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| **COURSE IDENTIFICATION FORM** |
| **Course Code and Name:** SM-624 Oxidative Stress and Antioxidant Defense Mechanisms in Aquatic Animals | **Department of :** |
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| **Semester** |

 | **Theoretic Hour** | **Practice Hour** | **Total Hour** | **Credits** | **ECTS** | **Education Language** | **Type: Compulsory Elective** |
| Fall | 2 | 2 | 3 | 3 | 6 | Turkish | Optional |
| **Prerequisite (s)** |  |
| **Instructor** | Prof. Dr. Azime KÜÇÜKGÜL | **Mail : akucukgul@munzur.edu.tr** **Web :** |
| **Course Assistant** |  | **Mail :****Web :** |
| **Groups / Classes** |  |  |
| **Course Aim** | The aim of the course is to enable the course of free radicals and antioxidants describes the chemistry of free radicals, oxygen toxicity, reactive oxygen species (ROS) and mechanisms of production, oxidative stress, the mechanisms of damage to cellular targets by ROS and the repair of damage, the cellular antioxidant defense mechanisms against oxidative damage; the role of each individual antioxidant molecules, some diseases related with free radical injury and oxidative stress markers the students |
| **Course Goals** | * General information the chemistry of free radicals and to describe the biologically important radicals and non-radicals, the description the markers of oxidative stres and oxidative stress
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| **Course Learning Outs and Proficiencie*s*** | * Will learn the description of oxidative stress
* Will be able to learn general information about the development of oxidative stress
* Will be able to learn and understand the markers of oxidative stress
* Will be able to learn the antioxidant defense mechanisms against oxidative damage in fish
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| **Course Basic and Auxiliary Contexts** | * Smith C, Marks AD, Lieberman M. Marks, Basic Medical Biochemistry A Clinical Approach,second ed. Lippincott Williams and Wilkins;2005
* Halliwell B, Gutteridge JMC, Free Radicals in Biology and Medicine. Third ed.United States.Oxford University Press; 1999
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| **Methods of Give a Lecture** | Lecture, The relevant notes from application, Question-answer, Discussion, Individual study, Relevant web information |

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| **Assessment Criteria** |  | **If Available, to Sign (x)** | **General Average Percentage (%) Rate** |
| **1. Quiz** | **X** | **40** |
| **2. Quiz** |  |  |
| **3. Quiz** |  |  |
| **4. Quiz** |  |  |
| **5. Quiz** |  |  |
| **Oral Examination** |  |  |
| **Practice Examination (Laboratory, Project etc.)** |  |  |
| **Final Examination** | **X** | **60** |
| **Semester Course Plan** |
| **Week** | **Subjects** |
| **1** | General information about oxidative stress and antioxidant defense mechanisms and the terms  |
| **2** | Oxygen toxicity and reactive oxygen species (ROS), oxidative stress |
| **3** | ROS: the mechanisms of production |
| **4** | ROS: the mechanisms of damage to cellular macromolecules and repair of damage  |
| **5** | Membrane damage: lipid peroxidation  |
| **6** | Nitric oxide (NO) and reactive nitrogen species(RNS) toxicity |
| **7** | The cellular defense mechanisms against oxidative damage; antioxidant enzymes |
| **8** | Intermediate exam |
| **9** | Antioxidant defense: sequestration of metal ions  |
| **10** | Antioxidant vitamins, other exogenous and endogenous antioxidants  |
| **11** | The beneficial effects of ROS  |
| **12** | Free radicals, other reactive species and disease  |
| **13** | Markers of oxidative stress |
| **14** | Markers of oxidative stress in aquatic animal |