

Bachelor of Engineering Technology

Version 2.0

with majors in: Civil
Electrical
Mechanical

Wintec code:	SC1001	MoE:	WK2611
Level:	7	Credits:	360
Owner:	Centre for Engineering and Industrial Design	Effective Date:	January 2021

These regulations should be read in conjunction with the Institute's Academic Regulations.

1. Admission and Entry

1.1 General Academic Admission

a) Candidates are required to have:

- i) University Entrance (UE), or equivalent, comprised of 60 credits at NCEA Level 3 or above and 20 credits at NCEA Level 2 or above, including:
 - (1) A minimum of 14 credits at NCEA Level 3 in Physics; **and**
 - (2) A minimum of 14 credits at NCEA Level 3 in Calculus; **and**
 - (3) A minimum of 14 credits at NCEA Level 3 in one other subject from the list of [UE approved subjects](#); **and**
 - (4) Literacy – 10 credits at Level 2 or above, made up of 5 credits in reading and 5 credits in writing; **and**
 - (5) Numeracy – 10 credits at Level 1 or above (specified achievement standards, or unit standards 26623, 26626, 26627 – all three required).

Or:

- ii) the New Zealand Diploma in Engineering (Level 6) (NZDE) with a 60% or better overall grade average; **or**
- iii) completed at least two years relevant work experience post-graduation; **or**
- iv) completed equivalent academic qualifications which may include University Bursary with 45% or more in both Physics and Calculus or Algebra, equivalent Cambridge score, equivalent International Baccalaureate.

1.2 Special Admission

Domestic applicants aged 20 years or above who have not met the General Admission or entry requirements for a programme but whose skills, education or work experience indicate that they have a reasonable chance of success¹ may be eligible for Special Admission. Special admission will be granted at the discretion of the relevant Centre Director or designated nominee. Such applicants may be required to successfully complete a foundation, bridging or tertiary introductory programme as a condition of entry into higher level programmes.

1.3 Provisional Entry

Domestic applicants aged under 20 years who have not met the general academic admission and entry criteria for a programme but who can demonstrate a reasonable chance of success through other educational attainment and/or work or life experience may be eligible for provisional entry at the discretion of the relevant Centre Director or designated nominee. Provisional entry places restrictions on re-enrolment to be lifted if the applicant's performance is deemed satisfactory by the relevant Centre Director or designated nominee.

¹ [Education Act 1989 Section 224 \(3\)](#)

Programme Regulations for:

1.4 Selection Criteria

- a) Candidates may be required to attend an interview and may be required to produce a work-based portfolio (where appropriate).
- b) Where applications exceed the number of places available, the following selection criteria may be applied:
 - i) academic achievement in related subject areas such as statistics, technology, and graphics
 - ii) previous academic achievements
 - iii) communication skills
 - iv) motivation to complete the programme
 - v) life or work experience in, or appropriate to, the programme
 - vi) ability to participate in fieldwork aspects of the programme, where relevant

1.5 English Language Requirements

Candidates who have English as a second language are required to have an overall International English Language Test System (IELTS) score of 6.0 or better in the academic band, with a minimum of 6.0 in the written and speaking bands, and a minimum of 5.5 in the reading and listening bands; **or** equivalent.

2. Transfer of Credit

- 2.1 Recognition of Prior Learning (RPL) will include both formal and experiential learning and Recognition of Current Competence (RCC) and is the granting of credit towards a qualification as a consequence. Recognition of Prior Learning (RPL) will be available for all modules/papers within this programme **except for** module *MG7101 Engineering Development Project*. RPL includes:
 - a) Credit Transfer (CT) where the same module/paper has been achieved in a different programme
 - b) Cross Credit (CC) where an equivalent module/paper, or multiple modules/papers, has been achieved and recognised as meeting the outcomes of a module/paper or multiple modules/papers within this programme
 - c) Assessment of Prior Experiential Learning (APEL) where current practice and competency, knowledge and skills are assessed to match individual or multiple modules/papers within this programme
 - d) Advanced Standing
- 2.2 Candidates may be eligible for Advanced Standing entry to the Bachelor of Engineering Technology programme. Advanced standing applications will be considered from experienced practitioners and/or graduates with other qualifications. Advanced standing will be assessed using the graduate profile and learning outcomes from the Bachelor of Engineering Technology.
- 2.3 Advanced Standing will be awarded when a candidate has been assessed for modules, qualifications and/or an APEL (Assessment of Prior Experiential Learning) process in which the outcomes equate to a minimum of sixty (60) credits, and in multiples of sixty (60) credits towards the qualification.
- 2.4 Candidates may be admitted to the second year of the programme if they have provided evidence that they have the qualifications and/or experience equivalent to the learning outcomes and standards of the first year of the degree.
- 2.5 Candidates may be admitted to the third year if they have provided evidence that they have the qualifications and/or experience that is equivalent to the learning outcomes and standards of the first and second year of the degree, including suitable qualifications and/or experience in the particular field of their intended major.
- 2.6 For cross credits from the New Zealand Diploma in Engineering (NZDE) listed on the New Zealand Qualifications Framework:

Programme Regulations for:

- a) The Programme Committee may award cross credits from the NZDE according to information that is available via the Metro Moodle site. A maximum of 180 credits shall apply in terms of credit recognition towards the 360 credits required for programme completion.
- b) Cross credits from other related completed qualifications may also be considered by the Programme Committee. These will be considered on a case-by-case basis.

3. Programme Requirements

- 3.1 Every candidate for the Bachelor of Engineering Technology shall, to the satisfaction of the Academic Board, follow a programme of study for a period of normally not less than three years of full-time study.
- 3.2 Each candidate's programme of study shall comprise compulsory and elective modules as listed in Section 7 of these regulations, totalling 360 credits, of which at least 120 credits (including a minimum of 75 credits at Level 7) must be at the awarding Institute of Technology/Polytechnic.
- 3.3 In order to pass a module, all candidates must achieve a minimum grade of 40% for assessments that have a weighting of 40% or more towards the final mark of the module; and an overall mark of 50% must be achieved for the module. All assessments must be attempted.
- 3.4 Candidates are required to complete the modules in Section 6 of these regulations as follows:
 - a) For all majors, all common compulsory modules as specified in Section 6 Schedule of Modules (135 credits); **and**
 - b) For the **Civil major** only:
 - i) all the compulsory modules in Section 6 (120 credits); **and**
 - ii) all modules as recommended for the selected Pathway in Section 6 (45 credits or 60 credits); **and**
 - iii) the balance of 45 credits or 60 credits from the Common Electives as listed in Section 6.
 - iv) In exceptional circumstances, an elective from outside the programme may be selected with approval from the Programme Committee/Centre Director. All electives must meet academic requirements for module prerequisites and completion of the programme for a total of 360 credits.
 - c) For the **Electrical major** only:
 - i) all the compulsory modules in Section 6 (45 credits); **and**
 - ii) all modules as recommended for the selected Pathway in Section 6 (135 credits, 150 credits, 165 credits); **and**
 - iii) the balance of 15 credits, 30 credits or 45 credits from the Common or Electrical Electives as listed in Section 6.
 - iv) In exceptional circumstances, an elective from outside the programme may be selected with approval from the Programme Committee/Centre Director. All electives must meet academic requirements for module prerequisites and completion of the programme for a total of 360 credits.
 - d) For the **Mechanical major** only:
 - i) all the compulsory modules in Section 6 (135 credits); **and**
 - ii) the balance of 90 credits from the elective modules as listed in Section 6. The choice of electives must include modules at the appropriate level to meet the overall requirements of the programme.
 - iii) In exceptional circumstances, an elective from outside the programme may be selected with approval from the Programme Committee/Centre Director. All electives must meet academic requirements for module prerequisites and completion of the programme for a total of 360 credits.

Programme Regulations for:

4. Completion of the Programme

4.1 Candidates may take up to ten years to complete this programme unless an extension is granted by special permission of the Centre Director or designated nominee.

5. Award of the Qualification

5.1 For Wintec to award this qualification, a student must successfully complete the required 360 credits, of which 120 credits, including a minimum of 75 credits at Level 7, must be completed at Wintec.

4.2 Graduates completing the programme at Wintec are awarded a Bachelor of Engineering Technology (Civil), or Bachelor of Engineering Technology (Electrical), or Bachelor of Engineering Technology (Mechanical), depending on the major area of study.

6. Schedule of Modules

Note: no value in the pre/co-requisite columns means there are no pre/co-requisites for that module.

Candidates should note that some Pathways and/or Elective Modules may not be offered or be available within any given year.

All Majors - Common Compulsory Modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG5001	Engineering Computing	5	15		
MG5002	Engineering Mechanics	5	15		
MG5003	Engineering Communication	5	15		
MG5004	Engineering Mathematics 1	5	15		
MG5005	Engineering Design and Drawing	5	15		
MG6103	Engineering Management	5	15	MG5003	
MG7101	Engineering Development Project	7	30	Minimum of 30 credits at level 6 in chosen major; and Civil: MG6106; and Electrical/Mechanical: MG6136	
MG7121	Professional Engineering Practice	7	15	MG6103	

Civil Major Compulsory Modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG5006	Land Surveying	5	15		
MG5008	Fluid Mechanics (Civil)	5	15	MG5002 MG5004	
MG5009	Engineering Site Investigation	5	15		
MG5012	Highway Engineering	5	15	MG5004 MG5009	
MG5107	Civil Materials	5	15		
MG5032	Basic Structures	5	15	MG5002	
MG6005	Civil Engineering Detailing and Modelling	6	15	MG5005	
MG6106	Civil Engineering Construction Practices	6	15		

Programme Regulations for:

Civil Pathways

Structural Pathway – recommended modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG6046	Structural Principles	6	15	MG5032 MG5107	
MG6007	Structural Steel and Timber	6	15	MG6046	
MG6008	Structural Concrete	6	15	MG6046	
MG7004	Design of Structures	7	15	MG6007 MG6008	

Water and Water Waste Pathway – recommended modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG6109	Water and Waste Engineering	6	15		MG5008
MG6011	Hydrology and Erosion Management	6	15		
MG6110	Water and Waste Treatment	6	15		MG5008
MG7005	Urban Drainage Systems	7	15	MG6109	

Geotechnical Pathway – recommended modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG6012	Geotechnical Engineering A	6	15	MG5009	
MG6045	Geotechnical Engineering B	6	15	MG6012	
MG6013	Engineering Geology	6	15	MG5107	MG5009
MG7045	Geotechnical Engineering C	7	15	MG6045	

Roading/Transportation Pathway – recommended modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG6014	Highway Design and Maintenance	6	15	MG5012	
MG6015	Traffic Engineering	6	15	MG5012	
MG7007	Urban Transport Planning	7	15	MG5012	

Environmental Pathway – recommended modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG5113	Fundamentals of Environmental Engineering	5	15		
MG6116	Sensitive Environment	6	15		
MG7008	Sustainable Resource Utilisation	7	15		
MG7109	Resource and Environmental Management	7	15		

Common Electives

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG7025	Project Management	7	15	MG6103	
MG7026	Risk Management	7	15	MG6103	
MG5090	Heritage, Culture and Sustainability in Engineering	5	15		
MG6048	Special Topic	6	15		
MG7047	Special Topic	7	15		
MG6190	Mathematics 2	5	15	MG5004	

Programme Regulations for:

Electrical Major Compulsory Modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG5034	Electrical Principles; and	5	15		
MG5035	Electronic Principles	5	15		
MG5014	Electrical and Electronic	5	15		
MG5015	Principles 1 and Electrical and Electronic Principles 2	5	15		
MG6136	Engineering Project	6	15	MG5003 MG5005 and Minimum of 45 credits at level 5 in chosen major	

Note: only one combination is compulsory – **either** MG5034/MG5035, **or** MG5014/MG5105

Electrical Pathways

Power Pathway – recommended modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG5016	Elements of Power Engineering	5	15	MG5015 or MG5034	
MG5017	Electrical Machines	5	15	MG5015 or MG5034	
MG5018	PLC Programming 1	5	15	MG5001 and one of MG5014 or MG5034 or MG5033	
MG5021	Electronics Manufacturing 1	5	15	MG5015 or MG5035	
MG6117	Power Distribution	6	15	MG5016	
MG6118	Sustainable Energy and Power Electronics	6	15	MG5004, MG5014 or MG5034 MG5015 or MG5035	
MG6019	PLC Programming 2	6	15	MG5018	
MG6190	Mathematics 2	6	15	MG5004	
MG6020	Automation	6	15	MG6019	
MG7110	Power Systems	7	15	MG5016	
MG7011	Electrical Machine Dynamics	7	15	MG5017	

Electronic Pathway – recommended modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG5019	Electronics 1	5	15	MG5015 or MG5035	
MG5020	Microcontroller Systems 1	5	15	MG5001	
MG5021	Electronics Manufacturing 1	5	15	MG5015 or MG5035	
MG5022	Computer Programming 1	5	15	MG5001	
MG6021	Electronics 2	6	15	MG5019	
MG6022	Microcontroller Systems 2	6	15	MG5020	
MG6023	Electronics Manufacturing 2	6	15	MG5021	

Programme Regulations for:

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG6024	Electronic Design	6	15	MG5015 or MG5035, MG5020	
MG7012	Signal Processing	7	15	MG5004 MG5019	
MG7013	Embedded Systems	7	15	MG6022	

Computer Pathway – recommended modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG5022	Computer Programming 1	5	15	MG5001	
MG5020	Microcontroller Systems 1	5	15	MG5001	
MG5023	PC Engineering	5	15		
MG6025	Computer Programming 2	6	15	MG5022	
MG6022	Microcontroller Systems 2	6	15	MG5020	
MG6026	Network Operating Systems	6	15	MG5023	
MG7014	Programming for Engineers 3	7	15	MG6025	
MG7013	Embedded Systems	7	15	MG6022	
MG6024	Electronic Design	6	15	MG5015 or MG5035 MG5020	

Network Pathway – recommended modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG5124	Introduction to Networks	5	15		
MG5125	Routing and Switching Essentials	5	15	MG5124	
MG5023	PC Engineering	5	15		
MG6026	Network Operating Systems	6	15	MG5023	
MG6127	Scaling Networks	6	15	MG5125	
MG6128	Connecting Networks	6	15	MG6127	
MG6129	Network Security	6	15	MG5125 MG6128	
MG6130	Advanced Network Routing	6	15	MG6128	
MG7115	Advanced Network Switching	7	15	MG6128	
MG7116	Advanced Network Troubleshooting	7	15	MG6130 MG7115	

Mechatronics Pathway – recommended modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG5018	PLC Programming 1	5	15	MG5001 and one of MG5014 or MG5034 or MG5033	
MG5021	Electronics Manufacturing 1	5	15	MG5015 or MG5035	
MG5026	Instrumentation and Control 1	5	15	MG5014 or MG5034	
MG6019	PLC Programming 2	6	15	MG5018	
MG6031	Instrumentation and Control 2	6	15	MG5004 MG5026	

Programme Regulations for:

MG6032	Fluid Mechanics (Mech)	6	15	MG5002 MG5004	
MG6033	Mechanics of Machines	6	15	MG5002 MG5004	
MG6190	Mathematics 2	6	15	MG5004	
MG6020	Automation	6	15	MG6019	
MG7017	Robotics	7	15	MG6019 MG6033	
MG7018	Systems and Control	7	15	MG6031	

Telecommunications Pathway – recommended modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG5020	Microcontroller Systems 1	5	15	MG5001	
MG5021	Electronics Manufacturing 1	5	15	MG5015 or MG5035	
MG5124	Introduction to Networks	5	15		
MG5125	Routing and Switching Essentials	5	15	MG5124	
MG6022	Microcontroller Systems 2	6	15	MG5020	
MG6190	Mathematics 2	6	15	MG5004	
MG6127	Scaling Networks	6	15	MG5125	
MG6049	Telecommunications Intermediate	6	15	MG5015 or MG5035 MG5124	
MG6128	Connecting Networks	6	15	MG6127	
MG7135	Telecommunications Advanced	7	15	MG6049	
MG7012	Signal Processing	7	15	MG5004 MG5019	

Common Electives

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG7025	Project Management	7	15	MG6103	
MG7026	Risk Management	7	15	MG6103	
MG5090	Heritage, Culture and Sustainability in Engineering	5	15		
MG6048	Special Topic	6	15		
MG7047	Special Topic	7	15		
MG6190	Mathematics 2	5	15	MG5004	

Electrical Electives

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG6047	Protection	6	15	MG5032 and MG5107	

Mechanical Major Compulsory Modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG5033 OR MG5034	Electrical Fundamentals OR Electrical Principles	5	15		
MG5028	Materials Science	5	15		
MG5029	Strength of Materials 1	5	15	MG5002 MG5004	
MG6032	Fluid Mechanics (Mech)	6	15	MG5002 MG5004	

Programme Regulations for:

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG5030	Thermodynamics and Heat Transfer	5	15	MG5004	
MG6038	Strength of Materials 2	6	15	MG5029	
MG6033	Mechanics of Machines	6	15	MG5002 MG5004	
MG6037	Advanced Thermodynamics	6	15	MG5030	
MG6136	Engineering Project	6	15	MG5003 MG5005 and Minimum of 45 credits at level 5 in chosen major	

Mechanical Major Elective Modules

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG6039	Applied Computational Modelling	6	15	MG6032 MG6038	
MG6040	Product Design Engineering	6	15	MG5002 MG5005	
MG6041	Quality and Reliability	6	15	MG5002 MG5004	
MG6044	Manufacturing Processes and Production	6	15	MG5028	
MG6190	Mathematics 2	6	15	MG5004	
MG7030	Air Handling Systems	7	15	MG5030	
MG7020	Mechanical Design 2	7	15	MG6136	
MG7023	Vibration and Seismic Design for Mechanical Plant	7	15	MG6136 MG6038	
MG7022	Energy Engineering	7	15	MG6037	
MG7028	Engineering Systems Analysis	7	15	MG5004 MG5005 MG6032	
MG7024	Fluids Power and Advanced Fluid Mechanics	7	15	MG6032	

Common Electives

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
MG5090	Heritage, Culture and Sustainability in Engineering	5	15		
MG6190	Mathematics 2	6	15	MG5004	
MG7025	Project Management	7	15	MG6103	
MG7026	Risk Management	7	15	MG6103	
MG6048	Special Topic	6	15		
MG7047	Special Topic	7	15		

Table D: Option

Module Code	Module Name	Level	Credits	Pre-Requisites	Co-Requisites
DFNZ701	Design Factory 1	7	30		

The 30-credit module DFNZ701: Design Factory 1 can be offered as an option within any Wintec degree programme, wherever the degree programme structures allows such an option. Admission into the Design Factory module is on negotiation with the Centre Director or delegated authority and selection into the module is in line with the Design Factory process.