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| **Subject** | **FOOD BIOTECHNOLOGY** | | |
| **Type** | **Semester ECTS Code** | |
| OBLIGATIVE (O) 4 4 130FBIO253 | | |
| **Course Lecturer** | **Prof. Ass. Dr. Arianeta Nura, Prof. Asst. Dr. Vese Pakashtica** | | |
| **Course Assistant** |
| **Course Tutor** |
| **Aims and Objectives** | The aim of the Food Biotechnology course is to provide students with basic knowledge about the application of Biotechnology in the food industry. Understand the basics of fermented food production and all new biotechnological strategies to obtain new food products and transform food products. This course provides students with content and activities through which they will acquire skills necessary for their professional development.  Objectives of the course - Obtaining basic theoretical knowledge in the field of microbiology such as: microbial growth and controle, microorganisms involved in fermentations (lactic acid bacteria, yeasts, molds). Potential microbiological hazards in fermented foods. Alcoolic fermentation at beer and wine, products of plant origin, fermentation of bread dough and acetic fermentation, fermentation of products of animal origin (yoghurt, cheese), fermented meat products. Knowledge of fermentation technology and design of bioreactors. Acquaintance of students with the technological lines of fermentation industries through visits and practical work. | | |
| **Learning outcomes** | **Students will be able to:**  - Understand how the basic theoretical concepts are applied in the practical terms,  - Understand factors related to probiotic technology  - Describe basic principles of fermentation  - Describe how fermentation can deliver nutrition  - Assess the positive sides of the biotechnology and understand the market economy in relation to biotechnological activities, as well as understand and interpret biotechnological literature.  - Recognize and discuss the various problems in the field of food biotechnology.  - Have a critical thought on the role of food biotechnology in today's world  - To conduct experiments in the field of microbiological analyzes of foods (probiotics, yeasts, molds).  - To carry out experiments in the field of fermentation of bread.  - To carry out experiments in the field of fermentation of beer and wine. | | |
| **Content** | **Weekly plan Week** | | |
| Introduction. Development and importance of biotechnology. | | 1 |
| Biological Characteristics of Microorganisms - Bacteria, Fungi,  Strain Improvement, Microbial Growth and Control. | | 2 |
| Microorganism cultivation systems | | 3 |
| Microorganisms involved in fermentation – lactic bacteria. | | 4 |
| Microorganisms involved in fermentation – Yeasts and molds | | 5 |
| Products of microbial origin and potential microbiological hazards in  fermented foods | | 6 |
| **Presentation of seminars** | | 7 |
| Alcoholic fermentation (beer) | | 8 |
| Alcoholic fermentation (wine) | | 9 |
| Fermentation of products of plant origin - fermentation of bread  dough and acetic fermentation. | | 10 |
| Fermentation of products of animal origin (jogurt, cheese) | | 11 |

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|  | Fermented meat products | 12 |
| Fermentation technology and design of bioreactors | 13 |
| **Presentation of case studies (group projects)** | 14 |
|  | **Final exam** | 15 |
| **Literature/References** | * - Perry Johnson Green-Introduction to food biotechnology, Canada 2018   - Kristaq Sini: Bioteknologjia Ushqimore, Tiranë, 2011  - Kasamedin Abdullai: Bioteknologjia e fermentimeve-dispensë, Tetovë, 2006.  - Y. Hoxha & K. Abdullai: Fiziologjia e bimëve-dispensë, Prishtinë, 2005.  - Efigjeni Kongjika, Zhneta Zekaj, Elvira Caushi, Iliriana - --  - StamoBioteknologjia e bimëve-Kulturat “in vitro”, Tiranë, 2002.  - Senadin D., Lejla D.: Prirucnik za rad u mikrobioloshkom laboratoriju, Zagreb, 1997.  - K.Abdullai: Fiziologjia e bimëve (dispensë-ptaktikum), Prishtinë, 2005.  - A. Salillari, Sh Fetahu, S. Aliu, L.Susaj: Bioteknologjia, Tiranë, 2002. | |
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