MODULE HANDBOOK

Course:	**Particle Physics**
Module Level:	Bachelor
Code:	FIT404
Sub-heading, if applicable:	-
Courses included in the module, if applicable:	-
Semester/Term:	7th/ Second Year
Module Coordinator:	Andi Hamim Zaidan M.Si., Ph.D.
Lecture(s):	Andi Hamim Zaidan M.Si., Ph.D. and Febdian Rusydi, Ph.D.
Language:	Bahasa Indonesia
Classification within the Curriculum:	~~Compulsory Course~~ / Elective Studies
Teaching format/class hours per week during the semester:	2 hours of lectures (50 min/hour)
Workload:	2 hours of lectures, 2 hours of structural activities, 2 hours of individual study, 14 weeks per semester, and total of 84 hours per semester (~2,8 ECTS*)
Credit Points	2
Requirement(s):	Nuclear Physics
Learning Goals/Competencies:	**General Competence (Knowledge):** 1. Able to classify elementary particles and their reactions in terms of quantum numbers and draw simple reaction diagrams (Feynman diagrams). 2. Able to describe the basic ingredients of the Standard Model of particle physics. 3. Able to describe and explain the fundamental physical principles for the standard model of particle physics, such as symmetries, invariants, and conservation laws. 4. Able to explain how experimental results are interpreted in terms of fundamental properties of quarks, leptons and force mediators. **Specific Competence:** 1. Able to use central concepts within particle physics, such as symmetries, invariants, and conservation laws in practical solution. 2. Able to apply these principles, together with logical and mathematical reasoning, to analyze particle physics processes. 3. Master how Feyman-diagrams and rules are employed in practical calculations.
Contents:	Introduction to Elementary Particles, Particle Zoo and Four Interactions. Symmetries and conservation laws and their significance in particle physics. The standard model for electroweak and strong interactions. Feynman rules. Quantitative

	comparing of theory and experiments for scattering and disintegration processes.
Soft Skill Attribute:	Effort and ethic.
Study/Exam Achievement:	Students are considered to be competent and passed if at least get 50% of maximum mark of the midterm test, final examination, quizzes and home work. Final score is calculated as follow: 35% Exam I + 35% Exam II + 20% Homework + 10% Quiz Final index is defined as follow : 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
Learning Methods:	Lectures and assessments
Forms of Media:	Powerpoints slides, LCD projectors and whiteboards.
Literature(s):	1. R. Eisberg, Quantum Physics of Atoms, Molecules, Solid, Nuclei, and Particle, John Wiley & Sons, 1985 2. Donald H. Perkins, Introduction to High Energy Physics, 4th edition, Cambridge University Press, 2000. 3. David Griffiths, Introduction to Elementary Particles, 2nd edition, Wiley-VCH, 2008.
Notes:	*Total ECTS = {(total hours workload × 50 min) / 25 hours Each ECTS is equals with 25 hours.