UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF CHEMISTRY
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Module name:	Atomic and Molecular Spectroscopy
Module level, if applicable:	Undergraduate
Code:	KMA 6202
Sub-heading, if applicable:	-
Classes, if applicable:	-
Semester:	6th
Module coordinator:	Prof. Dr. Endang Widjajanti Laksono FX
Lecturer(s):	Prof. Dr. Endang Widjajanti Laksono FX
Language:	Bahasa Indonesia, English
Classification within the curriculum:	Compulsory Course
Teaching format / class hours per week during the semester:	100 minutes lectures, 120 structured activities and 120 individual study per week
Workload:	Total workload is 90,67 hours per semester which consists of 100 minutes lectures, 120 structured activities and 120 individual study per week for 16 weeks
Credit points:	2 SKS (3 ECTS)
Prerequisites course(s):	1. Mathematics for Chemistry 2. General Chemistry 3. Chemical Equilibrium
Course Outcomes	After taking this course the students have ability to: CO1 – Understanding theoretical concepts of structure to solve problems and chemical research CO2 – apply chemical knowledge to explain the concept of spectroscopy CO3 – apply chemical knowledge to explain the concept of spectroscopy
Content:	The course discusses the basic concepts of spectroscopy, and structure of moleculer compounds. 1. Molecular Symmetry 2. Group theory and character tables 3. Rotation Spectroscopy 4. Vibration Spectroscopy 5. Electronic Transition Spectroscopy 6. Photoelectron and laser spectroscopy 7. Core magnetic resonance spectroscopy 8. Electron magnetic resonance spectroscopy 9. Its application in chemical systems
Study / exam achievements:	Attitude assessment is carried out at each meeting by observation and / or self-assessment techniques using the assumption that basically every student has a good attitude. The student is given a value of very good or not good attitude if they show it significantly compared to other students in

	general. The result of attitude assessment is not a component of the final grades, but as one of the requirements to pass the course. Students will pass from this course if at least have a good attitude. The final mark will be weight as follow:

No	CO	Assessment Object	Assessment Technique	Weight
1	CO1, CO2 and CO3	a. Assignment	Presentation / written assignment	30%
		b. Participation	Observation	20%
		c. Midterm Exam	Written test	20%
		d. Final Exam	Written test	30%
			Total	100%

Forms of media:	White Board, LCD Projector, Laptop/Computer, stationery
References:	1. Rita Kakkar, 2015, Atomic and Molecular Spectroscopy: Basic Concepts and Applications, 1 st ed., Cambridge University Press 2. Donald A. McQuarrie, 2011, Physical Chemistry: A Molecular Approach, 1 st ed., Viva Books 3. Hua Liu et al., 2019, Design and Synthesis of a Fluorescent Probe with a Large Stokes Shift for Detecting Thiophenols and Its Application in Water Samples and Living Cells, *Molecules*, 24(2), 375 4. Coralie Audoin et al., 2018, MS/MS-Guided Isolation of Clarinoside, a New Anti-Inflammatory Pentalogin Derivative, *Molecules*, 23(5), 1237 5. Irma Kartohadiprodjo. 1995. *Kimia fisika jilid 1*. Jakarta: Penerbit Erlangga (terjemahan dari Physical Chemistry 3rd Ed by P.W. Atkins) 6. Irma Kartohadiprodjo. 1999. *Kimia fisika jilid 2*. Jakarta: Penerbit Erlangga (terjemahan dari Physical Chemistry 3rd Ed by P.W. Atkins) 7. G.K. Venulapalli, 1993, *Physical Chemistry,* Prentice Hall, englewood Cliffs, New Jersey 8. J. M. Hollas, 1998, *Spectroscopie*, Dunod, Paris 9. G.M. Barrow, 1988, *Physical Chemistry*, Mc. Graw Hill book Co, Inc, New York

PLO and CO mapping

	PLO									
	Attitude	General Skill		Knowledge				Specific Skill		
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1						√				
CO2								√		
CO3									√	