<table>
<tr><td>Module name:</td><td colspan="2">Science, Technology, Engineering and Mathematics (STEM) Application</td></tr>
<tr><td>Module-level, if applicable:</td><td colspan="2">Bachelor</td></tr>
<tr><td>Code:</td><td colspan="2">MA200</td></tr>
<tr><td>Subheading, if applicable:</td><td colspan="2">-</td></tr>
<tr><td>Classes, if applicable:</td><td colspan="2">-</td></tr>
<tr><td>Semester:</td><td colspan="2">2nd</td></tr>
<tr><td>Module coordinator:</td><td colspan="2">Dr. Ida Kaniawati, M.Si</td></tr>
<tr><td>Lecturer(s):</td><td colspan="2">Lecturer Team of STEM Application</td></tr>
<tr><td>Language:</td><td colspan="2">Bahasa Indonesia</td></tr>
<tr><td>Classification within the curriculum:</td><td colspan="2">Compulsory course / Core Expertise Courses of Faculty (MKKF)</td></tr>
<tr><td>Type of Teaching</td><td>Contact hours per week during the semester</td><td>Class Size</td></tr>
<tr><td>1. Lecture (expository method, discussion, presentation, simulation).<br>2. Structured activity: exercise (assignments based on conceptual, contextual and problem-solving approaches)<br>3. Self-study: project (Creating design/prototype of solution)</td><td>150 minutes</td><td>40</td></tr>
<tr><td>Workload:</td><td colspan="2">The total workload is 136 hours/8160 minutes (4.8 ECTS) per semester, consisting of 2100 minutes (1.24 ECTS) lectures, 1260 minutes (1.74 ECTS) exercise, 2280 minutes (1.24 ECTS) structured activities, 2520 minutes (1.48 ECTS) self-study per week for 16 weeks.</td></tr>
<tr><td>Credit points:</td><td colspan="2">4.8 ECTS (3 SKS), 1 SKS = 1.6 ECTS</td></tr>
<tr><td>Prerequisites course(s):</td><td colspan="2">MA(100) Science, Technology, Engineering and Mathematics</td></tr>
<tr><td>Course Learning Outcomes:</td><td colspan="2">After taking this course the students have ability to:<br>● CLO1. Aware and tolerance to real life problems.<br>● CLO2. Literate in Mathematics, Science, Technology, and Engineering<br>● CLO3. Solve social, economic, and environment problems critically, creatively, integrative, and multidisciplinary.<br>● CLO4. Make a decision in solving problems by considering the local, national, and global challenges.<br>● CLO5. Collaborative skills in group activities to achieve the goals.<br>● CLO6. Communicate actively and effectively.</td></tr>
<tr><td>Content:</td><td colspan="2">Energy crisis and advanced material technology development</td></tr>
<tr><td>Study/exam achievements:</td><td colspan="2">The final mark will be weight as follow:
<table>
<tr><th>No</th><th>CLO</th><th>Assessment Object</th><th>Assessment Techniques</th><th>Weight (%)</th></tr>
<tr><td>1</td><td>CLO2,</td><td>Subject Specific competence:</td><td></td><td></td></tr>
</table></td></tr>
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| | | | | | |
|---|---|---|---|---|---|
| | | | a. Group assignments | Worksheet | 20 |
| | 2 | CLO1, CLO3, CLO4 | Generic and social competence:<br>a. Group assignments | Communication skills<br>Product | 15<br>20 |
| | 3 | CLO5<br>CLO6 | b. Peer assessment | Performance | 15 |
| | **Total** | | | | **100** |
| Forms of media: | Powerpoints, zoom meeting, Board, LCD Projector, Laptop/Computer, LMS SPOT UPI | | | | |
| Literature: | 1. Osman, Amina & Ladhani, Sultana & Findlater, Emma & Mckay, Veronica. (2017). *A Curriculum Framework for the Sustainable Development Goals First Edition*.<br>2. Robert M. Capraro, Mary Margaret Capraro, James R. Morgan (2013) STEM Project-Based Learning: An Integrated Science, Technology, Engineering, and Mathematics (STEM) Approach, 2nd Ed, SENSE PUBLISHERS ROTTERDAM<br>3. Coyle, Eugene D. and Simmons, Richard A. (2014), "*Understanding the Global Energy Crisis"*. Purdue University Press. (Knowledge Unlatched Open Access Edition.)<br>4. Richard M. Felder, Rebecca Brent (2016) Teaching and Learning STEM: a Practical guide, John Wiley and Sons.<br>5. W.D. Callister, D.G. Rethwisch (2008) Fundamentals of materials science and engineering , John Wiley and Son | | | | |

**PLO and CLO mapping**

| | BC-1 | BC-2 | BC-3 | BC-4 | BC-5 | BC-6 | BC-7 | BC-8 | BC-9 | BC-10 | BC-11 | BC-12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CLO1** | √ | | | | | | √ | √ | | | √ | |
| **CLO2** | √ | | | | | | √ | √ | | | √ | |
| **CLO3** | √ | | | | | | √ | √ | | | √ | |
| **CLO4** | √ | | | | | | √ | √ | | | √ | |
| **CLO5** | √ | | | | | | √ | √ | | | √ | |
| **CLO6** | √ | | | | | | √ | √ | | | √ | |