

MODULE HANDBOOK

Course:	Atomic and Molecul Physics
Module Level:	Undergraduate
Code:	FIT305
Sub-heading, if applicable:	-
Courses included in the module, if applicable:	-
Semester/Term:	6 th / third year
Module Coordinator:	Febdian Rusydi, Ph.D
Lecturer(s):	Febdian Rusydi, Ph.D and Andi Hamim Zaidan, Ph.D
Language:	Bahasa Indonesia
Classification within the Curriculum:	Compulsory Course / Elective Course
Teaching format / class hours per week during semester:	2 hours of lectures (50 min / hour)
Workload:	2 hours of lectures, 2 hours of structural activities, 2 hours of individual study, 13 weeks per semester, and total 78 hours per semester ~ 2.6 ECTS*
Credit Points:	2
Requirement(s):	(FIT301) Quantum Physics and (FIT303) Electricity and Magnetism
Learning Goals/Competencies:	<p>General Competence (Knowledge) : Students are able to apply their knowledge of quantum physics and electrodynamic theory on atomic and molecular property based on its ground state electronic structure.</p> <p>Specific Competence:</p> <ol style="list-style-type: none"> 1. Students understand the implementation of molecular physics theory to explain molecular interactions or phenomenons. 2. Students understand about physical and chemical properties of atoms and molecules based on their ground state electronic structure. 3. Students are able to use basis of density functional theory for constructing the ground state electronic structure.
Contents:	<p>Atomic theory plays prominent role in every single field in science and technology. The theory is applied in widen applications, from material science, medical physics, biological process, up to astrophysics. The reason is because all macroscopic properties of all matters, organic or inorganic, are determined by atoms that build up the matter.</p> <p>Before forming a complex matter, atoms must interact one with another to form molecules. Molecules can form more complex matter, either in cluster form (chemical compounds), periodic form (crystals and surface), or shapeless matter (amorf). This makes molecular physics becomes the second important theory to understand more complex field in science and technology.</p> <p>This course is to study the physical and chemical properties of atoms and molecules based on their ground state electronic structure. To simplify the problem, the ground state electronic structure is constructed with the basis of density functional theory.</p>
Soft Skill Attribute	Good communication, Organization, Leadership, Logic, Ethics, Effort and Group

Study/Exam Achievements:	<p>Passing score is D (equivalent of score 40.0 of 100.0).</p> <p>The score is determined by one exam (40%) and one final task (60%).</p> <p>Final grade is defined asfollow:</p> <p>A : 75 – 100</p> <p>AB : 70 - 74.99</p> <p>B : 65 - 69.99</p> <p>BC : 60 - 64.99</p> <p>C : 55 - 59.99</p> <p>D : 40 - 54.99</p> <p>E : 0 - 39.99</p>
Forms of Media:	Whiteboard, projector.
Learning Methods:	Lecturing, homework, tutorial
Literature(s):	Wolfgang Demtroeder, 2010, <i>Atoms, Molecules, and Photons</i> , 2 nd edition, Springer.
Notes:	<p>*Total ECTS = {(total hours workload x 50 min) / 60 min } / 25 hours</p> <p>Each ECTS is equals with 25 hours</p>