

Module Description

MPKP 425 Solid State Chemistry

Module Name	Solid State Chemistry
Module level, if applicable	Undergraduate Programme
Code, if applicable	MPKP 425
Subtitle, if applicable	-
Course, if applicable	-
Semester(s) in which the module is taught	7 th Semester
Module coordinator(s):	Risya Sasri, S.Si., M.Sc.
Lecturer	Berlian Sitorus, S.Si., M.Si., M.Sc., Ph.D Dr. Winda Rahmalia, S.Si., M.Si Intan Syahbanu, S.Si., M.Sc. Risya Sasri, S.Si., M.Sc Ferdinand Hidayat, S.Si., M.Si
Language	Bahasa Indonesia
Relation to curriculum	Elective Courses for the undergraduate programme in Chemistry
Type of teaching, contact hours	● Theory /Face-to-face lecture (for understanding): 10 lecture meetings ● Assignments: 2 ● Project: 2
Workload	<i>(Estimated) Total workload: 2 x 2.83 hours = 5.66 hours per week.</i> <i>Contact hours (lecture): 2 x 0.83 hours = 1.66 hours per week.</i> <i>Private study including examination preparation, specified in hours: 2 x 2 hours = 4 hours</i> <i>2 x 50 minutes lectures,</i> <i>2 x 60 minutes structured activity,</i> <i>2 x 60 minutes individual activity,</i> <i>79.33 total hours</i>
Credit points	2 (3.34 ECTS)
Requirements according to the examination regulations	Registered in this course Minimum 75% attendance in this course

Learning goals/competencies:	Intended Learning Outcomes (ILO) After taking this course, students will be able to: 1. LO-1 2. LO-2 3. LO-3 4. LO-4
Module objectives	1. Students can master the basics of materials science and apply logical, critical, systematic, and innovative thinking skills to implement the basics of materials science. 2. Students can explain and master the concept of crystal structure, which includes lattice systems, unit cell geometry, direction of crystal planes, polymorphic impurities, imperfections in crystals, non-crystalline materials, atomic vibrations, and atomic diffusion. 3. Students can explain the factors that influence crystal structure and solid characterization. 4. Students can master the concepts and apply the metal alloy system, which studies solid solutions in metals and compounds. 5. Students can explain the concept of electron transport in solids. 6. Students can explain the conductivity properties of materials based on the type of solid substance and band energy. 7. Students can explain the concept of single-phase metals, which include single-phase alloy processing, elastic and plastic deformation, plastic-deformed metals, recrystallization, and metal properties.
Content:	1. History and Development of Materials Science 2. The arrangement of atoms in crystalline materials 3. Factors influencing crystal structure and solid characterization 4. Metal alloy system 5. Transport of electrons in solids 6. Conductivity of materials, insulators, semiconductors, and superconductors 7. Single Phase Metal

Attribute Soft skill:	Discipline, effort, collaboration, responsibility, and argumentation in the natural classroom setting	
Recommended prerequisites	-	
Study and examination requirements and forms of examination	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 :	
	Assessment Components	Percentage Contribution
	Participation	10%
	Assignment	20%
	Mid-semester test	35 %
	Final semester test	35%
	Total	100%
	Mid and final semester tests are carried out as an essay exam.	
Learning Methods	Case-Based Teaching Method	
Media employed	white board; power point presentation; and e-learning system	
Reading list	Peter Atkins and Julio de Paula, 2014, Physical Chemistry: Thermodynamics, Structure, and Change, 10th edition, W.H.Freeman and Company, New York.	