# MAP04 Production Engineering for Manufacturing

# MAP MODULE COURSE SPECIFICATION

## Modular Acceleration Programme (MAP)

| About the MAP |
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| Preston College has been approved to offer specific modules through the modular acceleration programme (MAP). The modular acceleration programme is a 2-year pilot to fund tuition fees for learners who study specific modules of higher technical qualifications (HTQ), such as a Higher National Certificate (HNC) at level 4. Learners do not need to pay back any tuition fees. However, the funding accessed for MAP will reduce the amount remaining in a future Lifelong Learning Entitlement account. This is called the 'residual entitlement'. |

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## INTRODUCTION

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| **Programme Code** | PC45464 |
| **Programme Title** | MAP04 Production Engineering for Manufacturing |
| **Teaching Institution** | Preston College |
| **Professional, Statutory and Regulatory Body (PSRB) Accreditation** | N/A |
| **Language of Study** | English |
| **Version** | Version 1 |
| **Approval Status** | Approved for delivery |
| **Approval Date** | 2024 |

## COURSE OVERVIEW

The MAP04 Production Engineering for Manufacturing module is designed to equip learners with practical skills and knowledge to optimise production processes and implement quality assurance techniques in a manufacturing environment. Through an integrated delivery of two units - Managing a Professional Engineering Project and Quality and Process Improvement - students gain competencies that are immediately applicable in industry while earning credits towards a higher-level qualification. The course introduces project management best practices alongside tools like statistical process control, lean manufacturing and Six Sigma for analysing and enhancing manufacturing operations. Students undertake a work-based project to solve a real engineering problem, preparing them for the responsibilities of a production or quality engineering role.

## WHO IS THE COURSE FOR?

This course is designed for individuals who meet the following MAP eligibility criteria:

- Aged 19-60
- Living in England or living outside England but working in England
- Looking to retrain for a new career in the construction industry or upskill for their current built environment job

This may include:

- Current manufacturing technicians or team leaders seeking to progress into production engineering and quality roles
- Engineers from other disciplines (e.g. mechanical, electrical) wanting to specialise in manufacturing and production
- Skilled operators with shop-floor experience aiming to move into production planning and management positions
- Those quality related roles who are responsible for applying continuous improvement and lean techniques
- Those with related backgrounds (e.g. logistics, supply chain) interfacing with manufacturing who need to understand production processes

- Career changers with transferable project management or process improvement skills from other sectors
- Recent engineering graduates seeking practical skills to enhance their employability in manufacturing industries

## CAREER OPTIONS AND PROGRESSION OPPORTUNITIES

Upon successful completion of the course, students may consider the following progression routes:

- Combining with other relevant L4 Engineering HNC modules to build towards a full Higher National Certificate in Manufacturing Engineering
- Applying skills to move into or advance within production engineering, manufacturing engineering, continuous improvement, or quality roles
- Undertaking a higher apprenticeship in Manufacturing Engineering, Product Design & Development or Process Leader pathways
- Progressing to further study such as a HND in Manufacturing Engineering or related degree programs
- Pursuing industry certifications in lean manufacturing, Six Sigma, quality management or specific production processes to demonstrate expertise
- Working towards incorporated or chartered engineer status through a combination of education and industrial experience

## COURSE AIMS

The Production Engineering for Manufacturing programme delivered through MAP aims to provide students with the capabilities to:

- Plan, execute and evaluate a work-based project to solve a manufacturing or production engineering problem, considering professional standards and ethical principles
- Analyse manufacturing processes and facility layouts to optimise productivity, material flow and resource utilisation
- Apply statistical process control and quality assurance techniques to monitor and improve product quality in production environments
- Implement lean manufacturing, Six Sigma and continuous improvement tools to streamline processes and reduce waste
- Manage costs of quality and utilise quality standards to improve efficiency and customer satisfaction
- Develop project management, problem-solving, communication and teamwork skills required for production engineering roles

## COURSE OVERVIEW

**Unit 4004: Managing a Professional Engineering Project**

LO1 Select a project that will provide a solution to an identified engineering/manufacturing problem.
LO2 Conduct planned project activities to generate outcomes which provide a solution to the identified engineering/manufacturing problem.

LO3 Produce a project report analysing the outcomes of each of the project processes and stages.
LO4 Present the project report drawing conclusions on the outcomes of the project.

**Unit 4017: Quality and Process Improvement**
LO1 Examine the applications of statistical process control when applied in an industrial environment to improve efficiency
LO2 Analyse cost effective quality control tools
LO3 Determine the role of standards in improving efficiency, meeting customer requirements and opening up new opportunities for trade
LO4 Analyse the importance of Total Quality Management and continuous improvement in manufacturing and service environments.

## INDICATIVE COURSE STRUCTURE

| **Week 1** |
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| Course introduction, overview of projects, quality and process improvement in production engineering for manufacturing. |
| **Weeks 2-11** |
| Integrated delivery of content from quality and process improvement and engineering projects. Building from fundamentals to advanced topics, with formative assessment at midpoint |
| **Week 12** |
| Course review and reflection<br>Summative assessment submission<br>Next steps and progression opportunities |

## STUDY WORKLOAD

Whilst we have designed the course to be as flexible as possible, it's important to be realistic about the time and effort you'll need to invest outside of the classroom to get the most out of this course.

**So, what does independent study involve?**
Independent study is all the learning activities you'll do on your own time, outside of the scheduled lectures, workshops, and tutorials. This could include:

- Reading up on industry trends and best practices
- Watching software tutorials and practicing your modelling skills
- Researching case studies and real-world examples to inspire your projects
- Completing activities and assignments to check your understanding
- Reflecting on your progress and setting goals for improvement
- Collaborating with your classmates on group projects and discussions

How much time should you expect to spend on independent study?

The course is designed to be completed over 12 weeks, combining guided learning and independent study. This means that for every hour you spend in class, you should plan to spend about 1.5 hours studying on your own. Of course, some weeks may be more intense than others, depending on the topic and your assignment deadlines. But as a general rule, you should aim to set aside at least a couple of hours each day for independent study.

## TEACHING, LEARNING AND ASSESSMENT

This module incorporates a varied mix of teaching and learning methods to suit different learning preferences and build core production engineering competencies:

- Interactive seminars exploring manufacturing processes, industry trends and case studies
- Practical workshops using simulation tools, software and templates
- Industrial talks and site visits to observe production engineering in practice
- Small-group activities to collaboratively analyse problems and devise process improvements
- One-on-one tutorials to support your individual project and skills development
- Online learning materials and resources for self-study

Assessment will emphasise the application of learning to realistic scenarios, including, work-based projects, presentations and coursework.

Formative tasks, peer review and in-class activities will be used to monitor your progress and provide feedback to support your summative assessments.

## SKILLS DEVELOPMENT

The MAP03 Engineering Design, Quality and Production course offers the opportunity to develop a range of technical and transferable skills that are highly valued in the engineering sector and beyond. These skills can support career progression, further study, and personal development.

Key technical skills developed through this course include:

- Production planning and scheduling
- Process mapping and optimisation
- Statistical process control
- Quality assurance and quality control
- Root cause analysis and problem-solving
- Lean manufacturing and waste elimination
- Six Sigma methodologies (DMAIC)

Transferable Skills

- Critical thinking and problem-solving
- Research and information literacy
- Communication and collaboration
- Commercial awareness and financial acumen
- Decision-making and leadership
- Adaptability and resilience
- Time management and personal organisation
- Professionalism and ethics

## ENTRY REQUIREMENTS

At Preston College, we recognise that adult learners bring a wealth of experience and diverse backgrounds to their studies. Our entry requirements for the MAP03 Engineering Design, Quality and Production course are designed to be flexible and inclusive, while ensuring that learners have the necessary foundation to succeed in this challenging and rewarding field.

To apply, you should meet at least one of the following criteria:

- GCSEs at grade 4 or above in English and mathematics (or equivalent qualifications)
- A Level 3 qualification in an Engineering or Manufacturing discipline
- At least two years' experience in a manufacturing, production or quality role

In addition, you will need:

- Motivation to undertake independent learning and assessment activities
- Access to a manufacturing organisation to conduct a work-based project

We also consider applicants who can demonstrate relevant skills or knowledge gained through work or life experience. We understand that learning happens in many ways, and we'll take the time to understand your unique background and potential.

**Enhancing Your Learning Experience**

If you're not currently working in an engineering role, we encourage you to seek out paid or voluntary work opportunities alongside your studies. This will allow you to apply your new skills in a real-world setting, making your learning more meaningful and boosting your employability.

Our team is here to support you throughout the application process and your learning journey. We understand that returning to education as an adult can be challenging, and we're committed to providing the guidance and resources you need to succeed. If you have any questions about the entry requirements or whether this course is right for you, please get in touch. Contact Us - Preston College

## PRE-COURSE ACTIVITY

To prepare you for undertaking the work-based project in this module, you should draft an initial 1-2 page project proposal before the module begins. This should include:

- A problem statement, outlining a production or quality issue you have identified in industry
- Proposed project objectives and deliverables to address this problem
- Consideration of feasibility, resources and constraints
- Rationale for your project topic and how it aligns with module content
- Next steps to further define and plan the project

Your tutor will provide formative feedback on your proposal to shape the full project brief and plan that you will develop as part of the module assessments. This pre-course activity will help you hit the ground running and make the most of your learning on MAP04.

## TUITION COSTS

The course is fully funded by the government as part of the Modular Acceleration Programme (MAP) pilot. This means that if you meet the eligibility criteria, you can study this course without paying any tuition fees.

## RELATED COURSES

MAP03 Engineering Design, Quality and Production
HNC Manufacturing Engineering for England (HTQ)
For more information, please visit Engineering Courses (preston.ac.uk)