



## AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

|  |   |  |                      |   |   |                                |   |            |   |
|--|---|--|----------------------|---|---|--------------------------------|---|------------|---|
| Course Title                                     |   | Techniques of Protein Denaturation   |                      |   |   |                                |   |            |   |
| Course Code                                      |   | VBY631   |                      | Course Level  |   | Third Cycle (Doctorate Degree) |   |            |   |
| ECTS Credit                                      | 4 | Workload   | 100 ( <i>Hours</i> ) | Theory  | 1 | Practice                       | 2 | Laboratory | 0 |
| Objectives of the Course                         |   | To explain the principle of protein denaturation, teach the methods of denaturing,   |                      |   |   |                                |   |            |   |
| Course Content                                   |   | The principle of protein denaturation, precipitation of proteins by heat, alcohol, acid, ammonium sulfate, and salts of heavy metals |                      |   |   |                                |   |            |   |
| Work Placement                                   |   | N/A  |                      |   |   |                                |   |            |   |
| Planned Learning Activities and Teaching Methods |   |  |                      | Explanation (Presentation), Experiment, Demonstration, Individual Study |   |                                |   |            |   |
| Name of Lecturer(s)                              |   |  |                      |   |   |                                |   |            |   |

### Assessment Methods and Criteria

| Method              | Quantity | Percentage (%) |
|---------------------|----------|----------------|
| Midterm Examination | 1        | 20             |
| Final Examination   | 1        | 60             |
| Quiz                | 2        | 10             |
| Assignment          | 2        | 10             |

### Recommended or Required Reading

|   |   |
|---|---|
| 1 | 1-Klinik biyokimya (Yüregir, Güneş T.),   |
| 2 | 2- Klinik biyokimya = clinical biochemistry for medical students(Laker, M. F.), |
| 3 | 3-Klinik biyokimya analiz metodları (Adam, Bahattin)                            |

| Week | Weekly Detailed Course Contents |   |
|------|---------------------------------|---|
| 1    | Theoretical                     | Definition of proteins  |
|      | Practice                        | The introduction of laboratory equipment                        |
| 2    | Theoretical                     | Fuctions of protein   |
|      | Practice                        | The preparation of work plan                                    |
| 3    | Theoretical                     | Chemical structure of proteins                                  |
|      | Practice                        | Preparation of tools and equipment                              |
| 4    | Theoretical                     | Simple proteins   |
|      | Practice                        | Precipitation with heat test proteins                           |
| 5    | Theoretical                     | Conjugated proteins   |
|      | Practice                        | Protein precipitation with sulphpsalisilic acid acid test       |
| 6    | Theoretical                     | Derivative proteins   |
|      | Practice                        | Protein precipitation with concentrated nitric acid test        |
| 7    | Theoretical                     | Structure and conformation of the protein molecules             |
|      | Practice                        | Protein precipitation with tricloraetic asit (TCA) test         |
| 8    | Theoretical                     | Midterm exam  |
|      | Practice                        | Midterm evaluation  |
| 9    | Theoretical                     | Denaturation of proteins and precipitation reactions            |
|      | Practice                        | Denaturation of proteins and precipitation reactions            |
| 10   | Theoretical                     | Identification with the color reactions of proteins             |
|      | Practice                        | Identification of proteins by reaction assay ksantoprotein      |
| 11   | Theoretical                     | Proteins, sorting resolutions                                   |
|      | Practice                        | Identification of proteins by the reaction of lead acetate test |
| 12   | Theoretical                     | Separating proteins by molecular size                           |
|      | Practice                        | Identification of proteins by the reaction of lead acetate test |
| 13   | Theoretical                     | Separation of proteins by electrical charge                     |
|      | Practice                        | Identification of proteins by reaction assay Sakagucchi         |



|    |             |  |
|----|-------------|--|
| 14 | Theoretical | The amino-terminal amino acid of a protein or peptide Assays |
|    | Practice    | Determination of protein in the blood                        |

**Workload Calculation**

| Activity                              | Quantity | Preparation | Duration | Total Workload |
|---------------------------------------|----------|-------------|----------|----------------|
| Lecture - Theory                      | 14       | 0           | 1        | 14             |
| Lecture - Practice                    | 14       | 0           | 2        | 28             |
| Assignment                            | 2        | 5           | 1        | 12             |
| Term Project                          | 2        | 2           | 3        | 10             |
| Quiz                                  | 2        | 5           | 1        | 12             |
| Midterm Examination                   | 1        | 8           | 1        | 9              |
| Final Examination                     | 1        | 14          | 1        | 15             |
| Total Workload (Hours)                |          |             |          | 100            |
| [Total Workload (Hours) / 25*] = ECTS |          |             |          | 4              |

\*25 hour workload is accepted as 1 ECTS

**Learning Outcomes**

|   |   |
|---|---|
| 1 | Learn the structure of proteins                   |
| 2 | Learn the methods of protein denaturation         |
| 3 | Gain the ability to analyze and make hypothesis   |
| 4 | To learn the chemical properties of proteins      |
| 5 | To learn the methods of precipitation of proteins |

**Programme Outcomes (Biochemistry (Veterinary Medicine) Doctorate)**

|    |   |
|----|---|
| 1  | Has a deep and broad knowledge about the field and the interdisciplinary area related with the field through the achievements gained in undergraduate and professional levels.  |
| 2  | Has the knowledge to create original ideas, analyze them and develop definition/product/diagnosis methods by using the knowledge gained in undergraduate and/or professional experience, when needed.                               |
| 3  | Is knowledgeable about theories and practices in methodological and scientific research methods to run an independent research.   |
| 4  | Excels in the laboratory, clinical and similar fields by using the theoretical and practical information gained in former education, and has the ability to create solutions in related fields.                                     |
| 5  | Designs and develops scientific methodology for the advanced level/newly defined/emerged problems about the field.  |
| 6  | Excels in the known scientific methods in the field for the advanced level/ newly defined/emerged problems.   |
| 7  | Designs unique researches and implements independently.   |
| 8  | Analyzes, synthesizes and evaluates the new ideas in related fields by using critical thinking.   |
| 9  | Plans, creates teams and carries out the interdisciplinary research projects in order to create solutions to the known/newly defined problems.  |
| 10 | Joins to congresses, panels, symposiums, workshops, seminars, article discussions and problem solving sessions in different disciplines, and exchanges information with the other professionals to contribute to the solutions.     |
| 11 | Broadens the borders of scientific information by publishing scientific articles in national and/or international peer-reviewed journals.   |
| 12 | Creates new ideas and methods to contribute to the technological, social and cultural progress, or to help the development of information society by using the theoretical, practical, independent research, abilities responsibly. |
| 13 | Designs and implements social projects with the awareness of creating an information society.   |
| 14 | Compiles and interprets any type of data (field observation, scientific knowledge etc.) in accordance with the aims.  |
| 15 | Develops and uses strategies about related topics with the field.   |
| 16 | Implements and defends institutional and practical information and abilities in accordance with the needs of the country and the world, and changes when necessary.   |
| 17 | Follows up and uses all the updates about the field (scientific information, legislations etc.), and has the qualification to change them.  |
| 18 | Adopts lifelong learning as a principle and acknowledges that the information gained through research is the most valuable gain.  |

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

|    | L1 | L2 | L3 | L4 | L5 |
|----|----|----|----|----|----|
| P1 | 5  |    |    | 5  | 5  |
| P2 | 5  |    |    |    |    |



|     |   |   |   |   |   |
|-----|---|---|---|---|---|
| P3  | 5 |   |   |   |   |
| P4  |   | 5 | 5 | 5 | 5 |
| P5  |   |   | 4 | 4 | 4 |
| P8  | 4 |   |   |   |   |
| P10 |   |   | 4 | 4 | 4 |
| P12 | 5 | 5 |   |   |   |
| P18 |   | 3 |   | 3 | 3 |

