# AYDIN ADNAN MENDERES UNIVERSITY
# COURSE INFORMATION FORM

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|---|---|---|---|---|---|---|---|---|---|
| Course Title | Fuzzy Topological Spaces | | | | | | | | |
| Course Code | MTK577 | | Couse Level | Second Cycle (Master's Degree) | | | | | |
| ECTS Credit | 8 | Workload | 200 *(Hours)* | Theory | 3 | Practice | 0 | Laboratory | 0 |
| Objectives of the Course | The course aims to introduce and to understand fundamental notions of fuzzy topological spaces which is the generalization of general topological spaces and the course aims to provide a deep ability to search and study on these spaces. | | | | | | | | |
| Course Content | Fuzzy sets, fuzzy point, Fuzzy topological space, neighborhood system of fuzzy topological space, accumulation point, cluster point and closure, Fuzzy subspaces, Base of a Fuzzy topology, Fuzzy continuity in fuzzy topological spaces, Fuzzy product spaces, Fuzzy open and fuzzy closed functions, Fuzzy separation axioms, Fuzzy homeomorphic spaces. | | | | | | | | |
| Work Placement | N/A | | | | | | | | |
| Planned Learning Activities and Teaching Methods | Explanation (Presentation), Discussion, Individual Study, Problem Solving | | | | | | | | |
| Name of Lecturer(s) | | | | | | | | | |

| Assessment Methods and Criteria | | |
|---|---|---|
| Method | Quantity | Percentage (%) |
| Midterm Examination | 1 | 30 |
| Final Examination | 1 | 50 |
| Assignment | 1 | 20 |

| Recommended or Required Reading | |
|---|---|
| 1 | Fuzzy Topology, N. Palaniappan CRC Press, 2002. |
| 2 | First Course on Fuzzy Theory and Applications, KKwang, H.L., Springer |

| Week | Weekly Detailed Course Contents | |
|---|---|---|
| 1 | Theoretical | Classical Sets, Set Operations |
| 2 | Theoretical | Fuzzy Sets, Fuzzy Set Operations |
| 3 | Theoretical | Fuzzy point and examples |
| 4 | Theoretical | Fuzzy topological spaces and its properties |
| 5 | Theoretical | Fuzzy topological spaces and its properties |
| 6 | Theoretical | Neighborhood system in Fuzzy topological spaces |
| 7 | Theoretical | Accumulation point, cluster point and closure in fuzzy topological spaces |
| 8 | Theoretical | Midterm Exam |
| 9 | Theoretical | Fuzzy subspaces |
| 10 | Theoretical | Fuzzy continuity in fuzzy topological spaces |
| 11 | Theoretical | Base of a fuzzy topological space |
| 12 | Theoretical | Fuzzy product spaces |
| 13 | Theoretical | Fuzzy open and fuzzy closed functions |
| 14 | Theoretical | Fuzzy separation axioms |
| 15 | Theoretical | Fuzzy homeomorphic spaces |
| 16 | Final Exam | Final Exam |

| Workload Calculation | | | | |
|---|---|---|---|---|
| Activity | Quantity | Preparation | Duration | Total Workload |
| Lecture - Theory | 14 | 3 | 3 | 84 |
| Assignment | 1 | 22 | 2 | 24 |
| Midterm Examination | 1 | 40 | 2 | 42 |

| | | | | |
|---|---|---|---|---|
| Final Examination | 1 | 48 | 2 | 50 |
| | | | Total Workload (Hours) | 200 |
| | | | [Total Workload (Hours) / 25*] = **ECTS** | 8 |
| **25 hour workload is accepted as 1 ECTS* | | | | |

| **Learning Outcomes** | |
|---|---|
| 1 | Ability to understand the notion of fuzzy set and to learn how to apply its abstract properties |
| 2 | Ability to understand the notion of fuzzy space and ability to explain the differences between topological spaces |
| 3 | Ability to understand the concepts of continuity and basis of fuzzy topological spaces |
| 4 | Ability to determine a fuzzy function is open or closed |
| 5 | Ability to understand fuzzy separation axioms |

| **Programme Outcomes** *(Mathematics Master)* | |
|---|---|
| 1 | To be able to have an adequate theoretical and practical domain knowledge. |
| 2 | To be able to comprehend the interdisciplinary interaction associated with Mathematics. |
| 3 | To be able to use theoretical and practical domain knowledge gained in the field of Mathematics. |
| 4 | To be able to interpret knowledge from different disciplines integrating knowledge in the field of mathematics and produce new information. |
| 5 | To be able to define, analyse, model and to solve the problems by scientific methods in Mathematics. |
| 6 | To be able to conduct a math related specialistic study independently. |
| 7 | To be able to develop new strategic approaches to solve problems occurred in unforeseen and complex math-related applications by taking responsibility. |
| 8 | To be able to lead in situations that require solving problems related to the mathematics. |
| 9 | To be able to criticize his/her knowledge and skills acquired in the field mathematics. |
| 10 | To be able to transfer his/her ideas and suggestions for solutions to problems by supporting quantitative or qualitative data verbally and in writing. |
| 11 | To be able to communicate both orally and written in a foreign language. |
| 12 | To be able to use computer hardware and information technologies with software required by Mathematics. |
| 13 | To be able to contribute to the solution of the social, scientific, cultural and ethical problems related to the Mathematics, and being able to support the development of social, scientific, cultural and ethical values. |
| 14 | To be able to develop mathematics-related strategies, policies and operational plans, and to evaluate the results obtained within the framework of quality processes. |
| 15 | To be able to use his/her knowledge in the field of mathematics and practical problem-solving skills in interdisciplinary 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 | 4 | 4 | 4 | 4 | 4 |
| P2 | 3 | 4 | 4 | 4 | 4 |
| P3 | 3 | 4 | 4 | 4 | 4 |
| P4 | 3 | 4 | 5 | 5 | 5 |
| P5 | | 4 | 4 | 5 | 5 |
| P6 | | | 3 | 3 | 3 |
| P7 | 3 | 4 | 4 | 4 | 4 |
| P15 | 4 | 4 | 4 | 4 | 4 |