**PROTEOMICS CREDIT HOURS 2+1**

**LEARNING OUTCOMES:**

**Students will be able to:**

1. How proteomics application in molecular biology research can be helpful in solving the complex biological and biochemical processes
2. Experience to investigate if only one protein of the interest as well as whole proteome.

**COURSE CONTENTS:**

Expression, structural and functional proteomics; top down and bottom up strategies; 2 D gel, densitometry using software, affinity purification, tandem affinity purification (TAP) tagging, fluorescence resonance energy transfer (FRET) and co immune precipitation; Protein- protein interactions, Protein-DNA interaction, protein adducts, validation by two hybrid system (yeast) , mass spectrometry (APMS, MALDI TOF, FPLC,MALDI imaging), Protein microarray.

**PRACTICALS:**

1. Differential proteome analysis by 2D gel electrophoresis
2. *In silico* analysis and comparison of different proteomes

**RECOMMENDED BOOKS:**

1. Alexander,N G, and . Hiroshi. N. 2007. Microbial Biotechnology. Ch. The world of Omics: Genomics, Transcriptomics, Proteomics and Metabolomics pp147-168. Springer
2. Guenter, K. 2015. The Dictionary of Genomics, Transcriptomics and Proteomics and Proteomics 5thEdition. Published by Wiley Blackwell.
3. Hon-Chiu, E. W. L. 2012. Integrative Proteomics. Intech publishing. Germany.
4. Jung, K. 2016. Statistical analysis in proteomics. New York: Humana Press
5. Reinders, J. 2016. Proteomics in systems biology: Methods and protocols. New York: Humana Press.
6. Sechi, S. 2016. Quantitative proteomics by mass spectrometry. New York: Humana Press
7. Twyman. R. M. 2004. Principles of Proteomics. Taylor and Francis