PROGRAMME SPECIFICATION

The Programme Specification is designed for apprentices, academic staff and employers. It provides a concise summary of the main features of the programme and the intended learning outcomes.

SECTION A: DETAILS OF THE PROGRAMME AND AWARD

Programme Title	**BEng (Hons) Engineering Design (Mechanical Engineering)** **BEng (Hons) Engineering Design (Electrical Engineering)** **BEng (Hons) Engineering Design (Production Engineering)**
Apprenticeship Standard	**Product Design and Development Engineer** **Manufacturing Engineering**
Awarding Body	**Buckinghamshire New University**
Teaching Institution / Programme Location	**Buckinghamshire New University** **Newbury College**
Faculty	**Design, Media & Management**
Name of Final Award	**Bachelor of Engineering with Honours, BEng (Hons.)**
NQF/FHEQ Level of Qualification	**Level 6: Bachelor's degree with honours**
QAA Subject Benchmark Statement	**Engineering (February 2015)**
Course Codes	**BV1ENG2 (4 Years)** **BV6ENG1 (1 Year Top-up)**
Mode of Delivery	**Full Time (1 Year Level 6 Top Up)** **Part Time (4 Years)**
Length of Study	**4-6 years**
Number of Intakes	**1: September**
Regime of Delivery	**Work Based Learning**
Language of Study	**English**
Programme Accreditation	**n/a**
Month and Year valid from	**01 September 2017**
Publication & Revision Dates	**01 September 2023**

Programme Introduction

The current course setup at Newbury College and at the University for the Apprenticeship in Engineering Design enables this Engineering programme to draw students from the NC and HNC/D through to the BEng (Hons) programme and then on to the MEng programme as a progression route through to meet the academic requirements for Chartered Engineer. These courses will seek to be accredited to Incorporated Engineer with the Institution of Engineering Designers (IED) and the Institute of Mechanical Engineers (IMechE). The development of the Part time programme at Newbury Linked to the Apprenticeship Standards for Manufacturing Engineer and Product Design and Development Engineer will further add to the programme provision at the UCAV and at Newbury and will provide further support

of the growth in this area. The government has a high priority in supporting the STEM subjects at all levels which coupled with the drive for apprenticeships will improve the chances of recruitment. In addition to this, the recent development of the Degree Apprenticeship Levy has meant that companies are keen to explore the opportunities that this type of degree will bring to the business. It has been identified that Engineering has 20% of all apprenticeship applications. (Universities UK)

The subject contents of that the course portfolio and structure meets several elements which match with the University philosophy and strategy such as outward facing, externality and industrial involvement, looking to meet the needs of industry, and being industrially focused in delivery with work based learning.

From the student aspect, the course is student focused, providing students with the necessary academic qualifications to underpin and progress in their chosen apprenticeship career. It is externally supported, through the input from Industry and our industrial partners and provides a viable study platform through a variety of delivery modes with links and feedback from a wide range of industries.
These degrees have been aligned to the automotive apprenticeship standards Manufacturing Engineering and Product Design and Development Engineer. In particular they will be addressing the Manufacturing Engineering Standard and the Engineering and Product Design Standard. Appendix 1
There is further potential for expansion, through the needs of the economy as a whole and there is a need to provide people with a good level of both technical and managerial knowledge as part of their CPD.

The course will be delivered over 4-6 years with levels 4 and 5 in the years 1-3 and level 6 over a full 12 month period in 44 weeks for the taught element, and the remainder will be the dissertation. This will be delivered alongside the other modules for the taught element and the student centred learning will be continuous until the completion of the dissertation. This will be supported by tutorials usually on one to one bases or in small groups. The year 5 will normally be for the completion of the requirements for the EPA as set out in the assessment standard for the apprenticeship. Further explanation of the delivery is in the appendices along with a diagram of the course layout.

The programme of courses has been developed in accordance with the Framework for Higher Education Qualifications (FHEQ) and meets the requirements for *degree for Engineering.* The following is a summary of the FHEQ guidelines: In addition to this the programme meets the academic requirements for registration with the IED at incorporated Engineer status. To become an incorporated engineer the student will, after completing their studies, need to go through an interview to satisfy that they have met all requirements.

In addition the QAA subject benchmarks for Engineering have been used in developing this programme which identifies that:
“A graduate should have the qualities needed for employment in situations requiring the exercise of personal responsibility and decision-making in complex and unpredictable circumstances.”
The creative way of approaching all engineering challenges is being seen increasingly as a 'way of thinking' which is generic across all engineering disciplines. In order to operate effectively, engineering graduates need to possess the following characteristics:
“be pragmatic, seek to achieve sustainable solutions, to be skilled at solving problems, be risk, cost and value-conscious, be ethical, social, cultural, environmental, health and safety aware, be familiar with the nature of business and enterprise in the creation of economic and social value, appreciate the global dimensions of engineering, commerce and communication, be able to formulate and operate within appropriate codes of conduct, be professional in their outlook, be capable of team working and be effective communicators.”

Distinguishing Features of the Programme

The BEng Engineering Design is the academic aspect which forms part of the overall apprenticeship programme. The unique aspect of this programme is that the course is able to cater for a range of different industry requirements from Electrical through Mechanical to Production Engineering. The distinguishing features are listed below.

Distinguishing Features

- Part of the Manufacturing engineer Apprenticeship Standard and the Product Design and Development Engineer Standard
- Delivered as blended learning/work based learning
- Provides flexibility in the learning path in relation to course duration with regard to additional mandatory app qualifications entry and exit points
- Can be adopted to cover other apprentice standards within the engineering field
- Is unique in the region because of the try pathed agreement

Admission Requirements

Suggested Entry Requirement:
If entering this course through the degree apprenticeship route:

Individual employers will set the selection criteria for their Apprenticeships and appoint an appropriate candidate. In order to optimise success candidates will typically have 5 GCSE's at Grade C or above, including Mathematics, English and a Science, Technology or Engineering related subject, as well as A Levels at grade C or above in both a Mathematical based subject and a Science, Technology, Engineering or additional Mathematics related subject, or 90+ credits in an Engineering BTEC at level 3. The apprenticeship as a product design and development technician provides a potential preparation route for this apprenticeship.

Entrants from the direct entrant route who **are not** on the apprenticeship programme must have: completed to level 3 of their studies and will not be required to do the NVQ L4.

We would also consider applications from those who have gained relevant skills through a wide range of vocational qualifications or responsible experience and experiential learning for mature applicant.

Applicants will normally be in full employment when applying for this award. The course has a unique structure which works well with both contribution from employers and from the student this programme allows the students to gain knowledge and experience in their field of study.

As a minimum, the applicant will be interviewed. The interview should be able to demonstrate that the applicant can do the following:

- Show that they have an understanding of the chosen course of study
- Demonstrate that they have the necessary (or required) academic, design and practical skills, as appropriate, to enable them to embark upon their chosen course of study
- Show that they are motivated to undertake the chosen course of study
- Show an awareness of, and interest in, Engineering, technology and the development of ideas

Recognition of Prior Learning

Mature applicants without the above qualifications will also be considered for entry by interview and submission of an up to date relevant CV. In addition they will have a letter of support from their employer and demonstrate a significant knowledge gained through the work place. This group of applicants may or may not be eligible for the apprenticeship levy depending on their prior learning and background.

Students from a HNC/HND and Foundation Degree Engineering May have the opportunity to join this programme as part of the progression route at level 5 or level 6. These students will be interviewed to identify their point of entry. These applicants may enter the programme with advanced standing as allowed for in the Apprentice descriptor or may wish to continue their study outside of the apprenticeship programme.

All Applicants must have completed or will be required to complete their PEO(Practical Engineering Operations) learning programme at the start of the Apprenticeship. This will be completed in the Initial year of the apprenticeship.

Employability Statement / Career Prospects/ Work based learning

On completion, the apprentice will have the full complement of knowledge, skills and occupational competence and professional attributes to enable them to be gainfully employed as an Engineering Designer in one or more of the following fields: Manufacturing Engineer, Mechanical Engineer, or Electrical Engineer Production Engineer etc.

They will have the opportunity to apply for a range of jobs in the industry of their choice and will be in a position to apply for incorporated engineering status as a professional engineer through the various professional bodies.

Most applicants to the programme will be in employment. There will be a few who are not eligible for the apprenticeship programme but who wish to top up an existing qualification. The learning styles of the students will vary and delivery methods will be through a series of modules which will provide the basic knowledge base and the instruction on the application of theory.

This information will be distributed to the student body through the electronic course hand book which identifies what is expected from the students and the institutions. The students will have access through both Blackboard (University E-learning platform) and Moodle (College E-learning platform) throughout their studies with the Apprenticeship Degree.

Professional Statutory and Regulatory Body Accreditation

The course will be seeking accreditation by three bodies under the Engineering Council (EC). The IED (Institute of Engineering Designers www.institution-engineering-designers.org.uk), The IMechE (The Institute of Mechanical Engineers www.imeche.org) and The IET (The institute of Engineering Technologists www.theiet.org). Information on the EC can be found here: http://www.engc.org.uk/about-us/ and each of the professional bodies have their own web site and have been involved in the development of this programme of courses.

SECTION B: PROGRAMME AIMS, OUTCOMES, LEARNING, TEACHING AND ASSESSMENT METHODS

Programme Aims

The main educational aims of the programme are to:

- To provide students with a course of study to the standard of an Honours degree in the area of engineering design within the Apprenticeship Degree Standards to comply with quality, safety, ethical and competency level as deemed appropriate.
- To give students sufficient knowledge, understanding and skills to employ modern design methodologies and tools to achieve optimum solutions to engineering design and lean manufacturing problems in an efficient and effective manner, to further develop their design creativity, and to present their design solutions.
- To provide the students with a thorough understanding and knowledge of engineering principles, analysis, tools and practices, and the ability to apply these to the design of manufactured products and technical applications and the ability to communicate this information to their team and a wider audience.
- To provide the students with a broad understanding of business development processes, management techniques, industrial marketing activities, accounting, and the application of business law.
- To develop understanding of relevant stakeholders and the social, behavioural and cultural structures both inside and outside of their normal community of practice, thus recognising that the impacts of their decisions which may be global and long-lasting.
- To allow students to develop their abilities through self-motivation and to show a willingness to learn now techniques to improve their knowledge.

Programme Learning Outcomes

A. Knowledge and Understanding:

K1. Develop detailed knowledge and understanding of an increased range of engineering principles and processes.
K2. Develop systematic knowledge and understanding of analytical tools to gain confidence in applying them to engineering design and technological problems at a professional design engineer level.
K3. Have an advanced knowledge and understanding of the use of modern computer tools to model, simulate and analyse complex products and assemblies to achieve optimum solutions.
K4. Integrate and apply the knowledge and understanding acquired on the course in the planning, implementation and presentation of a major individual project.
K5. Analyse business situations with respect to strengths and weaknesses, opportunities and threats and develop ways and means to counteract or exploit such aspects.
K6. Comprehend the importance of competitiveness in industry and how to form a new enterprise.

B Intellectual skills

C1. Approach and implement design in a methodical and disciplined manner.
C2. Evaluate critically, and apply scientific knowledge and skills in the development and implementation of practical solutions to engineering problems.
C3. Evaluate computer based packages for the integration of design functions from concept to realisation.
C4. Plan and implement engineering design projects individually and in a group.
C5. Demonstrate a level and type of education to allow the pursuit of postgraduate research in a related discipline.

C Subject specific / practical skills

P1. Identify, understand and employ the appropriate mathematical models to solve engineering design problems.
P2. Use highly specialised manual and computer-based methods for engineering communication and product presentation.
P3. Be able to employ efficiently advanced modelling, simulation and analysis packages in engineering design.
P4. Critically review and select engineering materials and material processing methods for the design of components.
P5. Design and use a range of electronic system modules in the process of product design.

D Key/Transferable skills

T1. Communicate effectively by oral, written and visual means.
T2. Use IT including the Web, spreadsheets, presentation and word processing.
T3. Solve numerical and statistical problems using appropriate techniques.
T4. Work effectively in collaboration with others, including staff and students.
T5. Demonstrate creativity in problem solving and the application of knowledge across discipline areas.
T6. Identify and work towards targets for personal, career, and academic development.
T7. Be independent and reflective learners.

Table 1: Programme Learning Outcomes and Mapping to Modules

On successful completion of BEng (Hons) Engineering Design. Intermediate Qualification e.g. Foundation Degree, HND; will be able to:

Programme Learning Outcomes					Apprenticeship Standard Learning Outcomes
K	**Knowledge and Understanding**	**Core Modules (Code) Level 4**	**Core Modules (Code) Level 5**	**Core Modules (Code) Level 6**	
K1.	Develop detailed knowledge and understanding of an increased range of engineering principles and processes.	**ME421NC, ME422NC, ME423NC, ME425NC, ME426NC, EE421NC, EE422NC, EE423NC, EE421NC, PE421NC**	WB 501, ME522NC, ME523NC, ME524NC, ME525NC, ME526NC, ME527NC, EE521NC, EE522NC, EE523NC, EE524NC	**ME605NC WB601**	Mathematics and science for engineers Materials and manufacture Mechanical. electrical and electronic principles and applications
K2.	Develop systematic knowledge and understanding of analytical tools to gain confidence in applying them to engineering design and technological problems at a professional design engineer level.	**ME421NC, ME422NC, ME423NC, ME425NC, ME426NC, PE422NC**	**WB 501, ME522NC PE521NC, PE522NC, PE523NC, EE522NC, ME525**	**PD605NC WB601**	Using computer software packages to assist with and evaluate engineering activities
K3.	Have an advanced knowledge and understanding of the use of modern computer tools to model, simulate and analyse complex products and assemblies to achieve optimum solutions.	**ME428NC**	**ME527NC, EE522NC**	**ME605NC WB601***	Using computer software packages to assist with and evaluate engineering activities

K4.	Integrate and apply the knowledge and understanding acquired on the course in the planning, implementation and presentation of a major individual project.	**ME427NC**	**WB 501**	**ME605NC WB601* PD605NC**	Product improvement and engineering project management
K5.	Analyse business situations with respect to strengths and weaknesses, opportunities and threats and develop ways and means to counteract or exploit such aspects.	**ME424NC PE 422NC**	**ME522NC, ME526NC EE522NC**	**ME605NC, WB601***	How to run and manage business led projects Engineering operations and business management
K6.	Comprehend the importance of competitiveness in industry and how to form a new enterprise.	**ME424NC**	**ME522NC**	**ME605NC WB601 PD605NC***	How to run and manage business led projects
C	**Intellectual/Cognitive Skills**				
C1	Approach and implement design in a methodical and disciplined manner.	**ME421NC, ME422NC, ME423NC, ME425NC, ME426NC, PE422NC**	**WB 501, ME522NC, EE521NC, EE522NC**	**WB601***	Applying advanced technology techniques
C2	Evaluate critically, and apply scientific knowledge and skills in the development and implementation of practical solutions to engineering problems.	**ME421NC, ME422NC, ME423NC, ME425NC, ME426NC, EE421NC, EE422NC, EE423NC, EE421NC, PE421NC**	**WB 501, ME522NC, ME523NC, ME524NC, ME526NC, EE521NC, EE524NC**	**ME602NC WB601***	Managing and controlling product design change
C3	Evaluate computer based packages for the integration of design functions from concept to realisation.	**ME428NC**	**ME527NC, EE524NC**	**ME605NC**	3D Computer Aided Design and Computer Aided Engineering
C4.	Plan and implement engineering design projects individually and in a group.	**ME424NC**	**WB 501, ME522NC, ME524NC, EE523NC**	**PD605NC WB601***	Engineering operations and business management

C5.	Demonstrate a level and type of education to allow the pursuit of postgraduate research in a related discipline.		**WB 501**	**WB601***	
P	**Practical Skills**				
P1	Identify, understand and employ the appropriate mathematical models to solve engineering design problems.	**ME422NC, ME423NC EE421NC**	**ME525NC, ME526NC, EE523NC, ME522NC**	**ME605NC WB601***	Mathematics and science for engineers Applying advanced technology techniques
P2	Use highly specialised manual and computer-based methods for engineering communication and product presentation.		**ME527NC**	**WB601***	3D Computer Aided Design and Computer Aided Engineering
P3	Be able to employ efficiently advanced modelling, simulation and analysis packages in engineering design.	**ME428NC, EE423NC**	**WB 501, ME526NC, ME527NC**	**ME605NC, WB601***	Applying advanced technology techniques
P4	Critically review and select engineering materials and material processing methods for the design of components.	**ME421NC**	**WB 501**	**WB601***	Materials and manufacture
P5	Design and use a range of electronic system modules in the process of product design.	**ME424NC, EE423NC**	**PE523NC, EE521NC, EE522NC, EE523NC, EE524NC**	**WB601***	Mechanical. electrical and electronic principles and applications
T	**Key/Transferable Skills**				
T1	Communicate effectively by oral, written and visual means.	**ME424NC, ME427NC**	**WB 501, ME522NC**	**WB601*, ME605NC**	Product improvement and engineering project management
T2	Use IT including the Web, spreadsheets, presentation and word processing in communication and dissemination.	**PE421NC, PE422NC, ME424NC, ME427NC**	**WB 501, ME522NC**	**ME605NC WB601 PD605NC***	Using computer software packages to assist with and evaluate engineering activities
T3	Solve numerical and statistical problems using appropriate techniques.	**ME422NC, ME423NC**	**PE521NC, ME523NC, ME525NC**	**WB601***	Mathematics and science for engineers

T4	Work effectively and disseminate in collaboration with others, including staff and students.	**ME424NC, ME427NC**	**WB 501**		Securing appropriate resources and managing budgets and resources
T5	Demonstrate creativity in problem solving and the application of knowledge across discipline areas.	**ME428NC**	**WB 501, ME522NC**	**ME602NC, ME699NC***	Implementing, monitoring and evaluating engineering processes
T6	Identify and work towards targets for personal, career, and academic development.	**ALL**	**ME522NC**	**ALL**	**All of the above**
T7	Be independent and reflective learners.		**WB 501**	**ME699NC***	

Note: Outcomes specifically linked only to the (Hons) requirement (normally dissertation or equivalent), should be indicated with a *.

On successful completion of a Level 6 BEng. (Hons.)Engineering Design the graduate will have completed all of the modules below in their specific discipline as indicated in the table below

Mechanical Engineering	Design Manufacturing Engineering	Electrical Engineering
• ME 421NC • ME 422NC • ME 423NC • ME 424NC • ME 425NC • ME 426NC • ME 427NC • ME 428NC • WB 501 • ME 522NC • ME 523NC • ME 524NC • ME 525NC • ME 526NC • ME 527NC • ME 605NC • WB601* • PD605NC	• ME 421NC • ME 422NC • ME 423NC • ME 424NC • PE421NC • PE422NC • ME 427NC • ME 428NC • WB 501 • ME 522NC • PE521NC • PE522NC • PE523NC • ME 524NC • ME 526NC • ME 605NC • WB601* • PD605NC	• ME 421NC • ME 422NC • ME 423NC • ME 424NC • EE421NC • EE422NC • EE423NC • ME 427NC • WB 501 • ME 522NC • ME 525NC • EE523NC • EE524NC • EE525NC • EE526NC • ME 605NC • WB601* • PD605NC

Those highlighted in Blue are common modules.

On successful completion of a Level 6 Ordinary degree,
Graduates will have achieved the majority of the learning outcomes specified above for the full Honours award with the exception of those marked with a *. (Note: The apprenticeship will be deemed not to be complete if the Honours degree is not completed, all elements must be passed)

- A systematic and analytical approach to the application of quality management and design for manufacture techniques.
- A detailed and critical knowledge of advanced manufacturing techniques as applied in mechanical engineering design.
- A detailed and critical knowledge of advanced computer aided design techniques as applied in mechanical engineering design.
- The strategies associated with the management of finance and marketing and underlying concepts and principles outside the context in which they were first studied, including, where appropriate, the application of those principles in an employment context.
- A detailed critical, ethical and planned approach to researching a project.
- A methodical and productive approach to a project topic showing critical analysis and evaluation methods leading to logical conclusions.

- An ability to communicate information, ideas, problems, and solutions and justify own work convincingly to both specialist and non-specialist audiences and to work effectively within a team environment.
- A personal plan of work to meet a series of deadlines and to identify the main external constraints and processes to select appropriate solutions from a variety available.
- Excellent communication skills and a high degree of autonomy in all main areas of work.
- A high level of practical skills.
- An ability to devise and sustain arguments, and/or devise innovative solutions to problems, using a breadth of inventiveness, ideas and techniques.
- An ability to analyse, comment upon and/or debate particular aspects of current research, or equivalent advanced scholarship, in Mechanical Engineering Design.

The above learning outcomes will be demonstrated by the achievement of a combined total of 300 credits comprising 120 credits at Level 4, 120 credits at Level 5 and 60 credits at Level 6 from the above modules (excluding the dissertation or equivalent):

On successful completion of Level 5 FDEng/HND a graduate, will be able to demonstrate achievement of the following learning outcomes:

- Routine design techniques, theory and analysis toward the solution of engineering design problems.
- A knowledge of the mathematical and scientific principles as applied specifically to engineering design.
- A detailed knowledge and understanding of materials and manufacturing process selection.
- Scientific principles to the modelling and analysis of common engineering systems.
- Scientific principles to the modelling and analysis of common systems utilising applied thermodynamics and fluid mechanics.
- Effective interaction in a learning group.
- Appropriate tools and techniques in the analysis and design of engineering components and systems to solve given problems.
- Demonstrate qualities and transferable skills necessary for employment requiring the exercise of personal responsibility, increasing independence and decision-making.

The above learning outcomes will be demonstrated by the achievement of a combined total of 240 credits comprising 120 credits at Level 4 and 120 credits at level 5 for this programme.

On successful completion of Level 4 Cert HE a graduate will be able to demonstrate achievement of the following learning outcomes:

- Routine design techniques, theory and analysis toward the solution of engineering design problems.
- A knowledge of the mathematical and scientific principles as applied specifically to engineering design.
- A basic knowledge and understanding of materials and manufacturing process selection.
- Developed skills in scientific principles to the modelling and analysis of common mechanical systems.
- A basic understanding of principles to the modelling and analysis of common thermofluid systems.
- Effective interaction in a learning group and the work environment.

- Gained appropriate tools and techniques in the development and design of mechanical engineering components and systems to solve some problems.
- Demonstrate some qualities and transferable skills necessary for employment requiring the exercise of personal responsibility and increasing independence.

The above learning outcomes will be demonstrated by the achievement of 120 credits listed at Level 4 for this programme.

Learning, Teaching and Assessment Methods to achieve the Programme Learning Outcomes

How will an apprentice learn?

A substantial portion of the learning will be in the workplace and at least 20% of the learning will be will be outside the workplace. It is envisaged that the academic/knowledge/theoretical aspect of the course will be delivered by day release at the Newbury College.
Modules on this programme will be taught in line with the University's Teaching, Learning and Assessment strategy for the Apprenticeship Degrees, and the Course Team will strive to ensure that all modules embrace current industrial practice and work based learning, wherever possible. Where appropriate assessments will be drawn from the work place and used as part of the work based learning.

A range of teaching methods will be used to ensure that the student/apprentice is able to learn at their best ability. Typical techniques will include the following but will not be exclusive to:

- Lectures to transfer the basic and complex theory of the topic
- Seminars will be used for smaller groups to discuss and analyse the particular subjects
- Tutorials used for one to one assistances
- Work based learning skill learned in the workplace will provide the practical application to the learning process through the work based learning modules
- Blackboard for e-learning and transfer of information
- Workshop and Practical sessions development of particular skills
- Laboratories will be used for the testing and proving of theory
- Research and industrial visits: to provide depth and context to the students learning

The teaching, learning and assessment methods adopted embrace a wide range of approaches around a core of work based projects and workshop tuition, where currency will be maintained through strong links with allied professions and industries. The course is structured to allow students to take increasing responsibility for the content and direction of their work, and to become increasingly independent in their studies as the course progresses.

The teaching strategies employed throughout the course are those judged to be the most appropriate for each module at each stage and level of the course with a strong emphasis on work-based learning and work placed mentoring. They include the following strategies and techniques:

Lectures

This is the most formal teaching strategy used during the course. It is generally used for the delivery of a body of theoretical information to a large group of students, and this is most effective when followed by a seminar, tutorials or group discussion. The lecture format may also be used to introduce a module or a project to the whole cohort, and in all cases lectures will be supported by supplementary information in the form of handouts, or links to Blackboard or similar virtual learning environment (VLEs). This supplementary information will reinforce through the work place and possibly expand upon the information conveyed through the lecture, and may well include tutorial or other exercises to be carried out in the student's own time. On occasion, visiting lecturers and Associate Lecturers (ALs) will be used where specific areas of expertise are required, and also to launch external competitions and industrial collaboration projects.

Seminars
These are seen as an essential teaching tool, and can vary from large group seminars, which provide formal debate, to impromptu discussion sessions with small groups, which may follow on from a lecture, demonstration or video. Seminars will be promoted to encourage students from a range of courses within the Faculty to attend, to allow cross fertilisation of ideas.

Critiques
All students are required to present their work to the rest of the cohort and to the course team on a regular basis. All students, including those from other levels, are welcome to take part, but generally numbers are kept reasonably low, as this is less intimidating for those presenting. The onus is on the student to take responsibility for presenting their work in the most appropriate manner. This is an extremely effective teaching strategy, encouraging students to become increasingly articulate and confident in discussing their work as they enter into critical debate. It also acts as a communication vehicle to allow dissemination of good practice between all of the students and the staff.

Tutorials
Group and individual tutorials are used throughout all levels of the course. Each student also has a personal tutor; someone who follows their progress, but is also available to discuss other more personal problems that may occur, and where necessary refer them elsewhere for assistance. Students may request a personal tutorial as and when necessary. For the final Level 6 project dissertation, students are given a regular weekly timetabled tutorial. The role of the tutor is to provide advice, support, guidance and feedback on the student's work as it develops.

Blackboard
Blackboard is the University's choice of computer software for our virtual learning environment (VLE). It supports online teaching and learning and can be accessed by registered students and staff via the University's intranet system or by the internet from any location. Blackboard has become a key learning support tool whereby staff and student can communicate through text and image. Resources available within the „environment" include, course information, module materials that can comprise of anything from lecture notes to video clips, discussion forums for communication between staff and students, administrative information such as calendars, and the setting and marking of online assessment. Blackboard facilitates an inordinately flexible and remotely available teaching and learning world.

Work-based Learning
As part of the apprenticeship the students are required to complete a level of work-based learning. This is up to 80% of the apprentice's time, which will be spent in the work place learning on the job. This will be monitored by the provider and the work place mentor on an ongoing basis with regular visits to the work place by the provider. There are two assessment points which will act as gate ways for the apprentice. The first of these will be assessed by the work place mentor and the provider. The second assessment points as identified in the Apprenticeship Assessment Standard will be the end point assessment for the particular Apprenticeship Standard covered by this course. This will be independently assessed. The course will include all of the learning in the work place as supportive learning. This work will be used to develop and feed in to the apprentices work as cases studies and examples of applied theory. Where it is viable and practical in the course structure there have been work based modules used to ensure the continued learning in the workplace which is then independently assessed by the academic provider. These are provided at level 5 and at level 6, WB501, WB601.

Workshop and Practical Sessions
Practical sessions will allow the acquisition of specific skills and techniques, and also highlight the health and safety requirements of materials, equipment and processes. Cohorts will be split into small group sizes to ensure that each student has full access to each process. These will be expressed in their final project when they will have to demonstrate that they are able to coordinate their learning and use the knowledge learnt to apply to project management.

Laboratories
Lab sessions allow students to practically apply the theoretical aspects of the course, for example mathematical and physical science that has been introduced in more formal lectures, and therefore gain

another perspective on the academic material. The more relaxed atmosphere of the lab environment allows and encourages student experimentation.

Research/Industrial Visits / Study Tours

These may include visits to galleries, exhibitions, museums, retail outlets and manufacturers, both at home and abroad and are aimed at increasing the students" awareness of the wider world and possibilities within their area of study. Normally, students will be offered two optional annual study tours, aimed at promoting an international perspective on design, an awareness of other cultural attitudes and creating relationships with other institutions through visits, guided tours and collaborative projects. Also, the attributes as a bonding exercise between the different student groups and the students and staff cannot be underestimated.

How will students be assessed?

A variety of assessment vehicles, including a selection of those found in the QAA Engineering Benchmark, are used as appropriate to each module. These include assignments carried out in the student's own time, in-class assignments, worksheets, presentations, laboratory exercises and formal examination. The forms of assessment have been chosen so as to motivate students to achieve and to create positive learning opportunities. Both formative and summative approaches will be used throughout the assessment process. The formative assessments will be used in the early stages of the process and as the student progresses the summative approach will be used. Assessments will often be Work based activity and assignments drawn from the apprentices work place.

There will be two formal assessment points on the apprenticeship programme.

Gate way 1 students must have completed

Gateway 2 students must have

These are independent assessment points and represent gateways the first in integrated assessment to the study which will be based on work completed in their degree as well as in the workplace. This will not be part of the degree programme of study but will be related to the progress that the student is making. The final point is an EPA which is an independently reviewed and will again not be part of the degree but the degree will be one of the requirements for the completion of the Apprenticeship Degree programme. This is to ensure that the work aspect that the apprentice has completed is aligned with the academic study. This is outlined in the Apprenticeship Assessment Standard.

Personal Development Planning

According to the QAA National PDP definition, Personal Development Planning is a "structured and supported process undertaken by an individual to reflect upon their own learning, performance and/or achievement and to plan for their personal, educational and career development". The primary objective for PDP is to improve a student's capacity to understand what they are learning, and to review, plan and take responsibility for their own development. Opportunities for PDP are signposted throughout the programme, and can be most readily identified in proposals, reflective journals and sketchbooks, self-assessment, project tutorials, and through project review and presentation as detailed below.

The apprentice will develop a personal development portfolio over the course of the apprenticeship which will form part of the requirement for the end point assessment. This will take the form of a logbook for the work carried out in the workplace and will be monitored by the work place assessor.

The two main point of review of this will be the midpoint assessment and the endpoint assessment.

SECTION C: PROGRAMME STRUCTURES AND HOURS

Table 1: Programme Structure Table (Mechanical Engineering)

Programme Title	**BEng (Hons) Engineering Design (Mechanical Engineering)**								
Course Code	**BV1ENG2**								
Mode of Study	**Work Based Learning**								
Credit Value	**UK**	360		**ECTS**		180			
Module Code	**Module Title**	**QCF/FHEQ Level**	**Course Stage / Year**	**Status in Award *([C]ore / [O]ptional)***	**Credit Value**	**Assessment Regime**			**Semester Taught ***
						Written Exam %	**Coursework %**	**Practical %**	
Year 1									
ME421NC	Engineering Design	4	1	C	15		100		S1
ME422NC	Engineering Maths	4	1	C	15		100		S1
ME423NC	Engineering Science	4	1	C	15		100		S1
ME424NC	Managing a Professional Engineering Project	4	1	C	15		100		S1
ME425NC	Mechanical Principles	4	1	C	15		100		S2
ME426NC	Fundamentals of Thermodynamics and Heat Engines	4	1	C	15		100		S3
Year 2									
ME522NC	Professional Engineering Management	5	2	C	15		100		S1
ME525NC	Further Mathematics	5	2	C	15		100		S1
ME526NC	Lean Manufacturing	5	2	C	15		100		S1
ME427NC	Engineering Management	4	2	C	15		100		S2
ME428NC	Computer Aided Design and Manufacture (CAD/CAM)	4	2	C	15		100		S3
Year 3									
WB501	Action Inquiry in the workplace context	5	3	C	30		100		SB
ME523NC	Advanced Mechanical Principles	5	3	C	15		100		S1
ME524NC	Virtual Engineering	5	3	C	15		100		S2
ME527NC	Thermofluids	5	3	C	15		100		S2

Year 4									
PD605NC	Design for Manufacture	6	4	C	30		100		SB
ME605NC	Leadership and Management	6	4	C	30	50	50		SB
WB601	Work-Based Research Project	6	4	C	60		100		SB

Table 2: Programme Structure Table (Electrical Engineering)

Programme Title	**BEng (Hons) Engineering Design (Electrical Engineering)**								
Course Code	**BV1ENG2**								
Mode of Study	**Work Based Learning**								
Credit Value	**UK**	360		**ECTS**		180			
Module Code	**Module Title**	**QCF/FHEQ Level**	**Course Stage / Year**	**Status in Award *([C]ore / [O]ptional)***	**Credit Value**	**Assessment Regime**			**Semester Taught ***
						Written Exam %	**Coursework %**	**Practical %**	
Year 1									
ME421NC	Engineering Design	4	1	C	15		100		S1
ME422NC	Engineering Maths	4	1	C	15		100		S1
ME423NC	Engineering Science	4	1	C	15		100		S1
ME424NC	Managing a Professional Engineering Project	4	1	C	15		100		S1
Year 2									
ME522NC	Professional Engineering Management	5	2	C	15		100		S1
ME525NC	Further Mathematics	5	2	C	15		100		S1
ME427NC	Engineering Management	4	2	C	15		100		S2
EE421NC	Electrical and Electronic Principles	4	2	C	15		100		S2
EE422NC	Digital Principles	4	2	C	15		100		S3
EE423NC	Electronic Circuits and Devices	4	2	C	15		100		S3

Year 3									
WB501	Action Inquiry in the workplace context	5	3	C	30		100		SB
EE522NC	Industrial Systems	5	3	C	15		100		S1
EE523NC	Analogue Electronic Systems	5	3	C	15		100		S1
EE521NC	Industrial Power, Electronics and Storage	5	3	C	15		100		S2
EE524NC	Further Electrical, Electronic and Digital Principles	5	3	C	15		100		S2
Year 4									
PD605NC	Design for Manufacture	6	4	C	30		100		SB
ME605NC	Leadership and Management	6	4	C	30	50	50		SB
WB601	Work-Based Research Project	6	4	C	60		100		SB

Table 3: Programme Structure Table (Production Engineering)

Programme Title	**BEng (Hons) Engineering Design (Production Engineering)**			
Course Code	**BV1ENG2**			
Mode of Study	**Work Based Learning**			
Credit Value	**UK** 360	**ECTS**	180	

Module Code	**Module Title**	**QCF/FHEQ Level**	**Course Stage / Year**	**Status in Award *([C]ore / [O]ptional)***	**Credit Value**	**Assessment Regime**			**Semester Taught ***
						Written Exam %	**Coursework %**	**Practical %**	
Year 1									
ME421NC	Engineering Design	4	1	C	15		100		S1
ME422NC	Engineering Maths	4	1	C	15		100		S1
ME423NC	Engineering Science	4	1	C	15		100		S1
ME424NC	Managing a Professional Engineering Project	4	1	C	15		100		S1

Year 2									
ME522NC	Professional Engineering Management	5	2	C	15		100		S1
ME525NC	Further Mathematics	5	2	C	15		100		S1
ME427NC	Engineering Management	4	2	C	15		100		S2
ME428NC	Computer Aided Design and Manufacture (CAD/CAM)	4	2	C	15		100		S3
PE421NC	Production Engineering for Manufacture	4	2	C	15		100		S3
PE422NC	Quality and Process Improvement	4	2	C	15		100		S3
Year 3									
WB501	Action Inquiry in the workplace context	5	3	C	30		100		SB
PE523NC	Further PLCs	5	3	C	15		100		S1
ME523NC	Advanced Mechanical Principles	5	3	C	15		100		S1
ME524NC	Virtual Engineering	5	3	C	15		100		S2
PE521NC	Manufacturing Systems Engineering**	5	3	C	15		100		S2
Year 4									
PD605NC	Design for Manufacture	6	4	C	30		100		S/B
ME605NC	Leadership and Management	6	4	C	30	50	50		S/B
WB601	Work-Based Research Project	6	4	C	60		100		S/B

Table 3: Breakdown of Contact Hours

Note: Hours are worked on the basis of full-time study. 1 Academic Credit is equated to 10 notional learning hours. A full-time undergraduate student will normally study 120 credits in an academic year which is therefore equated to 1200 notional hours. A full time postgraduate student will normally study 180 credits in an academic year which equates to 1800 hours. Module Descriptors provide detailed breakdowns of the categories given below.

Year of course	Scheduled Learning and Teaching Activities	Work based learning	Guided Independent Study	Total
Year One	150	200	450	**800**
Year Two	150	200	450	**800**
Year Three	150	200	450	**800**
Year Four	200	200	800	**1200**
Total	**650**	**800**	**2150**	**3600**

SECTION D: ASSESSMENT REGULATIONS

This programme complies with the approved University regulations *Academic Assessment Regulations* and procedures as detailed on the University website.

The following modules will be non-compensable:
- WB501 Research Project
- WB601 Work-Based Research Project (Work Based project)

The calculation of this award will be **as in the University Assessment Regulations**

Exit Awards Available

Exit Award Type	Award Title	Credits Achieved
Certificate of Higher Education	Certificate of Higher Education in Engineering Design	120 Credits
Foundation Degree(interim award)	Foundation Degree Eng Engineering Design	240 Credits
Ordinary Degree	BEng. Engineering Design	300 Credits

Note: Where exit awards are made prior to the Degree, this would result in non-completion of the apprenticeship.

SECTION E: FURTHER INFORMATION

Reference Points

The following reference points were used when designing the programme:

- University Strategy 2016-2021
- Buckinghamshire New University Approval of Academic Provision policy and procedure
- QAA Subject Benchmark Statement for: Engineering
- QAA Framework for Higher Education Qualifications (2014)
- Apprenticeship standards
- PSRB documents (IED, EC)
- Equality & Diversity Teaching & Learning Toolkit
- QAA Education for Sustainable Development
- Work-based and Placement Learning Policy
- University Academic Qualifications Framework
- Apprenticeship assessment standard
- UK Spec.

Annual Review and Monitoring

This programme will be monitored annually through the University's annual monitoring, which is a continual cycle of review and enhancement. This process is supported by both the periodic review of departments and the periodic re-approval process for individual programmes. All processes are completed in consultation with students via the Students' Union or student representatives. Additional monitoring, evaluation and review of the apprenticeship is also undertaken with employers to ensure the programme remains fit for purpose as part of the apprenticeship.

The re-approval of this programme is scheduled for academic year: 2023