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| **Subject**   | **FOOD MICROBIOLOGY**  |
| **Type**   | **Semester**  | **ECTS**  | **Code**  |
| **OBLIGATIVE (O)**   | **3**  | **5**  | 130FM201  |
| **Course Lecturer**  | **Arianeta Nura, Prof. Ass. Dr. , IbrahimMehmeti Prof. Asoc. Dr.** |
| **Course Assistant**  | **Luljeta Ajdini, Mr.Sc**  |
| **Course Tutor**  |   |
| **Aims and Objectives**  | In the Food Microbiology course, students will gain knowledge about microorganisms important for food safety and spoilage. The aim of the course is: the development of theoretical and practical knowledge related to recognition of the characteristics of pathogenic microorganisms and their role in food spoilage and human health. Objectives of the course - students to gain knowledge on: history and origin of microorganisms in food products˒ conditions of microbial growth in food˒ microorganisms of food importance˒ cultivation methods, microscopy and sampling methods˒ physical, chemical and immunological methods˒ microbiology of water, milk and its by-products, meat, fish, eggs and their by-products, microbiology of fruits, vegetables, grains, intoxications and toxic infections, mycotoxins, vibriosis˒ protozoans, viruses and parasites˒ methods of eliminating and inhibiting microorganisms˒ hygiene in prevention of food spoilage and poisoning.  |
| **Learning Outcomes**  | * Understand the principles involving food preservation via fermentation processes

understand the role and significance of microbial inactivation, adaptation and environmental factors (i.e., Aw, pH, temperature) on growth and response of microorganisms in various environments  * To know the mechanisms of food spoilage and methods to control spoilage
* To understand the principles that make a food product safe for consumption
* To be able to apply the principles of food science to control and assure the quality of food products
* To be able to identify the conditions, including sanitation practices, under which the important pathogens and spoilage microorganisms are commonly inactivated, killed or made harmless in foods
* To work effectively with others individually and/or in groups
* To independently research scientific and non-scientific information and to realize group projects.
* To define and use the principles of sampling and sample relationships in microbiological analysis
* To assess the microbiological quality of foods with qualitative and quantitative microbiological analyzes
* To be able to identify the important pathogens and spoilage microorganisms in foods and the conditions under which they will grow.
* To be able to identify the conditions under which the important pathogens are commonly inactivated, killed or made harmless in foods.
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| **Content**  | **Weekly plan**  | **Week**  |
| Introduction. History of Microorganisms  Research in Foods. The origin of microorganisms in food products.   | 1  |
| Conditions of reproduction of microorganisms in foods. Foodstuffs                                Microorganisms    | 2  |
| Methods of cultivation, microscopy and sampling. Physical, chemical and immunological methods.   | 3  |
| Drinking water microbiology - Milk and its by-products                                                  | 4  |
| Meat and its by-products.                                                                                                   | 5  |
| Fish and its By-Products. Poultry Meat. Eggs and their by-products                                | 6  |
| **Presentation of seminars**  | 7  |
| Fruits and vegetables. Unfermented refreshments. Mixed food products. Mixed food products (herbivores, flours and dough products).   | 8  |
| Contamination of food, Intoxications and Toxi-nfections   | 9  |
| The main problematic genes of microbes that cause intoxications and  toxic infections.   | 10  |
| Pathogenic microorganisms – vibriosis, parasites˒ viruses˒ protozoans˒ mycotoxins.  | 11  |
| Methods of elimination and inhibition of microorganisms                                         | 12  |
| Hygiene in preventing food spoilage and poisoning                                                         | 13   |
| **Presentation of case studies (group projects)**  | 14  |
|   | **Final exam**  | 15  |
| **Literature/References**  | -     Michael P. DOYLE and Robert L. BUCHANAN (2013) Food Microbiology –   Fundamentals and Frontiers 4th edition -     Kristaq SINI (2011): Mikrobiologjia ushqimore dhe higjiena -     Bizena BIJO( 2007): Leksione te shtypura -     Kristaq SINI , Bizena BIJO( 2003):Manuali i Mikrobiologjise Ushqimore dhe Higjienes -     G. TIECCO; Microbiologjia degli alimenti do origine animale; -     R. BUTTIAUX; The microbiology of fish and meat curing brines -     Standart methods for examination of dairy products -     W.C. FRAZIER; Food microbiology -     B.M. GIBBS e bp: Identification methods for microbiologist -     G. MANOVANI : Ispezione degli alimenti i origine animale -     G. PENSA: I prodotti della pesca -     H. RIHEMAN: Food –borne infections and intoxications -      O. VERONA e bp: Microbiologia degli alimenti   |
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