



## AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

|  |   |   |                      |  |   |                                |   |            |   |
|--|---|---|----------------------|--|---|--------------------------------|---|------------|---|
| Course Title                                     |   | Water Delivery and Control Methods in Irrigation Systems  |                      |  |   |                                |   |            |   |
| Course Code                                      |   | ZTY612  |                      | Course Level   |   | Third Cycle (Doctorate Degree) |   |            |   |
| ECTS Credit                                      | 6 | Workload  | 150 ( <i>Hours</i> ) | Theory   | 2 | Practice                       | 2 | Laboratory | 0 |
| Objectives of the Course                         |   | The aim is to explain the water management in irrigation systems, introduciton of water measurement and distribution structures in irrigation systems   |                      |  |   |                                |   |            |   |
| Course Content                                   |   | Definition of a water delivery network, control and measurement of the irrigation water, deriving the water from upper level canals to the low level canals, rigid and flexible water delivery plans and terminology, preparing and application of the irrigation plan, optimal operation planning model for a canal system, performance criterions in water delivery system, importance of land consolidation in a water delivery system |                      |  |   |                                |   |            |   |
| Work Placement                                   |   | N/A   |                      |  |   |                                |   |            |   |
| Planned Learning Activities and Teaching Methods |   |   |                      | Explanation (Presentation), Discussion, Case Study, Project Based Study, 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 | Çevik, B., Tekinel, O., 1995. Irrigation Scheme and Operational Methods (Sulama Şebekeleri ve İşletme Yöntemleri). Çukurova Üniv. Ziraat Fakültesi Yayını, Adana                                    |
| 2 | FAO, 1994. Irrigation Water Delivery Models, Water Reports 2, FAO, Rome.  |
| 3 | Replote, J. A., Merrium, L.R., Swarner, L.R., Phelen, J.T., 1980. "Farm Water Delivery System, Design and Operation of Farm Irrigation Systems". Ed. M.E. Jensen. ASAE Monograph 3, St. Joseph, MI. |
| 4 | Cuenca, R.H., 1989. "Irrigation System Design: an Engineering Approach". Prentice Hall, Englewood Cliffs, New Jersey  |

| Week | Weekly Detailed Course Contents |  |
|------|---------------------------------|--|
| 1    | Theoretical                     | Identifying an irrigation scheme   |
| 2    | Theoretical                     | Control techniques in irrigation canals  |
| 3    | Theoretical                     | Importance of control in canals and applications in Turkey   |
| 4    | Theoretical                     | Basic principles of water measurement  |
| 5    | Theoretical                     | Basic principles of water distribution   |
| 6    | Theoretical                     | Water measurement and distribution structures in open canal and pipe irrigation systems                |
| 7    | Intermediate Exam               | Midterm Exam   |
| 8    | Theoretical                     | Modern water measurement methods in open canal systems   |
| 9    | Theoretical                     | Hydraulic properties of upstream, downstream and mixed control gates                                   |
| 10   | Theoretical                     | Linear quadratic control, Kalman filter and applications in irrigation systems                         |
| 11   | Theoretical                     | Effects of physical structures on water distribution   |
| 12   | Theoretical                     | Seasonal water distribution plan   |
| 13   | Theoretical                     | Improvement of irrigation water management systems   |
| 14   | Theoretical                     | Evaluation of measurement and distribution of water in irrigation systems in aspects of sustainability |
| 15   | Final Exam                      | Final Exam   |

### Workload Calculation

| Activity            | Quantity | Preparation | Duration | Total Workload |
|---------------------|----------|-------------|----------|----------------|
| Lecture - Theory    | 14       | 3           | 2        | 70             |
| Lecture - Practice  | 14       | 2           | 2        | 56             |
| Midterm Examination | 1        | 8           | 2        | 10             |



|   |   |    |   |     |
|---|---|----|---|-----|
| Final Examination                       | 1 | 12 | 2 | 14  |
| Total Workload (Hours)                  |   |    |   | 150 |
| [Total Workload (Hours) / 25*] = ECTS   |   |    |   | 6   |
| *25 hour workload is accepted as 1 ECTS |   |    |   |     |

### Learning Outcomes

|   |   |
|---|---|
| 1 | Identifying the measurement and distribution processes in irrigation systems  |
| 2 | The ability to use the basic engineering principles in water measurement and distribution   |
| 3 | Learning the modern technique and technologies in collecting the data from water measurement and distribution processes in irrigation systems |
| 4 | The ability to scientifically evaluate and bring new approaches to water measurement and distribution processes in irrigation systems         |
| 5 | Bring new approaches into irrigation system management improvement  |

### Programme Outcomes (Agricultural Structures and Irrigation Doctorate)

|   |   |
|---|---|
| 1 | Ability to analyze, synthesize and evaluate different forms of scientific knowledge in the field of studies         |
| 2 | Approach to information systematically, and gain skills related to their field the research methods                 |
| 3 | Innovative science to develop a scientific method or a method that is known to practice in their field              |
| 4 | Ability to organize and manage the project and advanced scientific research   |
| 5 | Advanced technologies, find solutions to engineering problems taking advantage of the software and model approaches |
| 6 | Creative, unbiased and critical thinking  |
| 7 | A topic in the field of written, verbally and visually as the ability to express                                    |
| 8 | Ability to publish in refereed journals National and international the results of studies                           |

### 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  | 5  | 5  |
| P2 | 5  | 5  | 5  | 5  | 5  |
| P3 | 5  | 5  | 5  | 5  | 5  |
| P4 | 5  | 5  | 5  | 5  | 5  |
| P5 | 5  | 5  | 5  | 5  | 5  |
| P6 | 5  | 5  | 5  | 5  | 5  |
| P7 | 5  | 5  | 5  | 5  | 5  |
| P8 | 5  | 5  | 5  | 5  | 5  |

