

Prospectus

Digital4Business

European Master's programme



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Welcome to Digital4Business!



It is with great pleasure that I welcome you to this prospectus for our innovative Master's programme, designed to shape the digital leaders of tomorrow.

At Digital4Business, we are deeply committed to equipping you with the most advanced digital skills to lead and navigate the digital transformation across Europe. Our curriculum is not just cutting-edge but also deeply grounded in real-world business applications, thanks to our close collaboration with industry, government, and academia across Europe. This approach ensures that the programme responds directly to the needs of employers and the digital economy. From artificial intelligence to cybersecurity and cloud computing, every module is crafted to equip you with the skills that are in highest demand.

What makes this programme unique is its flexibility. Whether you're a full-time student or a working professional, our modular structure allows you to tailor your learning journey. You can choose to complete the full 60-ECTS European-accredited Master's programme in part-time or full-time mode, or take single 10-ECTS modules as micro-credentials or single 5-ECTS modules, depending on your professional development needs. This flexibility ensures that you can seamlessly balance your studies with your professional commitments.

By joining Digital4Business as a learner, you are becoming part of an EU-wide initiative, accredited and backed by industry certification, designed to bridge Europe's digital skills gap, and empower a diverse, innovative workforce. I look forward to seeing how each of you will take advantage of this programme's unique flexibility to shape your future and contribute to Europe's digital growth.

Best Regards,

Professor Horacio González-Vélez
Coordinator, DIGITAL4Business

What is Digital4Business?

Digital4Business (D4B) is a revolutionary €19.9m EU-funded online Master's programme designed to equip future digital leaders with cutting-edge skills. This programme merges academic excellence with real-world business relevance to provide you with the advanced digital knowledge that European companies need to thrive. Whether you're looking to master AI, cybersecurity or digital transformation, D4B offers a flexible, market-led learning journey that's tailored to meet the current and future needs of SMEs across Europe.

The Need for Digital4Business

The digital skills gap is growing, and Digital4Business is on a mission to close it. The EU will need 20 million skilled ICT professionals by 2030, but currently only 9 million have the necessary skills. With 77% of EU companies struggling to find qualified workers, Digital4Business bridges this gap by delivering in-demand digital expertise. Whether you're looking to upskill or pivot your career, D4B is here to empower you with the digital competencies needed to drive innovation and stay ahead in the job market.

Career paths — who's it for?

Digital4Business is designed for ambitious professionals, business leaders and graduates who want to excel in the digital age. Whether you're aiming for a leadership role, exploring new technologies or advancing your current career, this programme offers the practical skills and industry certifications to boost your employability. Graduating from D4B will open doors to roles in AI, cybersecurity, data analytics, cloud computing and loads more, positioning you as a sought-after expert in Europe's evolving digital landscape.

Unlock your future as a digital leader

By the end of the programme, you will be able to:

- Master key digital competencies like AI, cybersecurity, cloud computing and more.
- Earn internationally recognised academic qualifications and industry certifications.
- Be equipped to lead digital transformation and innovation in any business environment.
- Gain hands-on experience through real-world projects, hackathons and industry collaborations.

Education model — how you will learn

Digital4Business offers a flexible learning experience that fits your lifestyle. Choose from various formats including:

- **Full-time MSc:** One year, two semesters of 30 ECTS each
- **Part-time MSc:** Two years, four semesters of 15 ECTS each
- **Accelerated part-time MSc:** One year, three semesters of 20 ECTS each
- **Micro-credentials and individual modules:** Flexible, stackable modular learning pathway.

With our 'Master's as a Service' model allows you can tailor your education through modular learning, combining online courses with physical workshops and networking events. You'll have access to live lectures, industry projects and mentoring. Learning is practical, engaging and relevant to the modern digital world.

Digital4Business features one mandatory module (Digital Transformation), 12 other elective taught modules, and a practical project to practically apply course learning.



The Digital4Business Consortium

The Consortium launching Digital4Business is a team comprised of academic institutions and industry partners from across Europe. As an initial launch, Università Di Bologna (UNIBO), Italy, will deliver the foundational mandatory module **Digital Transformation**. After this initial launch in November 2024, the full range of elective modules will be rolled out in January 2025, overseen by the Consortium's collective partnership of European higher education institutions.



Student life

A flexible learning experience with global connections

At Digital4Business, you'll enjoy the ultimate flexibility, learning from anywhere in the world while still feeling fully connected. Forget traditional classrooms — our programme is streamlined for your convenience, offering live lectures, interactive sessions and full access to academic staff and peers. You'll engage with a global network of learners, faculty and professionals, ensuring a rich, collaborative learning experience. Whether attending virtually or joining occasional physical networking events, hackathons or workshops, you'll have endless opportunities to connect, learn and grow. D4B combines convenience with real-world engagement.

Learning without boundaries: inclusivity and mobility

D4B is more than just a virtual classroom — it's a global community. With no need to attend physical campuses, you can learn from expert faculty across multiple EU countries. While most mobility will be virtual, there will be exciting opportunities to attend events and networking sessions in person across Europe. Inclusivity is at the heart of our programme, with scholarships supporting students from diverse backgrounds. We also offer tailored support for underrepresented groups, promoting gender equality, cultural diversity, and empowering those from disadvantaged communities. Everyone is welcome here, and everyone can thrive.

Boost your employability and career opportunities

At D4B, we're focused on preparing you for the future. Through our Employability Strategy, you'll have access to a variety of online, hybrid, and on-site events, including workshops, career fairs, and opportunities to connect with industry partners. Our Careers and Opportunities Service will help you sharpen your skills, explore new job opportunities, and even find pathways to further education. Whether you're aiming to advance in your current role or switch to a new career in the digital space, D4B is your gateway to success in the digital economy.



Digital Transformation

Lead digital change with innovative strategies



Grasp essential concepts and strategies for digital innovation

Explore the evolving world of digital transformation with this in-depth module, an essential pillar of the Digital4Business Master's programme.

This course equips you to explore, analyse and master the key principles and strategies of digital transformation. You'll investigate forward-thinking business models, evaluate digital paradigms critically, and craft strategic resource plans to drive meaningful change. With hands-on activities and real-world simulations, you'll create and execute cutting-edge strategies.

Gain the expertise to lead and steer digital transformation and seize new opportunities in the evolving digital business environment. Join us and become a leader in digital transformation.

Learning objectives

This engaging module is designed for business professionals, leaders and graduates all across Europe. It equips you with cutting-edge expertise in digital transformation. By the end of the course, you'll not only have a solid understanding of key concepts, but you will also be ready to lead innovative digital change. Here's what you'll learn:

Master the key concepts and enablers of digital transformation, unlocking new opportunities for growth.

Critically evaluate digital transformation paradigms to revolutionise business models and drive innovation.

Strategically deploy resources to maximise impact and efficiency in digital transformation efforts.

Design and implement advanced strategies, positioning yourself as a leader in digital business transformation.

Criteria — are you eligible?

- **Language proficiency:** Minimum C1 English proficiency, plus 2 years' work or education in an English-speaking environment. IELTS: 6.0; TOEFL PBT: 600; TOEFL CBT: 200; TOEFL iBT: 100
- **Education:** Relevant EQF Level 6 qualification required (eg STEM, economics). Without this you will have an interview and assessment to evaluate certifications, qualifications or professional experience.
**EQF levels explained*
- **Residency:** This EU-funded programme is open to all EU nationals with a passport or valid ID from one of the 27 EU countries.

Digital Transformation

Part of the Digital4Business ecosystem

This engaging module is a key element of the Digital4Business programme, a €19.9m EU-funded online Master's designed to develop the digital leaders and innovators of the future. Discover how digital transformation fuels business growth and efficiency, while gaining the skills needed to excel in the digital age.

Revolutionise your learning with innovative teaching methods

The Digital Transformation module offers a state-of-the-art online learning experience, combining hybrid learning with the expertise of renowned instructors. Engage in dynamic live sessions and flexible self-paced activities, with group projects, hands-on workshops, and immersive lab experiences.

Track your progress with a cutting-edge e-portfolio. Leverage the benefits of work-based learning, problem-solving exercises, gamification, and flipped classroom techniques, all supported by advancements in AI. This innovative learning approach provides a practical, interactive environment, preparing you to excel and lead in the fast-changing digital business landscape.

Full course content

Subjects you'll cover

The **Digital Transformation** module is a 10 ECTS course, conducted over 12 weeks with 3 hours of lectures per week. Here's an overview of the topics to be covered:

- **Introduction to Digital Transformation**
 - Basic concepts of digital transformation.
 - Evolution stages of digital transformation.
 - Economic and social impacts.
 - Digital paradigms and platform economy.
 - Ethical issues in digital transformation.
 - Interdisciplinary connections.
- **Technologies and Innovations**
 - Emerging digital technologies (AI, Blockchain, IoT).
 - Strengths and weaknesses of main digital technologies.
 - Evolution of AI.
- **Big Data and Platform Society**
 - Platform-based business strategies.
 - Platform economy case studies.
 - Digital and data literacy.
- **Digital Competences**
 - Digital competences framework.
 - Digital communication skills and capabilities.
 - Upskilling and reskilling.
- **Sustainable Development Goals (SDGs) Framework and Digital Transformation**
 - Ethics and sustainability in the digital age.
 - UN SDGs.
 - Digital projects supporting SDGs.
 - Circular economy.
 - KPIs for digital sustainability.
 - CSR and social impact.
- **Digital Transformation Design: Methodologies and Tools**
 - Industry trends in digital transformation.
 - Tools and methodologies for organisational culture and innovation.
 - SWOT analysis.

Opening up new digital opportunities

This module is ideal for business leaders, professionals and graduates seeking to excel in implementing effective digital strategies. It opens career paths in digital innovation management and leadership roles in technology-driven industries.

Our innovative Master's programme offers a diverse range of modules that complement the Digital Transformation course. Discover how you can enhance your expertise and advance your career by exploring the full spectrum of courses available at Digital4Business.

Generative AI:

Realising potential — from essential principles to breakthrough applications



Master advanced AI techniques and real-world applications

Elevate your expertise in generative AI to shape the future of digital innovation. The Generative AI module is designed to prepare the digital leaders of tomorrow. This innovative programme offers a deep dive into generative AI technologies and their transformative impact on digital business.

In this module, you will master natural language processing (NLP) and transformer models, refine your skills in prompt engineering, automate tasks with AI, and embrace ethical practices in AI development. This comprehensive approach ensures you're equipped to lead in the AI-driven landscape.

Learning objectives

This module equips students with the critical skills to analyse, design, and implement generative AI models, preparing them to drive innovation and create real-world business solutions across multiple sectors. You'll learn to:

Analyse and differentiate between the core principles and mechanisms of generative AI, focusing on text, image, video and code generation technologies.

Critically evaluate recent advancements in generative AI, including cutting-edge techniques, models, and applications, using academic and industry research.

Design and implement effective prompt engineering strategies for optimising interactions with generative AI models.

Develop competencies to architect and integrate generative AI models into complex real-world applications, assessing their potential impact and effectiveness.

Innovate by identifying and exploiting opportunities for leveraging generative AI in creating novel business solutions across various sectors and activity domains.

Criteria — are you eligible?

- **Language proficiency:** Minimum C1 English proficiency, plus 2 years' work or education in an English-speaking environment. IELTS: 6.0; TOEFL PBT: 600; TOEFL CBT: 200; TOEFL iBT: 100
- **Education:** Relevant EQF Level 6 qualification required (eg STEM, economics). Without this you will have an interview and assessment to evaluate certifications, qualifications or professional experience.
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Generative AI

Real-world applications

Generative AI is poised to shape progress for generations. Its potential applications are virtually endless, from automating customer service to generating marketing content and developing AI-driven tools for software development.

Graduates will be prepared for roles such as AI specialists, data scientists, machine learning engineers, and digital transformation consultants.

Innovative teaching for mastering digital business technologies

The module will be delivered using an innovative teaching approach that combines hybrid learning, alternating between live (synchronous) and self-paced (asynchronous) activities. A tutor, who is both an expert in the subject matter and a guide for the learning process, supports students throughout. Learning activities include live lectures, independent study and lab work.

Key teaching strategies include problem-based learning, gamification and the flipped classroom. These methods are enhanced by emerging technologies, such as artificial intelligence, to provide a richer learning experience through the digital platform.

Time commitment

- Classroom and demonstrations: 18 hours
- Practical work/tutorials: 18 hours
- Independent learning: 90 hours
- Total: 125 hours

Credit points

- 5 ECTS

Full course content

Our Generative AI module covers a comprehensive range of topics essential for mastering generative AI technologies and driving digital innovation:

Generative AI for Business is a 5 ECTS module with 3 hours per week, over 12 weeks. The following schedule outlines the topics covered each week:

● Introduction to Digital Transformation

- Overview of generative AI, its evolution, and recent breakthroughs.
- Introduction to key generative models, including GANs, VAEs, and diffusion models.

● Natural Language Processing Fundamentals

- Foundations of NLP, covering encoders and decoders.

● Transformer Architectures

- A deep dive into transformer architectures like BERT, exploring their applications and significance in language models and generative AI.

● Automating Work with Code and Content Generation (Part 1)

- Leveraging generative AI for automating tasks in software development, document creation (Excel, Word), and content generation.

● Automating Work with Code and Content Generation (Part 2)

- Hands-on session focused on using generative AI models to create websites and web applications.

● Automating Work with Code and Content Generation (Part 3)

- Developing mobile applications using generative AI models.

● The Creative Potential of Generative Art (Part 1)

- Exploring the possibilities of generative art, including the creation of images, music, and videos using models like DALL-E, MuseNet, and GPT-3.

● The Creative Potential of Generative Art (Part 2)

- Hands-on experience with prompt engineering for generative art, unlocking new avenues for human-AI creativity and collaboration.

● Developing Responsibly with Generative AI (Part 1)

- Investigating bias and ethical concerns in synthetic content created by AI models.

● Developing Responsibly with Generative AI (Part 2)

- Addressing transparency, accountability, and regulatory considerations in the development and deployment of generative AI systems.

● Generative AI in Action

- Real-world case studies showcasing generative AI applications across industries like healthcare, finance, and transportation.

● New Trends and Advances in Generative AI

- An exploration of cutting-edge generative AI research, emerging techniques like diffusion models and multimodal models, and novel applications across different industries.

Cloud Computing for Business

Unlocking the power of cloud computing in digital transformation



Deepen your knowledge of cloud technologies and applications

The Cloud Computing for Business module offers a comprehensive look at cloud technologies, highlighting their impact, challenges and advantages in digital business transformation. Students will explore the core principles of cloud computing, studying the frameworks and strategies essential for successful implementation.

The module also tackles governance and security concerns, helping students analyse cloud security architectures and deployment options. It covers a broad spectrum of cloud services, including storage, machine learning, computing, analytics, and quantum computing. Students will learn how to assess these services critically and create strategies to leverage them for business transformation.

Learning objectives

This module equips students with the skills to evaluate core cloud computing principles, address security challenges, explore the impact of Fog and Edge Computing, and develop strategies to leverage diverse cloud services for driving digital business transformation.

Master the core principles, frameworks, development methodologies and tools needed for adopting cloud computing solutions that drive and support digital business transformation.

Critically evaluate governance and security challenges in cloud-based systems to identify and assess suitable cloud security architectures and deployment strategies.

Analyse the role and impact of Fog and Edge Computing in relation to cloud computing.

Appraise a wide range of existing and emerging cloud services (storage, machine learning, computing, analytics, quantum computing, etc) and develop strategies to harness these services for digital business transformation.

Criteria — are you eligible?

- **Language proficiency:** Minimum C1 English proficiency, plus 2 years' work or education in an English-speaking environment. IELTS: 6.0; TOEFL PBT: 600; TOEFL CBT: 200; TOEFL iBT: 100
- **Education:** Relevant EQF Level 6 qualification required (eg STEM, economics). Without this you will have an interview and assessment to evaluate certifications, qualifications or professional experience.
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Cloud Computing

Opening up new digital opportunities

In this module, you will gain a deep understanding of cloud computing principles and technologies, learning how to design, implement, and manage effective cloud strategies tailored to business needs.

By the end of the module, you will be equipped for roles such as cloud architect, cloud security consultant, or digital transformation leader.

Innovative teaching for mastering digital business technologies

The Cloud Computing for Business module prepares future digital leaders to harness scalable and flexible IT resources, driving innovation and improving business efficiency.

Blending live and self-paced learning, the module uses cutting-edge methods such as problem-based learning, gamification, and the flipped classroom model, all led by experienced tutors. Students will explore cloud principles, governance, security, and a variety of services, with AI enhancing their learning journey and enabling business transformation.

Assessment is based entirely on a project (100% of the marks), evaluating your comprehensive, hands-on understanding of the material.

Time commitment

- Classroom and demonstrations: 36 hours
- Practical work/tutorials: 36 hours
- Independent learning: 178 hours
- Total: 250 hours

Credit points

- 10 ECTS

Full course content

Cloud Computing for Business is a 10 ECTS module delivered over 5 hours per week, across 12 weeks. The following schedule outlines the topics covered each week:

● Cloud Computing Introduction

- Foundations of Cloud Computing
- Service Models
- Deployment Models
- Cloud Technologies

● Enterprise Digital Architecture & Digital Transformation

- Enterprise Systems Architecture
- Functional/Non-functional architectural requirements
- Information & Applications
- Opportunities and Challenges
- Business Model Innovation
- Digital Transformation as a staged process
- Business Readiness

● Cloud Strategy for Digital Transformation

- Alignment with Business Goals
- Key Performance Indicators (KPIs)
- Service Level Agreements (SLAs)
- Innovation and Enterprise Architecture on the Cloud
- Performance, Interoperability, Scalability, Availability
- Mobility, Analyticity, Usability

● Cloud Adoption

- Cloud Adoption Frameworks
- Organisational Change Management
- Migration Scenarios
- Hybrid Model
- DevSecOps

● Cloud Security I

- Cloud Security Concepts
- Security for IaaS/PaaS/SaaS
- Identity and Access Management (IAM)

● Cloud Security II

- Intrusion Detection/Incident Response
- Encryption and Key Management Systems (KMS)
- Disaster Recovery and Business Continuity

● Cloud Native

- Cloud Native concepts and Architectural Considerations
- Microservices, Events, Streams, APIs, and Data
- Impact on Development and Deployment
- Impact on Organisational Structures and Processes
- Context-specific Patterns
- Automation and Orchestration

● Capacity Assessment & Optimisation

- Resource Utilisation
- Information Lifecycle Management
- Elasticity
- Economic Considerations

● Scope of Cloud Services

- Cloud Service Offerings
- Data Services
- Big Data Analytics
- AI & ML Services
- IoT Services
- Quantum Computing Services

● Fog & Edge Computing

- Architectural approaches to IoT and Edge Computing
- Fog and Edge Architectures (e.g., OpenFog Reference Architecture)
- Network Function Virtualization (NFV)
- Software Defined Networking (SDN)
- Recommendations from the National Institute of Standards and Technology (NIST)

● FCloud Governance

- Data Protection and Privacy in the Cloud
- Regulatory Compliance and Legal Considerations

● Emerging Topics in Cloud Computing

- State-of-the-art Research
- Contemporary Focus on Cloud Computing

Data Science for Business

Master data-driven strategies to lead in modern business



Tackle real-world business challenges with innovative data science strategies

This module introduces advanced techniques for interpreting and extracting data-driven insights. You'll dive into innovative data science methods and algorithms that promote creative problem-solving and optimise models crucial for digital transformation. Learn how to apply statistical and machine learning techniques to synthesise insights, driving informed decision-making and clear communication.

You'll also explore advanced visualisation and business intelligence tools, gaining the ability to effectively communicate complex data insights. These skills will boost model performance, while fostering business innovation and success.

Learning objectives

This module is central to digital transformation, equipping students to apply data science theories, concepts, and practices to solve real-world business problems. By the end of the course, you won't just master essential concepts — you'll be ready to drive innovative changes in the digital era. Here's what you'll achieve:

Evaluate and apply data science concepts and techniques to solve business challenges, extract valuable insights, and drive data-driven decisions, ensuring effective problem-solving and strategic improvements in a digital business environment.

Implement advanced algorithms and cutting-edge methods in data science to enhance problem-solving capabilities, improve model optimisation, and develop data-driven strategies that contribute to real-world business success and digital transformation.

Conduct comprehensive data analysis using statistical and machine learning techniques, providing actionable insights for decision-making, and effectively communicating complex data findings to diverse stakeholders within the business landscape.

Develop, implement, and assess data visualisations and business intelligence tools, enhancing your ability to interpret and present complex insights, optimise performance, and drive business innovation through advanced data solutions.

Criteria — are you eligible?

- **Language proficiency:** Minimum C1 English proficiency, plus 2 years' work or education in an English-speaking environment. IELTS: 6.0; TOEFL PBT: 600; TOEFL CBT: 200; TOEFL iBT: 100
- **Education:** Relevant EQF Level 6 qualification required (eg STEM, economics). Without this you will have an interview and assessment to evaluate certifications, qualifications or professional experience.
**EQF levels explained*
- **Residency:** This EU-funded programme is open to all EU nationals with a passport or valid ID from one of the 27 EU countries.

Data Science for Business

Opening up new digital opportunities

This course is ideal for professionals seeking to deepen their data science expertise. It opens up careers in data analysis, machine learning, AI, and business intelligence. Graduates can pursue roles like data scientists, AI specialists, or business intelligence developers.

The whole programme offers a broad range of modules that complement the Data Science for Business course.

Flexible online learning with expert guidance

This module is fully delivered online, offering a hybrid learning experience that combines live (synchronous) and self-paced (asynchronous) sessions. Led by expert tutors, you'll progress through dynamic lectures, individual study, and hands-on lab work.

Key methods include problem-based learning, gamification, and flipped classrooms. Using the latest in artificial intelligence, the module keeps you on the cutting edge of educational research and methods. Continuous assessments ensure steady progress, with projects and exams to apply data science concepts to real business problems.

Time commitment

- Classroom and demonstrations: 36 hours
- Practical work/tutorials: 36 hours
- Independent learning: 178 hours
- Total: 250 hours

Credit points

- 10 ECTS

Full course content

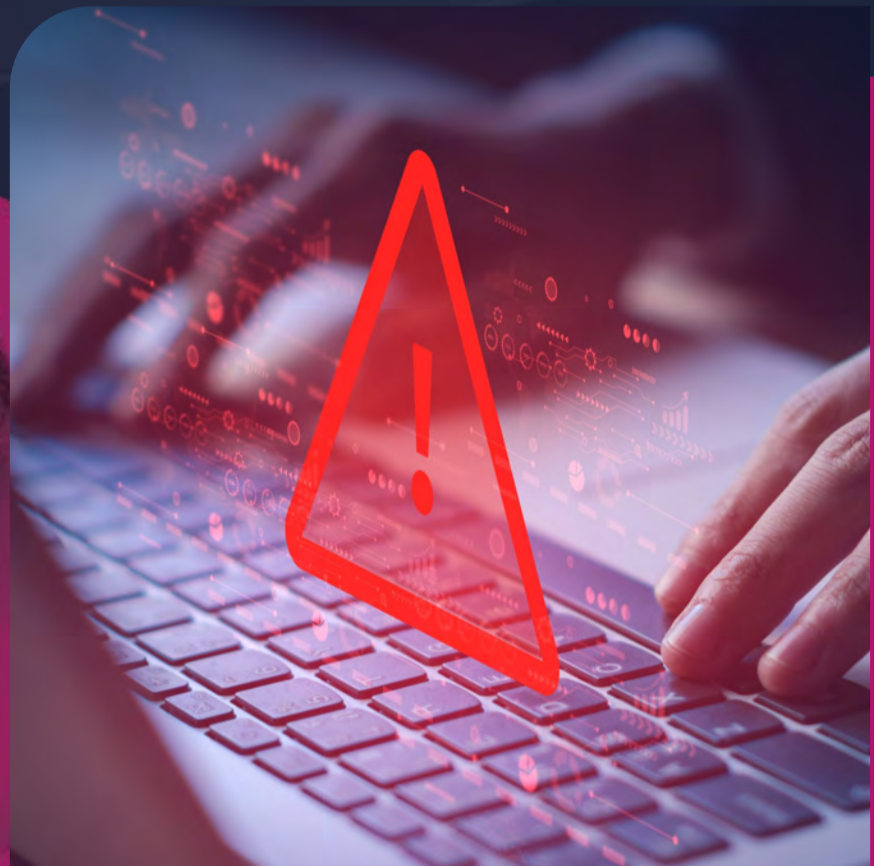
Subjects covered:

Data Science for Business is a 10 ECTS module delivered over 5 hours per week for 12 weeks. An indicative schedule of topics to be addressed each week is outlined below:

- **Introduction to Data Science**
 - Overview of data science processes
 - Methods, tools and real-world applications
- **Python for Data Science**
 - Python programming basics
 - Data structures
 - Packages for data analysis
- **Data Collection and APIs**
 - APIs
 - Web scraping
 - Working with unstructured data sources
- **Databases and Data Warehousing**
 - Relational databases
 - SQL
 - ETL processes
 - Data warehousing principles
- **Data Pre-processing and Cleaning**
 - Handling missing data
 - Outliers
 - Feature encoding
 - Normalisation
- **Exploratory Data Analysis**
 - Summary statistics
 - Visualisations
 - Identifying patterns
- **Statistical Analysis and Modelling**
 - Regression
 - Classification
 - Forecasting methods
- **Machine Learning**
 - Supervised learning models like classification and regression
- **Advanced Machine Learning Methods**
 - Neural networks
 - Deep learning
 - Reinforcement learning
- **Business Intelligence and Analytics**
 - BI process
 - Dashboards
 - Data storytelling
 - Predictive analytics
- **Data Visualisation and Dashboards**
 - Visual encodings
 - Interactive reports
 - Communicating insights
- **Ethics, Bias and Privacy in Data Science and Major Trends in ML and DS**
 - Responsible AI
 - Transparency
 - Ethical use of data
 - Major trends in ML and DS

Cybersecurity for Business

Become a cybersecurity expert and secure digital data systems



Equip yourself with advanced techniques to counteract emerging cyber threats.

Master techniques to protect against evolving cyber threats. This module equips you to safeguard both personal and organisational data. Learn to detect vulnerabilities and prevent breaches in data systems. Create effective protection measures to keep your data secure from future threats.

Discover the ethical and legal complexities of cybersecurity, and gain the confidence to navigate this rapidly changing field. Become a key player in digital security today, ready to handle tomorrow's challenges.

Learning objectives

This module equips students to detect vulnerabilities, craft protection strategies, and understand cybersecurity's legal and ethical aspects. By the end, you'll have learned to:

Examine and assess weaknesses in data systems to identify potential breaches and propose solutions to prevent them.

Implement advanced cyber attack strategies to simulate breaches, gaining deep insights into cybersecurity threats.

Create and execute comprehensive data protection methods using encryption and advanced security protocols.

Evaluate and use sophisticated tools to both identify and respond to cyber threats, staying proactive against future risks.

Critically assess and debate cybersecurity legal and ethical issues, formulating well-justified recommendations for policy and practice that reflect an advanced understanding of the complexities and responsibilities in the field of cybersecurity.

Criteria — are you eligible?

- **Language proficiency:** Minimum C1 English proficiency, plus 2 years' work or education in an English-speaking environment. IELTS: 6.0; TOEFL PBT: 600; TOEFL CBT: 200; TOEFL iBT: 100
- **Education:** Relevant EQF Level 6 qualification required (eg STEM, economics). Without this you will have an interview and assessment to evaluate certifications, qualifications or professional experience.
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- **Residency:** This EU-funded programme is open to all EU nationals with a passport or valid ID from one of the 27 EU countries.

Cybersecurity for Business

Unlock new cybersecurity career paths

The Digital4Business Cybersecurity module is designed for IT professionals and tech enthusiasts who want to progress in digital security. It opens doors to careers in cybersecurity analysis, ethical hacking, data protection and more.

Our Master's programme as a whole includes a wide range of complementary modules to enhance your learning.

Advanced online learning with expert guidance and emerging tools

This online module employs an innovative hybrid learning model, offering live lectures, self-paced study, and hands-on lab sessions with the guidance of expert tutors. You'll experience problem-based learning, gamification, and flipped classroom strategies, enhanced by artificial intelligence to enrich your education.

Assessments are continuous and final, involving exams, projects and assignments. Half of the assessment involves applying cybersecurity to real-world business issues, and the remaining 50% tests your comprehensive understanding of the subject.

Time commitment

- Classroom and demonstrations: 36 hours
- Practical work/tutorials: 24 hours
- Independent learning: 190 hours
- Total: 250 hours

Credit points

- 10 ECTS



Full course content

Subjects covered

Cybersecurity for Business is a 10 ECTS module with 5 hours per week, over 12 weeks. The following schedule outlines the topics covered each week:

● Introduction to Cybersecurity

- Overview of cybersecurity, its importance, and the growing demand for professionals
- Understanding online identity, data, and their significance to cybercriminals
- Seminar on real-world cybersecurity challenges

● Risk Management and Compliance

- Exploring the significance of safeguarding electronic information networks and data
- Regulatory compliance requirements for business
- Implementing risk assessments and developing risk mitigation strategies
- Lab on security breach case studies

● Network Security for Business

- Addressing software and hardware vulnerabilities, device, network, and cloud security
- Implementing secure network infrastructure including best practices for securing wireless networks and remote access
- Lab on securing the application landscape, incident response planning and security incidents management

● Cyber Attacks: Concepts and Techniques

- Analysis of cyberattacks, identifying and classifying security vulnerabilities
- Understanding endpoint security challenges in business environments
- Securing IoT devices and other connected endpoints in business networks
- Seminar on vulnerabilities and real-world use cases

● Data and Privacy Protection

- Best practices for protecting computer devices, wireless networks, and online accounts
- Implementing cryptographic methods for business data
- Exploration of ethical implications and considerations in using AI and cryptography for data privacy protection
- Practical exercises on implementing cryptographic techniques for privacy-preserving data sharing and analysis
- Lab on data encryption and backup strategies

● Organisational protection and cloud security for business

- Techniques for firewall configuration, port scanning, and certificate updates
- Securing cloud services and data storage in public, private, and hybrid cloud environments
- Identity and access management in the cloud
- Data backup and disaster recovery planning for cloud-based systems
- Lab on using tools for security monitoring

● Cyberattack Detection and Cyberdefense

- Real-time attack detection, best security practices, and understanding botnets and the kill chain
- Lab on behaviour-based security

● Tools for incident prevention and detection

- Overview of CSIRT, security playbooks, IDS, and IPS

● Cybersecurity Legal Issues

- Personal legal issues. Corporate Legal Issues.
- International Law and Cybersecurity

● Ethical Issues in Cybersecurity

- Overview of cybersecurity laws, regulations, and industry standards applicable to businesses
- Understanding ethical considerations in cybersecurity decision-making
- Addressing legal and ethical challenges related to incident response, data breaches, and privacy violations
- Discussion on ethical considerations and the role of professional organisations in cybersecurity ethics

● Cyberwarfare

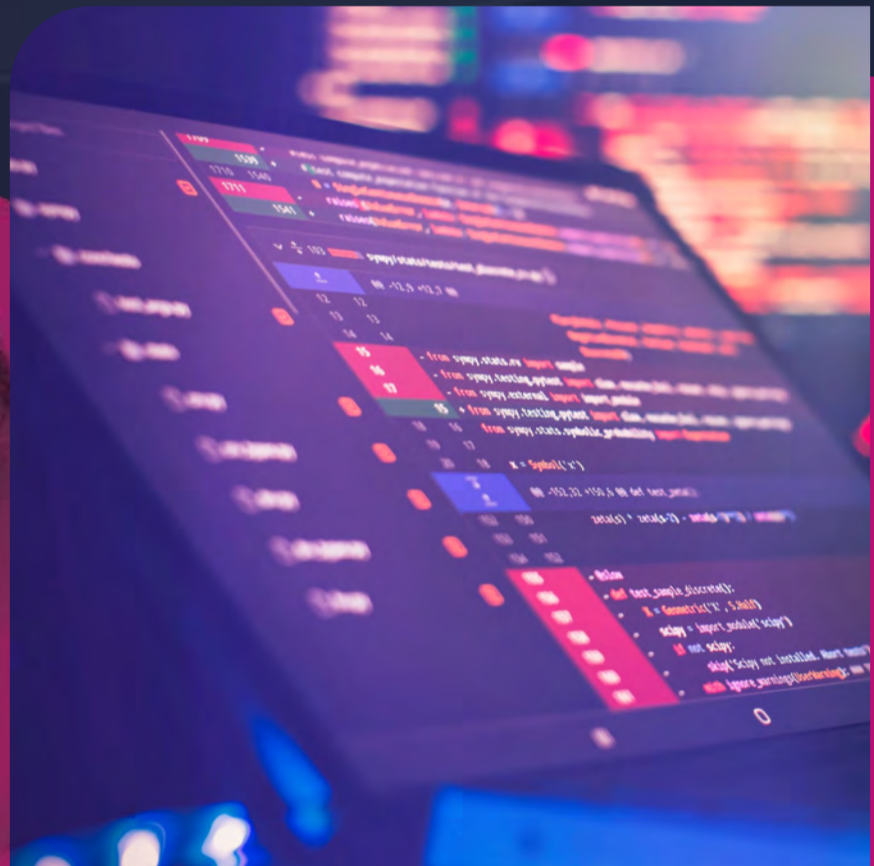
- Understanding cyberwarfare, its objectives, and impacts

● Emerging Topics and Careers in Cybersecurity

- Exploration of AI in cyberattacks and defence, the geopolitical aspects of cyberspace, and blockchain technology

Business Programming

Cutting-edge development skills that drive digital transformation



Develop transformative solutions with essential coding skills

Master key programming concepts, design web and mobile apps, and lead software projects while integrating data science and machine learning. This module offers a deep dive into programming foundations and their application in business. Explore programming paradigms, languages and low-code/no-code development strategies for innovative solutions.

You'll also gain leadership skills in managing software projects, incorporating machine learning, and addressing business challenges through case studies. Analyse how programming drives business success and predict future trends in business development.

Learning objectives

This module equips you with essential programming skills to transform business processes. By the end, you'll understand core concepts and apply them to drive impactful change. Here's what you'll achieve:

Understand and apply programming basics and languages to create innovative solutions for different industries and improve business models.

Design and develop advanced web and mobile apps using low-code/no-code strategies and business analytics to innovate business models.

Show leadership in managing complex software projects, using advanced methods and tools for debugging, testing and version control in business settings.

Incorporate data science and machine learning into business models to predict and solve business challenges with advanced programming techniques.

Evaluate programming case studies to understand their impact on business models and predict future programming trends and challenges.

Criteria — are you eligible?

- **Language proficiency:** Minimum C1 English proficiency, plus 2 years' work or education in an English-speaking environment. IELTS: 6.0; TOEFL PBT: 600; TOEFL CBT: 200; TOEFL iBT: 100
- **Education:** Relevant EQF Level 6 qualification required (eg STEM, economics). Without this you will have an interview and assessment to evaluate certifications, qualifications or professional experience.
**EQF levels explained*
- **Residency:** This EU-funded programme is open to all EU nationals with a passport or valid ID from one of the 27 EU countries.

Business Programming

Empower your career with advanced skills

This module is for professionals, academics, and programming enthusiasts. It equips students with development, business analytics, and digital transformation.

Ideal for IT professionals, analysts, and developers, it enhances your ability to lead complex software projects, integrate data science and machine learning, and prepare for challenging tech roles.

An innovative online learning experience

This module's online format combines live lectures, seminars, flipped classroom techniques, case study analysis, virtual labs and problem-based learning (PBL). Peer reviews and collaboration are integral parts of the experience.

Both formative and summative assessments monitor progress, providing feedback through assignments, projects, and exams. The final written test accounts for 100% of the grade, ensuring mastery of the business programming concepts needed to drive innovation.

Time commitment

- Classroom and demonstrations: 24 hours
- Practical work/tutorials: 24 hours
- Independent learning: 77 hours
- Total: 125 hours

Credit points

- 5 ECTS

Full course content

Subjects covered

Business Programming is a 5 ECTS module that runs for 12 weeks, with five hours of class time each week. Here's a schedule of the topics we'll cover each week:

- **Introduction to Programming Concepts**

- Basics of programming including algorithms, data structures, and problem-solving techniques.
- Foundation of software development for business applications.

- **Programming Paradigms and Languages**

- Examination of different programming paradigms (procedural, object-oriented, functional) and languages.
- Discussion on selecting appropriate languages for business model development.

- **Business Model Development Using Programming**

- Techniques for developing business models through programming.
- Includes custom software solutions, automation, and leveraging data for decision-making.

- **Web Development for Business**

- Fundamentals of web development focusing on HTML, CSS, and JavaScript.
- Overview of both front-end and back-end development to create web applications for businesses.

- **Software Development Methodologies**

- Overview of Agile, Scrum, and Waterfall methodologies.
- Importance of project management and best practices in developing business software.

- **Introduction to Low-Code and No-Code Platforms**

- Exploring low-code and no-code development platforms, highlighting their benefits and business use cases.

- **Advanced Low-Code and No-Code Development**

- Deep dive into visual development environments and how they enable rapid application development with minimal coding.

- **Debugging and Testing Business Applications**

- Techniques and tools for debugging and testing.
- Includes unit testing, integration testing, and test-driven development tailored for business applications.

- **Version Control and Collaboration**

- Importance of version control (e.g., Git) in software development.
- Collaboration tools and techniques for team-based projects.

- **Mobile App Development for Business**

- Overview of approaches to mobile app development (native, hybrid, cross-platform).
- Tools and frameworks like React Native and Flutter for creating business applications.

- **Automating Business Processes through Programming**

- Utilizing programming for business process automation.
- Covers APIs, web scraping, and robotic process automation (RPA).

- **Case Studies and Future Trends**

- Discussion of real-world case studies in business model development through programming.
- Future trends including AI and quantum computing's impact on business.

Internet of Things

Master IoT fundamentals and transform business models with advanced skills



Transform your business with the Internet of Things

Acquire expert knowledge in IoT and learn to drive business innovation. This IoT module provides a solid understanding of IoT basics, applications, and their impact on business models.

Study IoT architecture, communication protocols, devices and data management techniques.

You'll also explore IoT security, connectivity options, and risk management. Additionally, develop project management skills and examine real-world case studies to see how IoT can revolutionise business models.

Learning objectives

The Internet of Things curriculum provides an in-depth understanding of IoT basics, applications, and their impact on business models. By the end of this module, students will be able to:

Evaluate IoT fundamentals like architecture, communication protocols, devices, sensors and data management, and their impact on business model innovation.

Analyse IoT connectivity options and networking technologies, identifying challenges and proposing solutions for business applications.

Assess IoT security, privacy and risk management, and propose strategies to address these concerns.

Design and manage IoT projects by integrating data analytics, cloud computing and edge computing to drive business model development.

Analyse real-world IoT case studies to identify best practices, emerging trends, and future challenges in IoT business model innovation.

Criteria — are you eligible?

- **Language proficiency:** Minimum C1 English proficiency, plus 2 years' work or education in an English-speaking environment. IELTS: 6.0; TOEFL PBT: 600; TOEFL CBT: 200; TOEFL iBT: 100
- **Education:** Relevant EQF Level 6 qualification required (eg STEM, economics). Without this you will have an interview and assessment to evaluate certifications, qualifications or professional experience.
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Internet of Things

Opening opportunities for aspiring innovators

This course will appeal to professionals, students and industry stakeholders interested in IoT and its business applications. It's ideal for those pursuing careers as IoT developers, data analysts, IT project managers and business strategists.

Graduates will gain skills to innovate in tech-driven roles, manage IoT projects, and address security and data management challenges.

Experience interactive and engaging teaching methods

Teaching methods include lectures, guest lectures, seminars, case study analysis, and a flipped classroom approach. Both ongoing and final assessments will measure student progress. Ongoing assessments provide feedback to help improve your study pathway. Clear assessment rubrics and criteria will be provided for each topic.

Various assessment tools such as exams, assignments, projects, and exercises will directly measure your knowledge, skills, and competencies. The final grade consists of a 50% proctored written exam and a 50% end-of-term project.

Time commitment

- Classroom and demonstrations: 24 hours
- Practical work/tutorials: 24 hours
- Independent learning: 77 hours
- Total: 125 hours

Credit points

- 5 ECTS

Full course content

Subjects covered

Internet of Things is a 5 ECTS module that runs for 12 weeks, with three hours of class time each week. Here's a schedule of the topics we'll cover each week:

- **IoT Fundamentals for Business**

- Historical development
- Key concepts
- Applications across industries

- **IoT Business Models and Strategies**

- Value creation
- Monetization
- Competitive advantage
- Case studies

- **IoT Architecture and Protocols**

- Components
- Communication protocols
- Data management

- **IoT Devices and Sensors**

- Functions and applications
- Types of sensors, including motion sensors

- **IoT Connectivity and Networking**

- Connectivity options
- Networking technologies
- Challenges

- **IoT Security and Privacy in Business**

- Security concerns
- Mitigation strategies
- Business implications

- **IoT Data Analytics for Business**

- Data processing
- Storage
- Analysis techniques
- Tools and platforms

- **IoT Cloud Computing for Business**

- Cloud-based IoT platforms
- Services
- Benefits and challenges

- **IoT Edge Computing for Business**

- Benefits
- Challenges
- Use cases
- Fog computing

- **IoT Project Management for Business**

- Principles
- Practices
- Methodologies
- Risk management

- **IoT Standards and Regulations for Business**

- Industry standards
- Data protection
- Compliance

- **IoT Business Model Development Case Studies and Future Trends**

- Case studies
- Future trends
- Impact of emerging technologies such as AI and quantum computing

Blockchain Technologies

Evaluate blockchain's impact in modern business environments



Evaluate blockchain's impact in modern business environments

Discover how emerging technologies are transforming business operations and creating a competitive advantage.

This module teaches the fundamentals of blockchain, including distributed ledgers, decentralisation, cryptocurrencies, and dApps. You'll explore the ethical and legal aspects of blockchain technology and see how businesses can harness it for strategic gain.

By the end of the module, you will be equipped to use blockchain effectively in business contexts.

Learning objectives

This module guides students through the understanding and evaluation of blockchain's impact on modern business. It covers blockchain essentials like distributed ledgers, decentralisation, cryptocurrencies and dApps. Ethical and legal considerations are also addressed, highlighting how blockchain offers a competitive edge.

By the end of the course, students will be able to:

Understand and evaluate

blockchain technologies and their impact on financial systems, including key components and new use cases.

Compare different blockchain protocols, considering ethical, legal, and practical challenges to predict future developments.

Design and build a blockchain application, assessing its infrastructure and suitability in various contexts.

Plan blockchain integration in businesses, combining technology and regulatory knowledge to take advantage of new opportunities.

Criteria — are you eligible?

- **Language proficiency:** Minimum C1 English proficiency, plus 2 years' work or education in an English-speaking environment. IELTS: 6.0; TOEFL PBT: 600; TOEFL CBT: 200; TOEFL iBT: 100
- **Education:** Relevant EQF Level 6 qualification required (eg STEM, economics). Without this you will have an interview and assessment to evaluate certifications, qualifications or professional experience.
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Blockchain Technologies

New digital opportunities for D4B students

This module is suited to professionals, academics and industry figures interested in blockchain technology and its transformative applications.

Ideal for careers in blockchain development, financial technology data analysis and cybersecurity, it equips learners to become blockchain consultants, compliance officers, and innovation managers.

Embrace a new era of innovative digital learning

Teaching is fully online and includes hybrid learning with both live (synchronous) and self-paced (asynchronous) activities. Expert tutors support students throughout the course. Learning involves live lectures, self-study, and hands-on labs.

Methods like problem-based learning, gamification and flipped classrooms are used, leveraging technologies like artificial intelligence. Progress is measured through ongoing and final assessments, including a project (50%) and a final test (50%).

Time commitment

- Classroom and demonstrations: 24 hours
- Practical work/tutorials: 24 hours
- Independent learning: 77 hours
- Total: 125 hours

Credit points

- 10 ECTS

Full course content

Subjects covered

Blockchain Technologies is a 5 ECTS module delivered over four hours per week for 12 weeks. The schedule of topics to be addressed each week is outlined below:

● Introduction

- Introduction to Blockchain and Cryptocurrency
- Historical Context of Blockchain and Cryptocurrencies
- Overview of Different Blockchain Types
- Introduction to the Blockchain Stack and its Core Components

● Blockchain Stack and Core Components

- In-depth Discussion on Web3 and Technological Fundamentals
- Detailed Analysis of Block Composition and Consensus Mechanisms (POET/ POB/ POS/ POW)
- Basics of Distributed Systems and Distributed Ledger Technology (DLT)
- Cryptographic Foundations: Hashing and the Merkle Tree

● Blockchain Management

- Principles of Decentralisation and Brewer's CAP Theorem
- Examination of Public, Private, and Enterprise Blockchains
- Business Case Development for Blockchain Applications

● Cryptocurrencies and the Blockchain

- Handling Cryptocurrencies: Storage, Use, and Wallets
- Exploration of Altcoins and Mining Processes
- Overview of Recent Trends and Developments in the Cryptocurrency Space

● Evolution of Blockchain

- Detailed Study on the Evolution and Revolution of Blockchain: From Bitcoin to Hyperledger
- Discussion on Enterprise Blockchain, Digital Identities, and Current Use Cases

● Security, Identity & Cryptography in Blockchain

- The CIA Triad in Blockchain: Confidentiality, Integrity, Authentication
- Exploration of Symmetric and Asymmetric Encryption, Non-Repudiation, and Public/Private Keys
- Hash Functions, Digital Signatures, Anonymity, and the Concept of Self-Sovereign Identity (SSI)

● Blockchain Applications I - Bitcoin

- Comprehensive Overview of the Bitcoin System and Stack
- Examination of Bitcoin Transactions, the P2P Network, and the Mining Process
- Consensus Mechanisms: Proof of Work (POW)

● Blockchain Applications II - Ethereum

- Comprehensive Overview of the Ethereum System
- Smart Contracts, Decentralized Applications (DApps), and the Ethereum Virtual Machine (EVM)
- Introduction to DAOs, Decentralized Finance (DeFi), and NFTs

● DApp Development I

- Introduction to DApp Development Environments and the Web3 Stack
- Basics of NodeJS and Express in the Context of Blockchain

● DApp Development II

- Advanced Tools for DApp Development: Infura, RemixIDE, ERC Smart Contracts
- Practical Use of Ganache, Truffle, and Blockchain APIs

● Legal & Ethical Aspects of Blockchain

- Discussion on the Regulatory Landscape for Cryptocurrencies and Tokens
- Anti-Money Laundering (AML), Counter-Terrorist Financing (CTF), Know Your Customer (KYC), and Know Your Transaction (KYT) Requirements
- Ethical Considerations and Ongoing Legal Dynamics

● Emerging Topics in Blockchain

- Exploration of Current Research Directions and Emerging Topics: CBDCs, Privacy, the Metaverse, and Quantum Computing's Impact on Blockchain

Innovation

**Discover effective
strategies to lead
innovation and fuel
business growth**



Master innovative research and leadership strategies for driving innovation

Develop a sharp understanding of how to effectively implement creative and innovative strategies through this Digital4Business Master's programme module.

By leveraging case studies and in-depth research, this module explores how to craft and execute innovative strategies that drive change at individual, team, and organisational levels, turning businesses into more dynamic and competitive forces.

Students will uncover why some strategies thrive while others face resistance. Going beyond measuring impact, this course provides actionable insights on learning from outcomes and sparking creativity to enhance processes and results.

Learning objectives

This module is designed to instill a profound grasp of the creative development process and the strategic use of innovative methods in various contexts. It equips learners to dissect, engage with, and summarise innovation practices and key strategies for implementation. By the end of this module, you will be able to:

Showcase a deep understanding of the creative development process and apply a range of innovative strategies across diverse contexts.

Analyse and investigate various case studies and innovation methods to grasp creative and cutting-edge practices.

Discern, critique, and apply techniques that cultivate creative environments at the individual, team, and organisational levels.

Demonstrate measurable impacts and returns on investment at both individual and organisational scales.

Create and explore strategies to translate creative ideas into tangible business outcomes.

Criteria — are you eligible?

- **Language proficiency:** Minimum C1 English proficiency, plus 2 years' work or education in an English-speaking environment. IELTS: 6.0; TOEFL PBT: 600; TOEFL CBT: 200; TOEFL iBT: 100
- **Education:** Relevant EQF Level 6 qualification required (eg STEM, economics). Without this you will have an interview and assessment to evaluate certifications, qualifications or professional experience.
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Innovation

Innovation opens doors to new possibilities

Business leaders looking to foster growth while building agile, creative teams will gain the strategies and insights they need.

In today's fast-evolving global landscape, businesses must adapt and evolve constantly. This requires leadership with a deep understanding of innovation principles and how to implement them at individual, team, and organisational levels.

Immersive innovation powered by emerging technologies

This fully online module seamlessly integrates learning objectives with dynamic teaching. Innovative techniques like gamification, problem-based learning, and a flipped classroom format—where students review materials beforehand and use live class time for deeper exploration—ensure that student questions actively shape each session.

Students will participate in live lectures, independent study, and hands-on lab work. Cutting-edge technologies will be employed to enrich their learning experience, providing a firsthand understanding of digital innovation's transformative benefits.

Time commitment

- Classroom and demonstrations: 18 hours
- Practical work/tutorials: 12 hours
- Independent learning: 95 hours
- Total: 125 hours

Credit points

- 5 ECTS

Full course content

Subjects covered

Innovation is a 5 ECTS module delivered over 4 hours 10 minutes per week for 12 weeks. An indicative schedule of topics to be addressed each week is outlined below:

● **Fundamentals of Innovation I**

- Creativity and Innovation: Introduction to creativity and its role in innovation.
- Discussion on the creative process and techniques to foster creativity.
- Examples of how creativity has driven significant technological advancements

● **Fundamentals of Innovation II**

- Emotional Intelligence and Entrepreneurship: Definition and importance of emotional intelligence in entrepreneurship.
- The role of emotional intelligence in decision-making leadership.
- Practical exercises to develop emotional intelligence.

● **Innovation and Business Models I**

- Innovation Management in Business: Introduction to innovation management principles and its role in businesses.
- Identifying innovation drivers and their relationship with entrepreneurship.
- Case studies of companies that have successfully implemented innovative business models.

● **Innovation and Business Models II**

- Designing Innovative Business Models: Developing innovative business models for emerging technologies such as blockchain and 3D printing.
- Assessing the financial and strategic implications of new business models.
- Group exercises for creating and evaluating innovative business models.

● **Strategic Innovation and Entrepreneurial Leadership I**

- Data-Driven Innovation and Product Design: Using data analysis and product design to drive innovation in entrepreneurship.
- Practical examples of data-driven decision-making in business.
- Case studies showcasing successful entrepreneurial ventures based on data and design.

● **Strategic Innovation and Entrepreneurial Leadership II**

- Leading Collaborative Innovation Projects: Leading collaborative innovation projects and the role of entrepreneurial leadership.
- Effective team dynamics and communication in innovation.
- Learning from both successful and failed collaborative innovation projects.

● **Entrepreneurial Communication Strategies I**

- Effective Communication for Technology: Developing persuasive communication strategies for technology-based ventures.
- Using corporate storytelling and design thinking in technology-related communication.
- Practical exercises on creating impactful communication plans.

● **Entrepreneurial Communication Strategies II**

- Engaging Stakeholders through Corporate Stories: The power of corporate storytelling in engaging stakeholders.
- Examples of successful corporate story-driven communication.
- Group discussions on how to apply corporate stories to technology-driven ventures.

● **Solving Complex Problems I**

- Problem-Solving in Technology: Applying problem-solving concepts to technological challenges, including machine learning and robotics.
- Case studies demonstrating effective problem-solving strategies in the tech industry.
- Group exercises for hands-on problem-solving in technology.

● **Solving Complex Problems II**

- Leveraging Data Analysis and Simulations: Using data analysis and simulations to address complex technological problems.
- Practical application of data-driven decision-making in technology.
- Case studies on how data-driven solutions have driven innovation.

● **Between Innovation, Ethics, and Sustainability I**

- Ethical Innovation and Sustainability: Exploring the intersection of innovation, ethics, and sustainability in technologies like renewable energy and sustainable mobility.
- Identifying ethical and environmental challenges in technological solutions.
- Examples of innovations that promote ethical and sustainable practices.

● **Between Innovation, Ethics, and Sustainability II**

- Assessing Environmental and Social Impact: Methods for assessing the environmental and social impact of technologies.
- Practical exercises in evaluating the sustainability of tech-driven solutions.
- Case studies of technology initiatives that have positively impacted the environment and society.

Quantum Computing

**Transform your business
with advanced
computational theory and
practical skills**



Revolutionise business with advanced computational theory

Master cutting-edge technologies and develop practical skills for solving advanced computational problems.

Quantum computing is an evolving field that will revolutionise and expand computational power through quantum mechanics. With quantum systems now accessible via cloud platforms, this module offers a deep dive into the theoretical foundations and applications of quantum computing.

You'll gain hands-on skills in designing and applying algorithms to address computational challenges. The course also covers the current state and future possibilities of quantum computing, assessing its impact across industries and preparing you for its business use cases.

Learning objectives

This module covers the core principles of quantum computing, offering practical skills to design and implement algorithms for tackling complex computational challenges. By course completion, you'll not only understand the foundational theories but also be equipped to drive innovation in today's digital landscape. Here's what you'll accomplish:

Interpret and apply quantum mechanical and mathematical concepts to qubit-based systems.

Critically assess the distinctions and overlaps between quantum and classical computing.

Solve complex problems using algorithms designed for quantum processors.

Apply quantum gate circuit models in problem-solving and solution formulation.

Research and evaluate the potential and real-world impact of quantum computing.

Criteria — are you eligible?

- **Language proficiency:** Minimum C1 English proficiency, plus 2 years' work or education in an English-speaking environment. IELTS: 6.0; TOEFL PBT: 600; TOEFL CBT: 200; TOEFL iBT: 100
- **Education:** Relevant EQF Level 6 qualification required (eg STEM, economics). Without this you will have an interview and assessment to evaluate certifications, qualifications or professional experience.
**EQF levels explained*
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Quantum Computing

Unlock new career paths and digital opportunities

This Quantum Computing course is perfect for tech enthusiasts, computer science students, IT professionals and data scientists.

It's designed for those eager to dive into cutting-edge technology and its real-world applications. Career prospects include quantum software developer, research scientist, data analyst or IT consultant.

An innovative online learning experience

This comprehensive online course integrates lectures, seminars, flipped classrooms, case studies, virtual labs, problem-based learning (PBL), peer reviews and collaborative work. Your progress is measured through both formative and summative assessments.

Formative assessments offer valuable feedback to enhance your learning strategy, while exams, projects and exercises evaluate your knowledge, skills and competencies. The proctored written test assesses your grasp of programming in business model development, with the final exam accounting for 100% of your grade.

Time commitment

- Classroom and demonstrations: 24 hours
- Practical work/tutorials: 24 hours
- Independent learning: 92 hours
- Total: 125 hours

Credit points

- 5 ECTS

Full course content

Subjects covered

Quantum Computing is a 5 ECTS module delivered over 4 hours per week for 12 weeks. Here's a schedule of the topics we'll cover each week:

● Introduction

- Results from the theory of quantum mechanics
- Spin and polarisation
- Measurements/Observables
- Randomness and probability
- Bits and Qubits
- Quantum parallelism and interference

● Linear Vector Spaces, Hilbert Spaces, and Matrix Representations

- Review of linear spaces
- Hilbert spaces
- Dirac <bra|ket> notation
- Operations and operators
- The Bloch Sphere
- Pauli Matrices
- Orthogonal and unitary matrices
- Operations and operators
- Eigenvectors and eigenvalues

● Quantum Circuits

- Logic Gates
- Reversibility
- Multi-qubit Gates
- Diagrammatic representation
- Deutsch's Algorithm

● Programming for Quantum Computing

- Programming environments
- Language support
- Simulation
- Quantum Computing cloud services
- Coprocessor

● Entanglement

- Entangled states
- Bell's Inequalities
- Using the CNOT gate
- No Cloning Theorem
- Quantum Teleportation

● Quantum Information Theory

- Elements from the Classical Information Theory
- Information and Entropy
- Quantum Information Processing and Error-Correcting Codes
- Quantum Communications Channels

● Applications

- Quantum Cryptography
- Quantum Key Distribution
- Ekert Protocol
- BB84 Protocol
- Dense coding

● Business / Domain Applications

- Applications of QC in Pharma, Finance, Cybersecurity, Machine Learning, Chemistry, etc.
- Business Strategy & Innovation with QC

● Quantum Fourier Transform

- Fourier Series
- Discrete Fourier Transform
- Quantum Fourier Transform

● Quantum Algorithms

- Deutsch-Josza Algorithm
- Simon's Algorithm

● Quantum Algorithms

- Grover's Search Algorithm
- Schor's Algorithm

● Emerging Topics

- Quantum Hardware
- Quantum Supremacy
- Data Security
- Quantum ML

Data Governance and Ethics

Lead with integrity through ethical data management in business



Master ethical data management and regulatory compliance

Gain the skills to handle data responsibly while ensuring legal compliance and ethical practices in business operations.

This module delves into managing data within strict legal and ethical frameworks. You'll learn to assess various methods for acquiring, storing and transforming data, while understanding the complexities of data governance. It also equips you with strategies for managing business data ethically and effectively.

Additionally, the course covers the integration of artificial intelligence in data analysis, so you'll understand both the legal implications and technical requirements. It prepares future leaders to navigate the digital business landscape with a strong focus on ethical and societal responsibilities.

Learning objectives

This module emphasises responsible data management, covering legal, ethical and regulatory frameworks. Students will develop skills to handle data ethically, assess frameworks, and grasp the influence of artificial intelligence in data analysis. Here's what you'll accomplish:

Assess and critically compare regulatory processes for data acquisition, storage and transformation.

Map data flows to identify access rights and analyse data manipulation techniques.

Evaluate how data management affects security, confidentiality, and sustainability.

Critically analyse business data ethics and create responsible data management strategies.

Enhance the transparency and explainability of AI-driven data insights.

Criteria — are you eligible?

- **Language proficiency:** Minimum C1 English proficiency, plus 2 years' work or education in an English-speaking environment. IELTS: 6.0; TOEFL PBT: 600; TOEFL CBT: 200; TOEFL iBT: 100
- **Education:** Relevant EQF Level 6 qualification required (eg STEM, economics). Without this you will have an interview and assessment to evaluate certifications, qualifications or professional experience.
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- **Residency:** This EU-funded programme is open to all EU nationals with a passport or valid ID from one of the 27 EU countries.

Data Governance and Ethics

Open doors with ethical data management and compliance skills

This course is perfect for tech enthusiasts, data scientists, IT professionals and business analysts. It's an excellent fit for those pursuing roles like data manager, compliance officer, IT consultant, or AI specialist. Graduates will gain the expertise to manage data responsibly, ensuring legal compliance across diverse sectors.

A revolutionary online learning experience

This entirely online module blends cutting-edge teaching techniques with expert guidance. Students participate in live lectures, independent study and lab work. Core approaches include problem-based learning, gamification, and flipped classroom methods.

Advanced technologies like artificial intelligence enrich the digital learning environment, creating a highly interactive and immersive experience that fosters both deep comprehension and practical abilities. The course concludes with a proctored test and a final exam, each contributing 50% of the grade, ensuring thorough mastery of the content.

Time commitment

- Classroom and demonstrations: 24 hours
- Practical work/tutorials: 24 hours
- Independent learning: 77 hours
- Total: 125 hours

Credit points

- 5 ECTS

Full course content

Subjects covered

Data Governance and Ethics is a 5 ECTS module delivered over 4 hours per week for 12 weeks. An indicative schedule of topics to be addressed each week is outlined below:

● Introduction to Data Governance (DG)

- Overview of data governance
- Importance and objectives of data governance in contemporary organisations

● Big Data Management Principles

- Data lifecycle management
- Principles of data quality, data provenance and data generation
- Understanding master data and its importance
- Methods for assessing and improving data quality

● Data Integrity and Security

- Techniques and practices for ensuring data integrity
- Data security challenges and strategies
- Implementing master data management and data quality processes

● DG Frameworks

- Examining policies, principles, rules, and procedures
- Different operating models
- Implementation challenges and best practices

● Data Architecture and Metadata Management

- Designing data architecture tailored to enterprise needs
- Using metadata to enhance data governance and usage
- Integrating metadata management tools into enterprise IT infrastructure

● Data Risk Management

- Understanding data-related risks
- Roles, responsibilities, and maturity levels in risk management
- Assessing risks related to data
- Managing risks related to data confidentiality and security

● Implementing Data Governance for Business Value Creation

- Aligning data governance with business strategy
- Identifying stakeholders and responsibilities
- Developing data governance policies and standards
- Utilizing data for predictive analysis and decision-making
- Use cases of data analytics to enhance business processes
- Strategies for monetizing data and creating new business models

● Ethical Concepts and Frameworks

- Introduction to ethics in data management
- Ethical principles, standards, and practice

● Privacy, Analytics, and Ethics

- Balancing analytics ambitions with privacy laws and ethical standards
- Case studies

● Ethics and AI

- Ethical considerations in AI and ML
- Mitigating biases and ensuring fairness

● Governance of AI and Advanced Analytics

- Emerging trends and challenges in AI governance
- Regulatory and ethical frameworks for AI

● Business Data Ethics and Future Trends

- Applying ethical principles in business data analytics
- Future trends in data governance and ethics

Risk and Change Management
in Digital Business Environments

Driving transformation with effective change management



Manage risk and lead change

Learn how to analyse risks and use data-driven insights to ensure your business stays ahead in digital innovation.

In this module, you'll explore actionable strategies to cultivate a workplace culture that prioritises flexibility, agility and continuous learning. You'll apply key concepts of risk and change management tailored to your industry, gaining insight into how digital transformation reshapes business models and workforce dynamics.

The module emphasises communication, stakeholder engagement, and fostering a culture that embraces digital change. Through critical comparisons of digital business models, you will gain the skills to evaluate risks and opportunities, as well as the wider impact of digital disruption and innovation across industries.

Learning objectives

This hands-on module equips students to successfully implement change management in digital transformation projects. Participants will critically assess digital business models and strategies, evaluate the related risks and opportunities, and gauge the broader effects of digital disruption across industries.

Understand the essential principles of risk and change management in digital environments.

Apply change management strategies with an emphasis on communication, stakeholder involvement and developing a change-ready culture.

Critically compare and assess different digital business models, strategies, and their associated risks and opportunities.

Design and evaluate comprehensive digital transformation plans, measuring their impact on innovation, digital culture, and compliance with ethical standards.

Criteria — are you eligible?

- **Language proficiency:** Minimum C1 English proficiency, plus 2 years' work or education in an English-speaking environment. IELTS: 6.0; TOEFL PBT: 600; TOEFL CBT: 200; TOEFL iBT: 100
- **Education:** Relevant EQF Level 6 qualification required (eg STEM, economics). Without this you will have an interview and assessment to evaluate certifications, qualifications or professional experience.
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Risk and Change Management

Learn with Digital4Business

This module targets business leaders aiming to propel their organisations to the forefront of transformation, as well as graduates ready to step into leadership roles in companies poised for meaningful change. It provides practical strategies to engage stakeholders and drive innovation. Change can be challenging, but the skills acquired in this course will empower students to lead with agility.

Learn from industry experts and case studies

Gain valuable insights from guest lecturers, and industry leaders who provide unique perspectives on risk and change management. Through case studies, students analyse real-world scenarios. The seminar-based approach encourages collaboration and practical learning, as students apply these insights to their strategic thinking.

Regular assessments provide ongoing feedback. With clear rubrics and criteria, students are evaluated on various tasks including exams, assignments, projects, and activities, concluding with a proctored written exam.

Time commitment

- Classroom and demonstrations: 24 hours
- Practical work/tutorials: 24 hours
- Independent learning: 77 hours
- Total: 125 hours

Credit points

- 5 ECTS

Full course content

Subjects covered

Risk and Change Management in Digital Business Environments is a 5 ECTS module delivered over 4 hours per week for 12 weeks. An indicative schedule of topics to be addressed each week is outlined below:

- **Introduction to Risk and Change Management**

- Fundamentals of risk and change management within digital ecosystems.
- Explore the dynamics of digital societies and technology trends, highlighting both challenges and opportunities in digital transformation.

- **Digital Transformation and Change Management**

- Deep dive into digital transformation projects and the critical role of change management for their success.
- Focus on effective communication, stakeholder engagement, and cultivating a supportive organisational culture.

- **Digital Business Models and Strategies**

- Examination of prevalent digital business models and strategies, understanding their influence on industries, and the significance of innovation in spearheading digital transformation efforts.

- **Digital Workforce and Workplace Transformation**

- Investigation of digital technologies' impact on the workforce and workplace dynamics, including remote work, automation, and the use of collaboration tools.
- Discuss the management of a digital workforce.

- **Risk Management in Digital Transformation**

- Study of risk management within digital transformation contexts, focusing on risk identification, assessment, mitigation, and the formulation of comprehensive risk management plans.

- **Digital Disruption and Innovation**

- Exploration of digital disruption effects on industries and the pivotal role of innovation in driving transformation, creating novel business models, and seizing new opportunities.

- **Agile and Adaptive Leadership in Digital Environments**

- Insight into agile and adaptive leadership styles essential for digital transformation and change management, emphasising flexibility, resilience, and a commitment to lifelong learning.

- **Data-Driven Decision Making in Digital Environments**

- Introduction to the significance of data-driven decision making in digital environments, including methodologies in data analytics, visualisation, and reporting tools.

- **Digital Ethics, Privacy, and Compliance**

- Discussion on the ethical, privacy, and compliance challenges in digital environments, focusing on data protection, responsible tech use, and ethical guidelines development.

- **Building a Digital Culture and Fostering Innovation**

- Examination of the elements comprising a digital culture and methods to nurture a digital mindset within organisations, encouraging collaboration, innovation, and continuous learning.

- **Digital Talent Management and Workforce Development**

- Analysis of talent management strategies pivotal for digital transformation success, covering attraction, retention, development of digital talent, and the importance of upskilling and reskilling.

- **Risk and Change Management Case Studies and Future Trends**

- Review of real-world case studies in risk and change management across various industries.
- Discussion on future trends, potential challenges, and the impact of emerging technologies like AI and quantum computing.

AI for Business

Unlock business innovation with AI and machine learning mastery



Streamline operations with cutting-edge AI strategies and ethical practices

This module equips you with critical skills in AI and machine learning, focusing on innovative applications, ethical considerations, and optimising business processes.

In this AI for Business module, you will explore foundational concepts in artificial intelligence and machine learning. Through a mix of theory and hands-on practice, you'll learn to design, develop and assess advanced machine learning models.

The curriculum covers real-world projects, strategic AI solutions, and emphasises ethical, sustainable AI practices. By mastering these technologies, you'll enhance decision-making, increase efficiency, and gain a competitive advantage in today's business environment. Become a leader in AI-driven business transformation.

Learning objectives

In this AI for Business module, you will gain comprehensive expertise and practical skills in artificial intelligence and machine learning. By applying AI to real-world scenarios, you will drive innovation and implement ethical AI practices, supported by the following key learning outcomes:

Analyse, synthesise, and innovate within artificial intelligence and machine learning, with a focus on advancing understanding and application.

Design, train, and critically evaluate advanced machine learning models, focusing on cutting-edge data strategies to optimise performance.

Employ rigorous methods to assess machine learning models, interpret results, and effectively communicate outcomes across various settings.

Apply strategic thinking to AI and machine learning, evaluating their effectiveness and proposing innovative solutions to complex challenges.

Critically explore the ethical, societal, and environmental impacts of AI, advocating for sustainable and responsible development practices.

Criteria — are you eligible?

- **Language proficiency:** Minimum C1 English proficiency, plus 2 years' work or education in an English-speaking environment. IELTS: 6.0; TOEFL PBT: 600; TOEFL CBT: 200; TOEFL iBT: 100
- **Education:** Relevant EQF Level 6 qualification required (eg STEM, economics). Without this you will have an interview and assessment to evaluate certifications, qualifications or professional experience.
**EQF levels explained*
- **Residency:** This EU-funded programme is open to all EU nationals with a passport or valid ID from one of the 27 EU countries.

AI for Business

open new doors in an AI-powered landscape

This module is tailored for professionals and students in business, computer science, and related fields who want to expand their expertise in AI and machine learning. It equips you for roles in AI development, data analysis, business intelligence, and innovation management. you'll open doors to a range of industries, including technology, finance, healthcare, and the creative sectors.

Engaging online learning with expert support and hands-on activities

This fully online module uses a dynamic hybrid learning approach, blending live (synchronous) sessions with self-paced (asynchronous) learning. Tutors guide you through lectures, assignments and practical lab work. The module includes innovative teaching methods like problem-based learning and the flipped classroom model.

Emerging technologies, including AI, are integrated to enrich the learning experience. Formative assessments provide continuous feedback to refine your learning approach. The course assessment is split evenly between a practical project (50%) and a proctored final exam (50%).

Time commitment

- Classroom and demonstrations: 24 hours
- Practical work/tutorials: 36 hours
- Independent learning: 190 hours
- Total: 250 hours

Credit points

- 10 ECTS

Full course content

Subjects covered

AI for Business is a 10 ECTS module delivered over 5 hours per week for 12 weeks. An indicative schedule of topics to be addressed each week is outlined below:

- **Introduction to AI and its history:** Overview of AI, significance in today's world, historical development, key milestones.
- **Foundational Knowledge for AI:** Problem-solving, search algorithms, heuristics, adversarial search, optimisation.
- **Automated Planning:** Goal achievement, decision-making, resource allocation, simulation, prediction, learning, adaptation, autonomous systems.
- **Introduction to Machine Learning:** Overview of ML, supervised/unsupervised learning, reinforcement learning, introduction to deep learning.
- **Deep Learning:** Neural networks, CNNs, RNNs, deep learning applications.
- **Data and Datasets:** Importance of data, data types, data quality, pre-processing, quality datasets.
- **Reinforcement Learning:** Basics of Reinforcement Learning, exploration vs. exploitation, real-world applications.
- **Natural Language Processing (NLP):** NLP fundamentals, text processing, NLP models and techniques.
- **Computer Vision:** Basics of computer vision, image processing, object detection, challenges, and future trends.
- **AI Tools and Platforms:** Overview of AI tools/platforms, practical applications, deep learning frameworks.
- **AI and Creativity:** AI in creative industries, design, innovation, future prospects, industry speaker session.
- **Ethical and Social Implications in AI:** Ethical challenges, societal impacts, AI bias and fairness, privacy, security.

Digital Transformation Project

Elevate your skills with practical, ethical digital innovation strategies



Develop key skills for leading ethical digital transformation

Gain the tools to design and implement responsible digital innovation strategies.

To participate in this module, learners must have successfully completed the Digital Transformation module and earned at least 30 ECTS. This course centres on creating and managing digital innovation projects, incorporating advanced models for text, image, audio, video and data production. It prioritises ethical practices in digital development and explores the responsibilities associated with synthetic media, preparing learners to handle contemporary digital challenges thoughtfully and effectively.

Learning objectives

After completing this hands-on project module, learners will be able to:

Synthesise knowledge from core programme components to create, develop, and evaluate a transformative digital project that fits within an industry or business context.

Apply project management techniques to effectively plan, execute, and oversee the delivery of a practical project.

Analyse current industry trends, identify areas for digital innovation, devise strategies for transformation, and map out implementation steps.

Demonstrate professional communication skills by presenting and justifying the outcomes of their projects.

Reflect on the ethical impact and sustainability of their projects in a global and societal framework.

Criteria — are you eligible?

- **Language proficiency:** Minimum C1 English proficiency, plus 2 years' work or education in an English-speaking environment. IELTS: 6.0; TOEFL PBT: 600; TOEFL CBT: 200; TOEFL iBT: 100
- **Education:** Relevant EQF Level 6 qualification required (eg STEM, economics). Without this you will have an interview and assessment to evaluate certifications, qualifications or professional experience.
**EQF levels explained*
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Risk and Change Management

A vital element of the Digital4Business network

This project gives learners hands-on experience and in-depth knowledge of problem-solving abilities, project management skills, and learn to apply emerging technologies.

With guidance from both industry professionals and academic mentors, students benefit from a well-rounded experience that prepares them for leadership roles in the evolving digital landscape.

Experience cutting-edge learning with digital transformation techniques

This fully online course leverages modern teaching approaches tailored to digital transformation. The learning structure includes live interactive lectures, self-paced independent study, and hands-on lab work. Tutors guide students through advanced problem-solving, gamified learning experiences, and flipped classroom models.

Students will create a digital transformation plan and deliver a comprehensive research report, paired with a software-based artefact. Continuous assessments ensure progress, with the project proposal contributing 30% and the final report and artefact making up 70% of the total grade.

Time commitment

- Classroom and demonstrations: 12 hours
- Practical work/tutorials: 12 hours
- Independent learning: 226 hours
- Total: 250 hours

Credit points

- 10 ECTS

Full course content

Subjects covered

The Digital Transformation Project / Practicum is a 10 ECTS module delivered over 2 hours per week for 12 weeks with a significant component of independent study. The schedule of topics to be addressed each week is outlined below:

- **Introduction and Project Proposal Development**
 - Overview of module objectives, expectations, and project proposal guidelines.
- **Research Methodologies**
 - Techniques for conducting a literature review and selecting appropriate research methodologies.
- **Project Management for Digital Projects**
 - Applying principles from "Risk & Change Management in Digital Environments" to plan digital projects.
- **Ethical Considerations and Sustainability in Digital Projects**
 - Insights from "Data Governance and Ethics" on incorporating ethical practices and sustainability.
- **Core Area Integration into Practicum Development**
 - Integration of the core area of specialisation into project development. Namely: Data Science for Business, AI for Business, Cybersecurity for Business, and/or Cloud Computing for Business.
- **Project Development Workshop**
 - Hands-on session to develop and refine projects with peer and instructor feedback.

- **Project Presentation and Communication Skills**
 - Enhancing communication skills for presenting complex projects.
- **Project Evaluation and Reflection**
 - Evaluating projects based on set criteria and reflecting on learning outcomes and future research directions.
- **Project Showcase and Viva**
 - Final presentation of projects to an audience, including a viva voce examination.

Thank you!

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