**Course Contents for MS/PHD (Mathematics)**

**Title of the Course: Soft Set and its Applications**

**Credit Hours: 3 Course Code: MTH 604**

**Course Objectives:**

After successfully completing the 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. Further, students will be able to comprehend above mentioned classes in multi criteria decision making, such as, TOPSIS, AHP, SAW, etc for multi criteria decision making.

**Course Outline:**

Introduction to Soft set theory, basic operation on soft sets, Fuzzy soft sets , mappings on fuzzy soft set Recent advancements in soft set theoretic approach to decision making problems and practical achievements will be discussed in this course. Further potential topics include, but are not limited to:

Soft set-based decision making in incomplete information system, medical decision making, investment decision making problems, group decision making problems, multi-criteria group decision making, economic forecasting, etc.

**Recommended Text materials:**

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)