**BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI**
**INSTRUCTION DIVISION**
**FIRST SEMESTER 2017-2018**

**Course Handout (Part - II)**

Date: 02/08/2017

In addition to part-I (General Handout for all courses appended to the time table) this portion gives further specific details regarding the course.

*Course No.*              : **BITS F343**
*Course Title*            : **FUZZY LOGIC & APPLICATIONS**
*Instructor-in-charge*  : **CHANDRA SHEKHAR**

1. **Scope and objective of the course:**

The aim of this course is two fold: 1. to provide a thorough understanding of the basics of this topic which has important applications in almost all fields of study; 2. to bring the students face-to-face with an application in some important area. To this end, every student is required to work on a project, as part of the course, involving an application of Fuzzy Logic (preferably in the students own discipline). The nature of the project could be study oriented, or computer-oriented, or simulation of a system or design of a working model etc. (The scope of the project is limited only by the student's imagination, creativity, and vision). Further, the project work provides an opportunity to the students to study Research Articles / Papers appearing in various journals and learn about the latest developments in the applications of Fuzzy Logic.

2. **Text Book:** M. Ganesh: Introduction to Fuzzy Sets and Fuzzy Logic, PHI, (2006)
   **Reference Books:**
   R1   George. J. Klir & Bo Yuan: Fuzzy Sets and Fuzzy Logic, PHI, 1997.
   R2   Timothy J. Ross:- Fuzzy Logic with Engineering Applications, John Wiley & Sons, 2004.
   R3   R. Kruse et al.: Foundations of Fuzzy Systems, John Wiley & Sons, 1994.
   R4   J. Yen & R. Langari: Fuzzy Logic: Intelligence, Info. & Control, Pearson (2001)
   R5   Kwang H. Lee: First Course on Fuzzy Theory and Applications: Springer International Edition (2005).
   R6   D. K. Pratihar: Soft Computing: Narosa (2008).
   R7   S.N. Sivanandam and S.N.Deepa: Principles of Soft Computing: Wiley India, Second Edition (2011).
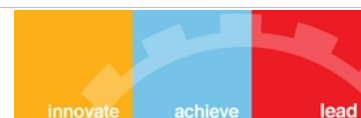
3. **Course Plan:**

| Learning Objectives | Topics to be covered | Lectures | Ref. to Text Book |
|---|---|---|---|
| Basics of crisp and fuzzy set and their properties | Crisp set Theory | 1 | Chap. 1 |
| | Fuzzy Set Theory | 2-9 | Chap. 6 |
| Introduction of fuzzy number and its applications | Fuzzy Numbers | 10-13 | R1 |
| To understand how fuzzy theory is useful in relation, logic, reasoning and their applications | Fuzzy Relations | 14-16 | Chap. 7 |
| | Propositional Logic & Predicate Logic | 17-20 | Chap. 2 & 3 |
| | Fuzzy Logic, Fuzzy reasoning | 21-25 | Chap. 8 |
| | Switching Functions & Boolean Algebra | 26-30 | Chap. 4 & 5 |
| How the fuzzy theory is applicable for real life problem | Applications of Fuzzy Logic | 31-34 | Chap. 9 & 10, Project |
| | Fuzzy Probability | 35-37 | R5 |
| To obtain understanding of neural network | Fundamentals of Neural Networks | 38-40 | R6 |

4. **Home & Reading Assignments:** Problems assigned in the class must be worked out. Students are expected to read relevant portions of the reference books and other books available in the library. Further, they must read all relevant articles and papers appeared/appearing in various Journals.

5. **Evaluation scheme:**

| Component | Duration | Weightage (%) | Date & Time | Remarks |
|---|---|---|---|---|
| Mid Semester | 90 minutes | 35 | 13/10  2:00 - 3:30 PM | CB |
| Assignment/Project/Presentation | ---------- | 20 | To be announced | Partly OB |
| Comprehensive | 180 minutes | 45 | 12/12  FN | Partly OB |

6. **Chamber Consultation Hour:** To be announced in the class.

7. **Notices:** Notices concerning the course will be displayed on Mathematics Department notice board and NALANDA.

**Instructor-In-Charge**