



Bioeconomy in the Circular Economy

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**FOURTH EDITION
2019-2020**

UNIVERSITY OF BOLOGNA IV MODULE

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*

THE PROGRAMME

Monday 16/11/2020. Primary production in the bioeconomy: economics and sustainability

- 9 **Patrizia Brigidi** (UniBo), Master BIOCIRCE
Welcome in Bologna and introduction to the Bologna Module
- 9.15 **Davide Viaggi** (UniBo), Economics of primary production in the bioeconomy
- 11 **Davide Viaggi** (UniBo), Economics of primary production in the bioeconomy
- 13 Lunch
- 14.30 **Silvio Salvi** (UniBo), Plant genetic improvement for sustainable bio-economy
- 16.30 **Marco Candela** (UniBo), Microbiomes circulations in food industry

Tuesday, 17/11/2020.

- 9 **Giulio Zanaroli** (UniBo), Valorization of agrifood byproducts and waste
- 11 **Noura Raddadi** (UniBo), Marine and environmental Biotechnology. Cell factories for bio-commodity production: productive potentiality and market potential.
- 13 Lunch
- 14.30 **Davide Viaggi** (UniBo), Demand of raw materials for the bioeconomy: trends of the main bio-based sectors and related needs of biomass, perspectives and scenarios
- 16.30 **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

Wednesday 18/11/2020. Industrial Bioprocess

- 9 **Davide Pinelli** (UniBo), Industrial process Technologies
- 11 **Davide Pinelli** (UniBo), Bioproduction: case studies: From research to process
- 13 Lunch
- 14.30 **Francesco Capozzi** (UniBo), The Foodomics link between industrial research and innovation

16.30 Augusto Bianchini (UniBo), Bioeconomy in the circular economy

Thursday 19/11/2020.

9.00 Alessandro Tugnoli (UniBo), Safety and sustainability issues in bioeconomy processes

11 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

13 Lunch

14.30 Patrizia Brigidi (UniBo) and **Simone Maccaferri** (UniBo). European Bioeconomy University and other Bioeconomy Initiatives

16.30 Fabio Fava (UniBo), European and Italian Bioeconomy: state of play and opportunities

Friday 20/11/2020. Industrial case studies

9.00 Patrizia Brigidi (UniBo), Bioeconomy and food industry

Silvia Buzzi (Caviro), Vine supply chain: a case study

Giovanni Sorlini (Inalca), Meat supply chain: a case study

13 Lunch

14.30 Silver Giorgini (Orogel), Veg supply chain: a case study

Emanuela Donati (Granarolo) Dairy supply chain: a case study (tbc)