SECTION ONE: General Information

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| **Programme Title** | HNC Mechanical & Production Engineering | |
| **Approval of Specification** |  | |
| **Award Title & Interim Awards** | HNC Mechanical & Production Engineering | |
| **Mode of Study** | Full-time:  Part-time:  E-learning:  Distance: Sandwich: | |
| **Programme Start**  **Date & Period of**  **Validation** | Start Date:  September 18 | Date of Last Update:  Click here to enter a date. |
| 5 Years Indefinite: Other (Please state): | |
| **Awarding Institution** | University of Derby:  Other (*Please State)*: | |
| **College Managing**  **the Programme** | Engineering and Technology | |
| **Institutions Delivering**  **the Programme** | University of Derby:  Other (*Please State)*: Preston’s College | |
| **Relevant External**  **Reference Points** | QAA Subject Benchmarks for Engineering 2015.  The Framework for Higher Education Qualifications 2014 (through the use of the University  level descriptors).  UK Standard for Professional Engineering Competence (UK-SPEC) 2014 | |
| **External Accreditation/**  **Recognition** | None | |
| **JACS Code(s)** | H300 | |

SECTION TWO: Overview

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| **Background/Context:** |
| Mechanical & Production Engineering is at the core of modern day manufacturing technologies and has changed the way industry operates and interacts with customers and suppliers. This qualification has been designed to provide the specific skills and knowedge required for a career within the engineering industry. It will provide you with the skills and confidence in using them to enhance or start your career in engineering. The programme creates a balance between academic and practical work that is linked ot the engineering industry. Providing the fundamental knowledge base required to operate as an engineer and progress to higher levels of education.  Specifically the programme will develop your skills in the key areas of:   * Manufacturing Technologies including Mechanical, Manufacturing and Production methodologies, methods, techniques and current developing theories and conceptual ideas. * Engineering Science and Applied Mathematics. * Management, including current management techniques and theories, Risk management, supplier relations and financial controls. * IT which will include developing the student’s skills in the areas of CAD, CAM, spread sheets, Internet usage and general IT skills. * Developing and running a project. * Transferable communication skills, including written, verbal and new media presentation skills. * The role of engineers in creating a sustainable and ethical environment.   This Higher National Certificate will provide you with the skills and knowledge to develop your existing career in engineering, or to provide you with a pathway into this exciting area of industry. |
| **Overview of the Programme:** |
| The HNC Mechanical & Production Engineering has been designed with our employer network to provide the skills and knowledge required for working in the engineering industry. This programme is designed for those wishing to progress their existing career in engineering and for those starting out on a new career in engineering. The programme is delivered on a part time basis at the college and provides a delivery model that fits with those working in the industry. The programme is delivered with a mixture of practical and theory sessions, with an emphasis on developing individuals academic skills in engineering. The programme is delivered in the Innovation and STEM Centre at Preston’s College, with access to industry leading facilities and technology. There is a range of delivery sessions from classroom based learning, laboratory practical and workshop based delivery. |
| **Key Characteristics:** |
| * Enhancing employability opportunities in the engineering sector. * Development of employability skills such as project management, teamwork, communication, research and technical ability. * High quality teaching that is delivered by industry experienced staff and relevant to the current sector initiatives. * Access to excellent facilities of industry standard equipment. * Development of an understanding of applications in the engineering industry. * Varied assessment methods designed to test academic ability and link to real world problem solving. * Developing creativity, problem solving and research skills through project work. |
| **Programme Aims:** |
| * To meet the changing needs of the Engineering Industry * To prepare students to achieve success in their working lives and in future studies. * To develop in students the skills and personal qualities which are of general importance and applicability to all aspects of working life. * To encourage students to develop as independent learners. * To provide students with intellectual challenge. |

SECTION THREE: Programme Learning Outcomes

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| * Intellectual ability – Thinking and creativity abilities   1. Diagnose causes of failure in materials.   2. Investigate materials and economic processes for a product.   3. Diagnose the nature of technical issues and problems in industry; recommend courses of action to remedy them.   4. Evaluate sustainable development in engineering activities.   5. Apply appropriate mathematical techniques to analyse engineering problems.   6. Evaluate and use CAD systems.   7. Create a detailed analysis of a project in the format of a Precedence Network and produce a project schedule in Gantt Chart form based on the Precedence Network analysis. * Transferable skills – Skills universally applicable to employment, business development, self-employment, further education.   1. Create a design study using CAD processes.   2. Apply safe working procedures, risk assessment and risk management.   3. Communicate in a professional manner and deliver a presentation.   4. Apply engineering skills to solve a range of problems. * Knowledge and understanding – Areas of knowledge that are relevant to engineering in general with particular focus on Mechanical Engineering.   1. Apply differential and integral calculus, trigonometry, complex numbers and matrices to a range of problems.   2. Select relevant library items in the production of CAD drawings.   3. Evaluate the framework, operation and benefits of a CAD system. * Practical and subject specific skills – Practical abilities and hand-in product development life cycle   1. Produce/modify to ISO standard 2D assembly and detail drawings on a specific CAD system.   2. Produce hard copies of CAD drawings relevant to industry standards.   3. Explore the relationship between manufacturing methods and materials behaviour. Select suitable materials given a component specification.   4. Design a detailed Organisation Breakdown Structure (OBS) and Work Breakdown Structure (WBS). |

SECTION FOUR: Programme Structure & Curriculum

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| The HNC is 120 Credits made up from the modules detailed below.   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **HNC Mechanical and Production Engineering – (Full time)** | | | | | | | | | | | | | | | | |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | Year 1 |  | Computer Aided Design  Level 4  20 Cr |  | Engineering Science  Level 4  20 Cr |  | Mechanical Engineering Science  Level 4  20 Cr |  |  |  |  |  | Manufacturing and Materials Technology  Level 4  20 Cr |  | Mathematics for Technology  Level 4  20 Cr |  | Project Management  Level 4  20 Cr |  |  |  |  |  | |  |  | Semester 1 & 2 |  | Semester 2 & 2 |  | Semester 1& 2 |  |  |  |  |  | Semester 1 & 2 |  | Semester 1 & 2 |  | Semester 2 |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  | Key:  Grey shaded modules are Core | | | | | | | | | | |  |  |  |  |  |  |  | |  |  |  |  |  |  | | |  |  |  | |  |  |  |  |  |  |  |  |  |  |  | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **HNC-Mechanical and Production: Part-time** | | | | |  |  |  |  | |  |  |  |  |  |  |  |  |  | | Year 1 |  | Computer Aided Design  Level 4  20cr |  | Engineering Science  Level 4  20cr |  | Manufacturing and Materials Technology  Level 4  20cr |  |  | |  |  | Semester 1 |  | Semester 2 |  | Semester 2 |  |  | | Year 2 |  | Mechanical Engineering Science  Level 4  20cr |  | Mathematics for Technology  Level 4  20cr |  | Project Management  Level 4  20cr |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  |  |  |  | |  |  | Semester 1 |  | semester 1 |  | Semester 2 |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Level** | **Year** | **Module Title** | **Credit rating** | **Optional/Prescribed** | | Level 4 | Year 1 Semester 1&2 | Computer Aided Design | 20 | Core | | Year 1 Semester 1&2 | Engineering Science | 20 | Core | | Year 2 Semester 1&2 | Mechanical Engineering Science | 20 | Core | | Year 1 Semester 1&2 | Manufacturing and Materials Technology | 20 | Core | | Year 1 Semester 1&2 | Mathematics for Technology | 20 | Core | | Year 1  Semester 2 | Project Management | 20 | Core |   Progression from this programme is available to the Higher National Diploma (HND) in Mechanical and Production Engineering. By selecting the appropriate modules in the HND there is further progression available to the Degree Top Up in Mechanical Engineering.  The programme is balanced with academic, practical and vocational skills in engineering. As you progress through the programme these skills will be developed and enhanced, while also providing transferable skills in engineering disciplines. |

SECTION FIVE: Learning & Teaching

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| The HNC Mechanical & Production Engineering is achieved when the set of required modules, detailed above, are all passed. Each module has a module specification. This outlines the indicative content of the module, the learning outcomes, the teaching, learning and assessment methods used. Every module has three or four learning outcomes. These are a fundamental statement of what will be learned from that module. Each is directly linked to an assessment. The modules are written so that together they meet the Programme overall Aims and Learning Outcomes.  The Learning and Teaching strategy is designed to impart the knowledge, understanding and associated skills which are defined in the programmes’ learning outcomes. A wide variety of learning and teaching methods are used within the programme including lectures, tutorials, practical workshops, peer group critiques, directed independent study and presentations. There are many fascinating, complex and interwoven concepts in engineering, and the experiential teaching and learning methods allows such concepts to be presented and developed.  **Key Terminology of Learning and Teaching:** Modules: This is a modular scheme. That means the programme of study is divided into modules, each of which cover a particular subject area and typically run for a single term, or year long.  As soon as you enrolled in the programme of study you will be given a user ID and password to access University of Derby when you enrol. An email will be also created for you. This will be you formal channel to communicate all the relevant information about your programme, modules and other administration information.  Some modules will use Course Resources to provide additional resources, such as reading lists, on-line discussion forums, links, jobs in local industry, relevant school/industrial lecture or events, exhibition, conference, workshop and so on.  **Lectures:**  The purpose of a lecture is to convey basic knowledge and concepts. You will learn both from the lecture content and by observation, from different approaches to the organisation and presentation of material.  Lectures are normally timetabled, and this information will be provided to you at the start of the programme.  **Tutorials:**  These may be individual, or in small groups, but the key element is the interaction between tutor and you around task have been given or problems that you have raised. They are important in helping you to learn to identify and articulate problems in their work, and to seek help and constructive criticism.    **Laboratories:**  Laboratory sessions provide you with an opportunity to put into practice some of the procedures described in lectures, and to carry out practical experiments to test concepts and methods. These sessions also enable you to gain experience in using specialist equipment. Laboratory sessions will be timetabled and often run with lectures and other classroom based activities.    **Group Work**  Group work is designed so that you learn to organise and structure collective or co-operative work processes. Group work provides a forum for you to address questions of roles and authority within the group, and may also be used to simulate relationships in organisations related to particular work situations. This is mainly exercised in a number of modules at various level of your programme of study.  Self-directed Learning  This is regarded as a vital extension of formal teaching and learning methods. You are expected to underpin learning by private study, and to utilise all available resources to good effect.  **Technology Enhanced Learning**  As well as the face-to-face activity tutors will support you in your learning via virtual learning environment and other communication opportunities, as appropriate, in your study. Health and safety: Health and safety must be considered in all activities that will take place in the College lecture/tutorial/lab’s spaces and computing labs. It is the responsibility of the University’s collaborative partners and programme leader to provide the relevant induction in health and safety for the programme of studies. It is the responsibility of the module leader to provide a risk assessment for each module considering the health and safety regulations and policy. |

SECTION SIX: Assessment

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| A range of assessment methods are applied including; practical assessments, presentations, written assessments, open and closed book exams and assignment. These are consistent with the University Assessment Policy, and recognise and test the diverse skills that a professional engineer needs to have. Note is also taken of the current high prevalence of plagiarism, in part due to web access; for this reason the formal examination remains an important element in the assessment strategy. Assessment methods in each module are chosen to reflect the Learning Outcomes they assess. As many modules contain both theoretical and practical elements, it is common to find assessments which address both components.  Assessments are designed to enable you to demonstrate achievement of the learning outcomes for your module. Up to two different assessments (assessment components) may be ascribed to a module. An assessment component may sometimes take the form of a number of small submissions e.g. lab reports or short in-class tests. Each assessment component may carry one or more learning outcomes which will be assessed against assessment criteria.  Examinations can include traditional unseen examinations, open-book examinations, or pre-briefed examinations based on case studies. The questioning style can include essay questions, multiple choice questions, or problem-solving questions. Online questions are also used in some modules to enable you to gauge their own knowledge and understanding of the module material.  Outlines of the assessment strategies for each module can be found in the module matrix. Precise assessment requirements, together with specific assessment criteria are issued to you in module handbooks at the commencement of each module.  A mixture of formative and summative assessment is utilised, with a strong commitment to deep learning and an assessment strategy that, on a formative level, aims to help to continuously develop as independent learners throughout the programme. The more formative assessment plays a crucial part in some modules, being a part of programmed activity. In these modules the learning experience and assessment are part of continuous activity based on not only the formal lectures, but also on frequent tutorial feedback, advice and discussion on initial proposals, project reviews and tutor one to one consultations, culminating in the final project submission. The objective is to encourage a creative philosophy and expression, whilst at the same time giving professional advice to take forward conceptual proposals to a working solution level. To achieve this, you will be involved in range of “live projects” and case studies, building upon successes from the previous year.  The programme delivery will fully support the University of Derby Equal Opportunities policies with regard to teaching and learning activities. The delivery team are committed to working with you to ensure they are provided with the best opportunity to fully participate in the course. Often included within a student’s individual support plan are recommendations regarding assessment strategies and methods. For example, it may be recommended that a student with dyslexia is allocated additional time for an exam and that the marking of a mathematical based assignment is assessed without prejudice to the English. The delivery team will follow the recommendations of the student support plan when designing and marking assignments.  This programme operates within the University’s Regulatory Framework and conforms with its regulations on assessment |

SECTION SEVEN: Admission

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| * a BTEC National Certificate Foundation Diploma, Diploma or Extended Diploma * an Advanced Vocational Certificate of Education (AVCE) * an NVQ at Level 3 * an Access Course * an A Level; or equivalent level qualifications. * students who in the opinion of the Course Leader would benefit from the course  Recognition of Prior Learning: If you have already completed some study in engineering, you may also be able to gain entry with exemptions on some of the modules, or advanced entry to Level 5, based on the evidence of other certified qualifications and experiential learning. In this case, Recognition of Prior Experiential Learning (RPEL) or Recognition of Prior Certified Learning (RPCL) processes will apply. You will need to discuss this with your Programme Leader at the college as all claims need to referred to the University of Derby. |

SECTION EIGHT: Student Support & Guidance

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| **Student Induction:**  A one-week induction is held for all new students which includes an introduction to IT facilities, University of Derby Library, Preston’s College Learning Zones and health and safety. The programme handbook provides all essential information about the programme detail and support we provide for your learning.  **Programme Management and Support:**  **Programme Support:**  The Programme Leader has the overall responsibility for the smooth running of the programme, and its day-to-day administration. He/she will provide advice, guidance and information including programme organisation, enrolment, assessment and feedback. You will be able to contact your Programme Leader by email or at his/her office to discuss your student experience and any programme or pastoral issues.  **Module Support:**  Each of your modules has a Module Leader. Module Leaders are responsible for communication of module information and should be your first point of contact for matters relating to specific modules.  **Tutoring and Support:**  The college ensures that staff are available to develop strong relations with students. Informal channels of communication are easily formed in the college community and student feedback is continually being received.  **Individual Student Support:**  You will be assigned a personal tutor at the start of the academic year at the College. Your tutor will aim to support you throughout your studies, and monitor your progress. He/she will meet with you at least once in each semester. If there are times of difficulty, he/she is available to address problems relating to your academic progress, as well as to discuss any personal issues that may hinder your academic development.  In overview, your personal tutor aims to:   * Inform and advise you on issues of academic nature, e.g. teaching methods, information on the modules, assessment methods; * Clarify issues regarding policies and regulations; * Provide support for any personal problems that might emerge, which may have an impact on your performance; * Provide guidance for further studies or career planning; * Contribute to a mutual understanding and the establishment good relations between students and academic staff; * Develop a sense of cooperation in accordance with the academic philosophy and mission of the college.   You will also be assigned a Student Manager for Pastoral Support. Course Resources: Various module material, including an overview of the module (sometimes called a “Module Handbook”), lecture slides, coursework assignment specifications, and other information is accessible on-line via the colleges Virtual Learning Environment (VLE). Reading Material: Of course, reading material is available in our College and university library. You will be provided with information on the Learning Zone, and the resources available there at the start of the course. The library is also an excellent source of on-line materials. Computer Aided Design Software Tools: As a student of the University’s collaborative partners, you can get certain Microsoft software products free to use at home. Also Autodesk and other technical software is available, please speak to your Programme Leader or Module Leader.  The programme team ensures that class discussions are managed so that students with hearing or sight impairments are not disadvantaged. All rooms used for teaching have adequate disabled access, as do the on-campus learning facilities used by students. Where staff make use of videos they check, for example, that there are transcripts available for hearing impaired students.  The Programme Leaders will support student queries covering:   * General advice and guidance * Assignment receipt and collection * Programme and module changes * Receipt of claims for extenuating circumstances * Enrolment support out of the main enrolment periods * Access to Learning Fund (ALF) Applications * Assessment and issue of student car parking permits * Programme representatives   The College offers a range of support and advisory services for students. Most services are accessible on a drop-in basis and also offer appointments if you would like to discuss personal or academic-related matters in more detail. Please familiarise yourself with the services and if you are experiencing any difficulties make sure that you speak to someone about it.  **Programme Monitoring and Student Feedback:**  The operation and health of this programme of study is monitored by the Programme Committee, which meets three times a year. This is hosted by the college and University of Derby, but may be undertaken by video conferencing. Student focus groups are held before each Programme Committee, to gather student feedback; where possible any issues raised are addressed before the Programme Committee meets. Larger issues are brought to the Committee. A process of Annual Monitoring is also undertaken, as defined by the University of Derby and the college. Programme Committee: This Committee provides a forum in which staff and students can discuss matters related to the overall quality of your learning experience, and recommend changes to the programme. The Programme Committee reviews teaching, learning and assessment strategies, and receives module and programme reports which include student evaluation. In addition, student representatives participate directly in the Programme Committee, as do representatives from various College and University support organisations. Student Representatives: Each stage of each the programme of study is required to elect or select a Student Representative to represent students. This involves seeking out the views of fellow students, presenting them to staff and providing feedback on the outcome. One forum where these views can be presented is at the Programme Committee but there are others. For example, student representation is required on Partner-University-wide Committees such as Academic Boards. Because of the importance of the role, training for Student Representatives is provided by the College.  **Students with Additional Needs:**  University’s collaborative partners and the University of Derby are committed to ensuring that all students engaged on a programme have equal opportunity to succeed in it. If you have a need which makes it difficult for you to engage with one of the activities on offer (whether teaching, learning or assessment), then we will make every effort to make adjustments to make it accessible to you.Liaison with student services ensures that systems for the early notification of student disabilities are fully utilised, so that appropriate account can be taken, from the outset, of particular learning needs. Regular team meetings and the arrangements for counselling students enable staff to build up a picture of individual student needs, and to ensure that colleagues are equally aware of these requirements. |

SECTION NINE: Employability

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| The Head of School for Engineering and key staff members meet regularly with local industrial representatives. This has a strong influence over curriculum development, and business and research matters. As a consequence students can be assured that the content and level of their knowledge is relevant for today’s industry.  During the programme there will be delivery of projects linked to industry and opportunities to examine real world scenarios from our industry partners.  Academic staff also interacts proactively with employers and the world of professional engineering through their consultancy activities*.* |

SECTION TEN: Post Programme Opportunities

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| Progression to HND Mechanical and Production Engineering |

SECTION ELEVEN: External Links

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| The college maintains links to various employers who influence curriculum design and assessment methods. Some of these industry partners are cited here:   * Leyland Trucks * Hyde Group * Helical Technologies * Alstom Transport * Unipart * F2 Chemicals * Total |