


<b>PROGRAMME SPECIFICATION</b>	
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<b>1 Awarding Institution</b>	Newcastle University
<b>2 Teaching Institution</b>	Newcastle University
<b>3 Final Award</b>	BEng (Hons)
<b>4 Programme Title</b>	Bachelor of Engineering with Honours in one of two named options.
<b>5 UCAS/Programme Code</b>	Stage 0 Entry (4 years with Foundation Year): H304 Stage 0 Entry (4 years with Foundation Year) Stage 1 Entry (3 years): H300 Mechanical Engineering HH73 Mechanical Design and Manufacturing Engineering
<b>6 Programme Accreditation</b>	IMechE, IET (2006): CEng (subject to further study) for H300 only
<b>7 QAA Subject Benchmark(s)</b>	<a href="http://www.qaa.ac.uk/Publications/InformationAndGuidance/Pages/Subject-benchmark-statement-Engineering.aspx">http://www.qaa.ac.uk/Publications/InformationAndGuidance/Pages/Subject-benchmark-statement-Engineering.aspx</a>
<b>8 FHEQ Level</b>	6
<b>9 Last updated</b>	Feb 2014

<b>10 Programme Aims</b>
<p>The programme aims to enable suitably qualified students from a range of school, Further and Higher Education backgrounds to:</p> <ul style="list-style-type: none"> <li>• Provide the engineering industry and profession, in the UK and elsewhere, with employable and enterprising graduates prepared for the assumption of technical, managerial and financial responsibilities.</li> <li>• Develop students' knowledge, skills (including transferable skills) and understanding, as well as awareness and "know how", in the field of mechanical engineering and its related disciplines (electrical and materials engineering, manufacturing, bioengineering and transport technology) so that as graduates they will be equipped to enter employment as professional engineers (progressing on to chartered engineer or equivalent status) or a wide range of other professional careers. After the first two broadly-based years depth of learning is provided in the final year to Honours level 6 through one of three optional routes:</li> </ul>

<ul style="list-style-type: none"> <li>- <i>Mechanical Engineering</i> – <u>either</u> exploring mechanical and manufacturing engineering technologies <u>or</u> developing a multi-disciplinary approach with electronic and software engineering.</li> <li>- <i>Mechanical Design and Manufacturing Engineering</i> – focussing on the core engineering activity of designing desirable and sustainable products.</li> <li>• Prepare students to engage in life-long learning (eg professional CPD or further Higher Education) and critical enquiry with skills in research and knowledge acquisition and an appreciation of the value of education to the wider community.</li> <li>• Achieve the above in the contexts of the School, SAgE Faculty and University business plans, following the University's policies and procedures and conforming to the relevant sections of the QAA Code of Practice.</li> </ul>

## 11 Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, qualities, skills and other attributes in the following areas. The programme outcomes have references to the benchmark statements for Engineering and to UK Spec Learning Outcomes as specified by degree programme accreditors IMechE and IET.

### Knowledge and Understanding

On completing the programme students should have:

- A1 Knowledge and understanding of scientific principles and methodology necessary to underpin their education in mechanical and related engineering disciplines, to enable appreciation of its scientific and engineering context and to support their understanding of future developments and technologies in mechanical engineering and manufacturing (UK Spec US1).
- A2 Knowledge and understanding of mathematical principles necessary to underpin their education in mechanical and related engineering disciplines (UK Spec US2).
- A3 The ability to understand and apply Engineering principles to analyse key processes in manufacturing and mechanical and related engineering (UK Spec E1).
- A4 Knowledge and understanding of commercial and economic contexts of mechanical and manufacturing engineering processes (UK Spec S1).
- A5 Knowledge of management techniques which may be used to achieve engineering and manufacturing objectives within the context of mechanical engineering processes (UK Spec S2).

- A6 An understanding of the requirement for mechanical and manufacturing engineering activities to promote sustainable development (UK Spec S3).
- A7 Knowledge of characteristics of particular mechanical and related engineering equipment, processes or products (UK Spec P1).

### **Intellectual Skills**

On completing the programme students should have:

- B1 Knowledge and understanding of scientific principles and methodology necessary to underpin their education in mechanical and related engineering disciplines, to enable appreciation of the scientific and engineering context and to support understanding of future developments and technologies (UK Spec US1).
- B2 The ability to apply mathematical methods, tools and notations proficiently in the analysis and solution of mechanical and manufacturing engineering problems (UK Spec US2).
- B3 The ability to apply and integrate knowledge and understanding of other engineering disciplines to support the study of mechanical and related engineering disciplines (UK Spec US3).
- B4 The ability to identify, classify and describe the performance of systems and mechanical components through the use of analytical methods and modelling techniques (UK Spec E2).
- B5 An understanding of and ability to apply a systems approach to mechanical and manufacturing engineering problems (UK Spec E4).
- B6 The ability to investigate and define a problem and identify constraints including environmental and sustainability limitations, health and safety and risk assessment issues (UK Spec D1).
- B7 An understanding of customer and user needs and the importance of considerations such as aesthetics (UK Spec D2).
- B8 The ability to ensure fitness for purpose for all aspects of mechanical engineering problems including production, operation, maintenance and disposal (UK Spec D5).
- B9 The ability to manage the engineering design process and evaluate outcomes (UK Spec D6).
- B10 An awareness of management and business practices, and how these may be applied appropriately to strategic and tactical issues in mechanical engineering and manufacturing (UK Spec S2).
- B11 An understanding of contexts in which mechanical engineering knowledge can be applied (ie operations and management, technology, product development) (UK Spec P3).

### **Practical Skills**

On completing the programme students should have:

- C1 The ability to apply quantitative methods and computer software relevant for mechanical and related engineering disciplines, to solve engineering

	problems (UK Spec E3).
C2	The ability to identify and manage cost drivers in mechanical engineering and manufacturing (UK Spec D3).
C3	An awareness of the framework of relevant legal requirements governing engineering activities, including personnel, health, safety, and risk (including environmental risk) issues (UK Spec S4).
C4	An awareness of nature of intellectual property and contractual issues (UK Spec P5).
C5	An understanding of appropriate codes of practice and industry standards (UK Spec P6).
C6	An awareness of quality issues (UK Spec P7).
C7	The ability to work with technical uncertainty (UK Spec P8).

### **Transferable/Key Skills**

With the exception of foreign language skills, on completing the programme students should have covered the Newcastle Graduate Skills Framework and, in addition have:

- D1 An understanding of customer and user needs and the importance of considerations such as aesthetics in mechanical and manufacturing engineering (UK Spec D2).
- D2 The ability to use creativity to establish innovation in manufacturing and mechanical and related engineering disciplines (UK Spec D4).
- D3 An understanding of the need for a high level of professional and ethical conduct in engineering (UK Spec S5).
- D4 Relevant Mechanical and manufacturing engineering workshop and laboratory skills (UK Spec P2).
- D5 An understanding of the use of technical literature and other information sources (UK Spec P4).

### **Teaching and Learning Methods**

Key elements of professional graduate employability are that employers need to be sure that graduates are able to take individual responsibility for their own work without supervision, that they are capable of assimilating and organising complete information quickly and effectively and that they are self-learners, capable of keeping abreast of new developments without organisational support. Our approach to teaching and learning is designed to produce graduates who meet these criteria. From the outset, students will be expected to meet the basic professional requirement of taking responsibility for their own learning.

With engineering degrees lectures are extensively used to provide structure for each subject, to help to direct students' further reading and self study, to convey how the underlying engineering science is applied to discipline specific problems, and to demonstrate approaches to problem-solving. Typically student self-study after lectures is supported by tutorial or problem classes, where advice is given on request to students who have issues arising from their application or understanding of the lecture material.

Other types of classes include longer “hands-on” practical laboratory/workshop sessions, seminar/presentation activities, design project work and CAD/computer sessions where teamwork often features.

Over the common core course at Stages 1-2, there will be an average of around 20 contact hours per week, about half of which will be lectures, about a quarter tutorials supporting those lectures and about a quarter practical activities. During the course of Stage 1, to support the transition to University training, students must attend a regular weekly small group tutorial with their allocated Tutor and there are additional support classes for students having difficulties. Stage 2 features industrial contact in design and manufacturing and input from industry on CVs and interviews for a professional career in engineering.

At Stage 3 there is a greater expectation that students will manage their own learning, with seminar classes in which students present material they have researched themselves and independent work on assignments more prevalent. At Stage 3 students undertake a major 30 credit individual project related to the specialist stream they are following. The Accrediting Institutions place a high importance on this project which must be passed to get an Honours Degree.

### **Assessment Strategy**

Professional practice in industry demands the ability to bring methods and data together, apply problem-solving skills and demonstrate understanding under time constraints. To reflect this, the major end-of-course examination remains a valid assessment tool and forms an important element in our assessment strategy. However, there are equally many disciplines and skills where it is restrictive or inappropriate and engineering degrees are noted for the breadth of assessment tools that are used to obtain a balanced measure of the student. Spot or phase tests (including MCA) and short assignments feature in the early stages to help students structure their study and revision towards the synoptic end-of-course examinations. Laboratory/workshop, design and computing work are all best assessed through realistic assignments, with many of these being team assignments and involving oral or poster, as well as written reporting. In later stages application of major engineering software features in most main technical subject areas.

At Stage 1 the balance of assessment between end-of-course examination and various forms of in-course assessment is about 50:50, changing to about 70:30 in Stage 2, as students develop. However, at Stage 3 the greater importance of self-study and of major project work shift the overall balance back again (depending on the specialisation stream followed).

Assessment of major project work at Stage 3 is particularly innovative. The traditional “mini PhD “ thesis or dissertation with vivas has been replaced by a much broader and more challenging assessment more in line with the needs of industry and professional engineering, incorporating the maintaining of a

contemporaneous logbook, a short report typical of business reports or technical journal papers, an oral presentation and a poster.

## **12 Programme Curriculum, Structure and Features**

### **Basic structure of the programme**

There is a Faculty Foundation Year (120 credit Stage 0) for students not adequately qualified in Mathematics and/or science. (<http://www.ncl.ac.uk/sage/undergrad/foundation/>). For non-native speakers of English who do not meet our basic English language test requirement (IELTS 6.0 or equivalent), the University supports the INTO Foundation Programme and guarantees first year entry offers to students on this who achieve the required progression standard.

<http://www.into.uk.com/newcastle/home>

Stages 1 and 2 are a broadly-based course common to all BEng and MEng Honours streams with all modules compulsory. Students will study a broad range of applied mathematics, engineering sciences, design and manufacturing and management as well as IT skills. BEng students who achieve a 60% average at Stage 2 may transfer to an MEng degree if they wish.

At Stage 3 BEng students follow one of the Honours streams in order to specialise in an area of their choice. There are no free option modules but there is a good choice of streams which are designed to meet all the requirements of UKSpec.

At Stage 3 all students have a 30 credit degree major individual project. To obtain an Honours degree it is necessary to pass this project.

### **Key features of the programme (including what makes the programme distinctive)**

The normal Undergraduate academic year is approximately 31 weeks full time from September – June divided into two semesters, with vacation breaks at Christmas/New Year and Easter. Engineering Honours students study 120 credits (1 credit  $\equiv$  10 study hours, including timetabled contact hours and private study) in each stage or academic year. Normally, students must complete one stage before proceeding to the next. Part-time study is not generally available.

BEng students conclude after Stage 3 (normally 360 credits). BEng students who pass all modules with an overall average of 60% at Stage 2 may transfer to MEng Stage 3 if they wish.

### **Programme regulations (link to on-line version)**

<http://www.ncl.ac.uk/regulations/programme/>

### **13 Criteria for admission**

#### *Entry qualifications*

Admission offers for BEng normally require UK GCE A-level grades of BBB (including mathematics and science but excluding General Studies) for Stage 1 admission (equivalent grades but without A-level Mathematics and/or science indicate Stage 0 Foundation Year entry). In addition, the University recruits candidates with a wide range of equivalent qualifications. A limited number of post-school qualifications with appropriate subjects and high grades may be considered for Direct Entry to Stage 2 (providing they have met the Learning Outcomes and standards of our Stage 1).

#### *Admissions policy/selection tools*

Engineering requires a wide range of attributes and abilities, so selection is not solely based on academic grades. Selectors seek evidence of motivation and commitment from the Personal Statement and Reference on UCAS forms and credible applicants are encouraged to attend for interview whenever practical. UK Engineering degrees are demanding and most have high drop-out rates.

#### *Non-standard Entry Requirements*

The School is committed to widening access, particularly for mature, female, disabled and ethnic minority students as well as those from state schools and disadvantaged areas. Links exist with the Engineering Access course at Newcastle College and the University's "Partners" programme and there is a Faculty Foundation Year (Stage 0) for those with insufficient mathematics and/or science to enter Stage 1 directly. All UCAS forms received by the UCAS deadline are considered, with the School using discretion to consider any late applications but the School does not normally take candidates through UCAS Clearing.

#### *Level of English Language capability*

Applicants who are non-native speakers of English will usually be required to provide evidence of English Language proficiency equivalent to IELTS 6.0 or better. Direct Entrants to Stage 2 may be required to achieve IELTS 6.5, but Stage 0 entry may be allowed with IELTS 5.5.

### **14 Support for Student Learning**

The Student Services portal provides links to key services and other information and is available at: <http://www.ncl.ac.uk/students/>

#### *Induction*

During the first week of the first semester students attend an induction programme. New students will be given a general introduction to University life and the University's principle support services and general information about the School and their programme, as described in the Degree Programme Handbook. New and continuing students will be given detailed programme information and the timetable of lectures/practicals/labs/tutorials/etc. The International Office offers an additional induction programme

for overseas students.

#### *Study skills support*

Students will learn a range of Personal Transferable Skills, including Study Skills, as outlined in the Programme Specification. Some of this material, e.g. time management is covered in the appropriate Induction Programme. Students are explicitly tutored on their approach to both group and individual projects.

Numeracy support is available through Maths Aid and help with academic writing is available from the Writing Development Centre (further information is available from the Robinson Library).

#### *Academic and Pastoral support*

Each undergraduate and taught postgraduate student will be assigned a personal tutor.\*

A personal tutor is one part of a wider network of advice and guidance available to students to support their personal and general academic development. The module leader acts as the first point of contact for subject-specific academic advice. Thereafter the Degree Programme Director or Head of School may be consulted. Issues relating to the programme may be raised at the Student-Staff Committee, and/or at the Board of Studies. Within the academic unit, students may also receive additional academic and pastoral advice from a range of other student-facing staff including degree programme directors, dissertation/project supervisors, and administrative support staff.

\*Arrangements may vary for students taking special types of provision.

The University also offers a wide range of institutional services and support upon which students can call, such as the Writing Development Centre, Careers Service and Student Wellbeing Service. This includes one-to-one counselling and guidance or group sessions / workshops on a range of topics, such as emotional issues e.g. stress and anxiety, student finance and budgeting, disability matters etc. There is specialist support available for students with dyslexia and mental health issues. Furthermore, the Student Union operates a Student Advice Centre, which can provide advocacy and support to students on a range of topics including housing, debt, legal issues etc.

#### *Support for students with disabilities*

The University's Disability Support team provides help and advice for disabled students at the University - and those thinking of coming to Newcastle. It provides individuals with: advice about the University's facilities, services and the accessibility of campus; details about the technical support available; guidance in study skills and advice on financial support arrangements; a resources room with equipment and software to assist students in their studies.

#### *Learning resources*

The University's main learning resources are provided by the Robinson and Walton Libraries (for books, journals, online resources), and Information Systems and Services, which supports campus-wide computing facilities.



All new students whose first language is not English are required to take an English Language Proficiency Test. This is administered by INTO Newcastle University Centre on behalf of Newcastle University. Where appropriate, in-session language training can be provided. The INTO Newcastle University Centre houses a range of resources which may be particularly appropriate for those interested in an Erasmus exchange

## **15 Methods for evaluating and improving the quality and standards of teaching and learning**

### *Module reviews*

All modules are subject to review by questionnaires which are considered by the Board of Studies. Changes to, or the introduction of new, modules are considered at the Board of Studies and/or the School Teaching and Learning Committee. Student opinion is sought at the Student-Staff Committee and/or the Board of Studies. New modules and major changes to existing modules are subject to approval by the Faculty Learning, Teaching and Student Experience Committee.

### *Programme reviews*

The Board of Studies conducts an Annual Monitoring and Review of the degree programme and reports to Faculty Learning, Teaching and Student Experience Committee. The FLTSEC takes an overview of all programmes within the Faculty and reports any Faculty or institutional issues to the University Learning, Teaching and Student Experience Committee.

### *External Examiner reports*

External Examiner reports are considered by the Board of Studies. The Board responds to these reports through Faculty Learning, Teaching and Student Experience Committee. External Examiner reports are shared with institutional student representatives, through the Student-Staff Committee.

### *Student evaluations*

All modules and stages\* are subject to review by student questionnaires. Informal student evaluation is also obtained at the Student-Staff Committee, and the Board of Studies. The National Student Survey is sent out every year to final-year undergraduate students, and consists of a set of questions seeking students' views on the quality of the learning and teaching. The results from student surveys are considered as part of the Annual Monitoring and Review of the programme and any arising actions are captured at programme and School / institutional level and reported to the appropriate body.

\*With the exception of intercalating years and the final stages of undergraduate programmes.

### *Mechanisms for gaining student feedback*

Feedback is channelled via the Student-Staff Committee and the Board of Studies.

### *Faculty and University Review Mechanisms*

Every six years degree programmes in each subject area undergo periodic review. This involves both the detailed consideration of a range of documentation, and a review visit by a review team (normally one day in duration) which includes an external subject specialist and a student representative. Following the review a report is produced, which forms the basis for a decision by University Learning, Teaching and Student Experience Committee on whether the programmes reviewed should be re-approved for a further six year period.

### *Accreditation reports*

### *Additional mechanisms*

## **16 Regulation of assessment**

### *Pass mark*

The pass mark is 40%

### *Course requirements*

Progression is subject to the University's Undergraduate Progress Regulations and Undergraduate Examination Conventions. In summary, students must pass, or be deemed to have passed, 120 credits at each Stage. Limited compensation up to 40 credits and down to a mark of 35% is possible at each progressing Stage and there are re-assessment opportunities, with certain restrictions.

### *Weighting of stages*

The marks from Stages 2 and 3 will contribute to the final classification of the degree in the ratio 1:2.

### *Common Marking Scheme*

The University employs a common marking scheme, which is specified in the Undergraduate Examination Conventions, namely

	<b>Modules used for degree classification (DC)</b>	<b>Modules not used for degree classification</b>
<40	Fail	Failing
40-49	Third Class	Basic
50-59	Second Class, Second Division	Good
60-69	Second Class, First Division	Very Good
70+	First Class	Excellent

*Role of the External Examiner*

An External Examiner, a distinguished member of the subject community, is appointed by Faculty Teaching and Learning Committee, following recommendation from the Board of Studies. The External Examiner is expected to:

- i. See and approve assessment papers
- ii. Moderate examination and coursework marking
- iii. Attend the Board of Examiners
- iv. Report to the University on the standards of the programme

In addition, information relating to the programme is provided in:

The University Prospectus: <http://www.ncl.ac.uk/undergraduate/>

The School Brochure:

<http://www.ncl.ac.uk/marketing/services/print/publications/ordering/>

Degree Programme and University Regulations:

<http://www.ncl.ac.uk/regulations/docs/>

The Degree Programme Handbook

Please note. This specification provides a concise summary of the main features of the programme and of the learning outcomes that a typical student might reasonably be expected to achieve if she/he takes full advantage of the learning opportunities provided. The accuracy of the information contained is reviewed by the University and may be checked by the Quality Assurance Agency for Higher Education.

## Mapping of Intended Learning Outcomes onto Curriculum/Modules

Either

Intended Learning Outcome	Module codes (Comp/Core in Bold)
A1	EEE1001, MEC1007, MEC1011 EEE2010, MEC2003, MEC2009 CME3097, EEE3010, MEC3013, MEC3019
A2	ENG1001 CME2012, ENG2010 MEC3014, MEC3020
A3	MEC1007, MEC1010, MEC1011 MEC2003, MEC2007, MEC2009 CME3097, EEE3009, MEC3013, MEC3014, MEC3015, MEC3016, MEC3018, MEC3020, MEC3098
A4	MEC1010 ENG2001, MEC2007, MEC2008 MEC3017, MEC3018,
A5	MEC1012 ENG2001, MEC2008 MEC3017
A6	EEE1006, MEC1002, MEC1007, MEC1010, MEC1012 EEE2010, MEC2001, MEC2003, MEC2007, MEC2008 CME3097, MEC3015, MEC3018, MEC3019, MEC3098
A7	EEE1006, MEC1002, MEC1010 EEE2010, MEC2001, MEC2007, MEC2009 EEE3009, CME3097, MEC3013, MEC3016, MEC3018, MEC3019, MEC3098
A8	
A9	
A10	
A11	
A12	
A13	
A14	
A15	
B1	EEE1006, MEC1002, MEC1007, MEC1011 EEE2010, MEC2001, MEC2003, MEC2009 CME3097, EEE3010, MEC3013, MEC3016
B2	ENG1001, MEC1011, MEC1012 CME2012, ENG2010, MEC2009 MEC3014, MEC3020, MEC3098
B3	EEE1006, MEC1002, MEC1012 EEE2010, MEC2001, MEC2003

	CME3097, EEE3009, EEE3010, MEC3013, MEC3015, MEC3016, MEC3018, MEC3019, MEC3098
B4	EEE1006, ENG1001, MEC1002, MEC1007, MEC1011 CME2012, EEE2010, ENG2010, MEC2001, MEC2003, MEC2007, MEC2009 EEE3009, MEC3013, MEC3014, MEC3015, MEC3016, MEC3020
B5	EEE1006, MEC1007, MEC1010, MEC1011, MEC1012 EEE2010, MEC2003, MEC2007, MEC2008, MEC2009 EEE3010, MEC3013, MEC3014, MEC3015, MEC3016, MEC3017, MEC3018, MEC3020, MEC3098
B6	MEC1010, MEC1012 MEC2007 CME3097, MEC3018, MEC3098
B7	MEC1010 MEC2007 MEC3013, MEC3018, MEC3019
B8	MEC1002, MEC1010 MEC2001, MEC2007 MEC3018, MEC3019
B9	MEC1010 MEC2007 MEC3018
B10	ENG2001, MEC2008 MEC3017
B11	ENG2001, MEC2008 EEE3009, MEC3013, MEC3017, MEC3019, MEC3098
B12	
B13	
B14	
B15	
C1	ENG1001, MEC1002, MEC1010, MEC1011, MEC1012 CME2012, EEE2010, ENG2010, MEC2001, MEC2007, MEC2008, MEC2009 CME3097, EEE3009, EEE3010, MEC3014, MEC3016, MEC3018, MEC3019, MEC3020, MEC3098
C2	MEC1010 ENG2001, MEC2007 MEC3017, MEC3018, MEC3019
C3	MEC1012 ENG2001, MEC2007, MEC2008

	MEC3013, MEC3017, MEC3018, MEC3019, MEC3098
C4	ENG2001, MEC2007, MEC2008 MEC3013, MEC3017
C5	MEC1010 MEC2003, MEC2007 MEC3013, MEC3018, MEC3019, MEC3098
C6	CME2012, MEC2007 MEC3017
C7	MEC1002, MEC1007, MEC1011 EEE2010, MEC2001, MEC2003, MEC2007, MEC2009 EEE3010, MEC3014, MEC3019, MEC3020, MEC3098
D1	MEC1010 MEC2007, MEC2008 CME3097, MEC3013, MEC3017, MEC3018
D2	MEC1010, MEC2007, MEC2008 MEC3016, MEC3018, MEC3019
D3	MEC1010, MEC1012 ENG2001, MEC2007, MEC2008 MEC3013, MEC3017
D4	EEE1006, MEC1002, MEC1007, MEC1010, MEC1011, MEC1012 EEE2010, MEC2001, MEC2007, MEC2009 MEC3015
D5	MEC1002, MEC1007, MEC1010, MEC1012 EEE2010, ENG2001, MEC2001, MEC2003, MEC2007, MEC2008, MEC2009 CME3097, MEC3013, MEC3014, MEC3015, MEC3016, MEC3017, MEC3018, MEC3019, MEC3020, MEC3098

Or

Module	Type	A	B	C	D
<b>STAGE 1</b>					
EEE1006	Compulsory	1, 6, 7	1, 3, 4, 5		4
ENG1001	Compulsory	2	2, 4	1	-
MEC1002	Compulsory	6, 7	1, 3, 4, 8	1, 7	4, 5
MEC1007	Compulsory	1, 3, 6	1, 4, 5	7	4, 5
MEC1010	Compulsory	3, 4, 6, 7	5, 6, 7, 8, 9	1, 2, 5	1, 2, 3, 4, 5

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MEC1011	Compulsory	1, 3	1, 2, 4, 5	1, 7	4
MEC1012	Compulsory	5, 6	2, 3, 5, 6	1, 3	3, 4, 5
<b>STAGE 2</b>					
CME2012	Compulsory	2	2, 4	1, 6	
EEE2010	Compulsory	1, 6, 7	1, 3, 4, 5	1, 7	4, 5
ENG2001	Compulsory	4, 5	10, 11	2, 3, 4	3, 5
ENG2010	Compulsory	2	2, 4	1	-
MEC2001	Compulsory	6, 7	1, 3, 4, 8	1, 7	4, 5
MEC2003	Compulsory	1, 3, 6	1, 3, 4, 5	5, 7	5
MEC2007	Compulsory	3, 4, 6, 7	4, 5, 6, 7, 8, 9	1, 2, 3, 4, 5, 6, 7	1, 2, 3, 4, 5
MEC2008	Compulsory	4, 5, 6	5, 10, 11	1, 3, 4	1, 2, 3, 5
MEC2009	Compulsory	1, 3, 7	1, 2, 4, 5	1, 7	4, 5
<b>STAGE 3</b>					
Mechanical Engineering/Bioengineering streams					
CME3097	Compulsory	1, 3, 6, 7	1, 3, 6	1	1, 5
MEC3013	Compulsory	1, 3, 7	1, 3, 4, 5, 7, 11	3, 4, 5	1, 3, 5
MEC3014	Compulsory	2, 3	2, 4, 5	1, 7	5
MEC3015	Compulsory	3, 6	3, 4, 5	-	4, 5
MEC3017	Compulsory	4, 5	5, 10, 11	2, 3, 4, 6	1, 3, 5
MEC3018	Compulsory	3, 4, 6, 7	3, 5, 6, 7, 8, 9	1, 2, 3, 5	1, 2, 5
MEC3098	Core	3, 6, 7	2, 3, 5, 6, 11	1, 3, 5, 7	5
Mechatronics/Microsystems streams					
EEE3009	Compulsory	3, 7	3, 4, 11	1	-
EEE3010	Compulsory	1	1, 3, 5	1, 7	-
MEC3015	Compulsory	3, 6	3, 4, 5	-	4, 5

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MEC3016	Compulsory	3, 7	1, 3, 4, 5	1	2, 5
MEC3017	Compulsory	4, 5	5, 10, 11	2, 3, 4, 6	1, 3, 5
MEC3018	Compulsory	3, 4, 6, 7	3, 5, 6, 7, 8, 9	1, 2, 3, 5	1, 2, 5
MEC3020	Compulsory	2, 3	2, 4, 5	1, 7	5
MEC3098	Core	3, 6, 7	2, 3, 5, 6, 11	1, 3, 5, 7	5
Transport/Design & Manufacturing (Newcastle) streams					
CME3097	Compulsory	1, 3, 6, 7	1, 3, 6	1	1, 5
MEC3014	Compulsory	2, 3	2, 4, 5	1, 7	5
MEC3015	Compulsory	3, 6	3, 4, 5	-	4, 5
MEC3017	Compulsory	4, 5	5, 10, 11	2, 3, 4, 6	1, 3, 5
MEC3018	Compulsory	3, 4, 6, 7	3, 5, 6, 7, 8, 9	1, 2, 3, 5	1, 2, 5
MEC3019	Compulsory	1, 6, 7	3, 6, 8, 11	1, 2, 3, 5, 7	2, 5
MEC3098	Core	3, 6, 7	2, 3, 5, 6, 11	1, 3, 5, 7	5