



## AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

|                                                  |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                      |                                                                              |   |                                  |   |            |   |
|--------------------------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------------------------------------------|---|----------------------------------|---|------------|---|
| Course Title                                     |   | Laboratory Techniques and Safety                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      |                                                                              |   |                                  |   |            |   |
| Course Code                                      |   | KZM103                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                      | Course Level                                                                 |   | Short Cycle (Associate's Degree) |   |            |   |
| ECTS Credit                                      | 4 | Workload                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 102 ( <i>Hours</i> ) | Theory                                                                       | 2 | Practice                         | 2 | Laboratory | 0 |
| Objectives of the Course                         |   | It has been proved statistically that a very low rate of accidents occurring in laboratories and production areas originate from technical errors and 85% from human errors. Lack of information about the substance being studied or not being shown the necessary attention and wrong habits play an important role in the accident. The other side, laboratories have great importance in chemistryIt is extremely important for students to be trained in laboratory work and techniques without starting laboratory work. The protection of the community and the environment is directly related to the individual behavior, knowledge and skills of the staff working in the laboratory. Our aim is to educate our students to learn about chemicals, hazards, safety precautions and protection methods and to inform them about working in a safe environment with less errors in their work and daily life and to have knowledge about the laboratory techniques to use in the field of chemistry. |                      |                                                                              |   |                                  |   |            |   |
| Course Content                                   |   | Basic principles and practices in ensuring a safe working environment, Classification of chemicals used in laboratories, Labeling, storage and usage information, Labeling, material safety data (MSDSs), Safety equipment: personal protective equipment, Storage and disposal of waste chemistries chemicals that should not be in contact with each other, Laboratory accidents and first aid emergency medical operations: selection, preparation, use of first aid / necessary tools, equipment, materials, equipment and protective equipment, introduction, functions, cleaning of glassware, Establishment of basic laboratory procedures and devices, Execution and termination of reactions and purification techniques, Separation techniques and chromatographic introduction                                                                                                                                                                                                                    |                      |                                                                              |   |                                  |   |            |   |
| Work Placement                                   |   | N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      |                                                                              |   |                                  |   |            |   |
| Planned Learning Activities and Teaching Methods |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                      | Explanation (Presentation), Demonstration, Individual Study, Problem Solving |   |                                  |   |            |   |
| Name of Lecturer(s)                              |   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                      |                                                                              |   |                                  |   |            |   |

### Assessment Methods and Criteria

| Method              | Quantity | Percentage (%) |
|---------------------|----------|----------------|
| Midterm Examination | 1        | 40             |
| Final Examination   | 1        | 60             |

### Recommended or Required Reading

|   |                                                                                                                                                  |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Prof Dr. Mahmure Üstün Özgür, Kimyasallar ve Tehlikeleri Dersi Ders Notları, İş Sağlığı ve Güvenliği Bölümü, Meslek Yüksek Okulu, YTÜ, 2004-2005 |
| 2 | Laboratuvar Güvenliği, Prof. Dr. Handan Ak Çelik, 2004                                                                                           |
| 3 | Prof. Dr. Lale ZOR, 17. ve 19. Ünite, Ders Notları, AÖF, Anadolu Üniversitesi, 2004                                                              |
| 4 | Dr. Kemal Akın ve Dr. Salih Cesur, Laboratuvar Güvenliği Ders Notları, Ankara Üniversitesi, 2004                                                 |
| 5 | Yrd.Doç.Dr. Memduh Sami TANER Akdeniz Üniversitesi Eğitim Fakültesi Kimya Eğitimi Anabilim Dalı                                                  |
| 6 | Leonard, J., Lygo, B. and Procter, G., "Advanced Practical Organic Chemistry", 2nd ed., Nelson Thornes, Cheltenham, 2001                         |
| 7 | Nüket Öcal ve Feray Aydoğan, Organik Laboratuvar Teknikleri, YTU, 2004.                                                                          |

| Week | Weekly Detailed Course Contents |                                                                                                                                                                         |
|------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Theoretical                     | Safety and proper use of laboratory in chemistry laboratory. Measures to be taken while working with hazardous chemicals in terms of laboratory safety and human health |
| 2    | Theoretical                     | Classification of chemicals, labeling, storage and usage information                                                                                                    |
| 3    | Theoretical                     | Labeling, material safety data (MSDSs), information and training                                                                                                        |
| 4    | Theoretical                     | Safety equipment: Personal protective equipment, laboratory safety equipment                                                                                            |
| 5    | Theoretical                     | Laboratory Accidents and First Aid                                                                                                                                      |
| 6    | Theoretical                     | Storage and disposal of waste chemicals                                                                                                                                 |
| 7    | Theoretical                     | Introduction, functions, cleaning of glass materials                                                                                                                    |
| 8    | Theoretical                     | The planning of an experiment, the establishment and implementation of the devices (Midterm exam evaluation)                                                            |
| 9    | Theoretical                     | The points to be noted during the purification of the product                                                                                                           |
| 10   | Theoretical                     | Establishment of basic laboratory procedures and devices                                                                                                                |
| 11   | Theoretical                     | Execution and termination of reactions and purification techniques                                                                                                      |



|    |             |                                                                                                                              |
|----|-------------|------------------------------------------------------------------------------------------------------------------------------|
| 12 | Theoretical | Execution and termination of reactions and purification techniques                                                           |
| 13 | Theoretical | Working under inert atmosphere, working with inert gases, storage and purification of liquids, and considerations for safety |
| 14 | Theoretical | Separation techniques and Introduction to Chromatography                                                                     |

**Workload Calculation**

| Activity                                     | Quantity | Preparation | Duration | Total Workload |
|----------------------------------------------|----------|-------------|----------|----------------|
| Lecture - Theory                             | 14       | 1           | 2        | 42             |
| Lecture - Practice                           | 14       | 1           | 2        | 42             |
| Midterm Examination                          | 1        | 8           | 1        | 9              |
| Final Examination                            | 1        | 8           | 1        | 9              |
| Total Workload (Hours)                       |          |             |          | 102            |
| [Total Workload (Hours) / 25*] = <b>ECTS</b> |          |             |          | 4              |

\*25 hour workload is accepted as 1 ECTS

**Learning Outcomes**

|   |                                                                                                                                                                                                               |
|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Students will be informed at the end of the semester on issues of chemistry, hazards, safety precautions and emergency aid. Thus, students will work more consciously and securely in home and business life. |
| 2 | Students will learn the necessity of laboratory training, the main rules to be followed and what to do in an emergency                                                                                        |
| 3 | Students will have information about planning an experiment, realizing it, and purifying the product.                                                                                                         |
| 4 | To have knowledge about laboratory accidents and first aid methods                                                                                                                                            |
| 5 | Ability to work effectively in multidisciplinary teams individually and have the confidence to take responsibility                                                                                            |

**Programme Outcomes (Cosmetic Technology)**

|    |                                                                                                                                                                                                                                                                                                                          |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | To define and classify cosmetics.                                                                                                                                                                                                                                                                                        |
| 2  | To learn the classification of cosmetic raw materials, purposes, products to use and what properties should be carried.                                                                                                                                                                                                  |
| 3  | To describe and classify toxicity, to learn toxic substances and analyze methods.                                                                                                                                                                                                                                        |
| 4  | To learn laboratory safety, to apply safety precautions when working with dangerous chemicals.                                                                                                                                                                                                                           |
| 5  | To learn and apply necessary tests for cosmetic raw materials, intermediates and finished products.                                                                                                                                                                                                                      |
| 6  | To perform a scientific study, analyze study and report results of study scientifically.                                                                                                                                                                                                                                 |
| 7  | To interpret experimental results, to evaluate data in point of cosmetic science.                                                                                                                                                                                                                                        |
| 8  | To act in accordance with the principles of ethics, to have awareness of professional and ethical responsibility.                                                                                                                                                                                                        |
| 9  | To be individuals who are committed to Atatürk's Principles and Revolutions, contemporary, democratic, secular, protecting and developing their country, protecting their nation, respecting human rights, protecting nature, non-discriminatory, adhering to their traditions and customs, and protecting their values. |
| 10 | To be an individual who has completed his personal development, can adapt to society and contribute positively                                                                                                                                                                                                           |

**Contribution of Learning Outcomes to Programme Outcomes** 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

|    | L1 | L2 | L3 | L4 | L5 |
|----|----|----|----|----|----|
| P4 | 5  | 5  | 5  | 5  | 5  |

