UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF CHEMISTRY
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Bachelor of Science in Chemistry **MODULE HANDBOOK**

Module name:	Synthesis of Inorganic Compound
Module level, if applicable:	Undergraduate
Code:	KMA6222
Sub-heading, if applicable:	-
Classes, if applicable:	-
Semester:	6th
Module coordinator:	Prof. A. K. Prodjosantoso
Lecturer(s):	Prof. K. H. Sugiyarto
Language:	Bahasa Indonesia , English
Classification within the curriculum:	Elective Course
Teaching format / class hours per week during the semester:	Lectures: 100 minutes lectures, 120 structured activities and 120 individual study per week
Workload:	Total workload of the activity 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):	-
Course Outcomes	After taking this course, the students have ability to: CO1. Able to describe synthesis of inorganic materials, precursors, solvents, additive compound, synthesis method CO2. Able to describe the basic of crystallography, crystal system and cell unite, miller index CO3. Able to describe the solid-gas reaction, gas phase intercalation, Physical Vapor Deposition (PVD), Chemical Vapor Deposition (CVD), and Molecular Organic CVD CO4. Able to define Solid-Liquid Reaction, Solid-Liquid Interface, crystallization, precipitation, solidication, sol-gel method, hydrothermal, solvothermal, microemultion CO5. Able to describe solid-solid reaction, ceramics method, mechanical alloying, combustion synthesis, microwave method CO6. Able to explain synthesis at high and low temperature CO7. Able to define nanomaterial synthesis CO8. Able to explain material characterization: DTA/TGA, FTIR, XRF, XRD, SEM, TEM, CO9. Able to do a search and describe the results of their study using their own language regarding the research in synthesis of inorganic material

<table>
<tr><td>Content:</td><td>This course discusses basic principal and influent factors of chemical reaction to produce inorganic materials. The study also elaborates the method of synthesis and several approach that can be applied. Lecture emphasizes the student’s knowledge logically and scientifically to improve the ability to use scientific methods to solve problems relating how to synthesis a specific inorganic material.</td></tr>
<tr><td>Study / exam achievements:</td><td>The final mark will be weight as follow:
<table>
<tr><th>No</th><th>CO</th><th>Assessment Object</th><th>Assessment Technique</th><th>Weight</th></tr>
<tr><td>1</td><td rowspan="6">CO1, CO2, CO3, CO4, CO5, CO6, CO7, CO8, CO9</td><td>Structural assignment: ability to rasionalize and describing</td><td>Assignment</td><td>15%</td></tr>
<tr><td>2</td><td>Structural assignment: ability to applying the formula according to context</td><td>Assignment</td><td>15%</td></tr>
<tr><td>3</td><td>Structural assignment: ability to collaborate, analyze, rasionalize, and communicate</td><td>Assignment</td><td>15%</td></tr>
<tr><td>4</td><td>Individual assignment: skill to collect literacy, understanding, and describing</td><td>Assignment</td><td>15%</td></tr>
<tr><td>5</td><td>Mid term exam</td><td>Written test</td><td>20%</td></tr>
<tr><td>6</td><td>Final exam</td><td>Written test</td><td>20%</td></tr>
<tr><td colspan="3"></td><td>Total</td><td>100%</td></tr>
</table></td></tr>
<tr><td>Forms of media:</td><td>Board, LCD Projector, handouts, PPT slides, and stationaries</td></tr>
<tr><td>Reference:</td><td>A. Ruren Xu and Yan Xu, 2017, Modern Inorganic Synthetic Chemistry, 2nd ed., Elsevier B.V.
B. Atim Johnson & Patricia Uwa (2019) Eco-friendly synthesis of iron nanoparticles using Uvaria chamae: Characterization and biological activity, Inorganic and Nano-Metal Chemistry, 49:12, 431-442.
C. Arshad, M.; Qayyum, A.; Abbas Shar, G.; Afshan Soomro, G.; Iqbal, M. Zn-Doped SiO_2 Nanoparticles Preparation and Characterization under the Effect of Various Solvents: Antibacterial, Antifungal and</td></tr>
</table>

	Photocatalytic Performance Evaluation. *J. Photochem. Photobiol. B: Biol.* 2018, *185*, 76–183. D. Schubert, U.; Husing, N (2012), *Synthesis of Inorganic Chemistry*, 3rd Edition, Wiley-VCH Verlag GmbH E. Rao, C.N.R; Biswas K. (2015), *Essentials of Inorganic Materials Synthesis*, Wiley F. Ningsih S.K.W., 2016, *Sintesis Anorganik*, UNP Press

PLO and CO mapping

CO	PLO									
	Attitude	Generic Skills		Knowledge				Specific Skills		
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10
CO1					✓					
CO2					✓					
CO3					✓					
CO4							✓			
CO5							✓			
CO6									✓	
CO7									✓	
CO8									✓	
CO9					✓					