Course Title: Chemometrics

Course Code: CH-825

Credit Hours: 3-0

Prerequisite: Nil

Course Objectives

1. To acquaint students with basic concepts of statistical techniques for chemistry data. To teach students about design of experiments; data processing by multivariate analysis; use of modern software for the application of mathematical and statistical methods. Students will be able to apply the new skills to real problems concerning applications and research.

2. Course Outcomes

At the end of the course, students have the following expertise: design of experiments; data processing by multivariate analysis; use of modern methods for the chemometric application.

3. Course contents

Inference - ANOVA- Least-squares.- Experimental design (two factors)- Experimental design with three factors. - Signal processing (centering and scaling). - Signal processing (time-domain methods). - Signal processing (the frequency-domain and the Fourier transform) - Latent variable analysis. Clustering. - Latent variable based regression. Classification.

4. Recommended Books

Bjørn K. Alsberg (2016) Chemometrics. Alsberg research group

Brereton, R. G. (2018). *Chemometrics: data driven extraction for science*. John Wiley & Sons.

Otto, M. (2016). *Chemometrics: statistics and computer application in analytical chemistry*. John Wiley & Sons.

Varmuza, K., & Filzmoser, P. (2016). *Introduction to multivariate statistical analysis in chemometrics*. CRC press.