ICT-based learning of Physics

Module Name :	ICT-based learning of Physics	
Module Level :	Undergraduate	
Code :	32252012	
Sub-heading, if applicable :		
Classes, if applicable :		
Semester :	$5^{st}/6^{st}/8^{st}$	
Module coordinator :	Dr.Firmanul Catur Wibowo, M.Pd.	
Lecturer(s) :	Dr.Firmanul Catur Wibowo, M.Pd. Dr. Hadi Nasbey, S.Pd., M.Si. Upik Rahma Fitri, M.Pd.	
Language :	Indonesian	
Classification within the curriculum :	Compulsory course	
Type of Teaching	Contact hours per week during the semester	Class Size
Lecture (Expository, discussion, exercise)	100 minutes	40
Workload	Total workload of this course 90,6 hours (3 ECTS) per semester which consist of 26,67 hours (0,89 ECTS) classroom activity, 32 hours (1.06 ECTS) structured task, and 32 hours (1.06 ECTS) per semester.	
Credit points :	3 ECTS	
Prerequisite course(s) :	-	
Course Outcomes :	After taking this course the student have ability to : CLO153. Students are able to design learning based on instructional development model with ADDIE approach. CLO154. Students are able to use electronic teaching materials in learning and package them in an integrated learning system (e-learning system). CLO155. Students are able to implement digital video processing to support learning CLO156. Students are able to make a variety of ICT-based assessments. CLO157. Students are able to abstract the report of all media development activities into articles and publish them.	
Content :	1. How to Develop ICT-based Physics Learning Course: Research and Development using ADDIE Models. 1.1 Identify Required Resources 1.2 Determine Potential Delivery System 1.3 Compose Performance Objectives 1.4 Generate Content and Develop Media 1.5 Generate Content 1.6 An Implementation Strategy	

	1.7 Determine Evaluation Criteria 2. Electronic Book: Project to develop Physics Book in electronic format using 3D-Pageflip Professional Software or related software. 2.1 PDF Creator Software 2.2 Office Word & PowerPoint 2.3 Animation 2.4 Short Video 2.5 3D-Pageflip Professional or related software 3. Simulation and Animation: Project to create simulation and animation for Physics Teaching Using I-Spring Software or related software. 3.1 Office PowerPoint 3.2 I-Spring or related plugin for Office 4. The Video for Motion Analysis: Project to record various motion based on kinematic topics using tracker software for analyzing motion and then create a worksheet for motion analysis. 4.1 Smartphone 4.2 Video Editor software 4.3 Tracker Software 5. The Video for Learning Purpose: Project to make a YouTube Channel as learning media. Preservice Physics teachers create a YouTube channel, record a learning video, upload and share. 5.1 Video Editor software 5.2 YouTube Channel 6. Assessment Tools: Project to create assessments based on ICT. 6.1 QuizMaker or related software 6.2 Kahoot! or related software 7. Augmented & Virtual Reality: Project to create Augmented & Virtual Reality for Physics Teaching and use the provided apps. 7.1 Unity Pro and Sample Project 7.2 Provided Apps 8. E-Learning Platform: Packaging all electronic resources in an e-learning platform. 8.1 LMS Platform

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<tr><td></td><td>8.2 Moodle

9. Writing Report and Portfolio Profile: Create a report (scientific article) and linking the scholar profile based on the project using Google Scholar and ResearchGate.
9.1 Search the relevant studies
9.2 Writing media development report
9.3 Google Scholar
10. 9.4 ResearchGate</td></tr>
<tr><td>Study/exam achievements:</td><td>Examination are conducted as unit test, as following
<table>
<tr><th>No</th><th>Assesment Object</th><th>Assesment Technique</th><th>Weight</th></tr>
<tr><td>1</td><td>Case-based learning</td><td>Project Assessment (for group project assignments)</td><td>55%</td></tr>
<tr><td>2</td><td>Midterm Test</td><td>Written test</td><td>15%</td></tr>
<tr><td>3</td><td>Final Test</td><td>Written test</td><td>20%</td></tr>
<tr><td>4</td><td>Attendance</td><td>Presence list</td><td>10%</td></tr>
</table></td></tr>
<tr><td>Media :</td><td>Laptop/Computer, Smartphone, Camera, Tripod/Other Support, and Rigid Body</td></tr>
<tr><td>Literatures :</td><td>1. Branch, R. M. (2009). Instructional Design: The ADDIE Approach. Springer, Boston, MA.
2. Lee, W. W., & Owens, D. L. (2004). Multimedia-based instructional design: computer-based training, web-based training, distance broadcast training, performance-based solutions. John Wiley & Sons.
3. Chesky, N. Z., & Wolfmeyer, M. R. (2015). Philosophy of STEM education: A critical investigation. Springer.
4. Iinuma, M. (2015). Learning and Teaching with Technology in the Knowledge Society: New Literacy, Collaboration and Digital Content. Springer.
5. Marshall, C. C. (2009). Reading and writing the electronic book. Synthesis lectures on information concepts, retrieval, and services, 1(1), 1-185.
6. http://fmipa.unj.ac.id/pfisika/wp-content/uploads/2016/08/3D-Pageflip-Professional-3.pdf
7. https://www.ispringsolutions.com/support/suite/video-tutorials
8. https://physlets.org/tracker/
9. Joe, D. (2016). Learn Adobe Premiere Pro CC for Video Communication. Adobe Press.
10. https://www.ispringsolutions.com/free-quiz-maker
11. https://kahoot.com/
12. Glover, J. (2018). Unity 2018 Augmented Reality Projects: Build four immersive and fun AR applications</td></tr>
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	using ARKit, ARCore, and Vuforia. Packt Publishing Ltd. 13. Mealy, P. (2018). Virtual & augmented reality for dummies. Hoboken, NJ Wiley. 14. Jemni, M., & Khribi, M. K. (2017). Toward empowering open and online education in the Arab world through OER and MOOCs. In Open education: from OERs to MOOCs (pp. 73-100). Springer, Berlin, Heidelberg. 15. Mendoza-Gonzalez, R. (2016). User-Centered Design Strategies for Massive Open Online Courses (MOOCs). Springer. 16. Waks, L. J. (2016). The evolution and evaluation of massive open online courses: MOOCs in motion. Springer. 17. Muliyati, D., Bakri, F., Yulia A., & Efrita, K.A. (2017). CMS wordpress: media e-learning sains. CV Green CircLe Digital. 18. Bowden, J. (2011). Writing A Report: How to prepare, write & present really effective reports. Hachette UK. 19. Aliotta, M. (2018). Mastering Academic Writing in the Sciences: A Step-by-step Guide. CRC Press. 20. Updated Resources in https://www.dmuliyati.com/p/pembelajaran-fisika-berbasis-ict.html.