

REGINNA 4.0 Second Summer School: Diving into high-innovation potential areas: Entrepreneurship and Business Strategies related to Industry 4.0 and Nanotechnology

REGINNA 4.0

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Report of Contributions

Contribution ID: 1

Type: **not specified**

Introduction to Quantum Computing

Wednesday, 6 September 2023 13:30 (1h 30m)

Participants will learn about quantum phenomena, which govern nature. These quantum phenomena will be explained through photon's interference, which will be introduced by double-slit and double-beam splitter experiments. Next, classical computation will be compared to quantum computation. Quantum bit will be introduced. Participants will learn through an example of the quantum algorithm, presented in real quantum computer and in a quantum computer simulator.

Primary author: Mr PAVLICA , Egon (University of Nova Gorica)

Presenter: Mr PAVLICA , Egon (University of Nova Gorica)

Session Classification: main session 06/09/23

Contribution ID: 2

Type: **not specified**

Technology Readiness Level

Monday, 4 September 2023 09:00 (1h 30m)

- How to evaluate the maturity of a new technology

Presenter: Mr SCOLARI, Franco (Polo tecnologico Alto Adriatico)

Session Classification: Main session 04/09/23

Contribution ID: 3

Type: **not specified**

Lean production (BUSINESS CASE)

Monday, 4 September 2023 11:00 (1h 30m)

1. Introduction to lean manufacturing (slides)- 10 minutes 2 The main dimensions for lean intervention (slides)- 10 minutes
2. How to detect waste (slides)- 10 minutes
3. Value-added and not value-added activities – 15 minutes
4. Digital transformation (slides)- 25 minutes
5. Tasks: 20 minutes (Hands-On)

Presenter: Mr OLIVOTTO, Marco (LEF)

Session Classification: Main session 04/09/23

Contribution ID: 4

Type: **not specified**

Digital Transformation Journey

Monday, 4 September 2023 13:30 (1h 30m)

The course allows to understand the meaning of a digital transformation. How to identify the needs

of the enterprise? how to design a digital project? In the second part of the lecture there will be provided examples of digital transformation that has been realized.

- Introduction to industry 4.0
- How to guide a Digital Transformation Project
- Digital Transformation Project: evidences from the FVG firms

Presenter: Mr FORNASIER, Andrea (Polo tecnologico Alto Adriatico)

Session Classification: Main session 04/09/23

Contribution ID: 5

Type: **not specified**

Data Modeling: From Relational Databases to Big Data_first part

Tuesday, 5 September 2023 09:00 (1h 30m)

Database management systems are a fundamental tool to store and analyze data in countless domains, empowering business intelligence as well as descriptive, predictive, and prescriptive analytics tasks. Choosing the right database technology is not trivial since, due to the intrinsic heterogeneous nature of information, different approaches must be followed to handle structured, semi-structured, and unstructured data, and the so called Big Data. This gives rise to complex information systems, in which data regarding a specific object may be fragmented and possibly replicated into several repositories, both relational as well as NoSQL in their nature. Data warehousing allows to bring order into such an information jungle, by means of employing a single,

enterprise-wide storage, which should be continuously fed by data streams, engineered to perform ETL (Extract, Transform, Load) tasks. The goal of the lecture is that of covering, from a general and

intuitive point of view, all the main aspects pertaining to the previously described issues.

1. What is data? (Lecture)
2. Approaches to store, integrate and manage data within an enterprise IT infrastructure (Lecture)

Presenter: Prof. BRUNELLO, Andrea (University of Udine)

Session Classification: main session 05/09/23

Contribution ID: 6

Type: **not specified**

Introduction to Industrial Cybersecurity

Tuesday, 5 September 2023 13:30 (1h 30m)

The aim of the lecture is to raise awareness about the relevance of cybersecurity in the context of Industry 4.0 and to get a glimpse of the most common threats and vulnerabilities in industrial control systems as well as the countermeasures available to mitigate risks.

Presenter: Prof. PRADA, Miguel A. (University of Leon)

Session Classification: main session 05/09/23

Contribution ID: 7

Type: **not specified**

Digital marketing (BUSINESS CASE)

Wednesday, 6 September 2023 09:00 (1h 30m)

Presenter: Mr FIOROT, Cristian (ALEA PRO)

Session Classification: main session 06/09/23

Contribution ID: 8

Type: **not specified**

Collaborative robotics

Wednesday, 6 September 2023 11:00 (1h 30m)

1. What is collaborative robotics? (Lecture)
2. Approaches to implement a safe collaborative robotics application (Lecture)

Presenter: Prof. SCALERA, Lorenzo (University of Udine)

Session Classification: main session 06/09/23

Contribution ID: 9

Type: **not specified**

Introduction to Quantum Computing

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Presenter: PAVLICA, Egon (UNG)

Session Classification: main session 06/09/23

Contribution ID: **10**Type: **not specified**

Nanomaterials - Introduction

Thursday, 7 September 2023 09:00 (1h 30m)

Nanotechnology and nanomaterials.
Classifications of nanomaterials, their properties.
Historical overview of nanomaterials.
Reasons for special properties of nanoscale materials.
Classical and quantum size effects.
Basic concepts of quantum physics.
The energy of an electron in an atom.
Harmonic oscillator: transition from classical to quantum.
Wave-particle duality. Uncertainty principle.
Condensed matter physics. Electrons in crystals.
Quantum dots and their applications.
Quantum tunneling.
Application of nanomaterials.

Presenter: Prof. TUROVSKA, Liliia (Vasyl Stefanyk Precarpathian National University)

Session Classification: main session 07/09/23

Contribution ID: 11

Type: **not specified**

Nanomaterials: Magic of Carbon

Thursday, 7 September 2023 11:00 (1h 30m)

Carbon. Allotropes.
Electronic structure of carbon.
Diamond. Properties.
Graphite. Properties.
Graphene. Unique properties. Crystal structure. Production.
Obtaining graphene oxide.
Carbon nanotubes. Properties. Synthesis.
Fullerenes. Properties. Application. Synthesis.

Presenter: Prof. BOICHUK, Volodymyra (Vasyl Stefanyk Precarpathian National University)

Session Classification: main session 07/09/23

Contribution ID: 12

Type: **not specified**

Introduction to Deep Learning and Nanotechnology Applications

Thursday, 7 September 2023 13:30 (1h 30m)

1. Paradigm of AI (Current Advancements): Slides: 15 minutes
2. How to think about neural networks (Slides): 15 minutes
3. Images = Matrices (+ what is Convolution?): 20 minutes
4. Building your first neural network: 20 minutes (Hands-On)
5. Can your network identify simple images?: 20 minutes (Hands-On)
6. Complex Network == Complex Tasks: 30 minutes (Hands-On)

Presenter: BHATTACHARYYA, Saptashwa (University of Nova Gorica)

Session Classification: main session 07/09/23

Contribution ID: 13

Type: **not specified**

Business strategies in high-innovation potential areas

Friday, 8 September 2023 09:00 (1h 30m)

This course aims to equip students with knowledge and skills in business strategy development and management process of its implementation in high-innovation potential areas (Nanotechnology, Industry 4.0, Artificial intelligence). This course focuses on strategic analysis, strategic planning, developing and implementing strategies.

- Paradigm of Business strategies in high-innovation potential areas (Slides): 30 minutes
- Key methods in strategic analysis in high-innovation potential areas (Slides): 30 minutes
- Workshop (team work) on strategic analysis in high-innovation potential areas (Team 1 - Nanotechnology, Team 2 - Industry 4.0, Team 3 - Artificial intelligence): 30 minutes (Hand-On)
- Creation vision, mission, objectives and road map in startups in high-innovation potential areas (Slides): 30 minutes
- Workshop (team work) on creation vision, mission, objectives and road map in start-up in high-innovation potential areas (Team 1 -Nanotechnology, Team 2 - Industry 4.0? Team 3 - Artificial intelligence): 30 minutes (Hand-On)
- Building a business model canvas for startups in high-innovation potential areas (Slides): 30 minutes
- Workshop (team work) on building a business model canvas for startups in high-innovation potential areas (Team 1 -Nanotechnology, Team 2 - Industry 4.0? Team 3 - Artificial intelligence): 30 minutes (Hand-On)
- Team presentation of the results of Business strategies in high-innovation potential areas (Team 1 -Nanotechnology, Team 2 - Industry 4.0, Team 3 - Artificial intelligence): 60 minutes

Presenter: Prof. YAKUBIV, Valentyna (Vasyl Stefanyk Precarpathian National University)

Session Classification: main session 08/09/23

Contribution ID: 14

Type: **not specified**

Digital interpretation of cultural heritage

Friday, 8 September 2023 11:00 (45 minutes)

Digital interpretation of cultural heritage and its potentials (Slides): 15 minutes

- How a 3D model is made (Slides): 15 minutes
- Making a simple 3D model with a mobile phone (Hands-On): 15 minutes
- New media for 3D digital interpretation – from AR, to VR, immersive technologies and metaverse (Slides): 15 min
- Narrating a heritage story with digital technologies: 20 minutes (Hands-On)

Presenter: Prof. STRAUS, Matevž (Arctur d.o.o)

Session Classification: main session 08/09/23

Contribution ID: 15

Type: **not specified**

A case study of the application of Tourism 4.0 technology in Odesa, Ukraine

Friday, 8 September 2023 11:45 (45 minutes)

Overview of Odesa City as a tourist destination

- Organisation of tourism in Odesa
- Problems of tourism development in Odesa
- Application of Tourism 4.0 models to address these problems
- Results and discussion of the findings

Presenter: Prof. GORIUP, Paul (NGO Agricola)

Session Classification: main session 08/09/23

Contribution ID: 16

Type: **not specified**

Entrepreneurship and startup management

Friday, 8 September 2023 13:30 (2h 15m)

What is an entrepreneur? (Lecture)

- Approaches to the start-up phase (Lecture)
- The lean start-up approach in action (Hands-on)

Presenter: Prof. LAUTO, Giancarlo (University of Udine)

Session Classification: main session 08/09/23

Contribution ID: 17

Type: **not specified**

Innovation as a managerial challenge

Saturday, 9 September 2023 09:00 (2h 15m)

The lecture aims to present innovation as a major driver of competitiveness. It aims to describe different types of innovation. Additionally, the lecture aims to present some of the main activities a

company should manage in order to create a successful innovation.

- What is innovation? Different types of innovations
- Challenges of managing innovation

Presenter: Prof. TABACCO, Raffaella (University of Udine)

Session Classification: main session 09/09/23

Contribution ID: **18**

Type: **not specified**

Innovation on the field - real cases

Saturday, 9 September 2023 11:30 (1h 30m)

1. Art & Design Thinking - introduction: Slides: 15 minutes
2. Innovation management on DeepTech in SMEs and social enterprises: Slides: 15 minutes
3. Deep tech innovation cases in Slovenia: Slides: 15 minutes
4. Deep Tech innovation cases in big companies: Slides: 15 minutes
5. Building your own first DeepTech innovation case: 30 minutes (Hands-On)

Presenter: Mr MOKOREL, Simon (RRA North Primorska)

Session Classification: main session 09/09/23

Contribution ID: 19

Type: **not specified**

Data Modeling: From Relational Databases to Big Data _second part

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Session Classification: main session 05/09/23