



ALMA MATER STUDIORUM  
UNIVERSITÀ DI BOLOGNA

# LeDAM-ER - LEveraging competences and skills of professionals in Digital and Automated Manufacturing processes in Emilia-Romagna

**Corso di alta formazione per professionisti  
in video-pillole**

**INNOVAZIONE ED EFFICIENZA: COME IOT, REALTÀ VIRTUALE E  
REALTÀ AUMENTATA TRASFORMANO LA PRODUZIONE**

*webinar* - Lunedì 17 giugno 2024, ore 17.00

**ARIN - Area dell'Innovazione**

## PROGETTO FORMATIVO INNOVATIVO – CARATTERISTICHE (1)

CORSO DI ALTA FORMAZIONE	LeDAM-ER - Leveraging competences and skills of professionals in digital and automated manufacturing processes in Emilia-Romagna
CONTENUTI OFFERTA FORMATIVA	<p><b>2 Percorsi formativi con moduli di base e specialistici</b></p> <ul style="list-style-type: none"> <li>• <b>Digital Twins e applicazioni AR/VR</b></li> <li>• <b>Management, Innovazione e Tecnologie per la Sostenibilità</b></li> </ul>
1° FASE DI IMPLEMENTAZIONE	<p>Fase pilota di 3 mesi in cui i 2 percorsi sono stati resi disponibili gratuitamente esclusivamente con moduli di base per un numero limitato di partecipanti</p> <ul style="list-style-type: none"> <li>• <b>LeDAM - Digital Twins and AR/VR applications – Basic modules</b></li> <li>• <b>LeDAM - Management, Innovation and Technologies for Sustainability - Basic modules</b></li> </ul>
2° FASE DI IMPLEMENTAZIONE	<p>I moduli di base sono attualmente disponibili a mercato su piattaforma Unibook di Ateneo (<a href="https://book.unibo.it/">https://book.unibo.it/</a>).</p> <p>I contenuti dei due moduli specialistici vengono adeguati alla piattaforma e saranno a breve pubblicati per la fruizione online.</p>



## PROGETTO FORMATIVO INNOVATIVO – CARATTERISTICHE (2)

STRUTTURA	<ul style="list-style-type: none"><li>✓ <b>Modulare:</b> i corsi si compongono di moduli accessibili in modo autonomo, ma al tempo stesso integrati all'interno di due percorsi formativi tematici più articolati, suddivisi in moduli di base e moduli specialistici</li><li>✓ <b>Flessibile:</b> i corsi sono progettati per permetterne la fruizione in funzione delle specifiche esigenze di formazione e degli impegni di lavoro del singolo discente</li><li>✓ <b>Online e asincrono:</b> i contenuti sono fruibili su piattaforma e-learning, accessibile 7/7, 24/24</li></ul>
MODALITÀ DI EROGAZIONE	<ul style="list-style-type: none"><li>✓ <b>asincrona: video pillole</b></li><li>✓ <b>durata dei video: dai 10 ai 15 minuti ciascuno</b></li><li>✓ <b>online</b></li><li>✓ <b>attraverso piattaforma UNIBook di Ateneo</b></li><li>✓ <b>fruibile da vari dispositivi</b></li><li>✓ <b>contenuti erogati in lingua inglese</b></li><li>✓ <b>possibilità di fruizione con sottotitoli in lingua italiana</b></li></ul>



# STRUTTURA E CONTENUTI – CORSO FORMATIVO # 1

## LeDAM - DIGITAL TWINS AND AR/VR APPLICATIONS – **Basic modules**

### 3 MODULI DI BASE

- ***Advanced Manufacturing (Lean Manufacturing, Maintenance, Industry 4.0 & Automation)***
  - ***Information & Communication Technology***
  - ***Quality Control & Safety***

Prova finale singoli  
moduli

Certificato di  
partecipazione



# STRUTTURA E CONTENUTI – CORSO FORMATIVO # 1 – MODULI DI BASE

## SCOMPOSIZIONE IN VIDEO-PILLOLE

<b>Advanced Manufacturing (Lean Manufacturing, Maintenance, Industry 4.0 &amp; Automation)</b>	1. Supply Chain Management
	2. Advanced Maintenance of production systems (from Corrective to Predictive Maintenance)
	3. Lean Thinking: the powerful industrial paradigm of modern production systems
	4. Industry 4.0 Techs: the revolutionary mix of technologies for advanced manufacturing
	5. Automatic Lines & Robotics
	6. Advanced Manufacturing (Lean Manufacturing, Maintenance, Industry 4.0 & Automation) - Final Assessment
<b>Information &amp; Communication Technology</b>	1. IoT and Digital Twins for Industry 5.0
	2. Introduction to Artificial intelligence
	3. AR/VR Technologies
	4. Cyber Security in Industry
	5. Information & Communication Technology - Final Assessment
<b>Quality control &amp; Safety</b>	1. Statistical quality control
	2. Quality assurance & compliance
	3. Risk Management
	4. Safety management for manufacturing
	5. ISO9000: Fundamentals and main Clauses
	6. Quality control & Safety - Final Assessment

1. IoT and Digital Twins for Industry 5.0

3. AR/VR Technologies

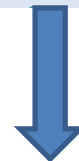


# STRUTTURA E CONTENUTI – CORSO FORMATIVO # 1 – MODULO SPECIALISTICO SCOMPOSIZIONE IN VIDEO-PILLOLE

## LeDAM - Digital twins and AR/VR applications - **Specialisation module**

### DIGITAL TWINS AND AR/VR APPLICATIONS UNIBO

1. Digital Twins for manufacturing lines: definition and taxonomy, specific characteristics, technologies and software stacks for IoT data analytics, goals, and opportunities
2. Introduction to Augmented and Virtual Reality
3. Reality check and capabilities of AR/VR systems
4. Hard/soft QoS requirements, case studies and practical success stories, innovation processes stimulated by digital twins
5. Digital Twins and cloud continuum technologies
6. VR examples for maintenance training
7. VR Applications
8. Marposs Case Study on AR devices for predictive maintenance



FINAL ASSESSMENT



## STRUTTURA E CONTENUTI – PERCORSO FORMATIVO # 2

### LeDAM – MANAGEMENT, INNOVATION AND TECHNOLOGIES FOR SUSTAINABILITY Basic modules

2 MODULI DI BASE

- *Management, Innovation & Entrepreneurship*
- *Innovation Technology for Energy Saving and Sustainability*

Prova finale singoli  
moduli



Certificato di  
partecipazione



# STRUTTURA E CONTENUTI – CORSO FORMATIVO # 2 – MODULI DI BASE

## SCOMPOSIZIONE IN VIDEO-PILLOLE

<b>Management, Innovation &amp; Entrepreneurship</b>	1. How to create an Innovation Strategy
	2. Managing Innovation in the Manufacturing Sector
	3. Circular strategies for sustainable business model innovation
	4. The business plan
	5. Finance for entrepreneurship
	6. Management, Innovation & Entrepreneurship - Final Assessment
<b>Innovation Technology for Energy Saving and Sustainability</b>	1. Efficient use of energy resources for the industry of the future
	2. Energy Management in the era of Energy Transition
	3. Introduction to Ecodesign and LCA
	4. Circular Economy and Secondary Raw Materials
	5. Innovation Technology for Energy Saving and Sustainability - Final Assessment





# STRUTTURA E CONTENUTI – PERCORSO FORMATIVO # 2 – MODULI DI BASE

## SCOMPOSIZIONE IN VIDEO-PILLOLE - DETTAGLI

Management, Innovation & Entrepreneurship	1. How to create an Innovation Strategy
	2. Managing Innovation in the Manufacturing Sector
	3. Circular strategies for sustainable business model innovation
	4. The business plan
	5. Finance for entrepreneurship
	6. Management, Innovation & Entrepreneurship - Final Assessment

### How to create an Innovation Strategy

This learning nugget describes the **key objectives and the steps required for the definition of a company's Innovation Strategy**, intended as a common innovation mission and a plan aimed to achieve future organizational growth. It addresses **key questions** such as: **what is Innovation Strategy? Why is it important? What are the steps that can help develop and implement an Innovation Strategy to guide Digital Transformation efforts? What are the tools available to support this process?**

### Managing Innovation in the Manufacturing Sector

The course aims to **present and experience the different innovation practices in use in organizations, enabled by digital transformation**. During the module, **Design Thinking, Open Innovation, Lean Startup, and Agile Innovation** will be presented in an integrated model called Hybrid Model Matrix. Innovation cases and literature will be introduced to present opportunities and emerging product/service/system innovation trends enabled by digital transformation.

### Circular strategies for sustainable business model innovation

This nugget **introduces how a circular economy can assist business model innovation towards sustainability**. Three strategies for circular business models will be presented: product **ownership retention, product life extension, and design for recycling**. It also elaborates on which criteria must be considered when deciding which strategy is more suitable for different business contexts

### The business plan

In many cases, a sound business idea will fail to take off because the entrepreneur made the common mistake of seeing a business opportunity that, in reality, was never really there. In this nugget, **we will learn which instruments can support the evaluation of a business idea**. In particular, the nugget provides basic training for **understanding the value of having a business plan and why it is so relevant**. Moreover, it provides some **guidelines for writing a business plan**

### Finance for innovative entrepreneurial activities

New businesses are fundamental generators of innovation and economic progress. But what favors the emergence and growth of these companies? Several internal factors influence innovation dynamics, but the drivers go much further. **The presence of an effective ecosystem and the interconnections among actors, in particular financial investors, play a critical role**

# STRUTTURA E CONTENUTI – PERCORSO FORMATIVO # 2 – MODULI DI BASE

## SCOMPOSIZIONE IN VIDEO-PILLOLE - DETTAGLI

<b>Innovation Technology for Energy Saving and Sustainability</b>	1. Efficient use of energy resources for the industry of the future
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### Efficient use of energy resources for the industry of the future

This nuggets provides an **overview of methodologies to improve energy efficiency**. In particular, by controlling the industrial process, **waste heat recovery, improvement of combustion efficiency, use of energy management systems, combined heat and power generation, power factor control, high efficiency lighting and motor, as well as proper building insulation**

### Energy Management in the era of Energy Transition

This learning nugget provides basic training in **how to link the energy management with the energy market variables and the sustainability variables**. We are leaving up today in an unprecedented historical era where market work, activities, sustainability, both financial, economic, social, environmental impacts are modern, strategic. Currently, **we must no longer see energy management only as a functional, as reducing, containing and controlling cost for companies and larger energy consumers**.

### Introduction to Ecodesign and LCA

As the call for sustainable solutions at several (operational, industrial and policy) increases, the **need for a comprehensive and effective design approach and assessment tools creation** have been addressed by researchers and practitioners. In particular, for the definition of a complete framework, the **use of a Ecodesign and a Life Cycle Thinking lens** is required to explore the longitudinal dimension of the impacts and possible direct and indirect effects triggered on environmental, social and economic level

### Circular Economy and Secondary Raw Materials

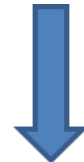
Nowadays, a complex and deep ecological and social crisis is responsible of the rapid deterioration of our physical, social, and economic environment and of the collapse of the traditional consumption model, based on an irreversible utilization and depletion of natural resources and pollution and waste production. **Circular economy is the ultimate answer to solving the problem of the depletion and economic scarcity of resources**. The transition to a more circular economy is now mandatory for a better use of resources and energy.

# STRUTTURA E CONTENUTI – CORSO FORMATIVO # 2 – MODULO SPECIALISTICO SCOMPOSIZIONE IN VIDEO-PILLOLE

## LeDAM - Management, Innovation and Technologies for Sustainability Specialisation module

### LCA, ECO-DESIGN AND ENERGY SAVING UNIBO

1. Circular economy - Introduction to water resources and water sustainable treatment
2. Recovery and recycling of company waste water
3. Methods for the implementation of water resources
4. Zero cost and zero impact phytodepuration basin to treat wastewater and make it suitable for discharge into the environment
5. Ecoefficiency and awareness on substances utilization and compliance with EU regulations
6. Monitoring and control of materials and chemicals complying to the latest RoHS (Restriction of Hazardous Substances in Electrical and Electronic Equipment) and REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals) EU Regulations
7. Technologies to improve electric energy efficiency
8. Energy production from renewables
9. Feasibility study of a photovoltaic plant for an industrial site connected with the grid through PVGIS, popular software used for design of PV systems



FINAL ASSESSMENT



# STRUTTURA E CONTENUTI – PERCORSO FORMATIVO # 2 – MODULO SPECIALISTICO SCOMPOSIZIONE IN VIDEO-PILLOLE

## LeDAM - Management, Innovation and Technologies for Sustainability Specialisation module

### Programme

This storyline provides knowledge on Life Cycle Assessment (LCA), eco-design and on technologies for electric energy efficiency. It presents the topics of ecoefficiency, awareness on substances utilization in production systems, analyses methods of implementing water, the integration of renewable energy sources in industrial environment and the use of photovoltaics (PV).

1. Introduction to Ecodesign and LCA
2. Energy management in the era of energy transition
3. Circular Economy and Secondary Raw Materials
4. Efficient use of energy resources for the industry of the future
5. Circular economy - Introduction to water resources and water sustainable treatment
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11. Technologies to improve electric energy efficiency
12. Energy production from renewables
13. Feasibility study of a photovoltaic plant for an industrial site connected with the grid through PVGIS, popular software used for design of PV systems
14. EVO Plant: case study of Bonfiglioli Bologna
15. LCA, Eco-design and Energy Saving – Final Assessment





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