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| **Course**   |  **FOOD CHEMISTRY AND BIOCHEMISTRY**   |
| Type   | Semester  | ECTS  | Code  |
| OBLIGATIVE (O)   | 4  | 5  |  130CBIO251 |
| **Lecturer**  | Valon DURGUTI, PHD  |
| **Course assistant**  |   |
| **Aims and objectives**  | Course content: Description of chemical and biochemical properties and function of ingredients in food: Carbohydrates, proteins, lipids, water, colors, aromatic compounds, vitamins and minerals. Chemical composition, structure, biochemistry and quality of important foods: fruits, vegetables, meat/fish, bread, milk. Quality degradation processes in foods. Oxidation of foods and mechanisms of action of antioxidants. Physiologically active ingredients of foods. Food microbiology, food hygiene, food borne diseases. Toxins, heavy metals. Additives and supplements. Chemical preservatives.  Objectives: * Gaining basic scientific knowledge related to chemistry and biochemistry of major food ingredients, such as proteins, carbohydrates, lipids and structural components, as well as in the field of minor food ingredients - bitter, vitamins, colorants, flavorings, flavoring substances and additives.
* Knowledge of basic laboratory techniques related to the qualitative and quantitative analyzes of the main food organic and inorganic compounds.

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|  **Learning Outcomes**  | Upon successful completion of the course students will:  * Articulate the molecular, macro, symbolic composition and chemical structure of macro- and micro-nutrients such as carbohydrates, fats, proteins, vitamins, minerals, and additives found in food;
* Explain properties and reactions of carbohydrates, lipids and proteins during storage and processing of food and how these influence the quality and properties of the food. Explain the importance of water for stability and quality of foods.
* Apply food chemical concepts to laboratories and industry-related issues
* Correctly interpret data obtained from chemical analysis techniques to qualitatively and quantitatively determine food components;
* Can read and understand relevant literature on a selected topic and present it in the form of a poster or seminar.

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| **Course Content**  | **Course Plan (Lectures)**  | **WEEK**  |
| Syllabus Treatment - Carbohydrates and Food   | 1  |
| Lipids, Fats, Oils and Food   | 2  |
| Amino Acids, Peptides, Proteins and Food   | 3  |
| Vitamins and Food  | 4  |
| Enzymes and Food Industry   | 5  |
| Nucleic Acid and Foods (molecular and biotechnological aspects)  | 6  |
| Problem-based learning (Determination of Students Tasks)  | 7  |
| Food Oxidants and  Mechanism of Antioxidants Action  | 8  |
| Bioactive Physiological Food Ingredients and Dietary Supplement  | 9  |
| Additives and Food Contaminants   | 10  |
| Biochemistry of Meat and Milk  | 11  |
| Biochemistry of Egg and Honey   | 12  |
| Biochemistry of Fruits, Cereals and Fermented Foods   | 13  |
| Presentation and Evaluation of Student Tasks  | 14  |
| **Final exam**  | 15  |
| **Literature/References**  |  1. K.Simpson, B. (2012): *Food Biochemistry and Food Processing*, ISBN: 978-0-8138-0874-1.
2. Yildiz.F. (2010): *Advances in Food Biochemistry*, ISBN: 978-0-8493-7499-9.
3. Fennema, O. R. (2008). *Food Chemistry*-Fourth Edition. Marcel Dekker, Inc., New York, USA, 1144 p.
4. Hui.Y.H. (2006): *Food Biochemistry and Food Processing*, First Edition, ISBN: 978-0-8138-0378-4.
5. Troja R (2006). *Kimia dhe Teknologjia Ushqimore*. Shtypshkronja M. Duri e re..
6. Fidanza F. (2005). *Alimentazione e Nutrizione Umana*” Idelson Gnocchi.
7. Fellows P.J. (2003). *Food Processing Technology*. Sec Ed, CRC Press Boca Raton USA, ISBN: 0- 8493-0887-9.
8. DeMan J. M. (1999). *Principles of Food Chemistry*. Aspen Publishers, Gaithersburg, Maryland, USA, 520 p.
9. Belitz H. D., Grosch W. (1999). *Food Chemistry.* Springer Verlag, Berlin, Germany, 992 p.
10. Troja R. (1997). *Sistemet dhe Ekulibrat Ushqimore*”, SHBLU.

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