COURSE AGENDA

Additive Manufacturing

A professional training programme focused on additive manufacturing, 3D printing technologies, digital production, materials, design and practical industrial applications

15 Hours	eLearning	English
Duration	Primary format	Language

Primary format	eLearning course delivered through the digital learning platform
Available on request	Live trainer-led online delivery or in-house classroom training
Contact us	Request a tailored quote for your organisation

About Us

This course is delivered by a team with strong expertise in cybersecurity, digital resilience, emerging technologies and secure digital transformation. Our work is grounded in internationally recognised standards, European regulatory requirements and practical experience supporting organisations operating in complex, regulated and technology-driven environments.

INFOSEC CENTER holds ISO/IEC 27001 certification for information security management and, reflecting a structured and responsible approach to cybersecurity, data protection, governance and AI-enabled technologies. The organisation is also recognised as an **EASA-approved** training provider for specialised aviation cybersecurity training, aligned with European aviation safety and information security requirements.

Our innovation capacity has been recognised through the **Impact Stars distinction** at the **Deloitte Technology Fast 50**, awarded for the innovation delivered by our Machine Learning platform. This reflects our commitment to practical, high-impact technology solutions that combine advanced digital capabilities with real business and societal value.

We are actively connected to European digital innovation networks, including the **European DIGITAL SME Alliance** and the **BSC AI Factory Incubation Program**, contributing to secure, competitive and responsible digital transformation across Europe.

Our broader innovation platform, **FACTORY X.0**, supports the secure transformation of industrial and digital ecosystems by integrating cybersecurity, automation, artificial intelligence, industrial digitalisation and advanced technology adoption, with a focus on resilience, compliance and sustainable innovation.

We support organisations in understanding cyber risk, strengthening digital infrastructure, improving governance, preparing for regulatory compliance and building a stronger security culture across aviation, industry, education, public services and digital business.

Why This Course Matters

Additive Manufacturing is reshaping the way organisations design, prototype and produce physical objects. Commonly known as 3D printing, additive manufacturing creates three-dimensional objects by adding material layer by layer, allowing complex geometries, personalised designs and rapid production methods that are difficult or impossible to achieve through traditional manufacturing techniques.

Additive manufacturing can create important opportunities. It can reduce prototyping time, support product customisation, lower material waste, enable more flexible production, simplify the creation of jigs, fixtures and tooling, and open new possibilities for innovation in sectors such as automotive, aerospace, healthcare, product design, architecture and industrial manufacturing.

The value of additive manufacturing does not come only from the equipment itself. It depends on understanding the full production workflow, from design and modelling to material selection, printing parameters, process control, quality assurance, finishing and cost-benefit evaluation. Organisations that adopt additive manufacturing without proper planning may face challenges related to material performance, dimensional accuracy, production consistency, post-processing, equipment costs and workflow integration.

This course helps learners understand the principles of 3D printing, the main additive manufacturing technologies, design requirements, material characteristics and practical aspects of production, quality and workflow optimisation.

Participants will leave this course equipped to:

- Understand the core principles, terminology and evolution of additive manufacturing
- Explain how three-dimensional objects are created through layer-by-layer material deposition and solidification processes
- Identify key additive manufacturing technologies
- Understand design and modelling requirements for additive manufacturing

- Select appropriate materials based on application needs, process compatibility and performance requirements
- Understand printing parameters, workflow optimisation, quality control and finishing techniques
- Assess the costs, benefits and implementation considerations of additive manufacturing adoption

Course Overview

Course Title	Additive Manufacturing
Total Duration	15 Hours
Primary Delivery Format	eLearning course delivered through the digital learning platform
Optional Delivery Formats	Available on request as live trainer-led online delivery or in-house classroom training
Target Audience	Professionals seeking to understand, evaluate and apply additive manufacturing technologies in organisational, industrial, product development
Prerequisites	No prior additive manufacturing experience required; basic digital literacy and general understanding of production or design processes are recommended
Language	English

Planning & Delivery Options

The standard version of this programme is structured as an eLearning course, allowing participants to progress through the agenda in a flexible and accessible format. This option is suitable for organisations that need scalable delivery, consistent learning materials and clear assessment through the digital platform.

At the client's request, the same course agenda can also be delivered with a live trainer, either online or in an in-house classroom format. These options are recommended when the organisation wants direct interaction with the trainer, applied discussions based on internal workflows or a more guided learning experience.

For organisational enrolment, adapted delivery or group implementation, please request a tailored quote.

Learning Approach

The learning approach is built on four pillars:

01 Conceptual Clarity

Each module introduces additive manufacturing concepts in a clear and structured way before moving into technologies, materials, design principles and practical production considerations. Learners build a solid understanding of 3D printing terminology, layer-based manufacturing, process categories and industrial relevance.

02 Applied Learning

Case studies, scenario-based exercises and practical examples connect additive manufacturing concepts to real business and production needs. Learners explore how additive manufacturing can support prototyping, customisation, tooling, product development and industrial innovation.

03 Security & Governance Integration

Data protection, intellectual property, quality control, process documentation, equipment safety, material traceability and operational governance are integrated throughout the course. Additive manufacturing is presented not only as a production method, but as a digital manufacturing capability that requires controlled workflows and responsible implementation.

04 Progressive Assessment

Each module includes a knowledge check through the eLearning platform. A final comprehensive assessment consolidates learning across all modules and supports the validation of knowledge gained throughout the programme.

Detailed Course Agenda

Module 01 Introduction to Additive Manufacturing

Learning Objectives

- Develop a clear understanding of Additive Manufacturing, also known as additive fabrication or 3D printing, and its role in modern digital production.
- Understand the basic principles of additive manufacturing, including the successive deposition of material layers, solidification or polymerisation processes and the creation of the final object.
- Explore how additive manufacturing differs from traditional subtractive and formative manufacturing methods.
- Investigate the origins and evolution of additive manufacturing, from early prototyping technologies to advanced industrial production systems.

- Examine the sectors where additive manufacturing has created significant impact, including aerospace, healthcare, automotive, product design, architecture and industrial manufacturing.
- Identify the benefits and advantages of additive manufacturing, including design freedom, reduced material waste, rapid prototyping, product customisation and the ability to create complex geometries.
- Understand the limitations and challenges of additive manufacturing, including production speed, material constraints, dimensional accuracy, post-processing requirements and cost considerations.

Tools & Methodology

eLearning modules, optional live trainer-led sessions.

Assessment: Knowledge test via the eLearning platform.

Module 02 Additive Manufacturing Technologies and Processes

Learning Objectives

- Understand the main categories of additive manufacturing technologies and how they differ in terms of material use, process logic, equipment requirements and final part characteristics.
- Explore stereolithography and understand how light-based curing processes are used to create high-resolution polymer parts.
- Understand selective laser sintering and how powder-based fusion can be used to produce functional components with complex geometries.
- Explore material jetting and multi-jet modelling processes, including their use in producing detailed parts, prototypes and multi-material outputs.
- Understand fused filament fabrication and fused deposition modelling, including how thermoplastic filament is deposited layer by layer to create physical objects.

- Compare the advantages, limitations and typical use cases of SLA, SLS, MJM and FFF/FDM technologies.
- Identify other relevant additive manufacturing processes and understand how different technologies are selected based on application, material, cost, accuracy and production requirements.
- Understand the importance of matching the manufacturing process to the intended part function, design complexity, material properties and quality expectations.

Tools & Methodology

eLearning modules, optional live trainer-led sessions, case studies.

Assessment: Knowledge test via the eLearning platform.

Module 03 Design and Modelling for Additive Manufacturing

Learning Objectives

- Understand the role of digital design and modelling in additive manufacturing workflows.
- Explore specialised software used for modelling and design in additive manufacturing, including CAD and CAM tools.
- Understand how digital models are prepared, reviewed and adapted before being transferred to the printing process.
- Learn techniques for optimising part geometry for additive manufacturing, with the aim of reducing material consumption, shortening printing time and improving functional performance.
- Understand how shape, topology and internal structures can be modified to take advantage of additive manufacturing capabilities.
- Examine the importance of support structures and fixation mechanisms during the additive manufacturing process.

- Learn how software tools can be used to generate, position and optimize supports to ensure stability and printing precision.
- Study strategies for part orientation and platform arrangement, considering print efficiency, surface quality, mechanical performance and production reliability.
- Understand how tolerances, shrinkage, deformation and thermal effects can influence the final part and how they should be managed during design and preparation.

Tools & Methodology

eLearning modules, optional live trainer-led sessions, case studies.

Assessment: Knowledge test via the eLearning platform.

Module 04 Materials Used in Additive Manufacturing

Learning Objectives

- Understand the properties of commonly used metal materials, such as aluminium, titanium and stainless steel, and their relevance for functional and industrial applications.
- Understand the properties of commonly used polymers, including ABS, PLA and nylon, and how they are selected for prototyping, functional parts or specific use cases.
- Examine the role of ceramics and composite materials in additive manufacturing and understand their potential applications and limitations.
- Analyse key material characteristics, including mechanical strength, temperature resistance, flexibility, thermal conductivity, electrical conductivity and chemical compatibility.
- Understand how material properties interact with specific printing processes such as FDM and SLS.
- Learn how to select appropriate materials based on the requirements of a specific application, including durability, corrosion resistance, aesthetics, chemical exposure and functional performance.

- Evaluate the advantages and limitations of different additive manufacturing materials in relation to cost, availability, processability, dimensional accuracy, post-processing needs and final part quality.
- Understand why material selection must be aligned with design requirements, equipment capabilities, process parameters and business objectives.

Tools & Methodology

eLearning modules, optional live trainer-led sessions, case studies.

Assessment: Knowledge test via the eLearning platform.

Module 05 Practical Applications

Learning Objectives

- Analyse relevant case studies from sectors such as automotive, aerospace, medical, product design and industrial manufacturing that demonstrate the use of additive manufacturing.
- Understand how additive manufacturing can support the production of customised automotive components, lightweight parts, complex geometries and production support tools.
- Explore the use of additive manufacturing in aerospace applications, including components with complex shapes, reduced weight and specialised performance requirements.
- Examine medical applications such as individually adapted prosthetics, anatomical models, customised devices and patient-specific design.
- Understand how SMEs can integrate additive manufacturing into existing production workflows, including design, material selection, printing, post-processing and quality control.
- Explore how additive manufacturing can be used to create moulds, fixtures, jigs, prototypes and low-volume customised components.

- Understand investment considerations, including equipment, materials, software, training, maintenance and workflow adaptation.
- Analyse potential benefits such as reduced material waste, shorter development cycles, faster prototyping, product customisation, lower tooling costs and new service opportunities.

Tools & Methodology

eLearning modules, optional live trainer-led sessions, case studies.

Assessment: Knowledge test via the eLearning platform.

Module 06 Practical Demonstration and Production Workflow

Learning Objectives

- Learn how printing settings and parameters influence the final result, including temperature, printing speed, layer height, infill density and material flow.
- Understand how to select appropriate parameters based on material type, object geometry, required strength, surface quality and production time.
- Examine the importance of quality control in additive manufacturing and learn how to identify common defects, dimensional issues or surface inconsistencies.
- Explore finishing techniques used to improve the quality, appearance and usability of produced objects.
- Understand how to optimize additive manufacturing workflows, from digital model preparation to printing, post-processing, inspection and documentation.
- Learn how to manage materials and stock efficiently, including monitoring material availability, planning usage and managing finished or semi-processed parts.
- Explore techniques and practices for improving efficiency, production consistency and final part quality in additive manufacturing environments.

Tools & Methodology

Final online assessment, optional trainer review session, individual feedback where applicable.

Module 07 Course Closing & Consolidation

Learning Objectives

- Consolidate understanding across all previous modules through a structured review of additive manufacturing concepts, technologies, materials, design principles.
- Revisit the most important technical and business themes covered throughout the programme, including 3D printing processes, material selection, design optimisation, cost-benefit analysis, workflow management and quality control.
- Prepare for the final assessment by reviewing key definitions, practical applications and decision-making criteria related to additive manufacturing adoption.
- Reflect on how additive manufacturing can be applied responsibly and effectively within the learner's own organisational or professional context.
- Receive personalised trainer feedback on learning progress and areas for further professional development when the course is delivered with trainer support.

Assessment & Certification

Assessment in this course is continuous, formative and cumulative. Rather than relying on a single high-stakes examination, the programme uses a layered approach that supports learning throughout and ensures that the final certification reflects a genuine command of the material.

Assessment Type	Description
Module Knowledge Checks	Each module is followed by a knowledge test delivered through the eLearning platform. These tests reinforce learning at the point of completion and allow learners to identify any gaps before progressing.
Final Assessment	A comprehensive online test covering all modules is completed at the end of the course. This assessment evaluates the learner's overall understanding and ability to apply key concepts across the programme.
Trainer Feedback	When trainer-led delivery is requested, live session interactions and final assessment performance can be reviewed by the course trainer, who provides structured feedback to support ongoing professional development.
Certificate of Completion	Participants who successfully complete the course and final assessment may receive a certificate of completion issued by INFOSEC CENTER, confirming participation and successful completion of the training programme.

Closing Note

The organisations that benefit most from additive manufacturing are those that understand both its possibilities and its constraints. Successful adoption requires more than access to a 3D printer. It requires appropriate design methods, informed material selection, controlled process parameters, quality assurance, workflow planning and a clear understanding of cost and business value.

This course has been designed with that understanding at its core. It aims to prepare learners not only to understand additive manufacturing technologies, but also to evaluate their practical relevance, support implementation planning and contribute to more efficient and innovative production processes.

By combining conceptual clarity, applied examples, technical awareness and business considerations, the programme helps learners build a practical and responsible perspective on additive manufacturing. The knowledge developed here is relevant across sectors where digital design, customised production and rapid innovation are becoming increasingly important.

We hope this programme supports your development as a confident, capable and responsible professional in the field of additive manufacturing. The perspective you build here will help you recognise opportunities, make informed decisions and contribute meaningfully to the future of digital production.

We wish you a productive and insightful learning experience.

Primary format: eLearning course

Live trainer-led and in-house delivery available on request

Request a quote: contact@edkore.com