MODULE HANDBOOK

Module Name	Spectroscopy and Chromatography Method
Module level	Bachelor
Abbreviation, if applicable	8420402190
Sub-heading, if applicable	-
Course included in the module, if applicable	-
Semester/term	5th/Third Year
Module coordinator(s)	Dr. Nita Kusumawati, M.Sc.
Lecturer(s)	1. Dr. Pirim Setiarso, M.Si; 2. Dr. Maria Monica Sianita, M.Si; 3. Prof. Dr. Titik Taufikurohmah, M.Si.
Language	Indonesian
Classification within the curriculum	Compulsory Course
Teaching format/class hours per week during the semester:	3 hours lecturers (50 min per hour)
Workload:	3 x 50 minutes lectures, 3 x 60 minutes structured activity, 3 x 60 minutes individual activity, 14 weeks per semester, 119 total hours per semester ~ 4.77 ECTS**
Credit points:	3 CU = 3 x 1.59 = 4.77 ECTS
Prerequisite course(s):	-
Targeted learning outcomes:	1. Students have knowledge of chemical analysis qualitatively and quantitatively in terms of chemical structure, energetics and analysis based on the working principles of several spectrophotometer and chromatography instruments. 2. Students have the ability to collaborate and are responsible for conducting qualitative and quantitative chemical analysis on several Spectrophotometer and Chromatography instruments. 3. Students have the skills to use the Spectrophotometer and Chromatography instruments in conducting chemical analysis qualitatively and quantitatively. 4. Students have the ability to communicate the results of chemical analysis qualitatively and quantitatively on several Spectrophotometer and Chromatography instruments.
Content:	1. Orientation of all analytical chemistry IV; 2. UV & UV-Visible Spectrometry; 3. Atomic Absorption & Fluorescence Spectrometry 4. Infra-red Spectrometry; 5. Nuclear Magnetic Resonance (NMR) spectrometry; 6. Mass Spectrometry (MS); 7. Gas Chromatography (GC); 8. High Perfomance Liquid Chromatography (HPLC).

<table>
<tr><td>Study / exam achievements:</td><td>Students are considered to complete the course and pass if they obtain at least 40% of maximum final grade. The final grade (NA) is calculated based on the following ratio:
<table>
<tr><th>Assessment Components</th><th>Percentage of contribution</th></tr>
<tr><td>Participation</td><td>20%</td></tr>
<tr><td>Assignment</td><td>30%</td></tr>
<tr><td>Mid-semester test</td><td>20%</td></tr>
<tr><td>Final semester test</td><td>30%</td></tr>
</table></td></tr>
<tr><td>Media:</td><td>Computer, LCD, White board</td></tr>
<tr><td>Learning Methods</td><td>Individuals assignment, group assignment, discussion, presentation, and practicum</td></tr>
<tr><td>Literature:</td><td>1. Harvey,D. 2000. Modern Analytical Chemistry. Int. Ed. Singapore: Mc.Graw Hill
2. Sawyer, Heineman, and Beebe,1984, Chemistry Experiments for Instrumental Methods, New York : John Wiley & Sons
3. Ewing G.W, 1981, Instrumental Methods Of Chemical Analysis, International Student Edition, Tokyo: McGraw-Hill Kogakusha Ltd
4. Skoog, D.A,1980, Principles Of Instrumental Analysis,ed II, Tokyo: HoltSounders Japan</td></tr>
<tr><td rowspan="2">Notes:</td><td>*1 CU in learning process = three periods consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.</td></tr>
<tr><td>**1 CU = 1.59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/Un38/Hk/Ak/2019</td></tr>
</table>