



UNIVERSITAS NEGERI YOGYAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCES
DEPARTMENT OF CHEMISTRY EDUCATION
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Bachelor of Education in Chemistry

MODULE HANDBOOK

Module name:	Chemistry Learning Workshop
Module level, if applicable:	Undergraduate
Code:	MPK 6214
Sub-heading, if applicable:	-
Classes, if applicable:	1
Semester:	Odd
Module coordinator:	Dr. Das Salirawati
Lecturer(s):	Marfuatun, S.Pd.Si.,M.Si.
Language:	Bahasa Indonesia and English
Classification within the curriculum:	Elective Course
Teaching format / class hours per week during the semester:	100 minutes lectures, 120 minutes structured activities, and 120 minutes individual study.
Workload:	Total workload is 90.67 hours per semester which consists of 100 minutes lectures, 120 minutes structured activities, and 120 minutes individual study per week for 16 weeks.
Credit points:	2SKS (3.28ECTS)
Prerequisites course(s):	-
Course Outcomes	After taking this course the students have ability to: CO1. evaluate chemical learning aids CO2. understand the principle of developing teaching aids CO3. prepare proposals for making chemical learning props CO4. make chemistry learning aids
Content:	This course is a practical course that aims to make students understand and be able to develop teaching aids for chemistry learning in secondary schools (SMA / SMK) to support constructive, innovative and fun chemical learning. Workshop materials on chemistry learning include identification of chemical material that is considered difficult in high school / vocational school, alternative chemical teaching aids in the chemistry learning process in chemistry classes and labs, proposals for making teaching aids, and making teaching aids.
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.

	<p>The final mark will be weight as follow:</p> <table border="1" data-bbox="628 286 1444 528"> <thead> <tr> <th>No</th> <th>CO</th> <th>Assessment Object</th> <th>Assessment Technique</th> <th>Weight</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>CO1 CO2 CO3 CO4.</td> <td>Activities Assignments Final Exam</td> <td>Presentation / written test</td> <td>15% 65% 20%</td> </tr> <tr> <td colspan="4" style="text-align: right;">Total</td> <td>100%</td> </tr> </tbody> </table>	No	CO	Assessment Object	Assessment Technique	Weight	1	CO1 CO2 CO3 CO4.	Activities Assignments Final Exam	Presentation / written test	15% 65% 20%	Total				100%
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1	CO1 CO2 CO3 CO4.	Activities Assignments Final Exam	Presentation / written test	15% 65% 20%												
Total				100%												
Forms of media:	Board, LCD Projector, Laptop/Computer															
Literature:	<p>Direktorat Pembinaan Sekolah Menengah Atas, (2011), <i>Pedoman Pembuatan Alat Peraga Kimia Sederhana untuk SMA</i>. Jakarta: Kemdikbud.</p> <p>Instructional Services Office Contact – Lori Sandgren, (2017), <i>Instructional Materials and Media Handbook</i>, Wakulla County School Board.</p> <p>Derrick W. Smith, Sandra A. Lampley, Bob Dolan, Greg Williams, David Schleppebach, Morgan Blair, (2020), <i>Effect of 3D Manipulatives on Students with Visual Impairments Who Are Learning Chemistry Constructs: A Pilot Study</i>, <i>Journal of Visual Impairment & Blindness</i> Vol. 114, Issues 5</p> <p>Inas Sausan , S Saputro , N Y Indriyanti, (2019), <i>An Integrated Learning Media In Chemistry: How Can It Help Teachers And Students To Create A Good Impression?</i>, <i>UNNES Science Education Journal</i>, VOL 8 NO 3</p> <p>M Suleman, K H Sugiyarto and J Ikhsan, (2019), <i>Development of Media Three-dimensional (3D) Visualization using Virtual Reality on Chemistry Education</i>, <i>Journal of Physics: Conference Series</i>, Volume 1397, The 6th International Conference on Research, Implementation, and Education of Mathematics and Science 12–13 July 2019, Yogyakarta, Indonesia.</p> <p>Sascha Bernholt Karolina Broman Sara Siebert, Ilka Parchmann, (2018), <i>Digitising Teaching and Learning – Additional Perspectives for Chemistry Education</i>, <i>IJC</i> Volume 59, Issue 6-7</p> <p>Andrew T., Stulla Morgan J, Gainerb, Mary Hegarty, (2018), <i>Learning by enacting: The role of embodiment in chemistry education</i>, <i>Learning and Instruction</i> Volume 55, June 2018, Pages 80-92.</p> <p>F S Irwansyah, Y M Yusuf, I Farida and M A Ramdhani, (2017), <i>Augmented Reality (AR) Technology on The Android Operating System in Chemistry Learning</i>, <i>IOP Conference Series: Materials Science and Engineering</i>, Volume 288, The 2nd Annual Applied Science and Engineering Conference (AASEC 2017) 24 August 2017, Bandung, Indonesia.</p>															

	<p>Matthew R. Penny, Zi Jing Cao, Bhaven Patel, Bruno Sil dos Santos, Christopher R. M. Asquith, Blanka R. Szulc, Zenobia X. Rao, Zaid Muwaffak, John P. Malkinson, and Stephen T. Hilton, (2017), Three-Dimensional Printing of a Scalable Molecular Model and Orbital Kit for Organic Chemistry Teaching and Learning, <i>J. Chem. Educ.</i>, 94, 9, 1265–1271.</p> <p>Ramdhani, Muhammad Ali and Muhammadiyah, Hilmi, (2015), The Criteria of Learning Media Selection for Character Education in Higher Education, <i>International Conference of Islamic Education in Southeast Asia</i></p>
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PLO and CO mapping

	PLO					
	Attitude		Knowledge	Specific Skill	General Skill	
	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6
CO1			√			
CO2			√			
CO3				√		
CO4				√		