**University of Management and Technology**



**School of Science**

***Department of Mathematics***

**Course Code:** MTH601

**Course Title: Fuzzy Logics and its Applications**

**Program: MS MA**

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| **Schedule** |  | **Pre-requisite** |  | |
| **Course Coordinator** | Dr. Tabasam Rashid | **Contact** | Ext 3499  Cell: 03214609358 | |
| **Course**  **Description** | Fuzzy logic allows translating statements from natural language into a mathematical form. Once we have this mathematical form of knowledge, we are able to draw upon hundreds of years of recent history in technology to manipulate this knowledge.  **TOPICS:**  Fuzzy Sets  Examples of Fuzziness  Modeling of Fuzziness  Operations on Fuzzy Sets  Level Sets, Alpha Cuts  Images of alpha level sets  Negations  t-norm  t-conorm  Generators of t-norms and t-conorms  Fuzzy Relation  Fuzzy Numbers  Fuzzy Intervals  Interval Arithmetic  Triangular Fuzzy Numbers  Trapezoidal Fuzzy Numbers  Fuzzy Convexity  Fuzzy Implication, Yager's Implicator  Lattices, Zadeh’s Extension Principle.  Applications of fuzzy logic  Different extensions of fuzzy sets  Fuzzy Similarity measure  Fuzzy Graphs  Intuitionistic Fuzzy Sets  Hesitant Fuzzy Sets  Hesitant Fuzzy Linguistic Term Sets | | | |
| **Expected**  **Outcomes** | * Students can transform the classical concepts of Mathematics into Fuzzy Mathematics and they can study the applications of these transformations. | | | |
| **Text**  **Book(s)** | 1. Fuzzy logic with Engineering applications, Timothy J. Ross, *University of New Mexico, USA, Third Edition* 2. Fuzzy Logic by H.T. Nguyen and E. A. Walker, 3rd Edition. | | | |
| **Reference books** | 1. Fuzzy Theory and Applications by Kwang H. Lee. 2. Fuzzy Set Theory and its Applications by H. J. Zimmermann. | | | |
| **Assignments** | 2 | **Project** | | 1 project from advanced topics and/or research papers |
| **Quiz** | 2 |  | |  |
| **Mid Term**  **Examination** | 1 Midterm Exam | **Final**  **Examination** | | 1 Final Examination |
| **Attendance**  **Policy** | According to University Policy | | | |
|  | **Grading Policy** | | | |
| **Assignments** | 10% | **Project + Presentation** | | 10% |
| **Quiz** | 10% |  | |  |
| **Mid Term**  **Examination** | 30% | **Final**  **Examination** | | 40% |