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| **Subject**  | **WATER TECHNOLOGY**  |
| Type   | Semester  | ECTS  | Code  |
|  Elective (E)   | 4  | 4  | 130WT258  |
| Course Lecturer  | Prof. Ass. Veton Haziri; Prof. Ass. Arianeta Nura;; Ass. Luljeta Ajdini  |
| Course Assistant  |   |
| Course Tutor  |   |
| **Goals and Objectives**  | The course aims to provide students with basic knowledge about the role, content and types of water, outdoor water circulation; molecular, colloidal and coarse water dispersion; The Regulation of the Republic of Kosovo as well as the International Water Regulations; Basic Water Analysis (Determination of Cations, Anions, Gases, and Organic Substances); Aeration Process; Flocculation process, Coagulation and mechanisms, tools for flocculation, apparatus for Flocculation, theoretical calculation of the Flocculation process, Sedimentation processes, High degree decanters. Membrane Filtration processes, Micro-filtration, Ultra-filtration, Nano-filtration, Reverse osmosis working principle, Filter cleaning methods, Disinfection processes (chlorine and chlorine based tools, ozone, silver, UV radiation, ultra-filtration) disinfecting apparatus, calculation of chemicals needed during disinfection, Corrosion control, negative corrosion effects, Taste and odor control, causes of water tastes and odors, Hardness and water softening by thermal method, chemical, ion exchange method, complete desalt or demineralization of water.  |
| **Expected** **results**  | Upon completion of the course the student will be able to: * Identify different problems in the processes of processing and obtaining the main water product,
* Gets familiar about the principles and operation of the most widespread equipment in water technology at various stages in the process: Airing, Coagulation, Flocculation, Sedimentation, Filtering, Disinfection Corrosion control effects of taste and odor,
* Selects key equations for surface water, groundwater flow in the food processing industry,
* Gains knowledge of hardness and softening of water
* Monitors and resolves problems in the laboratory, physico-chemical, microbiological analysis

 1. Application of theoretical knowledge: - BSc program. (Outcome 1, 2, ): Possess and understand advanced knowledge in food chemistry, microbiology, engineering and sensory evaluation, using this understanding to create, process and preserve healthy, safe and quality food items up. - To apply advanced techniques, methods, tools and instruments in the processing, analysis and safety assessment of food products, ensuring compliance with food laws and regulations. 2. Evaluation and critical analysis: - BSc Program (Outcome 3, 4,5,6,7,8,9): Analyze, evaluate and interpret food science data, including research literature, ensuring that findings are innovatively and ethically communicated to an audience different, from colleagues to the general public. • Demonstrate understanding and technical competence in basic principles of nutrition, distinguishing between different food components and their health implications. • Organize and convey technical and relevant information effectively, orally and in writing, ensuring clarity and accuracy to a diverse audience, including supervisors, peers and customers. • Execute and lead research projects in food science, navigating the complexities of nutrition and exercise science, particularly when addressing ethical, cultural and environmental dimensions. • Interpret, compare and classify findings from food science research, ensuring that decisions and results conform to established standards and best practices. • Exercise autonomy and initiative in identifying health-related interactions between dietary nutrients and exercise, designing optimal dietary and exercise programs to maintain health. • Address and solve complex problems related to food processing, utilizing integrated knowledge from different fields of food science. 3. Development of practical skills: BSc Program (Outcome 7,8 and 9): • Interpret, compare and classify findings from water science research, ensuring that decisions and results conform to established standards and best practices. • Address and solve complex problems related to food processing, utilizing integrated knowledge from different fields of food science. 4. Evidence-based approach: BSc program (Outcome 9 and 10): • Address and solve complex problems related to food processing, utilizing integrated knowledge from different fields of food science. • Engage in continuous learning, staying up-to-date with the latest trends, challenges and innovations in the field of water science.   |
| **Content**  | **Weekly plan (Lessons)**  | **Week**  |
| Introduction, distribution of water in nature, types of water and their properties  | 1  |
| Regulation of the Republic of Kosovo as well as the international one on waters; basic water analysis   | 2  |
| Sampling. Airing process  | 3  |
| Coagulation and flocculation processes  | 4  |
| Sedimentation process  | 5  |
| Water softening Seminar (part 1)  | 6 7  |
| Surface and underground water filtration technologies  | 8  |
| Water disinfection process  | 9  |
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| Physical parameters of water  | 10  |
| Chemical parameters of water  | 11  |
| Microbial contaminants in drinking water. Pathogens and their removal.  | 12  |
| Evaluation of microbes in drinking water. Microbiology of bottled water  | 13  |
| Seminar (part 2)  | 14  |
| Final exam  | 15      |
|  **Literature/References**  |  * M. Mulder: Basic Principles of Membrane Technology, Kluwer Academic Publishers, 1996.
* N. F. Gray,Water Technology An Introduction for Environmental Scientists and Engineers, Elsevier, 2010
* Fatmir Agolli : Teknologjia kimike inorganike. Prishtinë.
* Agjensioni për  Mbrojtjen e Mjedisit të Kosovës: Gjendja e ujrave në Kosovë 2010
* Water Technology –by N,F,Gray . ISBN0750666331 – Publisher :Elsevier Science & Technology Books-pub . Date:May 2005

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