	UNIVERSITAS PADJADJARAN FACULTY OF MATHEMATICS AND NATURAL SCIENCES MASTER PROGRAM IN CHEMISTRY	COURSE CODE: D20B.205

Module designation	Advanced Chemometrics
Semester(s) in which the module is taught	2
Lecturers	Ari Hardianto, PhD
Medium of instruction	English and Indonesian
Relation to curriculum	Mandatory Elective Courses Analytical Chemistry and Separation Master of Science in Chemistry
Teaching methods	Lecture and discussion
Workload	Total workload: 53.42 hours **CLASS** Lecture : 8.67 hours Tutorial : 4.69 hours Assignment : 15.02 hours Assesment : 3.34 hours Independent Study : 26.7 hours
Credit points	2 (2-0) 2 Credits = 3.62 ECTS

Required and recommended prerequisites for joining the module	-

Module objectives/intended learning outcomes	1. Students are able to explain the concepts of response surface methodology and principal component analysis accurately [C2, A2]. 2. Students are able to independently, systematically, and with high quality, establish the design of experiment for factor selection with the help of a computer [C4, P2, A3]. 3. Students are capable of independently, systematically, and with high quality, drawing conclusions from the experimental results of factor selection with the help of a computer [C5, P3, A3]. 4. Students are able to independently, systematically, measurably, and with high quality, establish various experimental designs for optimization in response surface methodology with the help of a computer [C4, P3, A3]. 5. Students are able to independently, systematically, measurably, and with high quality, draw conclusions from the experimental results of optimization in response surface methodology with the assistance of a computer [C5, P4, A4]. 6. Students are capable of independently, systematically, measurably, and with high quality, evaluating chemical data with principal component analysis using a computer [C5, P4, A5].

Contents	Chemometrics encompasses the use of mathematical and statistical methods to effectively and efficiently design experiments and measurements in the field of chemistry. Additionally, chemometrics also aids in the exploration, analysis, and evaluation of data from chemical experiments.

Examination forms	Assignment and Project-based assignment
Study and examination requirements	Minimum attendance at lectures is 80%. Final score is evaluated based on quiz (10%), individual assignment (20%), mid semester exam (35%), and end semester exam (35%).
Reading lists	1. Lawson, J. 2015. Design and Analysis of Experiments with R (1st ed.). Chapman and Hall/CRC. 2. Wehrens, R. 2011. Chemometrics with R: Multivariate Data Analysis in the Natural Sciences and Life Sciences. Springer-Verlag Berlin Heidelberg 3. Montgomery, D.C. 2013. Design and Analysis of Experiments. John Wiley & Sons, Inc.