

MODULE HANDBOOK

Module Name	Spectroscopy and Chromatography Methods
Module level	Bachelor
Abbreviation, if applicable	3074212041
Sub-heading, if applicable	-
Course included in the module, if applicable	-
Semester/term	5 st /Third Year
Module coordinator(s)	Dr. Pirim Setiarso, M.Si
Lecturer(s)	1. Dr. Nita Kusumawati, M.Sc.; 2. Dr. Maria Monica Sianita, M.Si; 3. Prof. Dr. Titik Taufikurohmah, M.Si.
Language	Indonesian
Classification within the curriculum	Compulsory/ Elective
Teaching format/class hours per week during the semester:	3 contact hours of lectures (Indonesia credit semester or sks*)
Workload:	Lecture: 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 sks (4.77 ECTS)
Prerequisites 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).		
Attribute Soft skill:	Active communication; Disipline; Collaboration; Responsibility; and Argumentation in class and outdoor setting		
Study/exam achievements:	The final grade (NA) is calculated based on the following ratio:		
	Assessment Components		Percentage of contribution
	Participation		20%
	Assignment		30%
	Mid-semester test		20%
	Final semester test		30%
	Grade Conversion of 0-100 scale into 0-4 scale is set as below:		
	Letter	Number	Grade interval
	A	4.00	$85 \leq A \leq 100$
	A-	3.75	$80 \leq A- < 85$
	B+	3.50	$75 \leq B+ < 80$
	B	3.00	$70 \leq B < 75$
	B-	2.75	$65 \leq B- < 70$
	C+	2.50	$60 \leq C+ < 65$
	C	2.00	$55 \leq C < 60$
	D	1.00	$40 \leq D < 55$
	E	0.00	$0 \leq E < 40$
Media:	Computer, LCD, White board, laboratory instrument, text books, latest journals		
Learning Methods	Lecture using, individual assignment, group assignment, discussion, and presentation		

Literature:	1. Harvey,D.2000.<i>Modern Analytical Chemistry</i>. Int. Ed. Singapore: Mc.Graw Hill. 2. Sawyer, Heineman, and Beebe,1984, <i>Chemistry Experiments for Instrumental Methods</i>, New York : John Wiley & Sons. 3. Ewing G.W, 1981, <i>Instrumental Methods Of Chemical Analysis</i>, International Student Edition, Tokyo: McGraw-Hill Kogakusha Ltd. 4. Skoog, D.A,1980, <i>Principles Of Instrumental Analysis</i>,ed II, Tokyo: Holt- Sounders Japan 5. Arifiyana, Djamilah & Fernanda, MA. Hanny Ferry (2018) Analisis Kualitatif Dan Kuantitatif Cemarkan Logam Berat Timbal (Pb) dan Kadmium (Cd) Pada Produk Kosmetik Pensil Alis Menggunakan Spektrofotometer Serapan Atom (SSA). <i>Journal of Research and Technology</i>, 4 (1) pp: 55-62 6. Handes, T., Permatasari, D.A.I., & Mahardika, M.P., (2021) Analisis Logam Cd, Cr, Cu dan Pb Pada Air Sumur di Sekitar Kampus Universitas Duta Bangsa Surakarta Menggunakan Metode Spektrofotometri Serapan Atom (AAS), <i>Duta Pharma Journal</i> Vol. 1, no 1, pp: 48-56 7. Rosiana, Putri A.R., Rohman A., Riyanto S. & Setyaningsih, W. (2020) Autentikasi Minyak Ikan Patin (<i>Pangasius micronemus</i>) menggunakan Metode Spektroskopi FTIR yang dikombinasikan dengan Kemometrika, <i>Indonesian.J.Chemom.Pharm.Anal.</i> 2021, 1(1), 1-10 8. Aliqa Tiara et.al., (2020) Analisis dan Perbandingan Data Spektrum UV, IR, dan NMR Terhadap Struktur Senyawa Skopoletin, <i>Katalis: Jurnal Penelitian Kimia dan Pendidikan Kimia</i>, Vol 4 No 1 pp: 39-45
Notes:	*1 sks in learning process = three periods consist of: (a) scheduled instruction in a classroom (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. For lab activity: 1 sks in learning process = two periods consist of: (a) scheduled lab activity (100 minutes); (b) structured lab activity (70 minutes); **1 sks = 1.59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/Un38/Hk/Ak/2019