Module Description

MPKP 307 Materials Chemistry and Nanomaterials

Module Name	**Materials Chemistry and Nanomaterials**
Module level, if applicable	Undergraduate Programme
Code, if applicable	MPKP 307
Subtitle, if applicable	-
Course, if applicable	-
Semester(s) in which the module is taught	6th Semester
Module coordinator(s):	Dr. Nelly Wahyuni, MSi
Lecturer	Dr. Nelly Wahyuni, MSi; Prof. Gusrizal, MSi; Dr. Antoni B. Aritonang, MSi
Language	Bahasa Indonesia
Relation to curriculum	*Compulsory* Courses for undergraduate programmes in Chemistry
Type of teaching, contact hours	Decide teaching/training components for each course outcome ● Theory /Face-to-face lecture (for understanding): 12 lecture meetings ● Problem: 2
Workload	*(Estimated) Total workload: 3 x 2.83 hours = 11.33 hours.* *Contact hours (lecture): 3 x 0.83 hours = 2.49.* *Private study including examination preparation, specified in hours: 3 x 2 hours = 6 hours* *3 x 50 minutes lectures,* *3 x 60 minutes structured activity,* *3 x 60 minutes individual activity,* *14 weeks per semester,* *119 total hours*
Credit points	3 (5.01 ECTS)
Requirements according to the	Registered in this course Minimum 75% attendance in this course

<table>
<tr><td>examination regulations</td><td></td></tr>
<tr><td>Learning goals/competencies:</td><td>Intended Learning Outcomes (ILO)
After taking this course, students will be able to:
1. LO-1
2. LO-3</td></tr>
<tr><td>Module objectives</td><td>After taking this course:
1. Students are able to explain the history of the development of materials science and engineering and the classification of metal-alloy, ceramic, polymer, composite, and biomaterial materials
2. Students are able to explain the formation of various types of materials
3. Students are able to analyze the relationship between structural aspects and the physicochemical properties of materials
4. Students will be able to apply and use the basic abilities of nanomaterial concepts in the manufacture and study of nanomaterial properties for the development of materials science</td></tr>
<tr><td>Content:</td><td>1. Introduction to materials science and engineering
2. Metal and metal alloy materials
3. Ceramic material
4. Polymer material
5. Composite materials
6. Biomaterials
7. Nanomaterials: classification, synthesis, characterization, and applications</td></tr>
<tr><td>Attribute Soft skill:</td><td>Discipline, responsibility, and argumentation in the classroom</td></tr>
<tr><td>Recommended prerequisites</td><td>-</td></tr>
<tr><td>Study and examination requirements and forms of examination</td><td>Students are considered to be competent and pass if they get at least 50% of the maximum final grade. The final grade (NA) is calculated based on the following :

<table><tr><td>Assessment Components</td><td>Percentage Contribution</td></tr><tr><td>Participation</td><td>10%</td></tr><tr><td>Assignment</td><td>20%</td></tr></table></td></tr>
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	<table><tr><td>Mid-semester test</td><td>35 %</td></tr><tr><td>Final semester test</td><td>35%</td></tr><tr><td>Total</td><td>100%</td></tr></table> Essay questions, take-home assignment
Learning Methods	Case-Based Teaching Method
Media employed	white board; power point presentation; and e-learning system
Reading list	1. Callister, W.D., 2007, Material Science and Engineering: An Introduction, 7th ed., John Wiley & Sons (Asia), New York. 2. Ishizaki, K., Komarneni, S., and Nanko, M., 1998, Porous Materials Process Technology and Applications, Kluwer Academic Publishers, Netherlands. 3. Kenneth J. Klabunde, 2001, Nanoscale Materials in Chemistry, John Wiley & Sons 4. Wilson, M., M Simmon, M,. and Regus, B., 2002, Nanotechnology: Basic Science and Emerging Technologies, UNSW Press Book