**Course Contents for MS/Ph. D (Mathematics)**

**Title of the Course: Soft Algebraic Structures**

**Credit Hours: 3 Course Code: MTH 704**

**Objectives:**

Specific Objectives of course: On successful completion of this course, students should be comfortable with several concepts of soft sets, fuzzy soft sets, intutionistic soft sets, intutionistic fuzzy soft sets and different operations among these classes of sets, soft group, soft ring soft vector space, soft module etc. Student should be able to write a research article.

**Course Outline:**

 This course is about soft sets and soft Algebraic Structures. A brief account of the developments that took place in last 17 years in the field of Soft Sets Theory (SST) will be studied. It will begin with a brief introduction on soft sets and then it will describe many generalizations of it. The notions of generalized fuzzy soft Sets will be defined and their properties will be studied. After that, a notion of Mapping, called soft mapping, in soft set setting will be introduced. Later, algebraic structures on soft sets like soft group, soft ring, etc. will be discussed. Next, some applications of hybrid soft sets in solving real life problems like medical diagnosis, decision-making, etc. will be studied.

**Recommended Text Material:**

1. Srikrishna S., Sreenivasulu Reddy. A., Vani S. A New Car Selection in the Market using TOPSIS Technique. International Journal of Engineering Research and General Science 2(4): (2014).

2. H. Deng, C. Yeh and R. Willis. Inter - company comparison using modified TOPSIS with objective weights. Computers & Operations Research 27(10): 963 – 973 (2000).

3. C. L. Hwang and K. Yoon. Multiple Attribute Decision Making: Methods & Applications. Berlin Heidelberg New York, Springer -Verlag (1981).

4. M. S. KhanmohammadiOtaghsara, M. Yazdani and J. Ignatius. A Review on state-of the-art survey of TOPSIS applications. Expert Systems with Applications 39: 13051–13069 (2012).

5. H. Yonghong. The Improvement of the Application of TOPSIS Method to Comprehensive Evaluation [J]. Mathematics in Practice and Theory 32(4): 572 – 575 (2002).

6. L. Chunhui and L. Aizhen. The Application of TOPSIS Method to Comprehensive Assessment of Environmental Quality. Journal of Geological Hazard and Environmental Preservation 10(2): 9 – 13 (1999).

7. Vimal J., Chaturverdi V., Dubey A.K. Application of TOPSIS method for supplier selection in manufacturing industry. International Journal of Research in Engineering and Applied Sciences 2(5): 25 – 35 (2012).

8. Y. J. Lai, . T. Y. Liu and L. Hwang. TOPSIS for MODM. European Journal of Operational Research 76: 486 – 500 (1994).

9. Jiang J., Chen Y.W., Tang D.W., Chen Y.W. Topsis with belief structure for group belief multiple criteria decision making. International Journal of Automation and Computing 7(3): 359-364 (2010).

10. Zadeh. LA. Fuzzy sets. Inf control 8, 338-353 (1965)

11. Pawlak, Z: Rough sets. Int. J. Comput. Inf. Sci. 11, 341-356 (1999)

12. Molodtsov, D: Soft set theory first result. Comput. Math. Appi. 37. 19-31 (2001)

13. Maji, PK, Biswas, R. Roy, AR: Fuzzy soft set. J. Fuzzy Math. 9(3), 677-692 (2001)

14. Neog, TI. Sut, DK: Theory of fuzzy soft sets from a new perspective. Int. J Latest Trends Comput. 2(3), 439-450 (2011)

15. De, SK. Biswas, R, Roy, AR: An application of intuitionistic fuzzy sets in medical diagnosis. Fuzzy sets syst. 117. 209-213 (2001).

16. Sanchez, E: Resolution of composite fuzzy relation equations. Inf. Control 30, 38-48 (1976).

17.Sanchez, E: Inverse of fuzzy relations, application to possibility distributions and medical diagnosis. Fuzzy Sets Syst. 2(1), 75-86 (1979)

18. Saikia, BK, Das, Pk, Borkakati, AK: An application of intuitionistic fuzzy soft sets in medical diagnosis. Bio-Sci. Res. Bull. 19(2), 121-127 (2003)

19. Chetia, B, Das, PK: An application of interval valued fuzzy soft set in medical diagnosis. Int. J. Contemp. Math. Sci. 5(38), 1887-1894 (2010)

20. Meenakshi, AR, Kaliraja, M: An application of interval valued fuzzy matrices in medical diagnosis. Int. J. Math. Anal. 5(36), 1791-1802 (2011)

21. Kaufmann, A, Gupta, MM: Introduction of fuzzy arithmetic Theory and Applications. Van Nostrand-Reinhold. New york (1991)

22. Ali, Ml, Feng, F, Liu, X, Min, WK, Shabir, M: On some new operations in soft set theory. Comput. Math. Appl. 57. 1547-1553 (2009)

23.Ali, Ml, Shabir, M: Comments on De Morgan’s law in fuzzy soft sets. J. Fuzzy Math. 18(3), 679-686 (2010)