



MADE

# MADE CYMRU

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**Prifysgol Cymru**  
Y Drindod Dewi Sant  
**University of Wales**  
Trinity Saint David



UNDEB EWROPEAIDD  
EUROPEAN UNION



Llywodraeth Cymru  
Welsh Government

**Cronfeydd Strwythurol a  
Buddosodi Ewropeaidd**  
**European Structural  
and Investment Funds**

# Background

- 22+ years experience in Industry driven full-time and part-time programmes.
- BEng and MSc Face-to-Face delivered in Swansea
- 4+ years experience with Face-to-Face and in Webspace delivery
- March/April 2018 UWTSD/CBM undertook a study: *'Industry 4.0: Welsh Manufacturing Sector Technological Needs Scoping Study'*
- Application for WEFO funding to support the “translational gap”
- 70% of the 2030 workforce are already here today

# MADE Cymru

## Upskilling

- Upskilling for Advanced Manufacturing (Industry 4.0)
  - Level 7 MSc programme and short course options
  - Level 5 (HND level) short course options
- International Innovation Management
  - Level 7 MSc programme and short course options.



# UPSKILLING FOR ADVANCED MANUFACTURING (INDUSTRY 4.0)





BD.

Industry 4.0





A man with a beard is wearing a VR headset. The image is overlaid with a semi-transparent red filter. On the right side, there are faint white technical graphics consisting of lines and circles, suggesting a digital or engineering environment.

# Virtual Reality



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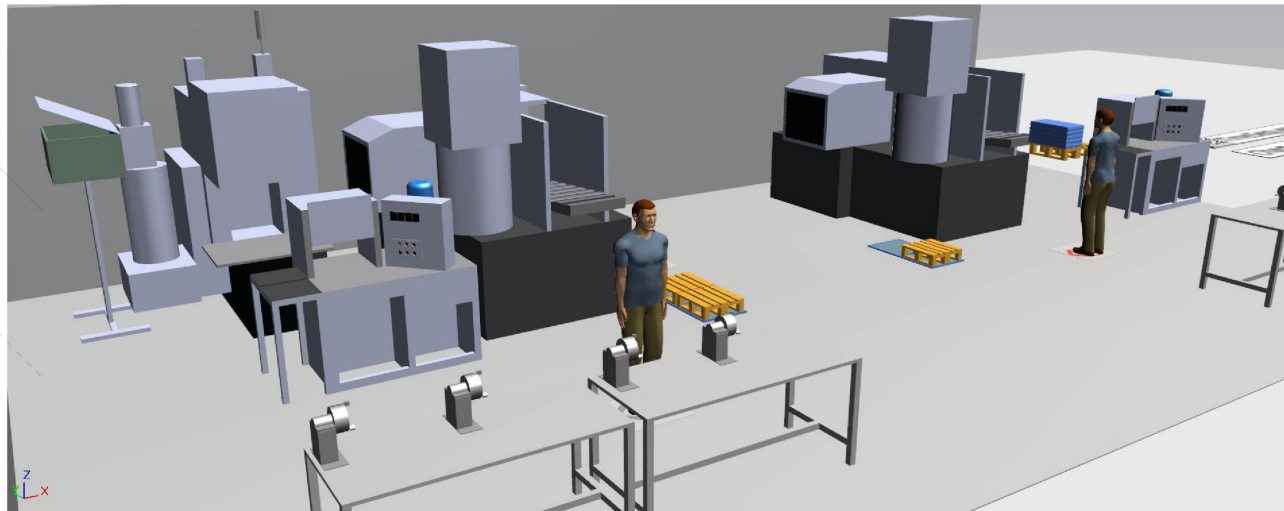
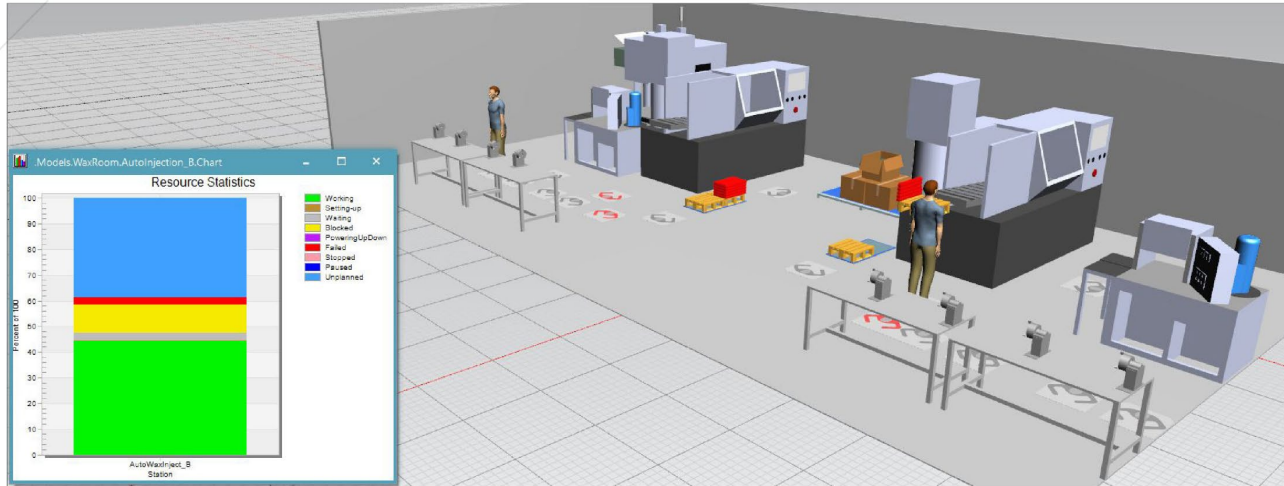


# Augmented (Mixed) Reality





# Discrete Event Simulation



# Programmes

**BUILD**  
A FUTURE-PROOF  
WORK FORCE,  
**TODAY**

MADE  
MANUFACTURE  
ADVANCED  
DESIGN  
ENGINEERING

**Fully Funded\***

Short & Flexible University Course:  
**SMART  
MANUFACTURING  
WITH INDUSTRY 4.0**

- » Introduction to Industry 4.0
- » Advanced Industry 4.0 or Design for Industry 4.0

“ Industry Wales is fully supportive of these EU programmes. At a time of significant change and challenge for the Welsh Manufacturing sector, this operation is both timely and critical. With an established track record in providing industry focused solutions, UWTSd are ideally placed to deliver such an operation.”

James Davies, CEO – Industry Wales.

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ADVANCED  
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ENGINEERING

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**MSc INDUSTRY 4.0  
ADVANCED  
MANUFACTURING**

Modules:

- Introduction to Industry 4.0
- Advanced Industry 4.0
- Design for Industry 4.0
- Financial Management and Planning
- Research Methods and Professional Development
- Introduction to Innovation Management
- Major Project / Dissertation

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Cronfa Gynwethbasol Ewrop  
European Social Fund



MADE  
MANUFACTURE  
ADVANCED  
DESIGN  
ENGINEERING

# BUILD

A FUTURE-PROOF  
WORK FORCE,  
TODAY

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Short & Flexible University Course:

## SMART MANUFACTURING WITH INDUSTRY 4.0

- » Introduction to Industry 4.0
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## Introduction to Industry 4.0

### Topics include:

- » Lean thinking manufacturing strategies benefitting from Industry 4.0 technologies.
- » Value Stream Mapping to identify potential economic impact technology.
- » Potential benefits of Industrial Internet of Things.
- » Smart manufacturing including Factory of the Future principles.
- » The role of data, including impacts of cloud-based computing and cyber-security.

## Advanced Industry 4.0

### Topics include:

- » Applications of advanced technology including virtual, augmented and mixed reality.
- » Identifying the benefits of 'digital twin' simulation.
- » Elimination of inefficiencies using the 'digital thread'.
- » Systems leadership, governance and ethics of Industry 4.0 technologies.

## Design for Industry 4.0

### Topics include:

- » Generative Design and Optimisation techniques for Industry 4.0 manufacturing strategies.
- » Design methodologies for Automated Assembly, Automated Dis-assembly etc.
- » Quality of Design methodologies underpinning technology application.
- » Value Analysis / Value Engineering to achieve economic benefit from Industry 4.0 technologies.



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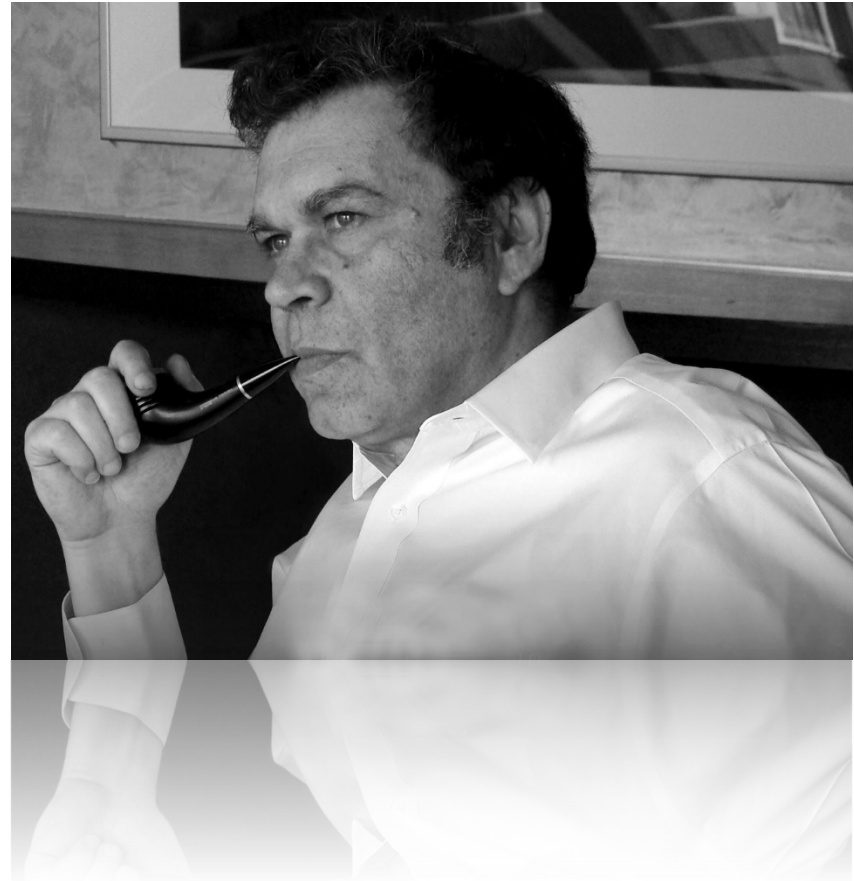


# CONTINUOUS IMPROVEMENT WITH INDUSTRY 4.0



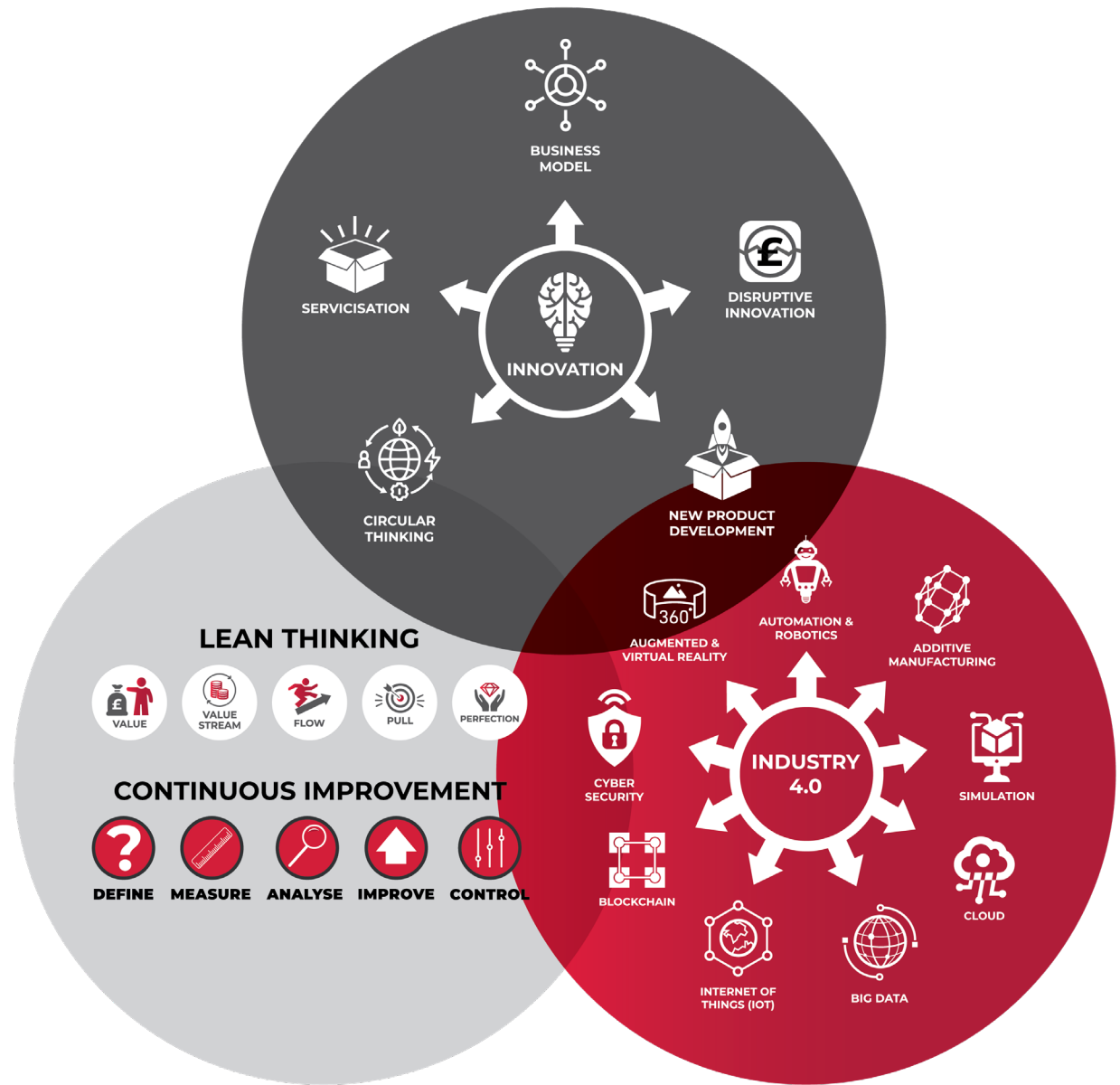
**“TECHNOLOGY  
CAN ONLY  
BRING  
BENEFITS, IF,  
AND ONLY  
IF, IT  
DIMINISHES  
A LIMITATION.”**

**Eli Goldratt (1995)**



# Operational Excellence

- Lean Principles to help us reduce operational complexity and improve productivity.
- Combine with Industry 4.0 technology.



# BUILD

## A FUTURE-PROOF WORK FORCE, TODAY

MADE  
MANUFACTURE  
ADVANCED  
DESIGN  
ENGINEERING

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Short & Flexible University Course:

### CONTINUOUS IMPROVEMENT WITH INDUSTRY 4.0

- » Quality Six Sigma Green Belt
- » Group Project

“The MADE Cymru team at UWTSO really understand manufacturing and have put their years of experience into the 'Continuous Improvement with Industry 4.0' course. We need to grow manufacturing in Wales, now more than ever. This is an easy way to invest in your staff and your organisation for the future.”

Jack Yates, Managing Director at Hi-Mark Automotive.

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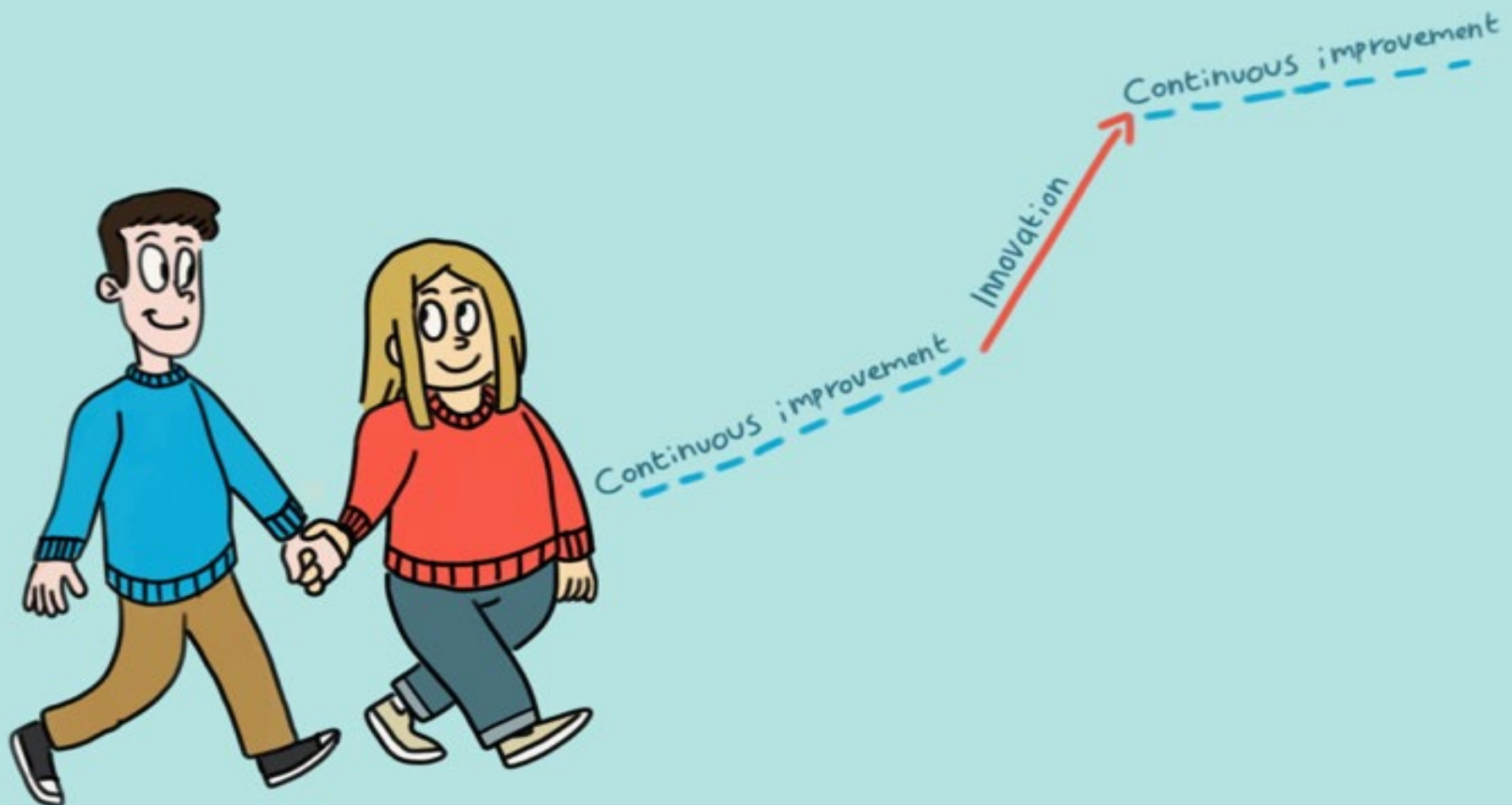
### Green Belt Six Sigma Topics include:

- » Six Sigma DMAIC Process; Define, Measure, Analyse, Improve and Control.
- » Topics such as Process Flow, Voice of the Customer, Measurement Systems, Process Capability, Nelson's Rules, Data Visualisation, Root Case Analysis, Design of Experiments and Risk Management etc.
- » Effective application of these tools to support each phase of a Six Sigma project.
- » Identification of relevant Industry 4.0 technologies to support Continuous Improvement.
- » Integration of Industry 4.0 technologies for existing and legacy equipment.

### Group Project Topics include:

- » Deployment of Industry 4.0 technologies with Six Sigma disciplines in workplace-based projects.
- » Introduction to Team Working methodologies, including team roles and responsibilities.
- » Six Sigma Six Panel reporting methods and presentations.
- » Fortnightly project tutorials with Continuous Improvement practitioners.

# Continuous Improvement and Innovation go hand in hand (Kaizen) (Kaikaku)



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# INNOVATION MANAGEMENT



# INNOVATION MANAGEMENT

*“Innovation Management transforms good ideas into something that has a value”*

- Innovation is a rapidly evolving area – there are no fixed definitions.
- Innovation management needs to be multidisciplinary and employ ‘simple’ methods and processes that can be used in all areas of a business or organisation
- International Innovation Management standards (ISO 56000 series) have been published in 2019 to provide some insight into the subject.

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# EMBRACE INNOVATION IN YOUR TEAM

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Short & Flexible University Course:

## BUSINESS IMPROVEMENT WITH INNOVATION MANAGEMENT

- » Introduction to Innovation Management
- » Management of New Product Development

“The mix of theory and practical examples of how to manage innovation made the course very accessible on a personal level, and immediately introduced new possibilities for applying the knowledge directly to the company. This encouraged a new surge of optimism to move innovation within the company to the next level.”

Jon Jolley, Managing Director at SRM Engineering Ltd



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# EMBRACE INNOVATION IN YOUR TEAM

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## MSc INTERNATIONAL INNOVATION MANAGEMENT

Modules:

- » Introduction to Innovation Management
- » Management of New Product Development
- » International Innovation Management
- » Introduction to Industry 4.0
- » Financial Management and Planning
- » Research Methods and Professional Development
- » Major Project / Dissertation



# INNOVATION MANAGEMENT

## Who's on the course?





# MADE CYMRU PROGRAMME DELIVERY.



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# 1. Upskilling for Advanced Manufacturing (Industry 4)

# 2. Innovation Management

- Flexible way to learn while you work.
- Friday afternoon online / blended learning delivery (1 or 2 lectures).
- 3 Entry points per year (February, June and October.)
- Hop-on / Hop-off Learning opportunities.
- Bite sized Learning at Level 5 & Level 7
- Option to achieve full MSc
- Fully funded (for limited period).

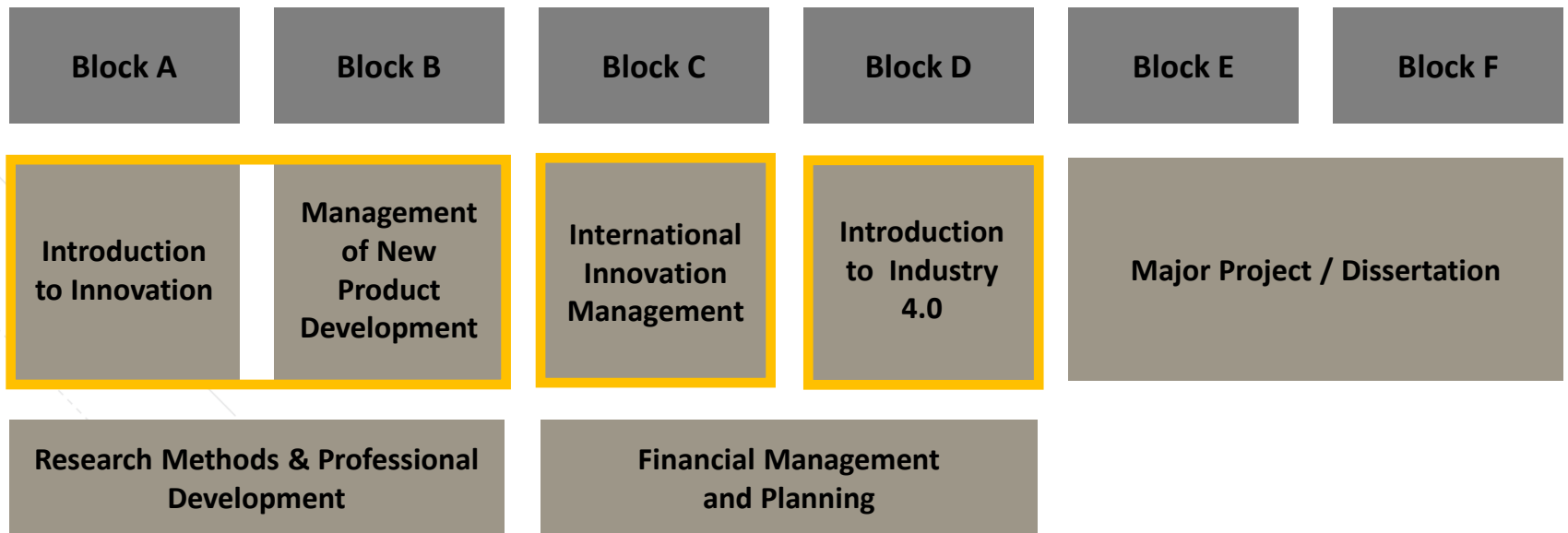
# Join Us for Your Learning Journey\_

## MSc Industry 4.0 Advanced Manufacturing



# Join Us for Your Learning Journey\_

## MSc International Innovation Management





# Example Timetable



