability Engineer

SALARY EXPECTATIONS*

Graduate engineers in the fields mentioned above usually earn $45 - $75K per year.
Senior engineers in the fields mentioned above usually earn $100 - $120K per year.
Consulting engineers and management usually earn > $120K per year.

*Sourced from www.careers.govt.nz
PROGRAMME ELECTIVE PAPERS

YEAR 1 - Choose 1 paper
BIOMO101B Molecular and Cellular Biology
CHEMY101A Structure and Spectroscopy
EARTH101A Introduction to Earth System Sciences
EARTH102B Discovering Planet Earth
ENGEN110B Engineering Mechanics
ENGEN111A/T Electricity and Electronics
PHYSIC101 Physics for Engineers and Scientists

YEAR 3 - Choose 1 paper
BIOMOXXX A/B Any BIOMO 200/300 level paper
CHEMYXXX A/B Any Chemistry 200/300 level paper
EARTHXXX A/B Any Earth Science 200/300 level paper
ENGEN390 A/B/C/D/Y Special Topics in Engineering 1
ENGEV341B Environmental Engineering 2
ENGENMP311B Materials 2

YEAR 2 - Choose 1 paper
BIOMO201A Biochemistry
CHEMY2XX A/B Any Chemistry level 200 paper
EARTH2XX A/B Any Earth Science level 200 paper
ENGENMP213A Mechanics of Materials 1

YEAR 4 - Choose 2 papers
ENGENMP311B Materials 2
ENGENMP313B Mechanics of Materials 2
ENGENV341B Environmental Engineering 2
ENGENMP391 A/B/C/D/Y Special Topics in Engineering 2
ENGENCB523B Advanced Energy Engineering
ENGENCB527A Advanced Biological Engineering
ENGENMP511A Advanced Materials Properties and Performance
ENGENMP512A Advanced Materials Manufacture
ENGENMP513B Materials Performance in Service
ENGENME580A Product Innovation and Development
ENGENV541 Advanced Water & Wastewater
ENGENV542 Waste Minimisation Engineering

CONTACTS FOR CHEMICAL AND BIOLOGICAL ENGINEERING

UNDERGRADUATE STUDY ADVISOR
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CONVENOR
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CIVIL ENGINEERING

CIVIL ENGINEERING AT WAIKATO WILL EQUIP YOU WITH THE PRACTICAL AND THEORETICAL SKILLS TO HELP CREATE, IMPROVE AND PROTECT OUR BUILT AND NATURAL ENVIRONMENTS. NEW ZEALAND FACES INCREASING CIVIL ENGINEERING AND INFRASTRUCTURE CHALLENGES.

Civil engineers play a key role in shaping our societies future, having the knowledge and skills to address those challenges in urban and rural infrastructure. This includes construction, earthquake proofing, energy recovery, water and waste management, power generation, road networks, transport management, agriculture and forestry development.

Civil Engineering at Waikato is multi-dimensional, having a strong technical focus but also an emphasis on the development of team working skills, knowledge of ethics and an awareness of the social and environmental impacts of their work.

Great civil engineers are so much more than just their technical skills. That’s why our civil engineering degree program aims to produce highly skilled engineers who are problem solvers, ready for life, ready for work, and ready for the world. To do this, we offer a range of papers from engineering mechanics to Water Engineering to help our students become well-rounded engineers with hands on experience of building solutions in the lab and gaining industrial experience.

CAREER OPPORTUNITIES

- Civil Engineer
- Structural Engineer
- Geotechnical Engineer
- Transport Engineer
- Coastal and Marine Engineer
- Water Resource Engineer
- Construction Engineer and Manager
- Water Resource Engineer
- Government and Urban Planning Engineer
- Compliance Officer
- Project Management
- Consultancy

SALARY EXPECTATIONS*

Graduate engineers in the above mentioned fields usually earn $45 - $75K per year.
Senior engineers in the above mentioned fields usually earn $100 - $120K per year.
Consulting engineers and management usually earn > $120K per year.

*Sourced from www.careers.govt.nz
Y1 ENGEN170 ENGEN180 ENGEN183 ENGEN184 ENGEN103 ENGEN112 ENGEN110 Programme Elective
Y2 ENGEN270 ENGCV280 ENGEN201 ENGCV212 ENGCV223 ENGCV231 ENGCV251 ENGCV241 ENGEN271 Engineering Work Placement 1
Y3 ENGEV342 ENGCV380 ENGEN301 ENGCV312 ENGCV323 ENGCV331 ENGCV351 ENGEV341 ENGEN371 Engineering Work Placement 2
Y4 ENGEN570 ENGEN581 Civil Design Challenge 3 ENGCV580 Programme Elective

**KEY**

- **Compulsory**
- **Placement**
- **Stream**
- **Programme Elective**
- **Project Paper**

**PROGRAMME ELECTIVE PAPERS**

**YEAR 1 - Choose 1 paper**
- CHEMY1XX A/B: Any Chemistry 100 level paper
- EARTH102 B: Discovering Planet Earth
- ENGEN111 A: Electricity and Electronics

**YEAR 4 - Choose 2 papers**
- ENGCV512 A: Advanced Structural Design
- ENGCV513 B: Earthquake Engineering and Design
- ENGCV531 B: Advanced Geotechnical Engineering
- ENGEV541: Water and Waste Water Engineering
- ENGEV542: Waste Minimisation Engineering
- ENGME540 A: Finite Element Analysis
- ENGEN585 A/B/C/D: Special Topics in Engineering 5

**CONTACTS FOR CIVIL ENGINEERING**

**UNDERGRADUATE STUDY ADVISOR**
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**CONVENOR**
Dr Graeme Glasgow
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Email: graeme.glasgow@waikato.ac.nz
ELECTRONIC ENGINEERING

ELECTRONIC ENGINEERING FOCUSES ON THE DESIGN, DEVELOPMENT, MANUFACTURE AND APPLICATION OF ELECTRONIC DEVICES, CIRCUITS AND SYSTEMS. THE WORK OF ELECTRONIC ENGINEERS IS ESSENTIAL TO OUR SOCIAL, BUSINESS AND INDUSTRIAL LIVES. NEW ZEALAND’S HIGH TECH SECTOR, WHICH INCLUDES ELECTRONICS, IS ONE OF THE FASTEST-GROWING SECTORS IN THE COUNTRY.

Electronic engineers design, build and maintain many of the latest technologies that society relies on. Students in this programme learn how to analyse, design and build electronic circuits; program embedded microcontrollers; and build devices to sense and control factory machines, fluid flows, vehicles and other applications.

There is a global shortage of electronic engineers, and the New Zealand Government has set a priority to expand the high tech manufacturing sector. When you graduate you will be in demand by employers looking for capable graduates with the practical experience and robust engineering and design skills you will gain at Waikato.

This programme has full Engineering New Zealand accreditation, meaning it is nationally and internationally recognised. This offers great and growing employment opportunities, with a high salary and excellent prospects of progress into management.

CAREER OPPORTUNITIES
• Electronic Engineer
• Mechatronic Engineer
• Product Design Engineer
• Network Engineer
• Control and Instrumentation Engineer
• Broadcast Engineer
• IT Consultant
• Manufacturing Manager
• Product Designer
• Programmer
• Project Manager
• Systems Analyst

SALARY EXPECTATIONS*
Graduate engineers in the above mentioned fields usually earn $50 - $60K per year.
Senior engineers in the above mentioned fields usually earn $80 - $120K per year.
Business engineering management usually earn > $120K per year.

*Sourced from www.careers.govt.nz
PROGRAMME ELECTIVE PAPERS

YEAR 1 - Choose 1 paper

BIOEB101 A  Concepts of Biology
BIOMO101 B  Molecular and Cellular Biology
CHEMY1XX A/B  Any Chemistry 100 level paper
COMPX102 B/S  Object-Oriented Programming
ECONS102 B  Economics and Society
ENGEN110 B  Engineering Mechanics
PHYSC101  Physics for Engineers and Scientists

YEAR 3 - Choose 2 of:

ENGEE334 A  Transmission Lines and Antennas
ENGEE335 B  Integrated Circuits
ENGEE353 A  Electrical and Mechanical Machines
ENGEE357 B  Mechatronics

Plus choose 2 of:

ENGEE311  Optoelectronics
ENGEE336 B  Power Electronics
ENGEE323 B  Sensors and Measurement

YEAR 4 - Choose 4 papers

ENGEE580 A  Mechatronics Projects
ENGEE517  Optical Instrumentation
ENGEE531 B  Advanced Signal Processing
ENGEE532 B  Image Processing and Machine Vision

ENGEE557 B  Robotics
ENGEN585 A/B/C  Special Topics in Engineering 5
ENGEE3XX A/B  Any 300 Level Electronic Engineering paper
ENGME3XX A/B  Any 300 Level Mechanical Engineering

CONTACTS FOR ELECTRONIC ENGINEERING

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CONVENOR
Professor Jonathan Scott
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ENVIRONMENTAL ENGINEERING

ENVIRONMENTAL ENGINEERING IS CONCERNED WITH THE APPLICATION OF SCIENTIFIC AND ENGINEERING PRINCIPLES TO THE PROTECTION AND IMPROVEMENT OF THE ENVIRONMENTAL QUALITY OF THE WORLD IN WHICH WE LIVE.

Environmental engineers make a major contribution to mitigating environmental harm. As the world’s demand for materials, food and energy grows, it is environmental engineers who ensure that practices are developed to meet this demand and contribute to protecting and enhancing our natural and man-made environments.

Environmental engineers evaluate and assess options, design equipment and systems as well as develop regulations and controls to solve issues of water quality and supply, waste reduction and disposal, soil and air quality management and noise.

During your degree you will learn how to identify, monitor and contribute to solving a variety of problems associated with the environment, the use and allocation of resources and sustainability.

Environmental engineering graduates learn to understand the environment using input from a wide range of disciplines. The Environmental Engineering programme at Waikato combines the fundamentals of engineering, science, mathematics and computing with the study of water resources, water quality, earth and ocean environments, environmental planning, modelling and sustainability, process energy and management.

CAREER OPPORTUNITIES

- Environmental Engineer
- Water and Sanitary Engineer
- Public/Environmental Health Engineer
- Infrastructure Engineer
- Sustainability Engineer
- Restoration Engineer
- Project Management
- Consultancy

SALARY EXPECTATIONS*

Graduate engineers in the above mentioned fields usually earn $50 - $60K per year.
Senior engineers in the above mentioned fields usually earn $80 - $120K per year.
Consulting engineers and management usually earn > $120K per year.

*Sourced from www.careers.govt.nz
### PROGRAMME ELECTIVE PAPERS

**YEAR 1 - Choose 1 of:**
- CHEMY101 A Structure and Spectroscopy
- CHEMY102 B Chemical Reactivity

**Choose 1 of:**
- BIOEB101 A Concepts of Biology
- BIOEB102 B Intro to Ecology and Biodiversity
- EARTH101 A Intro to Earth Systems Sciences
- EARTH102 B Discovering Planet Earth

**YEAR 3 - Choose 2 papers**
- BIOEB2XX A/B Any 200 Level BIOEB paper
- BIOMO203 A Microbiology
- CHEMY2XX A/B Any 200 Level Chemistry paper
- EARTH2XX A/B Any 200 Level Earth Sciences paper
- ENGX3XX A/B Any 300 Level Engineering paper
- ENVPL301 B Planning for Sustainability
- ENGEN390 A/B/C/D/Y Special Topics in Engineering 1

### CONTACTS FOR ENVIRONMENTAL ENGINEERING

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**CONVENER**

Dr Graeme Glasgow  
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MATERIALS AND PROCESS ENGINEERING

MATERIALS AND PROCESSING FOCUSES ON THE PROCESSES AND ACTIVITIES OF CONVERTING RAW MATERIALS INTO VALUABLE PRODUCTS NEEDED BY MANUFACTURERS AND THE END CONSUMER.

By studying Materials and Process Engineering at the University of Waikato, you will learn how to add value to raw materials used to manufacture a number of useful products, while minimising waste. These products can be as varied as dietary formula, foods, ceramics that can withstand high temperatures, new metal alloys, pharmaceuticals, laminated boards, functional proteins, and composites.

Materials engineers make critical decisions in selecting and developing the best materials for a particular product, while process engineers make critical decisions in the processes and utilities required to manufacture the product.

This programme has full Engineering New Zealand accreditation, meaning it is nationally and internationally recognised. This offers great and growing employment opportunities, with a high salary and excellent prospects of progress into management.

CAREER OPPORTUNITIES

- Materials Engineer
- Process Engineer
- Sustainability Engineer
- Energy Systems Engineer
- Material and Polymer Processing
- Products/Process Development Engineer
- Project Management
- Consultancy

SALARY EXPECTATIONS*

Graduate engineers in the above mentioned fields usually earn $50 - $60K per year.

Senior engineers in the above mentioned fields usually earn $70 - $120K per year.

Consulting engineers and management usually earn > $120K per year.

*Sourced from www.careers.govt.nz
PROGRAMME ELECTIVE PAPERS

YEAR 3 - Choose 1 paper
- CHEMY201 B: Organic Chemistry
- CHEMY202 B: Physical Chemistry
- ENGCB321 B: Thermal Engineering
- ENGCB322 B: Chemical and Biological Operations
- ENGCB323 A: Chemical Reaction Engineering
- ENGEV341 B: Environmental Engineering 2
- ENGEN390 A/B/C/D/Y: Special Topics in Engineering 1

YEAR 4 - Choose 2 papers
- ENGEV341 B: Environmental Engineering 2
- ENGCB321 B: Thermal Engineering
- ENGCB322 B: Chemical & Biological Operations
- ENGCB323 A: Chemical Reaction Engineering
- ENGCV323 A: Water Engineering 2
- ENGCB521 A: Advanced Process Control
- ENGCB523 B: Advanced Energy Engineering
- ENGEV541: Advanced Water and Wastewater Engineering
- ENGEV542: Waste Minimisation Engineering
- ENGMP511 A: Advanced Materials Properties and Performance
- ENGMP512 A: Advanced Materials Manufacture
- ENGME580 A: Product Innovation and Development
- ENGEN585 A/B/C/D: Special Topics in Engineering 5

CONTACTS FOR MATERIALS AND PROCESS ENGINEERING

UNDERGRADUATE STUDY ADVISOR
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CONVENOR
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MECHANICAL ENGINEERING

MECHANICAL ENGINEERING IS A DIVERSE AND INNOVATIVE FIELD WHICH USES MECHANICS AND ENERGY PRINCIPLES TO DESIGN, RESEARCH, DEVELOP AND MANUFACTURE TOOLS, ENGINES, MOTORS AND OTHER DEVICES.

Mechanical engineers design the tools and processes necessary to create all manmade products, and are often involved from idea and conception right through to seeing the finished product ready for its commercial application. Our undergraduate programme combines a broad-based education in the engineering sciences with a strong grounding in quantitative, problem-solving, design, and communications skills. It develops the relevant engineering fundamentals, provides experience in their application, and introduces the important methods and techniques of engineering practice.

Mechanical Engineering at Waikato uses project based learning, where students learn how to design, build and test mechanical, mechatronic machinery and energy systems in response to real-world problems to meet a design specification. They learn the use of computer aided engineering software for designing and analysing components, machinery and systems.

This programme has full Engineering New Zealand accreditation, meaning it is nationally and internationally recognised. This offers great and growing employment opportunities, with a high salary and excellent prospects of progress into management.

CAREER OPPORTUNITIES

- Mechanical Engineer
- Automation Engineer
- Medical Engineer
- Test Engineer
- Quality Engineer
- Agricultural Engineer
- Robotics Engineer
- Aeronautical Engineer
- Project Manager
- Safety Engineer
- Computer Aided Engineering Specialist

SALARY EXPECTATIONS*

Graduate engineers in the above mentioned fields usually earn $50K - $60K per year.
Senior engineers usually earn between $70K - $120K per year.
Business engineering management usually earn > $120K per year.

*Sourced from www.careers.govt.nz
### PROGRAMME ELECTIVE PAPERS

#### YEAR 2 - Choose 1 paper

<table>
<thead>
<tr>
<th>Manufacturing and Energy Stream</th>
<th>Mechatronics Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGCB224 B Heat and Mass Transfer</td>
<td>COMPX203 A Computer Systems</td>
</tr>
</tbody>
</table>

#### YEAR 3 - Choose 2 papers from either List A or List B

**List A - Manufacturing and Energy Stream**
- ENGCB223 B Fluid Mechanics (Compulsory)
- ENGCB321 B Thermal Engineering
- ENGM311 B Materials 2

**List B - Mechatronics Stream**
- ENGME323 B Thermofluids
- ENGME357 B Microcontrollers and Mechatronics

#### YEAR 4 - Choose 3 papers

<table>
<thead>
<tr>
<th>Environmental Engineering 2</th>
<th>Thermal Engineering</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENGEV341 B</td>
<td>ENGCB321 B Advanced Process Control</td>
</tr>
<tr>
<td>ENGCB521 A</td>
<td>ENGCB523 B Advanced Energy Engineering</td>
</tr>
<tr>
<td>ENGM540 A</td>
<td>ENGME557 B Robotics</td>
</tr>
<tr>
<td>ENGM511 A</td>
<td>ENGM512 A Advanced Materials Manufacture</td>
</tr>
<tr>
<td>ENGM513 B</td>
<td>ENGM512 A Materials Performance in Service</td>
</tr>
<tr>
<td>ENGEN585 A/B/C/D Special Topics in Engineering 5</td>
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</tr>
</tbody>
</table>

### CONTACTS FOR MECHANICAL ENGINEERING

**UNDERGRADUATE STUDY ADVISOR**
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**CONVENOR**
Dr Leandro Bolzoni

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SOFTWARE ENGINEERING

SOFTWARE ENGINEERS SPECIFY, DESIGN AND BUILD THE SOFTWARE THAT SOCIETY RELIES ON.

When you study software engineering, you’ll be learning about how to use a scientific and disciplined approach to designing and developing complex software systems. You’ll also learn how to operate and maintain such systems. From ATM machines to smart phones to cars - many aspects of modern society are driven by software which we expect to operate correctly and be reliable and flexible at all times.

During your studies at Waikato, you’ll develop an understanding of reliable processes and formal methods for software engineering. You’ll learn how to use systematic techniques to test software systems. You’ll develop the skills you need to be able to prove that safety-critical systems operate correctly under all possible operating conditions.

Strong emphasis is also put on the vitally important interface between critical complex systems and the people who use them or are affected by them. Once you graduate you will be well suited for all areas of employment that require development of high quality software that is safety or mission-critical.

This programme has full Engineering New Zealand (ENZ) accreditation, meaning it is nationally and internationally recognised. This offers great and growing employment opportunities, with a high salary and excellent prospects of progress into management.

CAREER OPPORTUNITIES

- Network Engineer
- Product Development Engineer
- Software Architect
- Software Consultant
- Software Developer
- Systems Engineer
- Test Engineer
- Safety Engineer
- Computer aided engineering specialist

SALARY EXPECTATIONS*

Software developers with some experience usually earn $58K - $80K per year.
Senior developers with several years’ experience usually earn between $80K - $110K per year.
Consulting engineers and management usually earn > $120K per year.

*Sourced from www.careers.govt.nz
UNDERGRADUATE STUDY

PROGRAMME ELECTIVE PAPERS

**YEAR 1 - Choose 1 paper**

- A PHYS111A  Applied Physics
- CHEMY100A  Chemistry in Context
- CHEMY101A  Structure and Spectroscopy
- CHEMY102B  Chemical Reactivity
- ENGEN110B  Engineering Mechanics
- ENGEN111A  Electricity and Electronics
- ENGEN112B  Materials Science and Engineering
- PHYS100A  General Physics
- PHYS101  Physics for Engineers and Scientists

**YEAR 4 - Choose 2 papers**

- COMPX526  Engineering Interactive Systems
- COMPX532A  Information Visualisation
- COMPX539A  Usability Engineering
- COMPX548  Developing Mobile Applications
- COMPX552A  Model Checking
- COMPX554B  Specification Languages and Models

**CONTACTS FOR SOFTWARE ENGINEERING**

SCHOOL OF COMPUTING & MATHEMATICAL SCIENCES

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BACHELOR OF ENGINEERING WITH HONOURS (BE(HONS)) TAURANGA CAMPUS

FROM 2019, YEARS 1 AND 4 OF THE BE(HONS) ELECTRONIC, MECHANICAL AND CIVIL ENGINEERING PROGRAMMES CAN BE COMPLETED IN TAURANGA. YEARS 2 AND 3 OF THE DEGREE NEED TO BE COMPLETED IN HAMILTON.

CONTACTS FOR BE(HONS) TGA

LECTURER
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LECTURER
Chanelle Gavin
Email: chanelle.gavin@waikato.ac.nz
PAPERS
GENERAL ENGINEERING PAPERS

100 LEVEL PAPERS

ENG100-19C (HAM)
GENERAL PHYSICS AND MATHS FOR ENGINEERS
A review of core topics in maths and physics that underpin study in engineering. Topics include kinematics, mechanics, electric circuits, geometry, trigonometry, complex numbers, basic algebra and basic calculus.

Prerequisite paper(s): 14 NCEA level 2 Physics or Maths credits or a minimum of 8 credits at NCEA level 3 across Mathematics and/or Physics
Assessment: Internal assessment/examination ratio 100:0

ENG103-19A/T (HAM) & 19A (TGA)
ENGINEERING COMPUTING
This paper introduces computer programming in languages such as C# and Python. It provides the basis for the programming skills required in more advanced papers within the School of Engineering.

Restricted paper(s): COMP103, ENGG182, COMPX101
Assessment: Internal assessment/examination ratio 33:67 or 67:33

ENG110-19B (HAM) & 19A (TGA)
ENGINEERING MECHANICS
This paper covers aspects of engineering mechanics.

Prerequisite paper(s): 14 credits at Level 3 in NCEA Physics or one of PHYS100 or PHYSC100 or B-grade in ENG100; and 14 credits at Level 3 in NCEA Calculus or one of MATH165, MATHS165, MATH101, MATHS101, MATH102 or MATHS102, ENGG183, ENGEN183, ENGG184, ENGEN184 or a B- in CAFS011 or FOUND011.
Restricted paper(s): ENGG110
Assessment: Internal assessment/examination ratio: 50:50

ENG111-19A/T (HAM) & 19B (TGA)
ELECTRICITY AND ELECTRONICS
Students are introduced to underlying concepts in electricity such as current, voltage and power, and apply these concepts in a laboratory by making circuits and measuring them with common laboratory instruments.

Prerequisite paper(s): 14 NCEA level 3 Physics credits or PHYS100 or PHYSC100 or B-grade ENGEN100
Restricted paper(s): ENEL111
Assessment: Internal assessment/examination ratio: 100:0
ENGEN112-19B (HAM) & (TGA)
MATERIALS SCIENCE AND ENGINEERING
Introduction to engineering materials (metals, ceramics, polymers, composites, semiconductors and biomaterials) and their atomic structure and mechanical properties. Includes: elastic and plastic deformation, fracture mechanisms, failure in service, iron-carbon phase diagram, redox reactions in corrosion, production of polymers, cement and concrete.

Restricted paper(s): ENMP102
Assessment: Internal assessment/examination ratio 50:50

ENGEN170-19B (HAM) & (TGA)
ENGINEERING AND SOCIETY
Introduction to the role of engineering in society in particular understanding of Treaty of Waitangi, history of science, engineering and technology, philosophy and ethics and public participation, participatory design, sustainability.

Assessment: Internal assessment/examination ratio 50:50

ENGEN180-19A (HAM) & (TGA)
FOUNDATIONS OF ENGINEERING
Introduction to the engineering design process and computer aided design, fundamental principles of engineering analysis, open ended problem solving, engineering economics and the skills of a successful engineer. Includes a design-build-test experience.

Restricted paper(s): ENGEN302, ENGG180, ENGG302
Assessment: Internal assessment/examination ratio 50:50

ENGEN183-19A/B (HAM) & 19A (TGA)
LINEAR ALGEBRA AND STATS FOR ENGINEERS
A study of introductory statistics and the fundamental techniques of algebra including Gaussian elimination, vector and matrix algebra, complex numbers, eigenvalues and eigenvectors, as well as basic statistical notions and tools, with engineering applications.

Prerequisite paper(s): Any one of MATHS165, MATHS166, MATH165, MATH166, at least a B-grade in CAFS004 or FOUND007, or 16 credits at Level 3 in NCEA Calculus; or equivalent, and a B grade or better in ENGEN100.

Restricted paper(s): ENGG183, MATH102, MATHS102
Assessment: Internal assessment/examination ratio 50:50

ENGEN184-19A/B/S (HAM) & (TGA)
CALCULUS FOR ENGINEERS
A study of the fundamental techniques of calculus, including differentiation and integration for functions of one real variable, with engineering applications.

Prerequisite paper(s): At least a B-grade in MATHS165, MATH165, MATHS166, MATH166, CAFS004 or FOUND007; or a pass in MATHS102, MATH102, ENGEN183 or ENGG183; or 16 credits of NCEA Level 3 Calculus including at least 11 credits from AS91577, AS91578 and AS91579; or equivalent, and a B grade or better in ENGEN100.

Restricted paper(s): ENGG184, MATH101, MATHS101
Assessment: Internal assessment/examination ratio 50:50
PHYSC100-19A (HAM)
GENERAL PHYSICS
This paper provides an introduction to the core ideas in physics. Topics covered include kinematics, mechanics, fluids, electric and magnetic forces and fields, electric circuits, optics, modern physics and relativity, taught in a problem solving context.

Prerequisite paper(s): 14 credits at Level 2 in NCEA Mathematics or Physics, or a minimum of 8 credits at Level 3 in NCEA across Mathematics and/or Physics.
Restricted paper(s): PHYS100, APHYS111
Assessment: Internal assessment/examination ratio 50:50

PHYSC101 (HAM)
PHYSICS FOR ENGINEERS AND SCIENTISTS
This paper will not be offered in 2019
200 LEVEL PAPERS

ENGEN201-19B/S (HAM)
ENGINEERING MATHEMATICS 2
Calculus of Several Variables and its Applications. Vector calculus (Green's, Gauss' and Stokes' theorems). Taylor’s Theorem in n dimensions. Introduction to partial differential equations. Fourier series.
Prerequisite paper(s): (ENGEN183/ENGG183 or MATH102/MATHS102) and (ENGEN184/ENGG184 or MATH101/MATHS101)
Restricted paper(s): MATH251, MATH255, MATHS201, MATHS203, ENGG284, ENGG285
Assessment: Internal assessment/examination ratio: 50:50

ENGEN270-19A (HAM)
ENGINEERING PROFESSIONAL PRACTICE 1
Preparation for success in the engineering workplace including CV preparation, interview techniques, job seeking skills, online profile, workplace and engineering business cultures and norms, ethics, communication and management structures.
Prerequisite paper(s): ENGEN170
Restricted paper(s): ENGG279, ENMP282
Assessment: Internal assessment/examination ratio: 100:0

ENGEN271-19T/S/C (HAM)
ENGINEERING WORK PLACEMENT 1
First work placement involving 400 hours of work experience at an approved engineering organisation relevant to your studies. Typically undertaken during the summer semesters at the end of second year.
Corequisite paper(s): ENGEN270
Restricted paper(s): ENGG371, ENGG372
Assessment: Internal assessment/examination ratio: 100:0

ENGEN272-19C (HAM)
ENGINEERING WORK PLACEMENT 1
30 points
First work placement involving 400 hours of work experience at an approved engineering organisation relevant to your studies. Typically undertaken during the summer semester at the end of second year.
Prerequisite paper(s): ENGEN270 or ENGG279
Restricted paper(s): ENGG371 and ENGEN271
Assessment: Internal assessment/examination ratio: 100:0
300 LEVEL PAPERS

ENGEN301-19A (HAM)
ENGINEERING MATHS 3
Introduces numerical methods and statistical ideas relevant to Engineering.
Prerequisite paper(s): ENGEN183 or ENGG183 and ENGEN184 or ENGG184
Restricted paper(s): ENGG381, MATH257, MATH342, MATHS304
Assessment: Internal assessment/examination ratio: 50:50

ENGEN371-19C (HAM)
ENGINEERING WORK PLACEMENT 2
Second work placement involving 400 hours of work experience at an approved engineering organisation relevant to your studies. Typically undertaken during the summer semesters at the end of third year.
Prerequisite paper(s): (ENGEN270 or ENGG279) and ENGEN271 or ENGG371
Restricted paper(s): ENGG372
Assessment: Internal assessment/examination ratio: 100:0

ENGEN372-19C (HAM)
ENGINEERING WORK PLACEMENT 2
30 points
Second work placement involving 400 hours of work experience at an approved engineering organisation relevant to your studies. Typically undertaken during the summer semester at the end of third year.
Prerequisite paper(s): ENGEN272
Restricted paper(s): ENGG372 and ENGEN371
Assessment: Internal assessment/examination ratio: 100:0

ENGEN390-19A/B/C/D/Y (HAM)
SPECIAL TOPICS IN ENGINEERING 1
An independent theoretical literature or experimental investigation of an engineering topic supervised by a member of staff.
Prerequisite paper(s): Departmental approval required
Assessment: Internal assessment/examination ratio: 100:0

ENGEN391-19A/B/C/D/Y (HAM)
SPECIAL TOPICS IN ENGINEERING 2
An independent theoretical literature or experimental investigation of an engineering topic supervised by a member of staff.
Prerequisite paper(s): Departmental approval required
Assessment: Internal assessment/examination ratio: 100:0
500 LEVEL PAPERS

ENGEN570-19Y (HAM)
ENGINEERING PROFESSIONAL PRACTICE 2
Role engineers in industry, business and society, contract law and legal responsibility, Treaty of Waitangi considerations, intellectual property, teamwork and leadership skills, responsibilities of a professional, ethics with industrial case studies.
Prerequisite paper(s): ENGEN270 or ENGG279 or ENMP282
Restricted paper(s): ENGG492
Assessment: Internal assessment/examination ratio: 100:0

ENGEN581-19A/B/C/Y (HAM)
HONOURS RESEARCH PROJECT
30 points
Final year honours research project carried out on a topic assigned and supervised by a member of staff.
Prerequisite paper(s): Departmental approval required
Restricted paper(s): ENGG492, ENGEN582
Assessment: Internal assessment/examination ratio: 100:0

ENGEN582-19A/B/C/Y (HAM)
HONOURS RESEARCH AND DEVELOPMENT PROJECT
45 points
This is the final year Honours, research and design "capstone" project.
Prerequisite paper(s): Departmental approval required
Restricted paper(s): ENGG492, ENGEN581
Assessment: Internal assessment/examination ratio: 100:0

ENGEN585-19A/B/C/D (HAM)
SPECIAL TOPICS IN ENGINEERING 5
An independent theoretical literature or experimental investigation of an engineering topic supervised by a member of staff.
Prerequisite paper(s): Departmental approval required
Assessment: Internal assessment/examination ratio: 100:0
CHEMICAL AND BIOLOGICAL ENGINEERING PAPERS

200 LEVEL PAPERS

ENGB223-19B (HAM)
FLUID MECHANICS
Basic principles of fluid statics and dynamics, including fluid viscosity, Bernoulli and mechanical energy equation, momentum analysis, dimensional analysis, flow in pipes and ducts, flow over bodies, and compressible flow.

Prerequisite paper(s): (ENGEN180 or ENGG180) and (ENGEN184 or ENGG184 or MATH101 or MATHS101)
Restricted paper(s): ENGCV223, ENMP223
Assessment: Internal assessment/examination ratio: 50:50

ENGB224-19B (HAM)
HEAT AND MASS TRANSFER
This paper covers the fundamentals of heat and mass transfer analysis, including conduction, heat convection, radiation, molecular diffusion and mass convection. Finned surfaces and heat exchangers are also covered.

Prerequisite paper(s): (ENGEN180 or ENGG180) and (ENGEN184 or ENGG184 or MATH101 or MATHS101)
Restricted paper(s): ENMP223, ENMP323
Assessment: Internal assessment/examination ratio: 50:50

ENGB280-19B (HAM)
PROCESS ENGINEERING DESIGN 1
This paper covers mass balances around reactors and separation processes used by engineers in process design, CAD tools for process flow diagrams, pipe and instrumentation diagrams, and simple batch and continuous process modelling using software tools.

Prerequisite paper(s): ENGEN180 or ENGG180
Restricted paper(s): ENGG282
Assessment: Internal assessment/examination ratio: 70:30
300 LEVEL PAPERS

ENGCB321-19B (HAM)
THERMAL ENGINEERING
Application of engineering thermodynamics to steady and unsteady industrial processes, including, steam boiler systems, advanced power and refrigeration cycles, cooling towers and plant utility systems.

Prerequisite paper(s): ENGME221 or ENMP221
Restricted paper(s): ENMP321
Assessment: Internal assessment/examination ratio: 50:50

ENGCB322-19B (HAM)
CHEMICAL AND BIOLOGICAL OPERATIONS
This paper covers the principle and application of enzymes, concepts of fermentation technology, principles of bioreactor operation, bioprocess variables and their measurement, key product separation techniques, and bioprocess economics.

Prerequisite paper(s): ENMP221 or ENGME221 and ENGG282 or ENGCB280
Restricted paper(s): ENMP322
Assessment: Internal assessment/examination ratio: 50:50

ENGCB323-19A (HAM)
CHEMICAL REACTION ENGINEERING
This paper is an introduction to the quantitative treatment of chemical and biological reaction and reactor engineering, including homogeneous and heterogeneous reacting systems.

Prerequisite paper(s): ENGCB280 or ENGG282
Assessment: Internal assessment/examination ratio: 50:50

ENGCB324-19A (HAM)
MASS TRANSFER OPERATIONS
This paper covers the application of heat and mass transfer, and thermodynamics to chemical and physical separation process.

Prerequisite paper(s): ENMP223 or ENME323 or ENGCB224 and ENGG282 or ENGCB280
Restricted paper(s): ENMP323
Assessment: Internal assessment/examination ratio: 50:50

ENGCB380-19B (HAM)
PROCESS ENGINEERING DESIGN 2
Conceptual and detailed design, costing and economic assessment of chemical, biological and materials process plants, including software and numerical simulation, separation trains, heat exchanger and pump sizing, and reactor kinetics.

Prerequisite paper(s): ENGG282 or ENGCB280
Restricted paper(s): ENMP321
Assessment: Internal assessment/examination ratio: 50:50
500 LEVEL PAPERS

ENGCB521-19A (HAM)
ADVANCED PROCESS CONTROL
This paper covers the fundamentals of process control, and introduces advanced process control strategies.
Prerequisite paper(s): ENGCB321
Restricted paper(s): ENMP422
Assessment: Internal assessment/examination ratio: 50:50

ENGCB523-19B (HAM)
ADVANCED ENERGY ENGINEERING
Analysis of chemical processing plants and renewable, cogen and smart energy systems through pinch analysis and total site process integration.
Prerequisite paper(s): ENGME221
Assessment: Internal assessment/examination ratio: 50:50

ENGCB527-19A (HAM)
ADVANCED BIOLOGICAL ENGINEERING
This paper will cover various aspects of biochemical engineering used in producing biologically derived products including fermentation, downstream processing, and meat processing.
Prerequisite paper(s): ENGCB322, ENGCB324, ENGCB380
Assessment: Internal assessment/examination ratio: 50:50

ENGCB580-19C/Y (HAM)
PROCESS ENGINEERING DESIGN PROJECT
30 points
This paper will cover various aspects of biochemical engineering used in producing biologically derived products including fermentation, downstream processing, and meat processing.
Prerequisite paper(s): ENGCB380 and ENGCB324 or ENGCB321
Assessment: Internal assessment/examination ratio: 100:0
CIVIL ENGINEERING PAPERS

200 LEVEL PAPERS

ENGCV212-19A (HAM)
STRUCTURAL ENGINEERING 1
Analysis of statically determinant structural systems under axial, bending and torsional loads, including beam deflections, buckling of struts, shear in joints, couplings, trusses and frames; plus introduction to design of simple structural elements.
Prerequisite paper(s): (ENGEN110 or ENGG110) and (ENGEN112 or ENMP102)
Restricted paper(s): ENGMP213
Assessment: Internal assessment/examination ratio: 50:50

ENGCV223-19B (HAM)
WATER ENGINEERING 1
Basic principles of fluid statics and dynamics, including fluid viscosity, Bernoulli and mechanical energy equation, dimensional analysis, flow in pipes and channels and introduction to hydrology and fluvial processes.
Prerequisite paper(s): ENGEN110 or ENGG110 or ENGME221 or ENMP221
Restricted paper(s): ENGCB223, ENMP223, ENGME323
Assessment: Internal assessment/examination ratio: 50:50

ENGCV231-19A (HAM)
GEOTECHNICAL ENGINEERING 1
This paper covers basic concepts and principles governing the mechanical behaviour of soils, rocks and slopes, including the effective stress concept, shear strength of soils, and stability concepts. Field and laboratory work provide opportunity to learn practical skills and apply the knowledge gained.
Prerequisite paper(s): ENGEN112 or ENMP102
Restricted paper(s): EARTH352, EARTH313
Assessment: Internal assessment/examination ratio: 50:50

ENGCV241-19B (HAM)
HIGHWAYS AND TRANSPORTATION
Introduces the basic theories and design techniques used in highway and pavement engineering, and traffic engineering and transportation planning.
Prerequisite paper(s): ENGEN180 or ENGG180
Assessment: Internal assessment/examination ratio: 50:50

ENGCV251-19A (HAM)
CONSTRUCTION 1
Engineering properties, performance and constraints of common construction materials including timber, steel, concrete polymers and composites. Materials selection and application to construction methods.
Prerequisite paper(s): ENMP102 or ENGEN112
Restricted paper(s): ENMP211, ENGMP211
Assessment: Internal assessment/examination ratio: 50:50
ENGCV280-19B (HAM)

CIVIL DESIGN CHALLENGE 1

Civil design principles are applied to an open-ended design challenge. Design standards and calculations for simple civil structures are introduced, along with engineering drawings, and construction and testing of simple structures.

Prerequisite paper(s): ENGG180 or ENGEN180
Assessment: Internal assessment/examination ratio: 70:30

300 LEVEL PAPERS

ENGCV312-19B (HAM)

STRUCTURAL ENGINEERING 2

Analysis of statically indeterminant structures, application of moment-area method, computer analysis of structures, design of structures in steel, wood, reinforced concrete and pre-stressed concrete.

Prerequisite paper(s): ENCV212
Restricted paper(s): ENGM313
Assessment: Internal assessment/examination ratio: 50:50

ENGCV323-19A (HAM)

WATER ENGINEERING 2

Application of fluid mechanics principles to water engineering applications such as design of pipe system networks, pump characteristics and selection, open channel flow, hydraulic jump, measurement, analysis and modelling of surface hydrological processes.

Prerequisite paper(s): ENCV223
Assessment: Internal assessment/examination ratio: 50:50

ENGCV331-19B (HAM)

GEOTECHNICAL ENGINEERING 2

Advanced course in geotechnical engineering including analysis and design of shallow and deep foundations, and retaining structures under a variety of conditions, includes a project based learning activity that reinforces threshold concepts and theory.

Prerequisite paper(s): ENCV231
Assessment: Internal assessment/examination ratio: 50:50

ENGCV351-19A (HAM)

CONSTRUCTION 2

Construction processes and building technology including surveying, site preparation, earthworks, foundations, Building Information Modelling (BIM), risk assessment, site health and safety, construction project management, demolition and site remediation.

Prerequisite paper(s): ENCV251
Assessment: Internal assessment/examination ratio: 50:50
ENGCV380-19B (HAM)
CIVIL DESIGN CHALLENGE 2
Engineering design principles applied to an advanced open-ended civil design challenge. Design standards, project finance, environmental consideration, health and safety and risk assessment.
Prerequisite paper(s): ENGCV280
Assessment: Internal assessment/examination ratio: 70:30

500 LEVEL PAPERS

ENGCV512-19A (HAM)
ADVANCED STRUCTURAL DESIGN
This paper covers advanced analysis and design of structures made from structural steel, reinforced concrete, reinforced masonry and timber, including connections, retaining walls and concrete floor slabs.
Prerequisite paper(s): ENGCV312 or ENGMP313 or ENMP313
Assessment: Internal assessment/examination ratio: 100:0

ENGCV513-19B (HAM)
EARTHQUAKE ENGINEERING AND DESIGN
Design of civil structures to withstand natural hazards and seismic events, including materials selection, geology and geotechnical considerations, types of foundations and single and multi-level structures.
Prerequisite paper(s): ENGCV312
Assessment: Internal assessment/examination ratio: 100:0

ENGCV531-19B (HAM)
ADVANCED GEOTECH ENGINEERING
Principles of critical state soil mechanics and soil plasticity applied to soil-structure interactions under seismic loading and the practical aspects of geotechnical earthquake engineering.
Prerequisite paper(s): ENGCV331
Assessment: Internal assessment/examination ratio: 50:50

ENGCV541-19A (HAM)
ADVANCED HIGHWAYS AND TRANSPORTATION
Universal design and participatory planning of useful, safe and resilient land-based transport systems and infrastructure.
Prerequisite paper(s): ENGCV241, ENGCV331
Assessment: Internal assessment/examination ratio: 50:50

ENGCV580-19Y (HAM)
CIVIL DESIGN CHALLENGE 3
30 points
Engineering design principles applied to a complex civil design challenge. Detailed considerations in the project to include using design standards, materials selection, life cycle costs, environmental impact, health and safety and risk assessment.
Prerequisite paper(s): ENGCV380
Restricted paper(s): ENGG492
Assessment: Internal assessment/examination ratio: 100:0
ELECTRONIC ENGINEERING PAPERS

200 LEVEL PAPERS

ENGEE211-19B (HAM)
ELECTROMAGNETICS
This paper covers engineering applications of electric and magnetic fields including capacitance, magnetic induction, and motors, taught in a problem-solving context.
Prerequisite paper(s): (ENG111 or ENEL111) and (ENG184 or ENGG184 or ENG183 or ENGG183 or MATH101 or MATH101 or MATH102 or MATH102)
Corequisites: ENG201
Restricted paper(s): ENEL281, ENEL284, PHYS201, PHYS304
Assessment: Internal assessment/examination ratio: 33:67

ENGEE231-19A (HAM)
CIRCUIT THEORY
This paper covers theory, analysis and frequency response of electrical circuits involving passive elements, complex impedance, complex gain, and feedback.
Prerequisite paper(s): ENEL111 or ENG111
Restricted paper(s): ENEL205
Assessment: Internal assessment/examination ratio: 50:50

ENGEE232-19B (HAM)
ANALOG ELECTRONICS
This paper covers the characteristics of diodes and BJTs, CE, CC, CB, Darlington and cascode configurations, push-pull amplifiers and operating class, power supply and oscillator circuits. To an assumed understanding of feedback, operational amplification, and complex impedance, the ideas of dynamic resistance and small-signal analysis are introduced.
Prerequisite paper(s): ENGEE231 or ENEL205
Assessment: Internal assessment/examination ratio: 50:50

ENGEE233-19A (HAM)
DIGITAL SYSTEMS
This paper provides students with an introduction to digital electronics and microprocessors. It covers combinatorial and sequential logic, hardware description languages, and processor architecture and construction.
Prerequisite paper(s): (ENG111 or ENEL111) and (ENG182, ENG103, COMP104 or COMPX102)
Restricted paper(s): ENEL212
Assessment: Internal assessment/examination ratio: 50:50
ENEE280-19B (HAM)
ELECTRONICS DESIGN
This course is an introduction to the design process in electronic engineering. The use of Computer Aided Design (CAD) as a tool is reinforced using practical exercises.
Prerequisite paper(s): ENEE231
Co-requisite paper(s): ENEE232
Restricted paper(s): ENGG282
Assessment: Internal assessment/examination ratio: 50:50

300 LEVEL PAPERS
ENEE311 (HAM)
OPTOELECTRONICS
The paper will not be offered in 2019

ENEE323-19B (HAM)
SENSORS AND MEASUREMENT
The paper covers the theory and applications of semiconductor sensors and the basic theory and design concepts used in common electronic measurement systems used by electronic engineers.
Prerequisite paper(s): ENEE231
Co-requisite paper(s): ENEE331
Restricted paper(s): ENEL213
Assessment: Internal assessment/examination ratio: 60:40

ENEE331-19B (HAM)
 SIGNALS
This paper covers communications signalling and modulation, and signals fundamentals. Wired and wireless, baseband and passband, the Fourier representation of signals, bandwidth, and transmit filtering, are taught.
Prerequisite paper(s): ENEE231 or ENEE232 or ENEL205
Restricted paper(s): ENEL382
Assessment: Internal assessment/examination ratio: 50:50

ENEE334-19A (HAM)
TRANSMISSION LINES AND ANTENNA
The paper uses classical electromagnetic theory to describe the propagation of electromagnetic waves and to analyse applications like transmission lines, waveguides, antennas, and microwave circuits.
Prerequisite paper(s): (ENEE211 or ENEL281 or ENEL284 or PHYS201 or PHYS304) and (ENEE231 or ENEL205)
Restricted paper(s): ENEL312
Assessment: Internal assessment/examination ratio: 50:50
ENGEE335-19B (HAM)
INTEGRATED CIRCUITS
The paper covers techniques for fabricating ICs, CMOS devices, logic gate characteristics and design, monolithic topologies such as differential pairs, multipliers, current mirrors, bandgap references, opamps, device failure mechanisms, ESD, electromigration, and estimating circuit reliability.

Prerequisite paper(s): (ENGEE232 and ENGEE233) or (ENEL205 and ENEL211)
Restricted paper(s): ENEL321
Assessment: Internal assessment/examination ratio: 50:50

ENGEE336-19B (HAM)
POWER ELECTRONICS
Paper covers theory, design, applications and the systems approach in power electronics. Subjects include power semiconductors, power converters, energy storage devices, DC power management, AC power conditioning and surge protection.

Prerequisite paper(s): ENGEE231 and ENGEE232
Restricted paper(s): ENEL385, ENEL485, ENEL585
Assessment: Internal assessment/examination ratio: 50:50
500 LEVEL PAPERS

ENGE517 (HAM)  
OPTICAL INSTRUMENTATION  
This paper will not be offered in 2019

ENGE531-19A (HAM)  
ADVANCED SIGNAL PROCESSING  
This paper introduces advanced methods for digitally processing signals. It covers signal transforms with applications in 1D and 2D, principles and practical methods of digital filter design, statistical signal processing.  
Prerequisite paper(s): ENGEE331 and ENEL382 for BE(Hons) or B average in ENGEE506 and 30 points of approved 500 level Management papers for MEngPrac students.  
Assessment: Internal assessment/examination ratio: 50:50

ENGE532-19B (HAM)  
IMAGE PROCESSING AND MACHINE VISION  
This paper is an introduction to image processing and machine vision in the context of machine automation and control and includes noise suppression, object recognition and tracking, and camera technologies and geometries.  
Prerequisite paper(s): (ENGEN103 or ENGG182 or COMP103) and (ENGEN201 or ENGEN285 or MATH251 or MATHS201) and (ENGEN284 or MATH255 or MATHS203)  
Assessment: Internal assessment/examination ratio: 50:50

ENGE580-19A (HAM)  
MECHATRONIC PROJECTS  
The paper brings together electronic, programming, and mechanical skills into projects where real-time systems are designed, constructed, and demonstrated. Timing of actuators and sensor inputs from fastest to slowest limits of a real-time controller imparts an appreciation of scheduling what is possible in any given mechatronic product.  
Prerequisite paper(s): ENGE232, ENGE233 and ENGME357  
Restriction(s): ENEL417, ENEL517 and ENGG492  
Assessment: Internal assessment/examination ratio: 100:0

ENGE585-19B (HAM)  
ADVANCED POWER ELECTRONICS  
This paper provides an advanced systems-level teaching on the subject of power electronics. Subjects include power semiconductors, power converters, energy storage devices, DC power management, AC power conditioning and surge protection.  
Prerequisite paper(s): B average in ENGEE506 and 30 points of approved 500 level Management papers.  
Restriction(s): ENEL385, ENEL485, ENEL585  
Assessment: Internal assessment/examination ratio: 50:50
ENVIRONMENTAL ENGINEERING PAPERS

200 LEVEL PAPERS

ENGEV241-19B (HAM)
ENVIRONMENTAL ENGINEERING 1
This paper covers skills, knowledge and capability for environmental engineers so they can understand, investigate and evaluate environmental engineering problems and solutions.
Prerequisite paper(s): (ENGG180 or ENGEN180) and (ENMP102 or ENGEN112)
Restricted paper(s): ENMP241
Assessment: Internal assessment/examination ratio: 60:40

300 LEVEL PAPERS

ENGEV341-19B (HAM)
ENVIRONMENTAL ENGINEERING 2
This paper covers the design, operation and management of unit processes used in environmental engineering including air, water, wastewater, storm water, waste, soils and noise treatment and control systems.
Prerequisite paper(s): ENGEN170, ENGEN180, ENGEN112
Restricted paper(s): ENMP341
Assessment: Internal assessment/examination ratio: 50:50

ENGEV342-19A (HAM)
SUSTAINABLE ENGINEERING
This paper covers sustainability in engineering design within the context of quality standards, emissions, carbon accounting and life cycle analysis.
Prerequisite paper(s): ENGEN270 or ENGG279 or ENMP282
Assessment: Internal assessment/examination ratio: 50:50

500 LEVEL PAPERS

ENGEV541 (HAM)
ADVANCED WATER AND WASTE WATER ENGINEERING
This paper will not be offered in 2019

ENGEV542 (HAM)
WASTE MINIMISATION ENGINEERING
This paper will not be offered in 2019

ENGEV580 (HAM)
ENVIRONMENTAL DESIGN PROJECT
30 points
This paper will not be offered in 2019
MATERIALS AND PROCESS ENGINEERING PAPERS

200 LEVEL PAPERS

ENGMP211-19A (HAM)
MATERIALS 1
This paper will provide a foundation for understanding the relationship between material structure, processing and behaviour to support engineering of materials and engineering with materials.

Prerequisite paper(s): ENGEN112 or ENMP102
Restricted paper(s): ENMP211, ENGCV251
Assessment: Internal assessment/examination ratio: 50:50

ENGMP213-19A (HAM)
MECHANICS OF MATERIALS 1
Stress and failure analysis of statically determinant and material systems under axial, bending and torsional loads, including beam deflections, buckling of struts, shear in joints, twisting in circular shafts and couplings.

Prerequisite paper(s): (ENGEN112 or ENMP102) and (ENGEN110 or ENGG110)
Restricted paper(s): ENMP213, ENGCV212
Assessment: Internal assessment/examination ratio: 50:50

300 LEVEL PAPERS

ENGMP311-19B (HAM)
MATERIALS 2
This paper will develop understanding of the relationship between material structure, processing and behaviour to support engineering of materials and engineering with materials.

Prerequisite paper(s): ENGMP211 or ENMP211
Restricted paper(s): ENMP311
Assessment: Internal assessment/examination ratio: 50:50

ENGMP312-19A (HAM)
MATERIALS MANUFACTURE
This paper deals with advanced materials science knowledge and principles underlying materials engineering. It focuses on the relationships between processing conditions and microstructures of materials and major materials processing technologies.

Prerequisite paper(s): Department approval required
Restricted paper(s): ENMGP512, ENMP411
Assessment: Internal assessment/examination ratio: 20:80
ENGMP313-19B (HAM)  
MECHANICS OF MATERIALS 2  
Advanced level knowledge on mechanics and performance of materials, covering stress and strain transformations, failure criteria, unsymmetrical bending, torsion of non-circular sections, fatigue, materials selection and materials testing.  
Prerequisite paper(s): ENGMP213 or ENMP213 or ENGCV212  
Restricted paper(s): ENMP313  
Assessment: Internal assessment/examination ratio: 50:50

500 LEVEL PAPERS

ENGMP511-19A (HAM)  
ADVANCED MATERIALS PROPERTIES AND PERFORMANCE  
This paper deals with advanced materials science knowledge and principles underlying materials behaviour and engineering.  
Prerequisite paper(s): ENGMP311 or ENMP311  
Restricted paper(s): ENMP513  
Assessment: Internal assessment/examination ratio: 100:0

ENGMP512-19A (HAM)  
ADVANCED MATERIALS MANUFACTURE  
This paper deals with advanced materials science knowledge and principles underlying materials engineering. It focuses on the relationships between processing conditions and microstructures of materials and major materials processing technologies.  
Prerequisite paper(s): ENGMP311 or ENMP311  
Restricted paper(s): ENMP411, ENMP514 and ENGMP312  
Assessment: Internal assessment/examination ratio: 20:80

ENGMP513-19B (HAM)  
MATERIALS PERFORMANCE IN SERVICE  
Students will learn the importance of design to avoid fracture using fracture mechanics, advanced stress analysis including plasticity and advanced fatigue, and creep behaviour.  
Prerequisite paper(s): ENGMP311 or ENMP311  
Restricted paper(s): ENMP413  
Assessment: Internal assessment/examination ratio: 20:80
MECHANICAL ENGINEERING PAPERS

200 LEVEL PAPERS

ENGME221-19A (HAM)
ENGINEERING THERMODYNAMICS
This paper covers the fundamental concepts and laws of thermodynamics, including thermodynamics properties of substances, first and second law analysis, power cycles, refrigeration cycles and simple combustion analysis of engines.
Prerequisite paper(s): ENGEN180 or ENGG180
Restricted paper(s): ENMP221
Assessment: Internal assessment/examination ratio: 50:50

ENGME251-19B (HAM)
DYNAMICS AND VIBRATION
This paper covers the principles and application of dynamics and vibration.
Prerequisite paper(s): ENGEN110 or ENGG110
Restricted paper(s): ENME351
Assessment: Internal assessment/examination ratio: 50:50

ENGME280-19B (HAM)
DESIGN AND MANUFACTURING 1
This paper covers the fundamentals of engineering design and manufacture.
Prerequisite paper(s): ENGEN180 or ENGG180
Restricted paper(s): ENGG282, ENMP215
Assessment: Internal assessment/examination ratio: 100:0

300 LEVEL PAPERS

ENGME323-19B (HAM)
THERMOFLUIDS
Application of basic principles of fluids and heat transfer to mechatronic engineering. Topics include fluid viscosity, fluid statics, hydraulics, flow in pipes, fans and pumps, conduction, convection and radiation heat transfer, heat exchangers and cooling electronic components.
Prerequisite paper(s): ENMP221 or ENGME221
Restricted paper(s): ENGCB223, ENGCB224, ENGCV223, ENMP223
Assessment: Internal assessment/examination ratio: 50:50

ENGME352-19A (HAM)
MACHINE CONTROL AND APPLICATIONS
This paper teaches students the theory and application of machine control.
Prerequisite paper(s): (ENEL111 or ENGEN111) and (ENGME251 or ENGEE233 or ENME351 or ENEL212)
Restricted paper(s): ENME352, ENEL317
Assessment: Internal assessment/examination ratio: 100:0
ENGME353-19A (HAM)
**ELECTRICAL AND MECHANICAL MACHINES**
This paper teaches students the theory and application of electrical and mechanical machines.

**Prerequisite paper(s):** (ENEL111 or ENGEN111) and ENGME251
**Restricted paper(s):** ENME380
**Assessment:** Internal assessment/examination ratio: 50:50

ENGME357-19B (HAM)
**MICROCONTROLLERS AND MECHATRONICS**
This paper teaches students the basics of mechatronics with advanced theory of machine control.

**Prerequisite paper(s):** ENGME352 and COMPX203
**Restricted paper(s):** ENEL417
**Assessment:** Internal assessment/examination ratio: 50:50

ENGME380-19B (HAM)
**DESIGN AND MANUFACTURING 2**
This paper covers modern aspects of engineering design and manufacture.

**Prerequisite paper(s):** ENGME280 or ENGG282
**Restricted paper(s):** ENME380
**Assessment:** Internal assessment/examination ratio: 100:0
500 LEVEL PAPERS

ENGME540-19A (HAM)
FINITE ELEMENT ANALYSIS
This paper covers kinematics, momentum and variational formulation of particles, dynamics of rigid body system, vibration of linear-lumped-parameters system and dynamics of continuous systems.

Prerequisite paper(s): ENGMP313
Restricted paper(s): ENME440
Assessment: Internal assessment/examination ratio: 60:40

ENGME557-19B (HAM)
ROBOTICS
This paper teaches students the advanced mechatronics with applications to mobile and industrial robotic applications.

Prerequisite paper(s): ENGME357 and ENGME352
Assessment: Internal assessment/examination ratio: 100:0

ENGME580-19A (HAM)
PRODUCT INNOVATION AND DEVELOPMENT
This paper covers modern aspects of product innovation and development

Prerequisite paper(s): ENME380 or ENGME380
Restricted paper(s): ENME480
Assessment: Internal assessment/examination ratio: 100:0
SOFTWARE ENGINEERING PAPERS

100 LEVEL PAPERS

COMPX102-19B/S (HAM)
OBJECT-ORIENTED PROGRAMMING
This paper continues from COMPX101, expanding upon data organisation and algorithms, and introducing code contracts, computer architecture, Boolean algebra, assembly language, program analysis and object-oriented programming.

Prerequisite paper(s): One of COMPX101, COMP103, ENGEN103, or ENGG182
Restricted paper(s): COMP104
Assessment: Internal assessment/examination ratio 67:33 or 33:67

200 LEVEL PAPERS

COMPX203-19A (HAM)
COMPUTER SYSTEMS
This paper provides an overview of the operation of computer systems. The central theme is the way in which the hardware and software co-operate to allow the execution of programs written in a high-level language.

Prerequisite paper(s): At least one of COMP104, COMP102, (COMPX101 and ENGEN111), (COMP103 and ENEL111), (ENGEN103 and ENGEN111), or (ENGG182 and ENEL111).
Restricted paper(s): COMP200
Assessment: Internal assessment/examination ratio 50:50

COMPX204-19B (HAM)
PRACTICAL NETWORKING AND CYBER SECURITY
Please refer to the School of Computing and Mathematical Sciences Handbook for further details.

COMPX223-19A (HAM)
DATABASE PRACTICE AND EXPERIENCE
Please refer to the School of Computing and Mathematical Sciences Handbook for further details.

COMPX241-19A (HAM)
SOFTWARE ENGINEERING DEVELOPMENT
Please refer to the School of Computing and Mathematical Sciences Handbook for further details.

COMPX242-19B (HAM)
SOFTWARE ENGINEERING PROCESS
Please refer to the School of Computing and Mathematical Sciences Handbook for further details.
300 LEVEL PAPERS

COMPX301-19A (HAM)
DESIGN AND ANALYSIS OF ALGORITHMS
Please refer to the School of Computing and Mathematical Sciences Handbook for further details.

COMPX304-19B (HAM)
ADVANCED NETWORKING AND CYBER SECURITY
Please refer to the School of Computing and Mathematical Sciences Handbook for further details.

COMPX307-19B (HAM)
FUNCTIONAL PROGRAMMING
Please refer to the School of Computing and Mathematical Sciences Handbook for further details.

COMPX324-19B (HAM) & (TGA)
USER EXPERIENCE DESIGN
Please refer to the School of Computing and Mathematical Sciences Handbook for further details.

COMPX341-19A (HAM)
SOFTWARE ENGINEERING METHODOLOGY
Please refer to the School of Computing and Mathematical Sciences Handbook for further details.

COMPX361-19B (HAM)
LOGIC AND COMPUTATION
Please refer to the School of Computing and Mathematical Sciences Handbook for further details.

COMPX374-19B (HAM)
SOFTWARE ENGINEERING PROJECT
Please refer to the School of Computing and Mathematical Sciences Handbook for further details.
500 LEVEL PAPERS

COMPX532-19A (HAM)
INFORMATION VISUALISATION
Please refer to the School of Computing and Mathematical Sciences Handbook for further details.

COMPX539-19A (HAM)
USABILITY ENGINEERING
Please refer to the School of Computing and Mathematical Sciences Handbook for further details.

COMPX548 (HAM)
DEVELOPING MOBILE APPLICATIONS
This paper will not be offered in 2019

COMPX552-19A (HAM)
MODEL CHECKING
Please refer to the School of Computing and Mathematical Sciences Handbook for further details.

COMPX554-19B (HAM)
SPECIFICATION LANGUAGES AND MODELS
Please refer to the School of Computing and Mathematical Sciences Handbook for further details.
GRADUATE STUDY
INTRODUCTION

Ground breaking research and state-of-the-art facilities, coupled with internationally renowned staff and top students, makes Waikato’s School of Engineering an exciting place to research and study.

Our research projects exist across a wide range of disciplines, and are supported by multi-million dollar investments from national and local government, many of which have significant iwi and other community involvement.

For more information on our activities, visit sci.waikato.ac.nz.

GRADUATE AND POSTGRADUATE QUALIFICATIONS SUMMARY

The School of Engineering offers the following graduate and postgraduate qualifications:

- Graduate Certificate (GradCert)
- Graduate Diploma (GradDip)
- Postgraduate Certificate (PGCert)
- Postgraduate Diploma (PGDip)
- Master of Engineering Practice (MEngPrac)
- Master of Engineering (ME)
- Master of Philosophy (MPhil)
- Doctor of Philosophy (PhD).

What follows is a brief description of each qualification. Precise details of the regulations can be found in the 2019 University of Waikato Calendar.

CONTACT

ASSOCIATE DEAN (POSTGRADUATE), POSTGRADUATE RESEARCH COMMITTEE AND SCHOLARSHIP COMMITTEE REPRESENTATIVE

Associate Professor Michael Mucalo

| Room: FG.06C | Phone: 07 837 4404 |
| Email: michael.mucalo@waikato.ac.nz |

POSTGRADUATE STUDY ADVISOR

Dr James Carson

| Room: EF.3.01 | Phone: 07 838 4206 |
| Email: james.carson@waikato.ac.nz |
GRADUATE AND POSTGRADUATE QUALIFICATIONS

You will need to discuss the choice of your programme of study – that is, the papers you are going to take and the area in which you plan to write a thesis – with the Postgraduate Study Advisor from the School of Engineering. They will go over your entire proposed programme with you, not just the papers you plan to take in the first year. The outcome of the discussion will be recorded on your student file. If you cannot come to the university in person, we can discuss your proposed programme by email or on the phone.

GRADUATE CERTIFICATE (GRADCERT)
The Graduate Certificate (GradCert) is a qualification for graduates with at least a bachelors degree in any subject. The normal minimal time for completion of the GradCert is one semester. You will need to pass 60 points at 100 level or above, including at least 45 points at 300 level or above. At least 45 points must be in your subject area.

GRADCERT PLANNER 60 points 6 months

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KEY

- Compulsory
- Elective paper

GRADUATE DIPLOMA (GRADDIP)
The Graduate Diploma (GradDip) is a qualification for graduates with at least a bachelors degree in any related subject. The normal minimal time for completion of the GradDip is one year. You will need to pass 120 points at 100 level or above, including at least 75 points at 300 level or above. At least 90 points must be in your subject area.

GRADDIP PLANNER 120 points 1 year

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TECHNOLOGY TEACHING
This specialisation can be taken with a Graduate Diploma in Engineering and is done in conjunction with a Graduate Diploma in Teaching (Secondary).
Please refer to the School of Education Handbook for further details.
There are other Graduate Diploma options available within the School of Science & School of Engineering. Please contact the School Office for further details.
POSTGRADUATE CERTIFICATE (PGCERT)
The Postgraduate Certificate (PGCert) is a qualification for graduates with at least a bachelors degree in a related subject. The normal minimal time for completion of the PGCert is one semester. You will need to pass 60 points at 500 level in your subject area.

POSTGRAD CERT PLANNER 60 points 6 months

POSTGRADUATE DIPLOMA (PGDIP)
The Postgraduate Diploma (PGDip) is a qualification for graduates with at least a bachelors degree in a related subject. It normally takes one year of full-time study. You will need to pass 120 points at 500 level with at least 90 points in your subject area.

You should design your programme in consultation with the Postgraduate Convenor in the School of Engineering.

PGDIP PLANNER 1 year 120 points
MASTERS QUALIFICATIONS

MASTER OF ENGINEERING PRACTICE (MENGPRAC)

The Master of Engineering Practice is a taught programme that prepares graduates with specialist skills and knowledge in the strategic areas of electronics, materials and processing or mechanical engineering, complemented with business training to work in diverse industries and fields in New Zealand and worldwide.

Students will learn about the latest advances in engineering practices and technologies so they are ready to take the next step in their engineering career. The course also includes a management component and a capstone research and development project that will allow students to apply their advanced technical skills to an industry relevant problem.

ENTRY REQUIREMENTS

Candidates for the programme must have:

a) completed a relevant 3 or 4 year undergraduate qualification in a related discipline with at least a B grade average across the final year papers and
b) satisfy the prerequisites for graduate study in the subject(s) being presented for the degree.

PROGRAMME OVERVIEW

The programme is comprised of 180 points: 30 points of problem-based engineering systems analysis, 30 points of management skills and professional practice, 60 points of Level 8 specialised technical training, and 60 points of project work (Capstone Project). The MEngPrac may be completed in either 12 or 18 months. Students must achieve at least a B average in their first semester’s papers in order to continue in the programme. When this isn’t achieved, students can continue their study with a Postgraduate Certificate or Postgraduate Diploma.

For brief descriptions of the MEngPrac papers, please see the Catalogue of Papers at papers.waikato.ac.nz
MENGPRAC - ELECTRONICS

Compulsory paper:
ENGEE506-19A (HAM)
ELECTRONIC SYSTEMS ANALYSIS
30 points
This paper uses the approach of problem based learning for the analysis of common electronics circuits and their applications
Prerequisite paper(s): Completed 4 year Electronics Engineering bachelors degree. Departmental approval required
Assessment: Internal assessment/examination ratio: 50:50

Plus choose 30 points from the following management papers, to be completed in Semester A:
EXMBM511
PEOPLE IN ORGANISATIONS
15 points

EXMBM512
LEADERSHIP AND CHANGE MANAGEMENT
15 points

EXMBM514
ECONOMICS AND THE GLOBAL CONTEXT
15 points

EXMBM521
MANAGING STRATEGICALLY
15 points

EXMBM522
MARKETING STRATEGY
15 points

Plus 60 points of advanced technical papers from the following list, to be completed in Semester B:
ENGEE516-19B (HAM)
SURGE PROTECTION OF ELECTRONIC SYSTEMS
15 points
This paper covers the essential principles related to surge protection of electronic systems powered by the commercial AC power utility and the systems interconnected via data or telecommunication interfaces.
Prerequisite paper(s): B average in ENGEE506 and 30 points of approved 500 level Management papers.
Restricted paper(s): ENELS506
Assessment: Internal assessment/examination ratio: 100:0
ENGEE532-19B (HAM)
**IMAGE PROCESSING AND MACHINE VISION**
15 points
This paper is an introduction to image processing and machine vision in the context of machine automation and control and includes noise suppression, object recognition and tracking, and camera technologies and geometries.

**Prerequisite paper(s):** (ENGEN103 or ENGG182 or COMP103) and (ENGEN201 or ENGEN285 or MATH251 or MATHS201) and (ENGEN284 or MATH255 or MATHS203)

**Assessment:** Internal assessment/examination ratio: 50:50

ENGEE585-19B (HAM)
**ADVANCED POWER ELECTRONICS**
15 points
This paper provides an advanced systems-level teaching on the subject of power electronics. Subjects include power semiconductors, power converters, energy storage devices, DC power management, AC power conditioning and surge protection.

**Prerequisite paper(s):** B average in ENGEE506 and 30 points of approved 500 level Management papers.

**Restricted paper(s):** ENEL385, ENEL485, and ENEL585

**Assessment:** Internal assessment/examination ratio: 50:50

ENGEN583-19A/B/C/D/Y (HAM)
**SPECIAL TOPICS IN ENGINEERING 3**
15 points
An independent theoretical literature or experimental investigation of an engineering topic supervised by a member of staff.

**Prerequisite paper(s):** Departmental approval required

**Assessment:** Internal assessment/examination ratio: 100:0

ENGEN584-19A/B/C/D (HAM)
**SPECIAL TOPICS IN ENGINEERING 4**
15 points
An independent theoretical literature or experimental investigation of an engineering topic supervised by a member of staff.

**Prerequisite paper(s):** Departmental approval required

**Assessment:** Internal assessment/examination ratio: 100:0

ENGEN585-19A/B/C/D (HAM)
**SPECIAL TOPICS IN ENGINEERING 5**
15 points
An independent theoretical literature or experimental investigation of an engineering topic supervised by a member of staff.

**Prerequisite paper(s):** Departmental approval required

**Assessment:** Internal assessment/examination ratio: 100:0

ENGEN586-19A/B/C/D (HAM)
**SPECIAL TOPICS IN ENGINEERING 6**
15 points
An independent theoretical literature or experimental investigation of an engineering topic supervised by a member of staff.

**Prerequisite paper(s):** Departmental approval required

**Assessment:** Internal assessment/examination ratio: 100:0
ENGEN587-19A/B/C (HAM)
DIRECTED STUDY 1
30 points
Students have the opportunity to pursue a topic of their own interest under the guidance of academic staff.

Prerequisite paper(s): Departmental approval required
Assessment: Internal assessment/examination ratio: 100:0

ENGEN588-19A/B/C (HAM)
DIRECTED STUDY 2
30 points
Students have the opportunity to pursue a topic of their own interest under the guidance of academic staff.

Prerequisite paper(s): Departmental approval required
Assessment: Internal assessment/examination ratio: 100:0

ENGME557-19B (HAM)
ROBOTICS
15 points
This paper teaches students the advanced mechatronics with applications to mobile and industrial robotic applications.

Prerequisite paper(s): ENGME357 and ENGME352
Assessment: Internal assessment/examination ratio: 100:0

ENGME585-19A (HAM)
INDUSTRIAL TECHNOLOGY AND INNOVATION 1
15 points
Industrial Technology and Innovation explores the process of technological innovation in industry through readings, assignments, case studies and discussion sessions. It is interactive and draws upon student experiences from work and project experience.

Restricted paper(s): ENMP585
Assessment: Internal assessment/examination ratio: 100:0

60 point capstone research and development project.

ENGEN508-19C (HAM)
MASTER’S CAPSTONE PROJECT
60 points
This paper requires students to carry out a theoretical or empirical investigation in a relevant subject/engineering discipline and write a report on the findings of the investigation.

Prerequisite paper(s): The student should have completed a 4-year bachelors degree in a relevant subject/engineering discipline, and the first 120 pts of the MEngPrac programme.
Assessment: Internal assessment/examination ratio: 100:0
MENGPRAC - MATERIALS AND PROCESSING

Compulsory paper:
ENGMP506-19A (HAM)
MATERIALS AND PROCESS SYSTEMS ANALYSIS
30 points
This paper covers the principles of materials and process engineering analysis.
Prerequisite paper(s): Departmental approval required
Assessment: Internal assessment/examination ratio: 100:0

Plus 30 points from the following management papers, to be completed in Semester A:
EXMBM511
PEOPLE IN ORGANISATIONS
15 points

EXMBM512
LEADERSHIP AND CHANGE MANAGEMENT
15 points

EXMBM514
ECONOMICS AND THE GLOBAL CONTEXT
15 points

EXMBM521
MANAGING STRATEGICALLY
15 points

EXMBM522
MARKETING STRATEGY
15 points

Plus 60 points of advanced technical papers from the following list, to be completed in Semester B:
ENGMP513-19B (HAM)
MATERIALS PERFORMANCE IN SERVICE
15 points
Students will learn the importance of design to avoid fracture using fracture mechanics, advanced stress analysis including plasticity and advanced fatigue, and creep behaviour.
Prerequisite paper(s): ENGMP311 or ENMP311
Restricted paper(s): ENMP413
Assessment: Internal assessment/examination ratio: 20:80

ENGMP516-19B (HAM)
MATERIALS CHARACTERISATION
15 points
This paper covers the basic theory and use of advanced analytical techniques used in materials characterization using optical microscopy, x-ray diffraction, scanning electron microscopy (SEM), transmission electron microscopy (TEM) and differential thermal analysis (DTA).
Prerequisite paper(s): B average in ENGMP506 and 30 points of approved 500 level Management papers.
Assessment: Internal assessment/examination ratio: 20:80
ENGCB523-19B (HAM)
ADVANCED ENERGY ENGINEERING
15 points
Analysis of chemical processing plants and renewable, cogen and smart energy systems through pinch analysis and total site process integration.
Prerequisite paper(s): ENGME221
Assessment: Internal assessment/examination ratio: 50:50

ENGEN583-19A/B/C/D/Y (HAM)
SPECIAL TOPICS IN ENGINEERING 3
15 points
Please see page 69 for details

ENGEN584-19A/B/C/D (HAM)
SPECIAL TOPICS IN ENGINEERING 4
15 points
Please see page 69 for details

ENGEN585-19A/B/C/D (HAM)
SPECIAL TOPICS IN ENGINEERING 5
15 points
Please see page 69 for details

ENGEN586-19A/B/C/D (HAM)
SPECIAL TOPICS IN ENGINEERING 6
15 points
Please see page 69 for details

ENGEN587-19A/B/C (HAM)
DIRECTED STUDY 1
30 points
Please see page 70 for details

ENGEN588-19A/B/C (HAM)
DIRECTED STUDY 2
30 points
Please see page 70 for details

ENGEV543-19B (HAM)
DESIGN FOR ENERGY AND THE ENVIRONMENT
30 points
This interdisciplinary paper focuses on the important aspects of science and technology related to new and existing energy resources and energy efficiency. Topics covered reflect the trend of current development in energy technology.
Prerequisite paper(s): ENGEV341 or ENMP341 or ENGEV342
Restricted paper(s): ENMP541 or ENMP544
Assessment: Internal assessment/examination ratio: 100:0
ENGEV545-19B (HAM)  
ENVIRONMENTAL TECHNOLOGY AND WASTEWATER 2  
15 points  

Prerequisite paper(s): B average in ENGMP506 and 30 points of approved 500 level Management papers.  
Restricted paper(s): ENMP542  
Assessment: Internal assessment/examination ratio: 100:0

ENGM557-19B (HAM)  
ROBOTICS  
15 points  
This paper teaches students the advanced mechatronics with applications to mobile and industrial robotic applications.  
Prerequisite paper(s): ENGME357 and ENGME352  
Assessment: Internal assessment/examination ratio: 100:0

ENGM585-19A (HAM)  
INDUSTRIAL TECHNOLOGY AND INNOVATION 1  
15 points  
Industrial Technology and Innovation explores the process of technological innovation in industry through readings, assignments, case studies and discussion sessions. It is interactive and draws upon student experiences from work and project experience.  
Restricted paper(s): ENMP585  
Assessment: Internal assessment/examination ratio: 100:0

60 point capstone research and development project:  
ENGEM508-19C (HAM)  
MASTER’S CAPSTONE PROJECT  
60 points  
Please see Page 70 for details
MENGPRAC - MECHANICAL ENGINEERING

Compulsory paper:
ENGME506-19A (HAM)
MECHANICAL AND MECHATRONICS SYSTEMS ANALYSIS
30 points
This paper covers the principles of mechanical and mechatronics engineering analysis.
Prerequisite paper(s): Departmental approval required
Assessment: Internal assessment/examination ratio: 100:0

Plus 30 points from the following management papers, to be completed in Semester A:
EXMBM511
PEOPLE IN ORGANISATIONS
15 points

EXMBM512
LEADERSHIP AND CHANGE MANAGEMENT
15 points

EXMBM514
ECONOMICS AND THE GLOBAL CONTEXT
15 points

EXMBM521
MANAGING STRATEGICALLY
15 points

EXMBM522
MARKETING STRATEGY
15 points

Plus choose 60 points from the following papers:
ENGC523-19B (HAM)
ADVANCED ENERGY ENGINEERING
15 points
Please see page 72 for details

ENGEN583-19A/B/C/D/Y (HAM)
SPECIAL TOPICS IN ENGINEERING 3
15 points
Please see Page 69 for details

ENGEN584-19A/B/C/D (HAM)
SPECIAL TOPICS IN ENGINEERING 4
15 points
Please see Page 69 for details
ENGEN585-19A/B/C/D (HAM)
SPECIAL TOPICS IN ENGINEERING 5
15 points
Please see Page 69 for details

ENGEN586-19A/B/C/D (HAM)
SPECIAL TOPICS IN ENGINEERING 6
15 points
Please see Page 69 for details

ENGEN587-19A/B/C (HAM)
DIRECTED STUDY 1
30 points
Please see Page 70 for details

ENGEN588-19A/B/C (HAM)
DIRECTED STUDY 2
15 points
Please see Page 70 for details

ENGEV543-19B (HAM)
DESIGN FOR ENERGY AND THE ENVIRONMENT
30 points
Please see Page 72 for details

ENGME555-19B (HAM)
ADVANCED CONTROL IN MECHATRONICS
This paper teaches students the advanced application of control in mechatronics.
Prerequisite paper(s): B average in ENGME506 and 30 points of approved 500 level Management papers
Assessment: Internal assessment/examination ratio: 100:0

ENGME557-19B (HAM)
ROBOTICS
15 points
Please see Page 73 for details

ENGME585-19A (HAM)
INDUSTRIAL TECHNOLOGY AND INNOVATION 1
15 points
Please see Page 73 for details

ENGMP513-19B (HAM)
MATERIALS PERFORMANCE IN SERVICE
15 points
Please see Page 71 for details

60 point capstone research and development project.

ENGEN508-19C (HAM)
MASTER’S CAPSTONE PROJECT
60 points
Please see Page 70 for details
MASTER OF ENGINEERING (ME)

This research-focused degree is designed for engineering graduates who wish to further their knowledge of the innovative research methodologies required in industry, and for professional engineers who wish to upskill in new areas related to their work.

Excellence in advanced engineering design, research and development skills are core features of the degree. The degree involves following an approved research investigation in either the School of Science or School of Engineering or the School of Computing & Mathematical Sciences. Candidates are required to complete a total of 120 points at 500 level over 12 months full-time or the equivalent in part-time study. Entry is via a recognised four-year professional engineering bachelors degree that contains a substantial design project. Potential candidates may be asked to complete a postgraduate certificate or postgraduate diploma before enrolling in an ME.

ME - YEAR 1 OPTIONS

Option 1

| 500 level (30 points) | Thesis (90 points) |

Option 2

| Thesis (120 points) |

Up to 30 points of the ME can be level 500 taught papers including papers from other subjects. Please refer to the Papers section for Engineering related papers.

Please refer to the 2019 University of Waikato Calendar online at calendar.waikato.ac.nz for degree regulations.

KEY

- Compulsory
- Elective Paper

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76 THE UNIVERSITY OF WAIKATO
SUBJECT AREAS WITHIN ENGINEERING

The School of Engineering is committed to fostering synergistic relationships between science, engineering, industry and management, which is essential for turning scientific knowledge into commercial products, processes and services.

The School of Engineering has developed a very strong research base to support its aims of providing students with in-depth knowledge, analytical skills, ideas on innovation, and techniques to translate science into technology in the real world.

Research programmes exist across a wide range of disciplines, supported by the primary research interests of staff. Research areas include:

• Agricultural Engineering
• Advanced Metals and Alloys
• Materials Engineering
• Energy Engineering
• Food and Water
• Infrastructure Engineering

Collaborative work with industry and research associations are also available.

CONTACT

SCHOOL OF ENGINEERING OFFICE
Room: E.2.07 Phone: 07 838 4266
Email: engineering@waikato.ac.nz

POSTGRADUATE STUDY ADVISOR
Dr James Carson
Room: EF.3.01 Phone: 07 837 4206
Email: james.carson@waikato.ac.nz
HIGHER RESEARCH DEGREES

DOCTOR OF PHILOSOPHY (PHD)

To enrol for a PhD you normally need a bachelor’s with honours or a master’s degree with a research component of at least 30 points and have achieved at least Second Class Honours (First Division) or Distinction.

Once your online application is received, it will be considered on a competitive basis along with other applications, in March, July, or November respectively. If your application is accepted, you will be sent an Offer of Place, and you will then be able to choose a start date for your study, which can be the first day of any month between February and November.

When you apply to undertake a Higher Research Degree, your application is assessed to check that you meet our admission criteria, as well as meeting any specific entry requirements for the qualification in which you wish to enrol. All incomplete or incorrect applications are unable to be considered further.

A PhD involves advanced study and research under the direction of a supervisor for at least three years (full-time). You write a thesis on an original investigation relating to some branch of your chosen subject. Although the PhD does not normally involve coursework, you may be required to take up to two preliminary papers. More details on the PhD regulations and general guidelines can be found in the Higher Degrees Handbook which can be obtained from the School of Graduate Research Office, or online in PDF format from the website.

Enrolment of all new candidates for the PhD approved by the Postgraduate Studies Committee is conditional for an initial period of six months. Confirmation of enrolment by the Postgraduate Studies Committee after the initial period of six months is subject to the submission by the candidate of:

- An acceptable research plan, and
- A formal presentation to a Confirmed Enrolment Panel, and
- A report by the supervisors recommending confirmation of enrolment, and
- Evidence of ethical approval or a statement confirming that it is not required, in accordance with the Ethical Conduct in Human Research and Related Activities Regulations 2008.

HIGHER DEGREE APPLICATION PROCESS

PhD applicants apply online through the University online application portal at waikato.ac.nz/enrol.

Documentation required:

- A completed supplementary form - this is where you will provide the contact details for your academic referees and the name of any Waikato academic you may have been speaking to.
- A Statement of Research Interest.
- A sample of your academic writing.
- Copies of academic transcripts and certificates.
- Copy of passport.
- Evidence of English language proficiency.

Ensure that your two academic referees submit their letters of recommendation by the application closing date for which you are applying. Academic referees must submit their references directly to doctoral.enrolments@waikato.ac.nz.

You will receive email notification of the outcome of your application and if appropriate, your scholarship application six weeks after the closing date. An offer of place in the higher degree programme will only be valid for 12 months.

For more information visit waikato.ac.nz/study/apply/higher-research-degrees-application-process.
RESEARCH EXPERTISE DATABASE

We strongly recommend you search our research expertise database, which holds the research profiles of the University’s supervising staff. Here you will see if there is an academic undertaking research in your area of interest. You may wish to contact an academic to discuss possible supervision but it is not required before you submit your application. Visit waikato.ac.nz/staff-profiles.

MASTER OF PHILOSOPHY (MPhil)

To enrol for a MPhil you normally need a bachelors with honours or masters degree with at least Second Class Honours (First Division) or Distinction. Like the PhD, this is a research degree, but of more limited scope, and the aim is to complete in one year (full-time). As with the PhD, you first choose a supervisor, topic, write a proposal and apply to the Postgraduate Studies Committee. You may be required to take up to two preliminary papers.

It is sometimes possible to transfer from an MPhil to a PhD, usually after one year, provided you have made good progress. An application and expanded research proposal must be submitted to the Postgraduate Studies Committee.

PROGRESS REPORTS

Progress reports are an integral part of enrolment in a higher degree. The Postgraduate Research Committee may terminate a candidate’s enrolment if progress reports are not submitted in a timely manner, or if progress is continually recorded as unsatisfactory.

PhD candidates must submit progress reports six-monthly from the date of confirmed enrolment; and MPhil candidates must submit progress reports six-monthly from the date of enrolment.

Progress reports require candidates to report on progress made in the previous six months, and to report on work that is to be achieved in the next six months. Reports must be endorsed by the supervisory panel, postgraduate convenors, and Postgraduate Research Committee representative. Copies of progress reports are sent to candidates. PhD candidates are encouraged to discuss progress reports with their supervisory panel first, before submission.

CHANGES TO CONDITIONS OF ENROLMENT

Candidates wishing to change their conditions of enrolment should seek advice from the School of Graduate Research. Changes to conditions of enrolment include: topic change, status change (full-time/part-time), supervisory panel change, school change, suspension of enrolment, and extension of enrolment.

Candidates must complete a Change of Conditions Form, which must be endorsed by the supervisory panel, Postgraduate Convenor and Postgraduate Studies Committee Representative. Any application for changes to conditions of enrolment must be approved by the Postgraduate Research Committee.

TE MATA KAIRANGI SCHOOL OF GRADUATE RESEARCH

Te Mata Kairangi School of Graduate Research, The University of Waikato, Private Bag 3105, Hamilton 3240, New Zealand

Phone: + 64 7 858 5096
Email: sgr@waikato.ac.nz
Web: waikato.ac.nz/students/research-degrees/
EXAMINATION
The Postgraduate Research Committee approves nominated examiners to examine the thesis; the examiners must be external to the University and must not be directly associated with the candidate or the candidate’s research.

An oral examination is also part of the examination process for the PhD degree. Oral examinations are not usually held for the MPhil degree. The oral examination gives the candidate an opportunity to further demonstrate their knowledge in the field of study, and is also an opportunity for the candidate to explain or justify aspects of the thesis that require clarification.

It is expected that the thesis will be under examination for three months from the time of submission of the thesis. The Postgraduate Studies Committee, after considering the examiners’ recommendations, will make the final decision on awarding the degree.

Note: This is a summary of the processes related to Higher Degrees enrolment.

FULL-TIME VS PART-TIME
A full-time student must complete a masters degree (ME) in 12 consecutive months from first enrolment to qualify for the award of honours.

Domestic candidates can apply for full-time or part-time enrolment and may apply to change this status at any stage during their enrolment in the degree.

International candidates are usually enrolled as full-time students as a condition of their student visa. International candidates studying full-time, are likely to qualify for domestic student fees, if they are residing in New Zealand during the period of their study. Those studying part-time may be required to pay international fees.

Full-time candidates should expect to devote the majority of their working time to their studies. The University defines full-time research study as a minimum of 30 hours per week on average over a period of 12 months that can be committed to study in reasonable ‘blocks’ of time. Part-time research study is defined as a minimum of 15 hours per week on average over a period of 12 months that can be committed to study in reasonable ‘blocks’ of time.

TAUGHT PAPERS VS THESIS PAPER
The relevant Postgraduate Convenor (or nominee) approves the papers taught in graduate qualifications. This ensures the candidate is well-prepared, in terms of skills and knowledge, to undertake the thesis topic proposed. The assessment in taught papers is varied and can be assessed exclusively on coursework, examination, or a mixture of both. Candidates should be certain of their deep interest in the proposed topic, as a thesis is a demanding activity and requires a high level of academic ability, commitment and stamina.
ACADEMIC STAFF

Professor Mark Dyer, Dean of Engineering mark.dyer@waikato.ac.nz
BBEng, BSc, MA, DPhil, FICE, FTCD, CEng
Research interests: Flood risk management and stability of flood levees as well as the biologically mediated processes in the soil for remediation of organic pollutants and deposition of calcite cement for ground improvement.

Dr Martin Atkins martin.atkins@waikato.ac.nz
BSc (Materials & Process Engineering), MSc (Materials & Process Engineering); PhD

Dr Chi Kit Au chikit.au@waikato.ac.nz
BSc, MSc, PhD Hong Kong
Research interests: Computation; geometric modelling; and manufacturing technology.

Dr Aydin Berenjian aydin.berenjian@waikato.ac.nz
BE, ME SUT, PhD USyd

Dr Leandro Bolzoni leandro.bolzoni@waikato.ac.nz
BMechEng Polytechnic of Turin, MMatSci Carlos III de Madrid, PhD Carlos III de Madrid
Research interests: Development, processing and characterisation of novel lightweight metals and composites via near-net-shape manufacturing techniques.

Dr Megan Boston megan.boston@waikato.ac.nz
BS, MS, MSE, PhD
Research interests: Structural engineering focusing on disaster preparedness, response, and recovery. How buildings respond to natural disasters in terms of physical damages, but also how the organisations within the buildings fair with the damage. Interdisciplinary research combining structural engineering, public health and sociology and use tools such as risk analysis, probability, and structural analysis to analyse and predict damages to buildings and the subsequent impacts on society.

Dr James K Carson james.carson@waikato.ac.nz
BE(Hons), ME Canterbury, PhD Massey
Research interests: Measuring and predicting thermo-physical and transport properties; mathematical modelling of thermal processes; refrigeration; food engineering; heat transfer; and thermodynamics in general.
Professor Yifan Chen  
*yifan.chen@waikato.ac.nz*

BEng(Hons I) PhD NTU  

Dr Michael Cree  
*michael.cree@waikato.ac.nz*

BSc(Hons), PhD Canterbury, SMIEEE, MNZIP, MACPSEM  
Research interests: Computer vision; medical physics; retinal imaging; range imaging; and image sensor technology.

Associate Professor Mike Duke  
*mike.duke@waikato.ac.nz*

BEng(Hons) SBankPoly, PhD South Bank, MISES, MANZSES  
Research interests: Integrated photovoltaic thermal systems (BIPVT); high performance battery electric vehicles (BEV), sustainable transport; renewable energy products; and vibrations and dynamics.

Dr Alessandro Fascetti  
alessandro.fascetti@waikato.ac.nz

Ing, BEng, MEng, PhD  

Chanelle Gavin  
*chanelle.gavin@waikato.ac.nz*

BE(Hons) Chemical and Biological Engineering, Waikato  
Research interests: Bioplastics, foamed materials, protein separation and structure, thermal analysis of materials and proteins.

Dr Graeme Glasgow  
*graeme.glasgow@waikato.ac.nz*

BE(Hons) Strath UK, MSc Strath UK, PhD Loughborough UK  

Professor Ilanko Sinniah  
ilanko.sinniah@waikato.ac.nz

BSc(Eng)(Hons), MSc Manchester, PhD University of Western Ontario  
Research interests: Numerical modelling; vibration and stability of mechanical/structural systems; passive vibration control; adaptive mechanisms; and engineering education.

Dr Seokho Jeong  
*seokho.jeong@waikato.ac.nz*

BEng(Korea), M2P (France), PhD (USA)  
Research interests: Seismic resilience of infrastructure, Geotechnical earthquake engineering, Implication of the site effect in local and regional seismic hazard, Application of geophysical methods in earthquake engineering.

Dr Ye Chow Kuang  
yechow.kuang@waikato.ac.nz

BEng (Electromechanical Engineering), PhD (Electrical Engineering), CEng  
Research interests: statistical machine learning, computational intelligence, Instrumentation and measurement
Associate Professor Nihal Kularatna nihal.kularatna@waikato.ac.nz
BSc(Eng) Ceyl, DSc Waikato, FIET, FIE, SMIEEE, FIENZ
Research interests: Power conditioning and power protection for electronic systems; Supercapacitor applications; DC power management; Smart sensor systems.

Dr Mark Lay mark.lay@waikato.ac.nz
BSc, MSc, PhD Waikato
Research interests: Biotechnology and process chromatography; chromatographic modelling; science education research; and co-operative education.

Dr Shen Hin Lim him.lim@waikato.ac.nz
BE(Hons) UNSW Australia, PhD UNSW Australia
Research interests: Agricultural engineering, autonomous systems, Magnetorheological (MR) fluids and dampers, composites materials and structures modelling and applications.

Dr Ginghis Maranan ginghis.maranan@waikato.ac.nz
BSCE, MEng, PhD University of Southern Queensland
Research interests: Structural analysis, structural testing and investigation, analytical modelling and simulation, reinforced concrete and FRP-reinforced concrete systems, earthquake engineering, and fibre composite materials for civil engineering applications.

Dr Yusuke Mochida yusuke.mochida@waikato.ac.nz
BE (Mechanical, Japan), ME (Waikato), PhD (Waikato)

Professor Kim Pickering kim.pickering@waikato.ac.nz
BSc(Eng)(Hons) London, PhD Surrey, FIPENZ, MIMMM
Research interests: Natural and synthetic composite materials; optimising advanced composite properties; and failure mechanisms of composite materials.

Prof Bill Redman-White bill.redman-white@waikato.ac.nz
MSc, PhD, FIEEE, FIET
Research interests: Analogue and RF IC design; currently active in IC technology and design for power management, wireless power and energy harvesting for sensor networks.

Professor Jonathan Scott jonathan.scott@waikato.ac.nz
BSc, BE, MEngSc, PhD Sydney, SMIEEE, MAES, MSPIE
Research interests: Analogue and digital electronics; microwave and millimetre-wave components; instrumentation and metrology; audio; linearity and distortion; vector correction; III-V and wide-bandgap devices and device models; embedded microcontrollers; electric traction; RF amplifiers; and microwave systems.
Dr Ali Shokri ali.shokri@waikato.ac.nz
BSCE, MEng, PhD
Research interests: Hydrodynamics in porous media and developing integrated surface/subsurface flow codes and numerical models.

Dr Ajit Pal Singh ajitpal.singh@waikato.ac.nz
BE Honours (Mechanical), PhD (Materials and Processing), Waikato
Research interests: Powder metallurgy/thermomechanical processing of titanium and titanium alloys. Effects of residual impurities and microstructure on the fracture behaviour of titanium alloys. Mechanical performance (particularly fracture toughness) of powder-produced Ti-6Al-4V. Processing and characterisation of powder produced metal matrix composites, nanofiber composites, sandwich structured composites and ceramic materials

Associate Professor Alistair Steyn-Ross alistair.steyn-ross@waikato.ac.nz
BSc, MSc, PhD Waikato, MNZIP, MRSNZ
Research interests: Cortical modelling; anaesthetics phase-change studies; quantifying brain state; and computational physics.

Professor Moira Steyn-Ross moira.steyn-ross@waikato.ac.nz
BSc, MSc, PhD Waikato, MNZIP
Research interests: Cortical modelling; theoretical modelling of bulk electrodynamics of the human brain; EEG simulation; and modelling of sleep, anaesthesia and cognition.

Dr Lee Streeter lee.streeter@waikato.ac.nz
PhD Waikato, MSc Physics Waikato

Dr Rachael Tighe rachael.tighe@waikato.ac.nz
MPhys (Hons) Physics; MSc Environmental Technology; PhD University of Southampton
Research interests: Non-destructive evaluation of materials, components and structures. To assess if existing techniques are well suited to new materials such as additive manufactured materials or advanced or bio composites.

Dr Rob Torrens rob.torrens@waikato.ac.nz
BSc(Tech), MSc, PhD Waikato
Research interests: Engineering education, including high school transition, the first year experience, and project-based learning.

Professor Michael Walmsley michael.walmsley@waikato.ac.nz
BE, PhD Auckland, MAIChe. AMICHemE
It is University policy to provide equal opportunities in both education and employment for all people regardless of factors that are irrelevant to their abilities, thereby deriving benefit from the overall pool of talent that exists in New Zealand society and contributing to its enrichment. The School is also committed to a policy of selection and appointment on the basis of merit. The interpretation of merit is comprehensive, and includes a diverse range of areas of experience and personal qualities as well as formal qualifications.

We seek a higher proportion of both Māori and people with disabilities in all areas of University life, and a more equal representation of genders, particularly at graduate level. There is recognition, too, that socio-economic situation and ethnic origins significantly affect access to university study. The University actively encourages participation from under-represented groups through student recruitment policies and student support services.

**YOUNG ENGINEERS SOCIETY (YES)**

YES supports student networking with engineering staff and industry in order to take advantage of the vast opportunities that engineering offers.

Come and find us every Wednesday during cultural hour (1.00 – 2.00pm) upstairs in LSL, you can get your membership sticker and meet the team.

[yeswaikato.co.nz](yeswaikato.co.nz)

**WESMO**

WESMO is a group of students working together to design, build and test an open wheeled single-seat race car to compete in Formula SAE Australasia.

Formula SAE-A is an exciting international education program where university students design, build and compete in small open-wheeled vehicles. Formula SAE graduates worldwide are considered to be among the most work-ready graduates emerging from the university system.

Formula SAE promotes careers and excellence in engineering as it encompasses all aspects of the automotive industry including research, design, manufacturing, testing, developing, marketing, management and finances. Formula SAE takes students out of the classroom and allows them to apply textbook theories to real work experiences and challenges students all over the globe.

[eng.waikato.ac.nz/wesmo/](eng.waikato.ac.nz/wesmo/)
STEM PACIFKA AND MĀORI

STEM Pacifika and Māori welcomes Pacific and Māori students studying in Science, Technology, Engineering and Mathematics. The club provides an environment where students are able to have social, academic and networking support through design challenges, quiz nights, networking nights and other events organised by the committee.

For more information, please email stem.pm18@gmail.com.

LADIES INC

Ladies Inc is a social club at the University of Waikato which aims to support women studying and working in science, technology, engineering and mathematical (STEM) related fields.

Our goal is to build a support network of women in which we can encourage and inspire each other through social and industry events. Along the way we hope to encourage women to continue pursuing careers in these areas as women are under-represented in the computing industry.

Check out facebook.com/groups/LadiesInCNZ for more information.
SOURCES OF FUNDING FOR DOCTORAL STUDY

UNIVERSITY OF WAIKATO DOCTORAL SCHOLARSHIPS
These awards provide three years of funding for students undertaking a full-time Doctoral degree at The University of Waikato. Awards are made on academic merit and the minimum average grade required for application is an A- (80%). Both international and domestic students are eligible to apply.
Application forms are available from the Scholarships website waikato.ac.nz/scholarships.

INTERNATIONAL STUDENTS
International PhD students are eligible for domestic fees for their PhD studies. Conditions apply. International (non-New Zealand resident) students can apply for a “New Zealand Scholarship” funded by the New Zealand Government or for scholarships funded by their own country.

POSTGRADUATE SCHOLARSHIPS
For further information on Engineering undergraduate and postgraduate scholarships contact the School of Graduate Research - Scholarships.

SCIENCE AND ENGINEERING MASTERS FEES AWARDS
UP TO $2,000
For students enrolling full-time in the first year MSc (Research), MSc, MSc (Tech) ME or MEnvSci programme in the School of Science or School of Engineering. Part-time applicants may be considered but any scholarship awarded will be on a pro-rata basis.

EXTERNAL FUNDING
External funding is often available for specific research projects. Students should initially consult with their Postgraduate Convenor or the director of the centre about external funding opportunities.
Dr Michael Mucalo is the School representative for the Scholarships Committee and can also be contacted for advice.

SCHOOL OF GRADUATE RESEARCH - SCHOLARSHIPS
Located in W Block and provides advice, administration services and information about available scholarships.
The University of Waikato, Private Bag 3105, Hamilton 3240, New Zealand

Phone: +64 7 838 5096
Email: scholarships@waikato.ac.nz
Web: waikato.ac.nz/scholarships
UNIVERSITY OF WAIKATO AND OTHER SCHOLARSHIPS

SIR EDMUND HILLARY SCHOLARSHIP PROGRAMME
The Sir Edmund Hillary Scholarship Programme provides support for students studying at Waikato who have an established record of excellence in sport, or in performing or creative arts, exhibit leadership qualities, have University Entrance, and have achieved merit or above at Level 2 NCEA in a specified number of approved subjects.

UNIVERSITY OF WAIKATO RESEARCH MASTERS SCHOLARSHIP
These awards provide one year of funding for students commencing the second or final year of a full-time masters degree at The University of Waikato. The awards are made on academic merit and the minimum average grade required for application is an A-

Application forms are available from the Scholarships website waikato.ac.nz/scholarships.

UNIVERSITY OF WAIKATO TAUGHT POSTGRADUATE SCHOLARSHIP
The University of Waikato established the Taught Postgraduate Fees Scholarship to support students studying at postgraduate level, primarily undertaking coursework. Preference will be given to students on a pathway to research qualifications at The University of Waikato. Awards will be determined on academic merit.

Application forms are available from the Scholarships website waikato.ac.nz/scholarships.

COMMONWEALTH SCHOLARSHIP
If you live in one of the 60 member countries involved in the Commonwealth Scholarship and Fellowship Plan, you may apply in your own country for a Commonwealth Scholarship to be taken up at The University of Waikato. If you do have a scholarship, or other funds, that will allow you to cover the cost of your education, then we encourage you to apply to enter our graduate programme.
EXTENSIONS FOR MASTERS THESES

APPLYING FOR AN EXTENSION
Candidates are expected to make a written application to the Faculty Registrar in the first instance. The application should outline the reasons for the extension, must be written by the candidate and include supporting documentation as appropriate, such as a medical statement or a support note from the supervisor. The Faculty Registrar may approach the supervisor and the Dean of Engineering independently to confirm the student’s version of events. Subject to these comments, the application may then be forwarded to the Associate Dean (Postgraduate) for consideration. In making an application for an extension, the obligations of candidates are as outlined below:

- Candidates must contact their supervisor as soon as they are able once a problem has been identified
- Candidates must make a formal application as soon as the period of impairment has been identified
- Applications on the basis of medical or personal problems must be accompanied by a medical certificate or a statement from a counsellor or similar.

Except in exceptional circumstances, the School undertakes to make a decision on any application within 10 working days.

RE-ENROLLMENT
Candidates who are awarded an extension of greater than three weeks are required to re-enroll and normally pay the equivalent of two-thesis papers of fees per semester of study.

If there are reasonable grounds provided, this fee may be waived with the ultimate decision on this being made by the Student and Academic Services Division after advice provided by the School.

GUIDELINES FOR THE APPROVAL OF EXTENSIONS TO THE SUBMISSION DATE OF A MASTERS THESIS
The commencement and submission dates are agreed to by the candidate and the Postgraduate Convenor when the degree is started.

The circumstances under which an application for an extension to this submission date may be considered by the Associate Dean (Postgraduate) are:

- Medical or personal problems leading to a period of significant impairment
- Significant and unforeseen equipment failure

The Associate Dean (Postgraduate) on a case-by-case basis will make decisions on what constitutes a period of significant impairment. Candidates should note that the following do not represent valid grounds for an extension (please note that this list is not exhaustive):

- Staff leave
- Requirements for editorial revision
- Loss of electronically-stored data
- Commitments due to employment

Candidates who feel that they have been unfairly disadvantaged in their interactions with their supervisor or any other persons, should in the first instance discuss this with their supervisor. If a satisfactory resolution cannot be found, candidates may then take their concerns to the Assistant Dean (Academic) and then to the Associate Dean (Postgraduate) as appropriate. Candidates should note that they are welcome to raise any concerns in confidence with the Associate Dean (Postgraduate) directly at any stage.
THE STUDENT CENTRE/ TE MANAWA

STUDENT ASSISTANCE
The Student Administration Desk is located on Level 2 of the Student Centre. Go here if you need any help, including the following:
• All student enquiries
• StudyLink
• Academic Records
• Academic Credit
• ID Cards
• International Student Services

PAYMENTS
The Payment Office is located on level 2 of the Student Centre. The following can be paid here:
• Tuition Fees
• Library Invoices
• Course-related costs including lab coats and science equipment
• Student visas for International students

THE LIBRARY
The Library is located in the Student Centre/Te Manawa. The Library provides students with access to:

BUILDING RESOURCES
• Computers, laptops, photocopiers, scanners
• Group study rooms
• Quiet study spaces

STUDY AND RESEARCH RESOURCES
• Books/Journal articles/Proceedings/Technical reports – print and online
• Other resources (DVDs, maps, microfilms etc).

STAFF ASSISTANCE
• Library tours
• Tutorials (how to find, reference and present your information; computing skills)
• General queries and information (Information desks, online chat, Virtual Reference Desk, Facebook)
• 1:1 consultations with your Subject Librarian

SCIENCE AND ENGINEERING LIBRARIAN – CHERYL WARD OR DEBBY DADA
The Library, The University of Waikato, Private Bag 3105, Hamilton 3240, New Zealand
Phone: +64 7 837 9132
Email: cheryl.ward@waikato.ac.nz or debby.dada@waikato.ac.nz
GENERAL INFORMATION FOR INTERNATIONAL STUDENTS

Under the Ministry of Education’s Code of Practice for the Pastoral Care of International Students there are statutory requirements in regards to the information we must include in our publications.

ENGLISH LANGUAGE REQUIREMENTS FOR UNDERGRADUATE STUDY IN THE SCHOOL OF ENGINEERING
All students whose application for admission is on the basis of study completed overseas where the medium of instruction is not English, are required to provide evidence of a satisfactory level of competence in the English Language.

An iBT (Internet Based TOEFL) score of 80 (with a Writing score of 21), or an IELTS overall score of 6.0 with no bands below 5.5, or a PTE Academic overall score of 50 (no PTE communicative skills score below 42).

International students seeking admission via The University of Waikato Pathways College may be accepted on the basis of a B grade or higher at level 7 in the Certificate of Attainment in Academic English.

ENGLISH LANGUAGE REQUIREMENTS FOR GRADUATE AND POSTGRADUATE STUDY
You are required to meet the English language requirements for admission into Graduate and Postgraduate qualifications. You are required to achieve an iBT (Internet Based TOEFL) score of 90 with a Writing score of 21, or an IELTS Overall score of at least 6.5 overall (with no less than 6.0 in any band), or an PTE Academic overall score of 58 and no PTE communicative skills score below 50, or a B grade or better at Level 8 in the Certificate of Attainment in Academic English.

CODE
The University of Waikato has agreed to observe and be bound by the Code of Practice for the Pastoral Care of International Students. Copies of the Code are available from education.govt.nz/quick-links/international-students.

IMMIGRATION
Full details of immigration requirements, advice on rights to employment in New Zealand while studying, and reporting requirements are available from Immigration New Zealand, and can be viewed on their website at immigration.govt.nz.

INTERNATIONAL STUDENT SUPPORT
All Graduate and Postgraduate International students should make contact with both the Postgraduate Study Advisor, and with the Assistant Dean (Academic) in the School, who can help with any problems or issues outside of the School.
SCHOOL SUPPORT

AFTER-HOURS ACCESS
After-hours access to the School complex for undergraduate students is normally not available. Undergraduate students may be allowed access after hours only with the written permission of a member of University staff, granted for a specific occasion.

ENROLMENT AND PROGRAMME ADVICE
The FG Link reception staff are available to help you make the best choices for your programme of study, answer any questions you may have about choosing papers, changing your enrolment, graduating from university, and more. We are available Monday – Friday, 8.30am – 5.00pm, FG Link reception.
Email science@waikato.ac.nz.

CLASS REPRESENTATION
All papers in the University should elect at least one class representative, and possibly more depending on the size of the paper. Class representatives are mainly concerned with academic matters, things that can impact on the quality of your education, and the ability to study effectively.

The election of class representatives leads to a greater spread of interest, involvement and responsibility among members of the student body. It results in greater student participation in the running of the University. Student involvement in the governance and management of the University is essential to the high quality of academic and institutional life, of which class representatives are an integral part. For more information relating to class representatives email student.reps@waikato.ac.nz.

SPECIAL CONSIDERATION FOR INTERNAL ASSESSMENT
Students should apply for Special Consideration if they are unable to complete an internal assessment item due to circumstance beyond their control or if their performance in an internal assessment item was seriously impaired.

Completed Special Consideration forms should be returned to the School of Engineering Office (E.2.06) together with supporting documentation within 72 hours of the deadline for the internal assessment item. Please note that medical certificates should be obtained from a registered medical or dental practitioner, midwife, registered psychologist or counsellor, depending on the circumstances, within 24 hours of the deadline.

If a student’s application for Special Consideration is approved, an estimated mark for the internal assessment item will be calculated at the end of the semester, based on their performance in comparable assessment items. In some circumstances, students may be offered the opportunity to complete an alternative assessment item instead.
TE PŪTAHI O TE MANAWA - STUDENT SUPPORT SERVICE

Te Pūtahi o te Manawa is a support service available to all Māori Students doing papers in the School of Science and School of Engineering. This includes advice and support, whether study orientated or otherwise. Please drop in to the Student Success Coordinator’s office on the ground floor of F Block (F.G.06A) or use our contact details to make an appointment. And remember ‘sooner is better than later’.

STUDY WĀNANGA AND WORKSHOPS

There comes a time in the academic year where students have to make sure that they are on-track and are well positioned heading into exams and peak assessment time.

Attending these workshops can help ensure your success and those on offer include: Time Management; MS Word; MS Excel; Essay Writing; Exam Preparation; APA Referencing and others if needed.

Study Wānanga will help students heading into exams to prepare, review and revise over their paper content before the final exams. Our Student Success Coordinator will let you know when wānanga will be held during the year. Keep an eye on your emails and on the School Facebook page.

MĀORI MENTORS

Our team of successful Māori Mentors are available to help you with subject specific areas within your programme.

ONLINE SUPPORT

Online Support via Moodle is a Te Pūtahi o Mānawa/Māori Science Support presence. This provides another forum where students can communicate with kaitiaki/mentors and the Student Success Coordinator, or as a forum to talk to each other.

STEM STUDENT SUCCESS COORDINATOR
Ms Rewa Gilbert
Room: F.G.06A
Email: rewa.gilbert@waikato.ac.nz
UNIVERSITY SUPPORT

CAREER DEVELOPMENT SERVICES
Career Development Services offers free advice to University of Waikato students, recent graduates and alumni. Our team can help you with career planning, developing your CV and cover letter, interview skills, social media, and personal brand. We also connect students and graduates with employers through Careers Fairs, employer campus visits and promoting employment opportunities. Please email careers@waikato.ac.nz to attend a workshop or to book a one-on-one consultation.

CHAPLAINCY
There is a chaplaincy service available at the University of Waikato. This service is available to students and staff of all religious backgrounds in the spirit of mutual respect and deepening understanding. Email chaplain@waikato.ac.nz

CHILDREncare SERVICES
We have a crèche on campus available for children aged three months to five years. We also have a Kohanga Reo (preschool taught in Te Reo Māori) near the Hamilton campus. Call 07 856 2982 for more information.

COMPLAINTS PROCEDURE
If you feel you have been unfairly disadvantaged, you should in the first instance consult the lecturer concerned. If the situation is not resolved you should then consult the relevant programme convenor.
Your next port of call should be the Dean of Engineering. Unresolved complaints should then be referred to the Associate Dean (Teaching and Learning). Students may also make a formal complaint to the office of the Vice-Chancellor if the situation has not been resolved.
Please also feel free to contact the Faculty Registrar if you feel that you have been unfairly disadvantaged in your dealings with staff in any part of the University.

CULTURAL HOUR
Cultural Hour is every Wednesday 1.00 – 2.00pm and is a time free of lectures and tutorials so clubs and societies can meet and other student and University activities can be held.

STUDENT COUNSELLING SERVICE
The Student Counselling Service aims to ensure that your time at University is the best it can be. Counselling can help with a range of issues, big and small. Some of the life issues the counsellors deal with are; loneliness, living arrangements, anger, study overload, grief, stress, anxiety, relationships, sexuality and depression. The Counselling service also offers workshops and seminars to assist you in preparing for exams and other issues.
Most appointments last for one hour. You can make a confidential appointment by phoning 07 838 4037.

DISABILITY SUPPORT SERVICES
Disability Support Services – Te Tari Kai Awhina Hauā provides you with access to a range of services, including lecture material, learning support, alternative examination arrangements, access to assistive technology, alternative formatting, ergonomic furniture, hearing equipment, specialist staffing and much more.
The Students with Disability Handbook provides comprehensive information about access arrangements and support available at the University. Contact the disability support staff by email disability@waikato.ac.nz to discuss any arrangements or accommodations you require.
DISABLED ACCESS IN THE SCHOOL OF SCIENCE & SCHOOL OF ENGINEERING

Disabled access to the blocks housing the School of Science & School of Engineering is by way of the lifts in D, F and FG Blocks. The ground floors of these blocks can be entered by ramps from the respective car park area.

DISCIPLINE POLICY

The University Discipline Regulations are set out in the 2019 University of Waikato Calendar and apply to misconduct, including cheating, plagiarism, misuse of computer facilities, or other breach of the University regulations. Plagiarism is unacknowledged copying or paraphrasing of someone else’s work, whether published or not. It may be heavily penalised and can even result in refusal of credit for the paper.

JUSTICE OF THE PEACE

We have many Justices of the Peace (JPs) on campus who can verify your documents for enrolment or other purposes. If you require the services of a JP, see the Student Centre for more information.

SPECIAL CONSIDERATION FOR IMPAIRED PERFORMANCE OR MISSED EXAMINATION

The Assessment and Graduation Office is responsible for the special consideration process for formal examinations only.

Application forms are available from: The University's Student Health Service, Student Counselling Service or the Student Administration Counter in the Student Centre.

If you need help with completing the form or you need further information on special consideration, contact staff in the Assessment Office on 07 838 4941.

STUDENT LEARNING

The Student Learning team (W.G.50) provides a University-wide service to support students’ academic learning needs. We actively seek opportunities to collaborate with staff to embed appropriate and effective learning development opportunities within Faculties, and we also work closely with the Library. Our overall goal is to help students acquire the skills, knowledge and attributes to become independent, successful learners.

STUDENT HEALTH SERVICE

We have a team of qualified doctors and nurses on our Hamilton campus to look after your healthcare needs. Routine consultations and prescriptions are free if you enrol with Student Health Services. No appointment is necessary, simply drop-in to see them or call on 07 838 4037.

STUDYLINK SUPPORT

For help and advice on how best to use StudyLink services, please contact the Student Centre at info@waikato.ac.nz or call 0800 924 528 for free and confidential support.
COMPUTING FACILITIES

The School of Science & School of Engineering have three computer labs for student use. All three labs are only available to students taking courses in the School of Science or School of Engineering.

The Large Scale Lab features a suite of equipment dedicated to engineering teaching and research, including 3D printers, a mechanical workshop and computer labs with engineering design software.

**LSL.1.16** is open from 8am–6pm (Monday to Friday). After hours swipe card access to LSL.1.16 is provided for graduate students only.

**F.1.14** is open from 7.45am–6.30pm (Monday to Friday). After hours swipe card access to this lab is provided for graduate students only.

**R.1.22** is open from 8am–6pm (Monday to Friday). After hours swipe card access to this lab is provided for both undergraduate and graduate students.

The order of priority for using the labs above is:

- Booked classes
- Graduates
- Undergraduates.

Students should see their School Administrator to obtain swipe card authorisation forms and to sign a Terms of Use agreement form for the computer labs.

Each school/centre/unit has designated areas for graduate students and their research studies. These areas are equipped with specialised software and computing facilities for research purposes.

*Note:* All students using University computer facilities must abide by the computer systems regulations. Personal devices should be connected using the wireless network only. Attention is drawn in particular to the provisions relating to the privacy of information on the system, the copyright provision covering most of the software and the unlawful possession of material breaching the Code of Conduct.

Disciplinary action will result if students or staff are found contravening these regulations. The systems may not be used for work other than University business without prior arrangement. Private computers/laptops are not covered by University insurance if stolen from University buildings or grounds.

GENERAL RULES

- Smoking is not permitted in any part of the University campus
- Dogs (except guide dogs) and bicycles are not allowed in University buildings
- Only those who have enrolled in the paper, except with the written permission of the lecturer, may attend lectures
- Photocopying is available for undergraduate students in the Student Centre. Lecturers will tell you if you can use the School photocopier for a piece of assessment
- Footwear must be worn at all times in the Science & Engineering buildings.
CODE OF CONDUCT

It is a basic assumption that researchers are committed to the highest standards of professional conduct when undertaking and supervising research. They have a duty to maintain the highest standards of probity in research applicable to their discipline and to the good standing of the University.

• Rigorous opposition to all forms of fraud, including misrepresentation and falsification of results.
• Observance of highest standards of safety in relation to themselves, co-workers and research participants.
• Maintenance of confidentiality where appropriate and full attribution of the sources of assistance and guidance.
• Acknowledgment of authorship of all published material.
• Researchers should only participate in work which conforms to agreed ethical standards, and for which they are capable to perform.

Misconduct Constitutes:

• Fabrication of data by claiming results where none have been obtained.
• Falsification of data by changing records or falsely claiming the use of techniques, methods or levels of precision.
• Plagiarism including the direct copying of handwritten, typed, printed or published text or notation; use of other people’s data, arguments or literature reviews without appropriate acknowledgment or permission; and deliberate use of published or unpublished ideas from other people without adequate attribution or permission for such use.
• Misleading ascription of authorship, including listing authors without their permission where this is relevant, attributing work to others who have not contributed to the research and failing to acknowledge work primarily produced by a student, trainee or associate.
• Other practices that deviate from those accepted within the research community for proposing, conducting or reporting research, such as intentional infringement of the University’s code of ethical behaviour.

Misconduct does not include honest error or honest difference in the interpretation or judgement of data.
UNDERGRADUATE SAFETY POLICY

1. Footwear must be worn inside all School of Science & School of Engineering buildings. Some laboratories and workshops restrict entry to those wearing reinforced shoes. Read the notices on the door of any room you are about to enter to see the restrictions that apply.

2. When the fire alarm sounds, you must obey the instructions of the laboratory supervisor and floor warden, leave by the nearest exit, and go down the nearest staircase to the assigned assembly point outside. Lifts must not be used in a fire. If you have a medical condition or a disability, please let your laboratory supervisor know, so they may provide you with assistance during an emergency.

3. You must wear safety glasses and other protective equipment as directed by the laboratory supervisor. Prescription glasses are NOT safety glasses. There are specific requirements for some specialised laboratories. Laboratory coats and ‘covered in’ shoes must be worn in laboratories and workshops where hazardous substances are used.

4. You must not eat or drink in any laboratory.

5. You may not enter any laboratory outside the times scheduled for laboratory classes except with the permission of the supervisor or technician in charge.

6. You are not permitted to take any chemicals, equipment or any other material from any laboratory for private use.

7. Laboratory equipment, chemicals, or materials may be taken out of laboratories only with the written permission of the supervisor or technician in charge.

8. Visitors may be allowed in laboratories only with the permission of the supervisor or technician in charge. ALL visitors must sign in at the School office, or the entrance to the Large Scale Lab.

9. For their own safety, children under 16 are not permitted in laboratories or workshops, unless on a visit organised in conjunction with the Laboratory Safety Supervisor.

10. Before going on a field trip, you must read and adhere to the field trip safety regulations supplied to you by the lecturer in charge. Please note that it is not permitted to take alcohol, drugs, or firearms on any field trip.

11. Accidents, incident, and near misses that occur in laboratories, workshops, or on field trips, must be reported as soon as possible (within 48 hours for non-serious, or immediately for serious accidents) to the appropriate supervisor and the prescribed form must be filled in. Accidents in the University grounds should be reported to Student Services.
GRADUATE SAFETY, SECURITY AND RESPONSIBILITIES POLICY

All graduates must read, understand and acknowledge the booklet Introduction to Health and Safety in the FSEN before starting work in the School. Student research projects need to be discussed between the student, their academic supervisor and the laboratory safety supervisor BEFORE the project begins.

All laboratories have a designated laboratory safety supervisor. Each laboratory safety supervisor is responsible for the safe operation of his/her laboratory and has full authority over all operational and health and safety matters relating to the laboratory. The supervisor’s name and contact details are on the laboratory safety signage, posted on the entrance doors to each laboratory complex. Make sure you know who your laboratory safety supervisor is and how to contact him/her.

There is a laboratory safety folder in each laboratory which contains details of the hazards and safety requirements pertinent to the laboratory; details of any special handling requirements and precautions necessary when using equipment and instrumentation; matters related to storage of chemicals; details of any training that may be required to work in the laboratory and; copies of Material Safety Data Sheets for any toxic or dangerous substances that may normally be used in the laboratory.

Student inductions must be completed with the academic or laboratory safety supervisor BEFORE starting any laboratory work. Make sure you are familiar with all the hazard, accident and emergency information in the laboratory safety folder in any laboratory that you work in.

All laboratory hazards must be appropriately controlled. Report any new or uncontrolled hazards to the laboratory safety supervisor immediately.

Students must comply with the safety requirements of the laboratory, which includes the use of gloves, masks and other protective equipment as advised. You must be fully trained to use laboratory chemicals and equipment, and this must be documented.

You will be advised where the fire exits, fire extinguishers, and first aid boxes are located in any laboratory or workshop you occupy. If you are unsure or have questions regarding what to do in an emergency, please ask you laboratory safety supervisor for assistance.

1. It is not permitted to eat or drink in laboratories.
2. Smoking is not permitted in any areas of the University campus.
3. Bare feet are not permitted in the Science & Engineering buildings. Jandals and sandals are not adequate foot protection in workshops and some laboratories. Beware – the vinyl flooring can become very slippery when wet.
4. Chemicals and equipment must not be taken for private use. Equipment taken out of the buildings for research use must be properly logged.
5. It is not permitted to carry out experimental work in laboratories after hours unless permitted by the laboratory safety supervisor, and at least one other person is in the building and knows you are there.
6. Card keys are issued through the School offices to research students and staff who need access to the buildings after normal working hours. Security staff are authorised to ask anyone who cannot produce a card key to leave at once. You must not lend your card key to anyone else; this may lead to your key being withdrawn. Visitors must be approved by the laboratory safety supervisor.
7. All visitors must report to the FG Link reception FG.G.04, or relevant School for a visitors’ pass. You are responsible for anyone who visits you in the laboratory.
8. Experimental equipment that is left running overnight must have a Leave On Card attached showing the date, your name, address, and contact phone number. Normally, water stills and water-cooled equipment should not be left running overnight. The security staff may turn off unlabelled equipment. Before use, any electrical equipment must have an up-to-date electrical test sticker attached; if not, advise the laboratory safety supervisor. Electrical equipment should be unplugged from the mains supply when not in use. All hoses must be securely fixed to equipment using approved clamps.

9. Acids, strong alkalis, solvents, hydrogen peroxide, and formaldehyde should normally be supplied and stored in glass or approved types of containers only. Plastic containers can become brittle and break.

10. The Science Store will issue chemicals and other requirements only to properly authorised users. Make sure you know the authorisation system applied by your School. A filled-out Requisition Form is required, stating full name, School, account code and authorising signature.

11. The Science Store will issue 2 or 2.5 litre containers of any chemical only to customers who come equipped with an approved Winchester carrier.

12. Gas cylinders must be securely restrained in laboratories. Chains are recommended. Gas cylinders may be moved about the corridors only in purpose-built trolleys and should have their regulators removed or capped before moving out of position. Valves must never be greased.

13. Glassware and other equipment must be clean and free from contaminants or mercury residues before being taken to a Technical Service for repair. All equipment for repair must be accompanied by a signed Contaminant Declaration Label available from your laboratory safety supervisor. Workshop job forms are available on the intranet (info.sci.waikato.ac.nz)

14. For advice on the disposal of all samples and chemicals, consult your supervisor or the laboratory safety supervisor.

15. Field trips require special safety precautions. School policy relating to field trips and industrial site visits can be viewed on the intranet (info.sci.waikato.ac.nz)

16. Only authorised users may drive University vehicles. Consult your School to obtain the necessary authorisation. University vehicles cannot be used for personal purposes.

**RESPONSIBILITIES**

It is your responsibility to find out about any hazards associated with your laboratory work and to ensure that you wear gloves, masks and other protective equipment as advised. You must be fully trained to use equipment and this must be documented. Each laboratory area has its own safety folder and instructions – make sure you are familiar with them.

In case of fire, you must report it to a staff member, activate the alarm, and leave the building.
HEALTH AND SAFETY INFORMATION AND CONTACTS

If you have any safety and health concerns, contact your supervisor in the first instance. Your first contact in all matters relating to the use and function of any laboratory that you work in should normally be with the Laboratory Safety Supervisor.

THE CHAIR OF THE SCHOOL OCCUPATIONAL HEALTH AND SAFETY COMMITTEE
Shelley Catlin
Phone: +64 7 838 4292
Email: shelley.catlin@waikato.ac.nz

SCHOOL CHEMICAL SAFETY OFFICER
John Little
Phone: +64 7 838 4103
Email: john.little@waikato.ac.nz

SCHOOL FIELD TRIP HEALTH AND SAFETY OFFICER
Annie Barker
Phone: +64 7 838 4392
Email: annie.barker@waikato.ac.nz

EVACUATION OFFICER
Ivan Bell
Phone: +64 7 838 4117
Email: ivan.bell@waikato.ac.nz

LASER SAFETY OFFICER
Mr Viking Zhou
Phone: +64 7 838 4795
Email: viking.zhou@waikato.ac.nz

Sources of Health and Safety information in the School can be found on our info.sci website: info.sci.waikato.ac.nz/health_safety/has_intro.shtml and the Health and Safety notice board in the School of Science & School of Engineering Tearoom. Many staff in the School hold current first aid certificates; these are listed in the internal phone book: phonebook.waikato.ac.nz

CONTACTS FOR EMERGENCY USE ARE:

CHEMICAL EMERGENCIES
Phone: +64 7 838 2889 extn 8888 OR 027 629 1802

UNIVERSITY SECURITY
Phone: +64 7 838 4444

EMERGENCY SERVICES
Phone: 111
### 2019 TEACHING AND ASSESSMENT PERIODS

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<th>State School dates</th>
<th>Week</th>
<th>Starting</th>
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<th>Holidays and other important dates</th>
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WHERE THE WORLD IS GOING
TE AHUNGA O TE AO