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**Bioeconomy in the Circular Economy**

[www.masterbiocirce.com](http://www.masterbiocirce.com)

**THIRD EDITION  
2018-2019**

## MILANO BICOCCA MODULE

**Training objectives:** Participants will be provided with state-of-the-art knowledge about advanced technologies that are boosting modern Bioeconomy, in particular bioprospecting techniques, system and synthetic biology. The principal components of the whole industrial production chain will be described and analyzed, thus identifying technological needs and benefits arising from the paradigm shift to circular economy. All information needed to understand mechanisms behind a long lasting successful technology transfer will be provided.

**Course content:** Scientific and technological advances in next generation sequencing, systems and synthetic biology. Application of advanced biotechnologies to the production of metabolites, chemicals and novel biocatalysts. Case studies on the valorization of lignocellulose and waste materials into novel high-added value chains will be described. Special attention will be paid to the market needs and EU strategies, which novel production chains respond to. Examples of technological and business acceleration will be provided through business models. Project Management aspects will be addressed as well.

### Monday 21/1/2019. The Basics and Economics of Sustainability

**09.45 Danilo Porro.** UNIMIB (Dipartimento di Biotecnologie e Bioscienze). *Welcome.*

**10.00 Mario Bonaccorso.** FEDERCHIMICA\_ASSOBIOTEC. *Inside the world Bioeconomy.*

**11:00 Anna Monticelli.** INTESA SAN PAOLO. *Introduction to Circular Economy.*

13:00 Lunch and speakers corner

**14:00 Lucia Visconti Parisio.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *Sustainable economic growth.*

**15:00 Lucia Visconti Parisio.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *Market failures in the environmental economics and the reasons for policy intervention.*

**16:00 Lucia Visconti Parisio.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *Public business model and strategy (instruments and their impact on green development: regulation and market instruments).*

**17:00 Lucia Visconti Parisio.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *Bioeconomy and Circular Economy as new paradigms of economic development: contributions to GDP and employment across the EU.*

### Tuesday, 22/1/2019. The Economics and Management of new Industries and Start-ups (Part A)

**09:00 Salvatore Torrasi.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *Innovation as a public good: externalities, market failures and public policy.*

**09:30 Salvatore Torrisi.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *Protection of innovation: trade secrets, patents and other instruments.*

**10:30 Salvatore Torrisi.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *The origin and management of technology startups.*

**11:30 Salvatore Torrisi.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *Startups' business model and strategy.*

13:00 Lunch and speakers corner

**14:00 Maria Garbelli.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *The analysis of a startup's external environment.*

**15:00 Maria Garbelli.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *Competitive environment.*

**16:00 Maria Garbelli.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *Competitors' behavior.*

**17:00 Maria Garbelli.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *Other competitive forces.*

### **Wednesday 23/1/2019. The Economics and Management of new Industries and Start-ups (Part B)**

**09:00 Elisa Arrigo.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *Marketing of new business ideas.*

**09:30 Elisa Arrigo.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *Strategic marketing.*

**10:30 Elisa Arrigo.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *Operational marketing.*

**11:30 Elisa Arrigo.** UNIMIB (Dipartimento di Economia, Metodi Quantitativi e Strategie di Impresa). *Market-driven management. Strategic and operational marketing.*

13:00 Lunch and speakers corner

### **Wednesday 23/1/2019. Bioeconomy in Action (Part A)**

**14:00 Monica Delsignore.** UNIMIB (Dipartimento di Giurisprudenza). *Waste treatment and environmental certification as key issues in Bioeconomy.*

**15:00 Maurizio Bettiga.** CHALMERS UNIVERSITY OF TECHNOLOGY GOTHENBURG (S). *Biomass conversion technologies, an overview.*

**16:00 Massimo Labra.** UNIMIB (Dipartimento di Biotecnologie e Bioscienze). *Bioprospecting.*

**17:00 Emenuale Ferri.** TRUSTICERT Srl. *Case study from the private side.*

20:00 Dinner and speakers corner

### Thursday 24/1/2019. Bioeconomy in Action (Part B)

**09:00 Maurizio Casiraghi.** UNIMIB (Dipartimento di Biotecnologie e Bioscienze). *Omic sciences as an advanced tool in Bioeconomy.*

**10:30 Elena Sacco.** UNIMIB (Dipartimento di Biotecnologie e Bioscienze). *Systems biology: concepts and perspectives in the Bioindustry.*

13:00 Lunch and speakers corner

**14:00 Paola Branduardi.** UNIMIB (Dipartimento di Biotecnologie e Bioscienze). *Synthetic Biology underpinning the construction of effective microbial cell factories.*

**16:00 Valeria Mapelli.** SACCO Srl. *Case study from the private side.*

### Friday, 25/1/2018. From the Green Chemistry to Industry (visit to Novamont)

**08:30** leaving for Novara

**09:45** Arrival of participants and welcome coffee

**10:15 Federica Mastroianni** (Corporate Communication Manager) and **Alberto Fragapane** (Study Center). *Novamont's welcome and introduction to the company.*

**10:45 Fernanda Farachi** (Certification and Regulatory Affairs). *Bioplastics: definitions, compostability vs renewability, certification schemes.*

**11:15 Roberto Vallero** (Polymer Synthesis Lab, Bioplastics area, R&D Department). *R&D in the circular bioeconomy.*

**11:45 Alessandro D'Elcio** (Chemical Technologist, Bioplastics Area, R&D Department). *When chemistry meets agriculture and the environment*

**12:15 Stefano Mambretti** (Market Developer Waste Management). *The quality management value chain of organic waste.*

**12:45** Lunch and speakers corner (Novamont's canteen)

**13:45 Alessia Pilone** (Polymer Synthesis Lab, Bioplastics area, R&D Department). *Visit to R&D laboratories.*

**15:00** Group picture and end of business

**17:00** End of business - End of Milan Module.

## NAPOLI FEDERICO II MODULE

**Training objectives:** aim of the module is to provide updates regarding advanced technologies for the industrial applications of enzymes and microbial cells as "cell factories". The activities will be focused on: i) the use of enzymes as additives and processes ancillaries for the production of products of industrial interest; ii) the strategies to optimize and exploit the productive potential of

the microorganisms. The module also deals with the identification and analysis of the opportunities available for a new venture, focusing on the research for entrepreneurial initiatives (academic and not) aimed at commercializing research outcomes. Aim of the course is to equip learners with the theoretical and practical tools for the recognition and structuring of innovative business ideas.

**Course content:** The course focuses on scientific and technological issues regarding the potential of biotechnological processes based on enzyme systems and wild-type or recombinant microorganisms; industrial case studies will be presented. During the course, the essentials of strategic and operational management of new research entrepreneurial initiatives will be presented, as well as the mechanisms for recognition of new business initiatives. Thanks to the tools provided, learners will be able to model a business idea and to evaluate it from a strategic and financial point of view.

### **Monday 11/2/2019. Bioeconomy in the Campania Region**

**Aula del Consiglio, Scuola Politecnica e delle Scienze di Base - Piazzale Tecchio 80, Napoli**

- 09.00** **Piero Salatino**, President of the Scuola Politecnica e delle Scienze di Base  
**Giovanni Sannia**, President of the Master BIOCIRCE  
**Vito Grassi**, President Unione Industriali Napoli,  
*Welcome in Naples and introduction to the Naples Module.*
- 09.30** **Valeria Fascione**, Assessore internazionalizzazione, Start up - Innovazione, Regione Campania  
*Politiche e strategie regionali in materia di bioeconomia*
- 10.15** **Marco Moracci**, Unina.  
*IBISBA A new Research Infrastructure in Industrial Biotechnology*
- 10.30** **Lucia Gardossi**, Unitrieste.  
*European Bioeconomy and bio-based industry: opportunities and challenges of the new value chains*

### **Monday 11/2/2019. Enzymes, proteins and microbial cell factories for biotechnological applications**

- 12.00** **Marco Moracci**, Unina.  
*Carbohydrate active enzymes in biorefineries.*
- 13:00 Lunch and speakers' corner
- 14.30** **Antonio Marzocchella**, Unina.  
*Cell factories for bio-commodity production: productive potentiality and market potential.*
- 16.00** **Chiara Schiraldi**, UniVanvitelli.  
*Metabolic engineering and Biotechnological processes to boost production of building blocks of industrial interests: patent overview and case studies.*

### **Tuesday, 12/2/2019. Industrial case studies**

**Aula del Consiglio, Scuola Politecnica e delle Scienze di Base - Piazzale Tecchio 80, Napoli**

- 09.00 Rudy Parton**, GFBiochemicals.  
*Biochemicals: strategies to conquer the market, historical case studies & Approach of GFB.*
- 11.00 Alessia Guarnaccia**, Pandora Group Srl.  
*Life-cycle as value, a circular economy experience*
- 12.00 Vincenzo Lettera**, Biopox.  
*Biopox enzymatic systems: turning research into business opportunities*
- 13.30 Lunch and speakers' corner
- 14.30 Donato Giovannelli**, Nano-Tech.  
*Nano-Tech Spa: from business idea to industry*
- 15:30 Guido Alfani**, Endura.  
*Switching to Circular – La prospettiva di una media impresa italiana*
- 16.30 Domenico Centrone**, Eggplant.  
*EggPlant: setting-up a business on bioplastic from wastewater*

**Wednesday 13/2/2019. The Novamont Piana di Monteverna laboratories**

**The Novamont Piana di Monteverna laboratories, Caserta**

- 09.00** Bus transfer to Piana di Monte Verna
- 10.00 Maria Dani**, Novamont.  
**Welcome to the students**
- 10.30 Rosa Turco**, Unina.  
*Green Chemistry and Biotechnology*
- 11.00 Antonio Marzocchella**, Unina.  
*Biotechnology for a sustainable energy.*
- 12.00 Mario Malinconico**, Istituto per i Polimeri, Compositi e Biomateriali, CNR.  
*The industrial scenario of bioplastics*
- 13.30 Lunch and speakers corner
- 14.30 Visit to the Novamont Laboratories**
- 17.00** Bus transfer from Piana di Monte Verna to Napoli

**Thursday 14/2/2019. Production and characterization of bioplastics: case studies**

**Sala del Consiglio, Department of Chemical Sciences, via Cinthia, 4, Napoli**

- 09.00 C. Valeria L. Giosafatto**, Unina.  
*Plastics vs Bioplastics: characterization of novel biomaterials for tailored applications*
- 10.30 Cinzia Pezzella**, Unina.  
*Sustainable strategies for biomaterial production*
- 12.00 Laboratory demonstration**
- *Production and purification of microbial biopolymers: designing a bioprocess*
  - *Experimental determination of bioplastic main properties*
- 13.30 Lunch and speakers corner

#### Thursday 14/2/2019. How to develop a new company

**14.30 Marco Leonetti di Santojanni**, Campania NewSteel.

*Business creation approach part 1: Analysis of processes, tools and methods to create a Business Model; how develop a Business Plan for a startup; the Business Model Canvas; Practical cases; How to reach the customer; Customer Relationships; Revenue Streams; Key Resources; Key Activities; Key Partners.*

**16.00 Marco Leonetti di Santojanni**, Campania NewSteel.

*Business creation approach part 2: Setting of the Business Model Canvas and identification of the key resources; Primary evaluation of economic feasibility; Primary determination of financial needs.*

#### Friday, 15/2/2019. How to develop a new company

**Aula del Consiglio, Scuola Politecnica e delle Scienze di Base - Piazzale Tecchio 80, Napoli**

**9.00 Nadia Di Paola**, Unina.

*Communicating the business idea: the elevator pitch.*

**11.30 Giuseppe Meli**,

*Business acceleration tools: incubators, accelerators, universities.*

**13.30** Lunch and speakers corner

**14.00 Roberto Vona**, Unina.

*From ideas to entrepreneurial applications, technology transfer and entrepreneurial development.*

**16.00 Luigi Iavarone**, Iavarone Wood Technology.

*A business testimony.*

**17.00 Amedeo Lepore**, UniVanvitelli, Ufficio Presidenza SVIMEZ.

*L'evoluzione della bioeconomia e dell'economia circolare, come opportunità per lo sviluppo del Mezzogiorno*

**18.00** Group picture and end of business

## UNIVERSITY OF TORINO - MODULE

**Training objectives:** The module aims to update participants on new regulations on access to genetic resources and the possible sharing of the benefits derived from them. It will also present some examples of valorization of the processing industry by-products. The educational objective of the teaching is to present actors of the capital market operating in innovative projects funding and to provide communication tools to succeed in new businesses; furthermore the module provides an illustration of the principles and operation of Economic – financial and sustainability report.

**Course content:** The module aims to update participants on new national and international regulations governing access to genetic resources and the fair and equitable sharing of benefits derived from them in the event of commercial exploitation. In the second part of the scientific

module the exploitation of by-products of the processing industry as a crucial step to the sustainability of supply chains will be addressed. Some industrial case studies will be presented. During the course different figures of investors will be presented illustrating investment model and procedures also involving evidences and cases. Beside it will be presented how to approach to an integrated model of communication for knowledge transfer and start up. Finally reporting models and major economic and financial key performance indicators and sustainability indicators international guidelines will be presented.

### **Monday, 11/3/2019. Welcome in Torino and introduction to the Torino Module**

**9.30: Prof. Silvio Aime**, President Incubator 2i3T e Vice Rector for Research of the University of Torino

*Access and Benefit sharing of genetic resources*

**10.00 Avv. Valentina Veneroso**, Studio Legale Anello&Partners.

*Utilization and management of genetic resources. An overview on access and benefit sharing rules: the Convention of Biological Diversity and the Nagoya Protocol:*

13.00 Lunch and speakers corner

**14.00 Prof. Giovanna Cristina Varese**, Unito.

*The effect of Nagoya Protocol on research*

**15.00 Prof. Laura Gasco**, Unito.

*Circular economy: the insect opportunity.*

**17.30 Dott. Daniela Marchis**, IZSTO.

*Identification of insects in feed and food.*

### **Tuesday, 12/3/2019. Integrated reporting: sustainability report**

**9.00 Riccardo Beltramo**, Unito

*Sustainability report as company value*

**11.00 Enrica Vesce**, Unito

*Industrial ecology and EEIA (Ecologically Equipped Production Areas)*

13.00 Lunch and speakers corner

**14.00 Claudia Pescitelli**, 2i3T

*Integrated model of communication for knowledge transfer and start ups; Evidences and experiences in communication*

### **Wednesday , 13/3/2019. Integrated Valorization of by-products**

**8.00 Laura Gasco**, (Unito)

*Visit to the STROPPIANA ORTOFRUTTICOLI S.P.A. - (Rif. Gasco L.) e Cascina del DISAFA a Carmagnola*

**14:30 Giuseppe Tresso**

*Visit to the BEF BIOSYSTEMS - Cascina Razza di San Carlo - Casalnoceto (Alessandria)*

**Thursday, 14/3/2019. Integrated reporting: economic-financial report**

**9.00 Maria Febronia Sciacca**, Incubator 2i3T  
*Start Up Business Plan*

13.00 Lunch and speakers corner

**14.00 Max Tellini**, Head of Circular Economy Circular Economy Unit, Intesa Sanpaolo Innovation Center Team  
*Visit to Intesa Sanpaolo headquarters Finance in CE - Open Innovation – Business Modeling – Elevator pitch simulation*

**16:00 Maurizio Perello**, Intesa Sanpaolo  
*Visit of the building (Leed Platinum certificate)*

20:00 Social dinner

**Friday , 15/3/2019. Funding and start up evaluation: Business Angel, Venture Capital, Corporate Venture**

**08.30 Roberto Schiesari**, Unito  
*Investors and start up evaluation*

12.30 Lunch and speakers corner

**13.30 Prof. Roberto Schiesari**, Unito  
*Term sheet model: terms and conditions of the investment agreement*

**15.00 Giuseppe Serrao**, 2i3T  
*Meeting with Bioentrepreneurs*

**17.00** *Conclusions, evaluation, test assignment*

## **UNIVERSITY OF BOLOGNA - MODULE**

**Training objectives:** The module aim is to provide students with basic knowledge of industrial biotechnological process to sustain bioeconomy in different fields of application, including agrifood and nutraceuticals, plant genetics improvement, marine and environmental biotechnology for the production of bio-based products for industrial applications. A further goal of the course is to describe the economic characteristics and related technical bases of primary production of raw materials for the bioeconomy. It includes the ability of understanding essential economic statistics and the mechanisms of reaction of the sector to markets and policies.

**Course content:** Design, optimization and scale up of bioreactors. Case studies of bioproductions. Main unit operations involved in downstream processing. Biotechnological production of nutraceuticals. Introduction to plant breeding with emphasis on biotechnological approaches

(marker-assisted selection - MAS -, genetic engineering, genome editing). Multipurpose biorefineries for the integrated valorization of food-processing by-products and surplus into food ingredients, biomaterials, bio-based chemicals and biofuels. Biosurfactants, enzymes and bioactive compounds produced by marine bacteria and their applications. Main characteristics of the supply of raw materials in the bioeconomy. Main characteristics of the demand of raw materials in the bioeconomy. Market structures. Forms of integration and organization: chains, contracts, districts, international markets. Bioeconomy policies. Specificity of the concept of efficiency and of the mechanisms of innovation.

**Venue:** *Sala Riunioni, 1° piano Dip. FaBiT, Via Belmeloro 6*

### **Monday 1/4/2019. Industrial Bioprocess**

**9:00 Patrizia Brigidi**, Master BIOCIRCE

*Welcome in Bologna and introduction to the Bologna Module*

**9.15 Noura Raddadi**, UniBo

*Marine and environmental Biotechnology*

*Cell factories for bio-commodity production: productive potentiality and market potential.*

**11:00 Fabio Fava**, UniBo

*European and Italian Bioeconomy: state of play and opportunities*

13:00 Lunch and speakers corner

**14.30 Lorenzo Bertin**, UniBo

*Valorization of agrifood byproducts and waste*

**16.30 Silvio Salvi**, UniBo

*Plant genetic improvement for sustainable bio-economy*

### **Tuesday, 2/4/2019.**

**9:00 Cristiana Boi**, UniBo

*Industrial process Technologies*

**11:00 Cristiana Boi**, UniBo

*A case study: from research to process*

13:00 Lunch and speakers corner

**14.30 Alessandro Tugnoli**, UniBo

*Safety and sustainability issues in bioeconomy processes*

**16:00 Augusto Bianchini**, UniBo

*Bioeconomy in the circular economy*

### **Wednesday 3/4/2019. Economics of primary production in the bioeconomy**

**9:00 Davide Viaggi**, UniBo

*Economics of primary production in the bioeconomy*

**10.30 Davide Viaggi**, UniBo

*Economics of primary production in the bioeconomy*

13:00 Lunch and speakers corner

**14.30 Davide Viaggi, UniBo**

*Demand of raw materials for the bioeconomy: trends of the main bio-based sectors and related needs of biomass, prospectives and scenarios*

**16.30 Marco Candela, UniBo**

*Microbiomes circulations in food industry*

#### **Thursday 4/4/2019.**

**9.00 Patrizia Brigidi, UniBo**

*Bioeconomy and food industry*

**10.00 Silvia Buzzi, Caviro**

*Vine supply chain: a case study*

**11:00 Vittorio Zambrini, Granarolo**

*Dairy supply chain: a case study*

**12:00 Giovanni Sorlini, Inalca**

*Meat supply chain: a case study*

13:00 Lunch and speakers corner

**14.30 Silver Giorgini, Orogel**

*Veg supply chain: a case study*

**16:00 Davide Viaggi, UniBo**

*Forms of integration and organisation of the bioeconomy: market structure, contractualisation, vertical and horizontal integration in the bioeconomy; specificity of the concepts of efficiency and mechanisms of innovation in the bioeconomy chains.*

#### **Friday 5/4/2019.**

**9.00 Davide Viaggi, UniBo**

*Forms of integration and organisation of the bioeconomy: market structure, contractualisation, vertical and horizontal integration in the bioeconomy; specificity of the concepts of efficiency and mechanisms of innovation in the bioeconomy chains*

**10.30 Davide Viaggi, UniBo.**

*Policies for the bioeconomy: policy instruments; main economic features of EU and national policies, interaction with agricultural and environmental policies.*

13:00 Lunch and speakers corner

**14.30 Visit to Food for the future**

