MODULE HANDBOOK

Course:	**Many Body Quantum Mechanics**
Module Level:	Undergraduate
Code:	FIT306
Sub-heading, if applicable:	-
Courses included in the module, if applicable:	-
Semester/Term:	7th / Fourth 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:	3 hours of lectures (50 min / hour)
Workload:	3 hours of lectures, 3 hours of structural activities, 3 hours of individual study, 13 weeks per semester, and total of 117 hours per semester ~ 3.9 ECTS*
Credit Points:	3
Requirement(s):	(FIT301) Quantum Physics and (FIT303) Electricity and Magnetism
Learning Goals/Competencies:	**General Competence (Knowledge) :** Students are able to solve Schrödinger equation for many-electron system based on first principles calculations. **Specific Competence:** 1. Students are able to solve Schrödinger equation for many-electron atoms using some approximations. 2. Students understand how to implement Hartree-Fock theory method and Density Functional Theory method for many body quantum mechanics problems.
Contents:	In FIT301, students learn how to model hydrogen atom based on Schrödinger equation. Hydrogen atom is the only realistic case where Schrödinger equation can be solved analytically. For atoms with the number of electrons is two or more, the Schrödinger equation is impossible to solve analytically due to the complexness of interaction among electrons. This course is the extention of FIT301 Quantum Physics. Here students learn to solve Schrödinger equation for many-electron atoms using some approximations but still based on first principles (ab-initio) methods. The first method is Hatree-Fock theory and the second one is density functional theory.
Soft Skill Attribute:	Effort and ethic.

Study/Exam Achievements:	Passing grade is D (equivalent of score 40.0 of 100.0). The score is determined by one exam (40%) and one final task (60%). Score to grade conversion: A : 75 – 100 AB : 70 - 74.99 B : 65 - 69.99 BC : 60 - 64.99 C : 55 - 59.99 D : 40 - 54.99 E : 0 - 39.99
Forms of Media:	Whiteboard, projector.
Learning Methods:	Lecturing, homework, tutorial
Literature(s):	1. David J. Griffiths. 2004. *Introduction to Quantum Mechanics*, 2nd edition, Prentice Hall, 2. Attila Szabo and Neil S. Ostlund. 1996. *Modern Quantum Chemistry – Introduction to Advanced Electronic Structure Theory*, Dover.
Notes:	*Total ECTS = {(total hours workload × 50 min) / 25 hours Each ECTS is equals with 25 hours.